UPCOMING VMA PROGRAMS INCLUDE VIRTUAL AND LIVE EVENTS

VALVE

MAGAZINE
SUMMER 2021
VOL. 33, NO.3

On the Brink: A Stronger Infrastructure

- SUPPLY CHAIN CHALLENGES
- THE BASICS OF BALL VALVES
- THE FINAL CONTROL ELEMENT
- METALS: COUNTRY OF ORIGIN MATTERS!

175 Years

ESTABLISHED 1846

POWELL VALVES

Powell Valves

Customer Focus, Service and Purpose are Built Into Everything We Do.

For 175 years we've been on a mission. Your mission. When people are counting on you. You can count on us.

Every day, our employees and global partners teams come to work with one focus – our customers' missions. Whether it's designing custom valves with our engineering expertise developing valve solutions. We bring an unwavering commitment to help our customers succeed, and it's that sense of purpose and opportunity that make a difference in the world that drives us every day.

Our extensive portfolio of valves are currently being used for a variety of applications, including Petrochemical, Industrial Gas, Pulp & Paper, Pharmaceutical, Hydrocarbon processing, Food processing, Mining, Power Generation, Pipeline, Chemical, Space Science, Military and Mechanical construction.

You can count on us.

www.PowellValves.com
Contact your Powell Representative at:
513.852.2000

Reliability (noun):

the ability to consistently deliver sustained performance, efficiency and durability in industrial flow control applications through proven mission-critical technology and services.

Reinventing reliability
neles.com

NELES

The proven choice for low fugitive emissions valves

We've got you covered: Full qualification with optimized valve performance

Check out Velan valves that qualify to API 624, API 641, ISO-15848-1, and packing qualified to API 622. All of that while offering fugitive emissions lower than 100 ppmv from both the valve stem packing and body bonnet gasket.

How can we help you address your FE challenge?

Learn more at: www.velan.com

+1 514 748 7743
www.velan.com

70
1950-2020

VELAN
Quality that lasts.

VMA MAGAZINE
SUMMER 2021 | VOL. 33, NO. 3

VALVE MAGAZINE

www.VALVEmagazine.com

VALVE Magazine (ISSN No. 1057-2813) is the official magazine of the Valve Manufacturers Association of America (VMA) and is owned by VMA, located at 1625 K Street NW, Suite 325, Washington, DC 20006; 202.331.8105; Fax: 202.296.0378. Advertising queries: 513.527.8809. VALVE Magazine is mailed quarterly. Periodicals postage paid at Washington, DC, and at additional mailing offices.

VALVE Magazine is produced by Gardner Business Media on behalf of VMA.

POSTMASTER: Send address changes to **VALVE Magazine**, P.O. Box 1673 Williamsport, PA 17703-1673. Subscriptions are free to qualified readers in the United States and Canada; $40 per year to unqualified readers in the United States and Canada; $60 per year for all subscribers outside the United States and Canada.

VMA VALVE MANUFACTURERS ASSOCIATION OF AMERICA

www.vma.org

On Our Minds: Education, Supply Chain, Infrastructure and More

In this issue of VALVE Magazine we introduce the first in a series of Valve Basics articles in which we present different types of valves, actuators and controls to help provide a foundation for those wanting to develop their knowledge of the valve industry. The Valve Basics series also supplements our ongoing Basics seminars and training programs. This is another way VMA is working to ensure that all those who use, specify, distribute or manufacture valves—whether you are new to the industry or need a refresher on the fundamentals—turn to VMA and VALVE Magazine for unbiased and accurate information. We hope you find these articles valuable, and if you'd like more, attend our Valve Basics programs in person as well as our virtual, on-demand seminars.

This issue also addresses two topics that are top of mind to many and in the news recently: improving the country's dated and crumbling infrastructure and how to deal with supply chain disruptions brought on by the pandemic. A foremost thought leader on supply chain issues provides her perspective on why disruptions are here to stay, and the importance of having and preparing for resiliency and redundancy (page 30).

While the infrastructure article on page 14 focuses on water and wastewater infrastructure, there are take-aways for others who are not active in that market: the need for digitization, cybersecurity and system redundancy, and of course, government funding. VMA's Government Affairs Committee is working this issue from the legislative front on behalf of our members.

VMA, alongside the Hydraulic Institute, will host Tom Decker, who is quoted in our infrastructure article (page 14) as a speaker at our well-regarded Market Outlook Workshop, Aug. 5-6. In addition to the opportunity to explore water and wastewater issues and forecasts further with Mr. Decker, participants will also hear predictions and analyses on key market segments to the valve and pump industries. A new market, hydrogen, is added to the program this year to help our industry understand its potential in the energy space. We hope to see you virtually at this event.

If you are a manufacturer, supplier or distributor of valves, actuators or controls in the U.S. or Canada and like the work VMA is doing with this magazine and other programs, please join the organization. Members receive the latest updates and help steer VMA's work, as well as benefit from education, information, business intelligence and exclusive networking. Contact me at hrhoderick@vma.org or visit www.vma.org to find out more.

Heather

Heather Rhoderick, CAE
President

GLOBAL CERTIFICATION

Electric actuators for all types of industrial valves

Reliable and long-term service. AUMA offers a comprehensive portfolio.

- Customized solutions thanks to the modular scheme
- Corrosion protection with offshore certification
- Temperatures down to –76 °F
- Integration into all conventional distributed control systems
- Worldwide certifications and vendor approvals
- Service worldwide

Find out more on our automation solutions
www.auma.com

auma®
MANUFACTURED IN USA SINCE 1976

CONTRACTS AND PARTNERSHIPS

Baker Hughes, Horisont Energi Sign MoU for Carbon Capture Project

Baker Hughes and Horisont Energi AS have signed a memorandum of understanding (MoU) for the Polaris carbon storage project off the northern coast of Norway. Under the agreement, the two companies will explore the development and integration of technologies to minimize the carbon footprint, cost and delivery time of carbon capture, transport and storage.

Horisont Energi's Polaris offshore carbon storage facility is part of its "Barents Blue" project, which is the first global and full-scale carbon neutral "blue" ammonia production plant. Currently at the concept phase, the facility is expected to begin the construction phase in the second half of 2022.

Emerson Helps Neste Rapidly Increase Production of Biofuels

Emerson has been selected to support Neste's digital transformation of its expanded refinery in Tuas, Singapore. Emerson's automation systems and software will support Neste's plans to increase production by up to 1.3 million tons per annum by 2023.

Neste is the world's largest producer of renewable diesel and sustainable aviation fuel produced from renewable waste and residue raw materials. At the end of 2018, Neste made a strategic decision to expand its production facility in Singapore via the Singapore Expansion Project.

Curtiss-Wright Awarded Contract from Federal Equipment Company

Curtiss-Wright Actuation Division has been awarded a contract to provide Exlar electro-mechanical actuators to Federal Equipment Company in support of their weapons elevator systems for the Ford-class aircraft carrier program. Exlar actuators are used in several other mission critical areas on the Ford-class carriers, including the jet blast defector, integrated catapult control station and LSO actuation systems.

Eastern Controls Expands Territory and Partnership

Endress+Hauser announces its representative partner, Eastern Controls, is its exclusive authorized sales and service provider for the municipal market in Northern New Jersey and the New York City metropolitan area, effective April 1, 2021. "Eastern Controls is very excited to expand our water and wastewater industry presence with Endress+Hauser," said Cliff Mclaughlin, president of Eastern Controls. The company has supported the critical infrastructure of the U.S. with world-class products, solutions, training and services since 1969.

ACHIEVEMENTS

The Wm. Powell Company Celebrates its 175th Anniversary

The Wm. Powell Company is proud to announce its 175th anniversary, having been formed in 1846 in Cincinnati, OH, where it remains to this day. Reflecting on the company's long history, President, CEO & Chairman Randy Cowart, says, "The fact that we have been a healthy corporation during this period of time, having survived wars, depressions and natural disasters—in a very competitive marketplace—speaks well for itself."

The Wm. Powell Company also has a long and remarkable history with VMA. When the association first formed in 1938, a Powell representative was there. In fact, the Wm. Powell Company is the only company that has remained a member of the association without interruption to the present day.

As for the future, Powell has great expectations: "The company remains committed to the valve industry and is poised for significant future growth."

Neles Sets 3D Printing Milestone

Neles has delivered its first valve with a 3D printed valve body for field testing. Except for the body, the valve is a standard T5-series ball valve made of stainless steel. Neles started testing the suitability of 3D printing technologies for metal components years ago and supplied the first valves with non-pressure retaining 3D printed metal components in 2018.

The field tests will pro-

vide valuable information on the feasibility of using 3D printing to produce pressure-retaining parts with significantly quicker delivery times.

Optimation Wins Technology and Manufacturing Awards

Optimation Technology won the Manufacturing Innovation award from the Rochester Technology and Manufacturing Awards. Sean DeNeef, an Optimation pipefitter apprentice, won the Apprenticeship of the year award.

DeNeef began the program in October 2018. He is a veteran of the United States Army, serving overseas in Afghanistan and Korea as a wheeled vehicle mechanic. He attained an Auto Mechanical Technical Certificate from the Wayne Technical Career Center in High School and has worked as a mechanic in a variety of jobs. DeNeef chose to pursue the NYS-sponsored Apprenticeship Program with Optimation to expand his trade knowledge and skills.

ACQUISITIONS

Richards Industrials Acquires Equilibar LLC

Richards Industrials is pleased to announce the acquisition of Equilibar LLC. Headquartered in Fletcher, NC, Equilibar offers a wide range of back pressure, vacuum, and electronic regulators, as well as specialty valves and other fluid control products. Equilibar's unique, patented, dome-loaded multiple orifice technology provides best-in-class fluid control for some of the most challenging applications in the world.

"Equilibar's product technology and problem-solving capabilities are unparalleled. The team's impressive track record of innovation will bolster our existing pipeline of new products," said Jordan Bast, president and CEO of Richards Industrials.

Allied Valve Acquires Edgen Murray's Valve Services Business

Barry Shoulders, president and CEO of Allied Valve, announced the acquisition of Edgen Murray Corporation's Valve Services Business. Headquartered in Norwich, OH, Edgen Murray's Valve Services Business is a pipeline service provider with deep expertise in line valve repair, particularly for ORBIT valves.

The new valve services group will be led by David McHugh, vice president of Allied Valve's Pipeline Services, along with Wes Kemper, a 30-year Cameron valve repair and service team leader, and Paul Warren, who currently runs Allied Valve's pipeline valve and automation services team.

STANDARDS AND CERTIFICATIONS

MSS Elects New President and Officers

During the Annual Membership Meeting on May 6, 2021, the Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry membership elected Jim Barker of DeZURIK, Inc. as the new President of MSS. In addition, the membership elected David Bayreuther of Neles Corporation as First Vice President; Fred Washburn of Rexa, Inc. as Second Vice President and Paul Heald of Bonney Forge as Treasurer. Washburn previously served as President.

Jim Barker has over 48 years of experience in the valve and fittings industry. During his 24 years of participation in MSS, Barker has served on the Coordinating Committee and chairs multiple technical committees. He has also been a member and officer of the MSS Board of Directors, in addition to serving on the VMA Technical Committee for 17 years.

Highland Foundry Completes NORSOK Qualifications

Highland Foundry Ltd. has successfully completed its update of 22Cr (MDS D46) Duplex and 25Cr (MDS D56) Super Duplex casting Qualification Test Records (QTRs) to the current Rev.5 for NORSOK M-630 Edition 6 and M-650 Edition 4. In addition, the company updated MDS-R16 (CK3MCuN/254-SMO/6Mo) to the current Rev.5.

The NORSOK standards were developed by the Norwegian petroleum industry to ensure adequate safety, value adding and cost effectiveness for existing and future petroleum industry developments and operations.

Highland Foundry has been working with this widely referred to standard the past 14 years in addition to being included on approved and qualified vendor lists for duplex and super duplex castings for many of the major oil companies.

MSS Publishes Revised Standard for SP-51-2021

The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry

JULY-DECEMBER

Virtual Valve Basics
www.vma.org/valvebasics

Virtual Valve Forum
www. vma.org/valveforum

AUGUST

5-6
VMA Virtual Market Outlook Workshop with Hydraulic Institute
www.vma.org/marketoutlook

16-19
Offshore Technology Conference 2021
Houston
www.otcnet.org

OCTOBER

6-8
VMA Annual Meeting*
Scottsdale, AZ
www.vma.org/annualmeeting

13-14
Valve World Americas Expo
Houston
www.valveworldexpoamericas.com

16-20
WEF-TEC Conference & Exhibition
Chicago
www.weftec.org

NOVEMBER

2-4
Valve Basics Workshop (VMA)
Pasadena, TX
www.vma.org/valvebasics

OTHER VMA EVENTS
Please visit www.vma.org for additional programs scheduled this year. All dates subject to change.

* Open to VMA/VRC members only. Visit www.VMA.org to learn if your company qualifies for membership.

VALVE MAGAZINE

STAFF

PUBLISHER
Todd Luciano

EDITOR-IN-CHIEF
Judy Tibbs

MANAGING EDITOR
Jann Bond

CONTRIBUTING EDITOR
Greg Johnson

ART DIRECTOR/
PRODUCTION MANAGER
Rhonda Weaver

ADVERTISING DIRECTOR
Bill Caldwell

How to Contact VALVE Magazine

EDITORIAL OFFICES
1625 K Street, NW, Suite 325
Washington, DC 20006
phone: 571.274.0402
email: jtibbs@vma.org
website: www.ValveMagazine.com

ADVERTISING SALES
Todd Luciano
6915 Valley Ave.,
Cincinnati, OH 45244
phone: 513.527.8809
fax: 513.527.8801
email: tluciano@pfonline.com

CIRCULATION/SUBSCRIPTIONS
phone: 570.567.1193
fax: 570.320.2079
email:
valve@psaemail.com

NEW PRODUCTS, MEDIA AND INDUSTRY NEWS
Judy Tibbs
phone: 571.274.0402
email: jtibbs@vma.org

ARTICLE SUBMISSIONS
VALVE Magazine welcomes articles, proposals, manuscripts, photographs and ideas from our readers. For a copy of the magazine's Author's Guidelines, contact Judy Tibbs, Editor-in-Chief, at jtibbs@vma.org.

announces that SP-51-2021, Class 150LW Corrosion Resistant Flanges and Cast Flanged Fittings, has been revised and published by MSS.

Standard Practice (SP)-51 has served as an industry norm for over 72 years. The subject matter of this Standard Practice was formerly part of MSS SP-42 until it was re-written, and SP-42 now covers valves only. The committee had decided that a commercial need remained for flanges and flanged fittings of reduced weight. SP-51 continues to be maintained under the consensus of MSS Technical Committee 110, Steel Flanges and Flanged Fittings.

SAMSON Certified as Materials Manufacturer for Additive Manufacturing

SAMSON achieved certification as a materials manufacturer for the additive manufacturing (AM) of parts in compliance with the Pressure Equipment Directive. By applying the laser beam powder bed fusion method for metals (LB-PBF-M), the company is now capable of making pressurized valve parts of the stainless steels 1.4401/316 and 1.4404/316L. The 3D printer makes it possible to manufacture valves in sizes up to DN 100/NPS 4 that weigh max. 250 kg.

PEOPLE IN THE NEWS


Steve Dalton

VAL-MATIC... has appointed **Steve Dalton** as president following the retirement of **John V. Ballun**. Dalton began his career as a consulting engineer in the waterworks industry in Chicago and joined Val-Matic in 2011. As director of engineering, he participated in various standard-developing organizations including AWWA, MSS, ASSE and API.

During his tenure as president and CEO, Ballun led the company through six years of sustained growth in the water and wastewater valve markets and recently oversaw the acquisition of Val-Matic Valve by A.Y. McDonald. He previously served on the VMA Board and was a past president of the Manufacturers' Standardization Society (MSS).


Sean Winstone

BRADKEN... has appointed **Sean Winstone** as CEO. He joined Bradken in March 2019 as executive general manager manufacturing and has led the team through product and performance improvements, innovation and a clear customer focus. Acting CEO **Tetsuya Kitagawa** will resume his role as COO.

EMERSON... announced the election of **James Turley** as chair of the company's board of directors. Turley, who has served as a member of Emerson's board since 2013, is an independent director. Turley succeeds former chair and CEO **David N. Farr**, who retired after 20 years as CEO in February and concluded his board term on May 4, 2021.

SETPOINT INTEGRATED SOLUTIONS... announced that **Matthew Bate**, previously CFO, was promoted to the role of president and CEO. Bate will succeed **Jeff Birch**, who is transitioning to managing director, president and CEO of fellow Pon Holdings organization, The Hiller Companies.


Matthew Bate

VELAN... has appointed **Benoit Alain** as its new CFO. Beginning as special advisor to the CEO, Alain started his official responsibilities as CFO on June 1, 2021. He will succeed **John Ball**, who has been effectively carrying out his mandate as interim CFO since last January.

SPIRAX SARCO... has appointed **Ivan Gottberg** as president and general manager. He assumed his role on April 1, 2021, and is responsible for the USA business.




Sixty years. Hundreds of Customers. Thousands of Valves.

1961 was a good year to start a business. Leonard Johnson was chasing the American dream by starting the company after serving in World War II and participating in a partnership for a number of years. The original 2000 sq. ft. warehouse would be outgrown several times as the company grew into its current 102,000 sq. ft. facility.

The guiding principle has always been honesty, great service, and the desire to be the best at what we do. Through the decades the company has been blessed with great employees and great customers. The business model has changed over the years as new products and services were added, but the goal has always been to never cut corners and always do things the right way.

We thank all of those that have been, and still are on the United Valve payroll. All the valve technicians, engineers, machinists, welders, office staff and managers that continue to be the lifeblood of our organization.

We also thank the extensive list of customers that have entrusted us to take care of their valves, some of which have been with us for over 40 years. That list includes refiners, chemical companies, power plants, engineering companies, valve manufacturers and valve distributors all over the world.

It is estimated that less than 0.5% of companies last for 60 years. We are privileged to have done so and proud of the way we have done it.

The United Valve Team

60 UNITED VALVE
SIXTIETH ANNIVERSARY 1961 – 2021

United Valve
The Valve Service Specialists

9916 Gulf Freeway, Houston, Texas 77034-1045
Phone 713/944-9852 888/715-5093 Fax 713/944-5964

Visit us online at: www.unitedvalve.com

Second Half of 2021 Provides Diverse Programs for Valve Industry

VMA continues its work to be the voice of the industry, help our members address common challenges, and provide education, networking and business opportunities. We are excited to be able to offer top notch insight, analysis and educational opportunities this year. In addition to our renowned Valve Basics program and the members-only Annual Meeting—taking place in person—the Valve Forum and Market Outlook Workshop will be offered virtually. VMA members also have access to a variety of webinars on topics such as cybersecurity, valve design and test standards, implications of Buy America, valve materials, check valves and functional safety Some of these webinars are also open to the valve industry.

Programming for the remainder of 2021 includes both virtual meetings and, in the case of the VMA Annual Meeting, the first live event following the pandemic.

VMA's Government Affairs Committee is working on numerous issues on behalf of our members, including infrastructure, taxes, trade and tariffs, energy credits and more. Meetings with policy makers are on the cusp as the country opens back up again from the pandemic.

To help guide us and provide benchmarking to our members, the association's monthly statistics survey informs us that many in the industry share a positive outlook for this year and next, though concerns around the supply chain persist.

VMA's other committees continue to develop content for the education program and VALVE Magazine. Learn more about these committees, starting in this issue as we interview Paul Souza, Education & Training Committee chair (page 12).

MARKET OUTLOOK WORKSHOP REGISTRATION OPEN

The Market Outlook Workshop, taking place virtually on **Aug. 5-6, 2021**, is the must-attend event for valve and pump professionals responsible for strategy and forecasting. Both the VMA and the Hydraulic Institute work together to produce this event.

Bringing together global and national economic experts, as well as the experts who research and follow the economic indicators for end-use markets important to the valve industry, you will gain the insights you need to build a smarter and more accurate planning and forecasting process. This year's program offers speakers from some new markets important to the industry such as hydrogen, mining and pharmaceuticals, as well as experts on oil/gas, water/wastewater, energy, chemicals and more. A look at the global and domestic economies are also provided.

The Virtual Market Outlook provides all registrants access to the content and presentation for weeks, allowing for on-demand viewing of the presentations to fit each person's schedule. However, attendees will want to participate on both Aug. 5 and 6 for live Q&A discussions with the speakers.

Learn more and register at vma.org/marketoutlook.

VIRTUAL VALVE FORUM MANUFACTURING TRACK IS NOW LIVE

Ideal for those who work or supervise the production and assembly process in their companies, the sessions that make up this year's Valve Forum Manufacturing track cover key issues such as post-M&A business integration, automation and how to determine when to transition into and out of markets.

The Manufacturing Track is just one of the topical tracks that encompass the Valve Forum. Other tracks include technical, valve repair, and management and marketing topics, which are all scheduled to be released later in the year. All registrants received access to all content from all tracks, can network with each other throughout the year, and have access to the content throughout the year. Additionally, speakers and the member's planning the event host live discussions throughout the year on the topics addressed. There is no better way this year to stay apprised and on top of trends and issues in 2021, and to help you prepare for and lead the way in 2022.

MANUFACTURING TRACK COURSE DESCRIPTIONS

Considerations for Post-M&A Business Integration

Speakers: *Brendan Dignan, Partner, Baker Botts, Washington, DC, and John Kaercher, Partner, Baker Botts, Austin, TX*

This session covers important considerations regarding integrating businesses following an acquisition. The integration process is an important but often overlooked aspects of M&A transactions, as properly integrating a business is critical to recognizing the benefits and synergies of an acquisition.

Why Automation and How to Justify It

Speaker: *George Krause, Account Manager, JR Automation*

The levels of automation in all areas of life are constantly increasing, especially in manufacturing. How can your organization benefit from automation regarding health and safety, quality, floor space and labor costs? Also, learn when it's the right time to automate, how to establish viable solutions and how to calculate and justify the needed investment.

Transitioning to Other Markets—or Knowing What Markets to Transition Away From

Speaker: *Dr. Kenneth Sullivan, President and CEO, Micro Craft, Inc.*

Over the past couple of decades, issues such as offshoring and sequestration have forced companies to re-evaluate if their current core competencies permit them to survive, let alone succeed in this ever-changing marketplace. This presentation includes a case study of a company whose 60-year-old expertise is deteriorating due to changes in the market.

Learn more and register at vma.org/valveforum. Registration includes access to all topical tracks for the entire year! VM

Sandler Scholarship Offers Opportunities for VMA Members

In 2020, the VMA launched the William Sandler Scholarship Program to promote careers in manufacturing and to provide educational opportunities to VMA and Valve Repair Council member company employees and their children. The primary goal of the program is to encourage students to enter manufacturing fields.

Now in its second year, the William Sandler Scholarship program is available to dependents of employees from VMA or VRC member companies.

The scholarships are offered to dependent children of any full-time employee from a VMA or VRC member company who is pursuing a full-time undergraduate course of industrial or engineering studies in an accredited two- or four-year college, university or vocational/technical school. They can be students already in those programs or high school seniors accepted into a program, and they must maintain or achieve a 3.0 grade point average.

The program offers two awards to eligible candidates:

The William Sandler Engineering Award, an award of $1,000 to each recipient. Up to three awards per year will be given to applicants who are entering or in an engineering discipline consistent with the needs of the valve manufacturing industry.

The William Sandler Vocational Award, an award of $500 to each recipient. Up to two awards per year will be given to candidates entering a technical or vocational school in a manufacturing-related field such as welding.

This is the second year for this member-only program which was established to honor former VMA President Bill Sandler who served VMA for 42 years and retired in 2019 after serving for 20 years as President.

The application deadline is July 30, 2021.

For more information and to view the application, visit www.vma.org/SandlerScholar or email Marc Pasternak at mpasternak@vma.org. VM

Committee Spotlight: Education and Training Committee

VMA's committees are comprised of member company individuals who help drive forward VMA's mission by leading the activities around various issues, events and activities. Below, we learn about the Education and Training Committee and Chair **Paul Souza**, Training Manager for AUMA Actuators, Inc.

In addition to Paul, other members of the committee are:

John Molloy (Vice Chair), Manager, Sales Training, Fluid & Motion Control, Emerson Automation Solutions

Saverio Aloe, East Regional Channel Manager, Actuation Technologies, Emerson Automation Solutions

Mitchell Anderson, Director, Triple Offset Valve and Ball Valve Engineering, Bray International Inc.

Jeff Kane, Director of Sales and Marketing, DFT Inc.

Paul Souza, Education & Training Committee chair, presents a lesson on actuators at a Valve Basics event in 2019.

Greg Johnson, President, United Valve

Noah Miller, Applications/Engineered Sales Manager, Check-All Valve

For a full list of committees and how to get involved, contact VMA President Heather Rhoderick at hrhoderick@vma.org.

Q: Tell us about VMA's Education and Training Committee.

A: The Education and Training Committee educates and trains end-users and the industry on valves, actuators and controls. We provide introductory topics and content, as well as more advanced information. Our goal is to provide a strong foundation on valves, actuators and controls to help anyone working in the industry do their jobs better and gain an understanding of all the various types of these products, where they could be used, and considerations in selecting the appropriate type of V/A/C. To accomplish this, we have online training, in-person training, webinars and training that we bring directly to a facility. Through these programs, we've touched nearly 3,000 people during the 12 years since Valve Basics was launched.

Q: What do you enjoy about being a part of the Education & Training Committee?

A: Being with a group of very experienced team members. We all have the goal of transferring our knowledge without it being a sales presentation. We try to keep it very generic and informational.

Q: How is the Education & Training Committee helping VMA members? And you, personally and professionally?

A: Members have access to very experienced people who have been in the industry for years. I wish I had access to them when I started. The

E&TC team even offers our help outside of the meetings. Through my involvement, which goes back to when the committee was formed in 2009, I've learned a lot. I'm still involved because I learn something new almost every day. Interacting with the committee members has expanded that learning experience.

Q: What future changes, innovations, technologies, opportunities, etc., are you excited about for the valve industry?

A: The technology is changing most rapidly on the controls side. The applications are getting more involved with fieldbus protocols. Additionally, actuators are getting much smarter with the capability of custom programs for special applications.

Q: How did you get into the valve industry?

A: By mistake! I had put everything in my car on Cape Cod and moved temporarily to my sister's house in Pittsburgh. After several weeks, she told me if I was going to stay, I needed to find a job which was fine with me as I really liked it there. Got the job through the state employment system. As they say, the rest is history.

Q: What are some hobbies or activities that you enjoy outside of work?

A: Being from Cape Cod, I enjoy anything to do with the water, fresh or salt. I fish, scuba dive, boat, etc.

Q: If you could write a book, what would it be about?

A: Life. If you don't like it, try something else until you do.

Q: What is your favorite sports team?

A: Pittsburgh Steelers VM

WELCOME NEW MEMBERS!

VMA welcomes its newest member, **Gilmore** (www.gilmore.com), a Proserv company. Gilmore has been in business since 1960 and mainly serves the upstream energy market from its facilities and headquarters in Houston, TX. In 2010 they became part of ProServ. The company is committed to continually improving the reliability of infrastructure through innovative flow control solutions, and provides offerings in drilling, production, downhole and industrial solutions to the energy and industrial markets.

Zwick Valves North America (www.zwick-valves.com) is based in Houston, TX. The company has over 40 years of experience in the development and manufacture of valves and fittings, and focuses on providing quality products in demanding applications. Applications include exhaust gases, liquids, hot water or steam at low and high temperature ranges. The company's products are used in the chemical and petrochemical industries, as well as energy, mining, gas, oil/refining, sugar, and pulp and paper. Zwick is a global company with a global reach. The parent company is based in Germany.

The Valve Repair Council is pleased to announce its newest member, **Control Southern Inc.** (www.controlsouthern.com), located in Suwanee, GA. Control Southern is an integrated solutions provider helping manufacturers in the Southeast for more than five decades. CSI offers a comprehensive range of integrated industry solutions focused on improving its customers' operational reliability, safety and performance. It employs 65 people across several different locations. CSI is an Emerson Impact Partner serving as a local point of contact for service and applied engineering for Emerson's Automation Solutions business. VM

America Moves Toward a Stronger Infrastructure

Water tower in Lexington, KY
CREDIT: ABLOKHIN

Here's what you need to know about the multi-billion-dollar funding designated for the water and wastewater markets as part of the American Jobs Plan.

BY SUSAN KEEN FLYNN

President Biden's American Jobs Plan proposed a sweeping $2.3 trillion proposal to rebuild the economy. The initial Republican counterproposal was significantly smaller, endorsing approximately $568 billion in new spending. Both plans earmarked funds for improving America's water and wastewater infrastructure. The American Jobs Plan contains $111 billion for water/wastewater upgrades, and the GOP sets aside $35 billion for the task.

There has been abundant back-and-forth since those first proposals were presented. Several other plans have been offered that have a price point in between. Much of the deliberations have centered around the definition of infrastructure and whether it should include elements of social infrastructure along with the physical assets (i.e., "traditional infrastructure").

"Infrastructure is on center stage now—finally. And there's bipartisan backing and public support for a lot of it. That's good news for the water/wastewater space and the valve companies that serve that space," said Tom Decker, a water/wastewater consultant and owner of Thomas E. Decker Consulting. "There will continue to be debate between physical and social infrastructure, and the magnitude of the spending, but both the Democrats and Republicans agree that water/wastewater funding needs to be included."

The water/wastewater market has been strong for several years. The total

market size was $265 billion in 2018 and is projected to reach $457 billion by 2026, with a compound annual growth rate of 7.1% during that period, according to a market research report from Fortune Business Insights.

"Federal funding is one of the major factors affecting municipal water and wastewater construction spending," said Tim Nebosis, executive vice president, municipal, for valve manufacturer DeZURIK Inc. "If [legislation] passes, I would expect the recent strong demand across all valve and control products to continue for several more years as new project activity is executed."

As elected officials continue to debate how much money should be spent on infrastructure—and in what capacity—here are six things you should know about the water/wastewater market.

1. AN INFLUX OF FEDERAL MONEY EARMARKED FOR WATER/WASTEWATER IS LIKELY.

In addition to the various proposals for a large, comprehensive infrastructure package, there are numerous legislative bills in the works related to water/wastewater, but these three are the most significant:

- Senate Bill 914 – The Drinking Water and Wastewater Infrastructure Act of 2021, which passed the Senate in May, reauthorizes or establishes a variety of programs to provide safe drinking water or treat wastewater. For instance, the bill authorizes and revises the clean water state revolving fund (SRF) and the drinking water SRF, as well as the Water Infrastructure Finance and Innovation Act (WIFIA).
- House Bill 1848 – This is a broad bill related to infrastructure that includes rehabilitating the drinking water infrastructure. It also increases SRF fund money for drinking water and sets aside funds related to lead lines replacements as well as for polyfluorinated alkyl substances, remediation and treatment.
- House Bill 1915 – Introduced in March, the Water Quality Protection and Job Creation Act of 2021 focuses on wastewater infrastructure. It amends the Federal Water Pollution Control Act to reauthorize certain water pollution control programs and increases the funding for the clean water SRF.

"There's a lot to play out here. Is there going to be a single bill or a collection of targeted bills?" said Decker. "I believe there will be investment in water/wastewater infrastructure in some shape or form. We just don't know exactly what yet."

2. FUNDING WILL FACILITATE CONTINUED MARKET GROWTH, NOT A BOOM.

"When legislation passes in whatever form it takes and the money is appropriated, it will juice the market a little bit more than it is now," said Decker. "But in my estimation, it won't be a sudden avalanche because the market has already been growing. It will be incremental."

Part of the reason for steady growth is the nature of municipalities and private water companies, which tend to be conservatively managed, added Decker. "These aren't dot-coms or chip makers. They are not prone to wild spending sprees," he said. "They have the general public, elected officials, customers and shareholders to answer to, depending on if they are public or private."

To date, the WIFIA program has funded 50 large projects—over $20 million each—through long-term, low-cost

WATER AND WASTEWATER AT-A-GLANCE

America's infrastructure scores a C- on the American Society of Civil Engineer's 2021 Report Card for America's Infrastructure. Here are some facts and figures from the report card related to drinking water and wastewater:

DRINKING WATER – OVERALL GRADE C-

- Every two minutes there is a water main break in the U.S.
- 6 billion gallons of treated water are lost each day in the U.S.
- The average nationwide monthly drinking water rate increased 31% from 2012 to 2018.
- From 2015 to 2019, the U.S. Department of Agriculture provided more than $4.5 billion for 2,016 drinking water projects in rural communities.
- In 2019, more than a third of all utilities had a robust asset management program in place to prioritize capital and operations/management investments.

WASTEWATER – OVERALL GRADE D+

- Nationwide, the drinking water and wastewater pipes in the ground are on average 45 years old.
- The nation's more than 16,000 wastewater treatment plants are functioning, on average, at 81% capacity.
- 15% of plants have reached or exceeded capacity.
- Utilities spent more than $3 billion in 2019 to replace almost 4,700 miles of pipeline across the U.S.
- 62.5 billion gallons of wastewater per day is being treated by centralized wastewater treatment plants.

supplemental loans. And applications have skyrocketed during the past three years, said Decker. Selected projects range from a new $50 million water treatment facility in Biddeford, Maine, that replaces a facility built in 1884 to a $1.3 billion joint project involving a water district and a city in Oregon to provide additional resilient water supply capacity. While large-scale proposals such as these gain media attention, many other municipalities and utility companies focus on smaller projects.

3. REPAIR AND REHABILITATION PROJECTS WILL REMAIN ON THE AGENDA.

Bluefield Research forecasted that utilities throughout the U.S. would spend more than $234 billion on water and wastewater pipe repairs and replacements between 2019 and 2028. On the drinking water side, maintenance costs reached an all-time high of $50.2 billion above capital in 2017, according to the American Society of Civil Engineers 2021 Report Card for America's Infrastructure.

Utilities are spending more on operating expenses than capital expenses. "That's a pattern that's been in place for a while now, and the driver is that companies and municipalities are rehabilitating and replacing components," said Decker. "Rather than sinking money into brand new stuff, they're fixing what they've got." In addition, energy and supply costs are also on the rise, which further increases operating expenses.

"Determining top priorities for funding water and wastewater upgrade projects is a challenge for utilities because the need is so great," said Nebosis. "In certain parts of the country, the focus will be upgrading old infrastructure, while in others it may be on water and wastewater expansion to accommodate population growth."

4. INVESTING IN CAPITAL EXPENDITURES (CAPEX) MAY INCREASE.

Decker recalls one utility manager telling him the municipality had been "kicking the can down the road" on overdue capital projects. "The manager said, 'Sooner or later, we're going to have to stop fixing this waterline that keeps breaking and just put in a new one,'" said Decker. "An influx of potentially available capital from these legislative bills will likely be used for CapEx projects that have been put off."

So, what capital projects might utilities embark upon, and what valve and control products will they need? Decker said that utilities in the drinking water segment assert their greatest needs are in transmission and distribution systems, while the wastewater segment is focused on collection systems. "All types and sizes of valves commonly used for flow control associated with pumping stations out in the system are probably going to be in more demand than ones in treatment plants," he added.

Decker also recommends that valve suppliers pay close attention to the kinds of work being done by consulting engineering companies. Currently, the increase in drinking water consultation has been greater than the increase in wastewater work. "Down the road, something the engineers are working on is going to be built and need equipment," he said. "If you sell valve products on the water side, you might want to take a serious look at what your water side product line looks like."

CREDIT: KEN TANNENBAUM

Watermain breaks are frequent occurrences due to America's aging infrastructure. Here, a 2014 watermain in New York City is under repair.

5. SYSTEM DIGITIZATION IS THE WAY OF THE FUTURE.

Digitization of systems is a priority for the water and wastewater industry. Utilities require an array of digital technologies related to everything from smart meters to operations and maintenance management. Sensors and monitoring innovations collect valuable real-time data. For instance, a wastewater utility in San Antonio, Texas, installed in-pipe sensors to collect data and optimize the network's cleaning schedule. It saved thousands of dollars in each location a sensor was installed.

Decker encourages valve and control product suppliers to consider their role in digitization. "Do you offer a more modern, more functional, more efficient

digitized smart valve that can replace one from 20 years ago?" he said. The goal for a utility employee is to "sit at a screen in their den and operate anything out in the system," he said. "How does the digitized part of your product fit in with that?"

6. SYSTEM RESILIENCY IS PARAMOUNT.

The May ransomware attack that shut down the Colonial Pipeline led to an emergency declaration for 17 states and Washington, DC, as well as gasoline shortages and price hikes. While it highlighted the vulnerability of America's infrastructure system, including water and wastewater utilities, it wasn't the first major warning of 2021. The historic cold snap in Texas in February caused widespread frozen and burst water pipes.

"There was a real wake-up call for a number of utilities in the south," said Decker. "Municipalities and private companies are searching for ways to fortify and strengthen their systems from the forces of nature and outside attacks so they can assure reliable operations." The Environmental Protection Agency's Creating Resilient Water Utilities initiative provides tools, training and technical assistance to water, wastewater and stormwater utilities to increase resiliency.

These aren't the only factors affecting the water/wastewater industry and valve and control product suppliers serving the market. Supply chain concerns and inflationary pressure also play a role. "Global supply chains are currently strained as they attempt to get back to pre-COVID levels," said Nebosis. "Valve suppliers will need to accelerate ramping up capacity to meet additional demand if [legislation] passes."

However, inflation could dampen capital spending even if there are additional federal dollars available, said Decker. "So, watch inflation and interest rates—the state revolving funds and WIFIA. They currently have excellent rates, but they are subject to market pressure," he said.

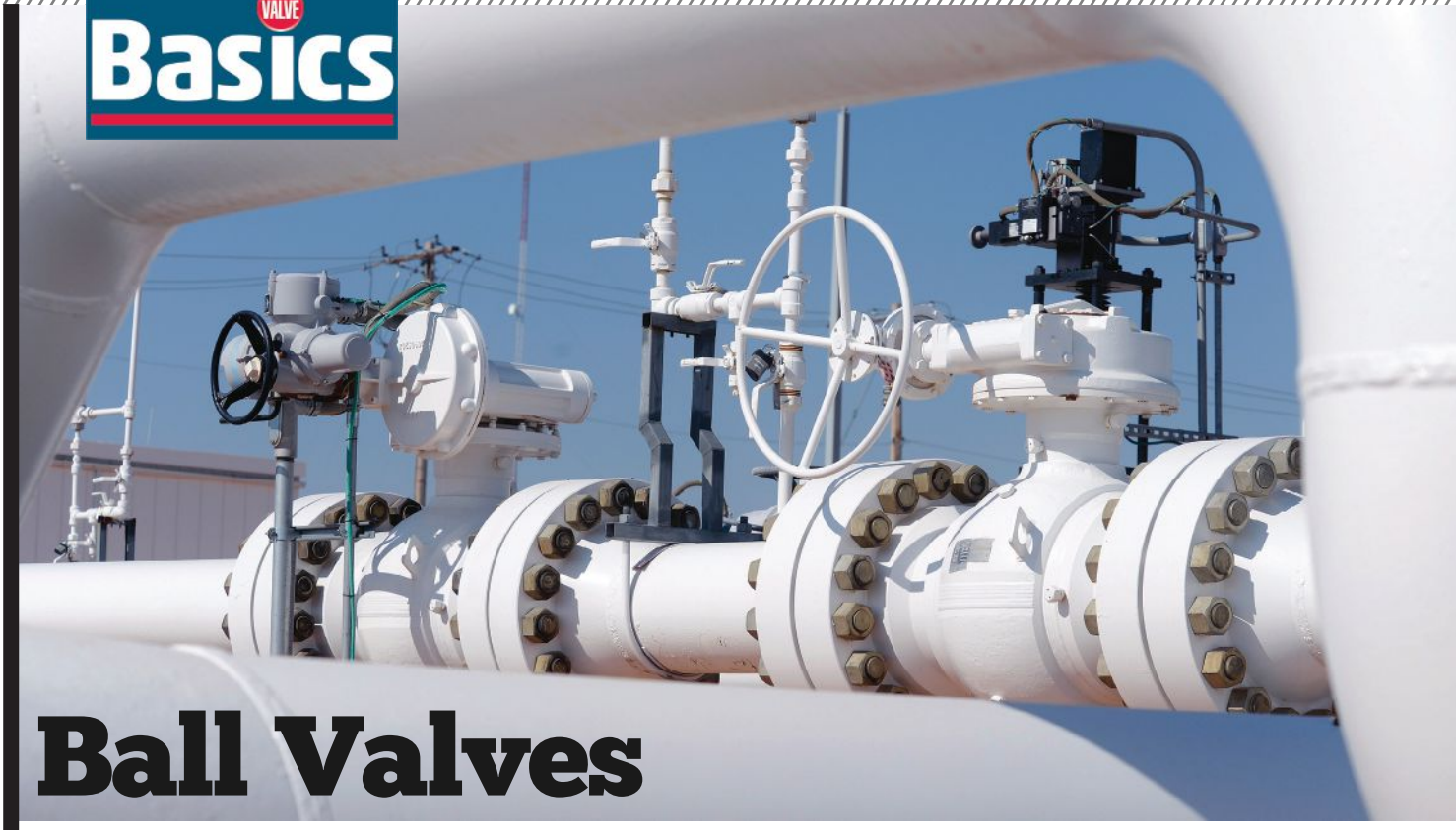
In addition to these global issues, water/wastewater utilities face a host of industry-specific challenges. "Their concerns include dealing with everything from aging systems, struvite, wipes, regulatory compliance, safety, odor and more," said Nebosis. "Many facilities are developing systems that can deal with too much water or not enough, depending on location and changing weather conditions."

Rather than bemoaning the challenges, suppliers should view them as opportunities. "As valve manufacturers, we need to provide options for practical, cost-effective valve solutions to help utilities meet these challenges," said Nebosis.

If the federal government allocates long-overdue money to infrastructure, that will go a long way toward helping suppliers with their water and wastewater clients. VM

Susan Keen Flynn is a freelance writer. Reach her at sflynn@keenconcepts.net.

Valve Basics



Ball Valves

Welcome to the first in a series of Valve Basics articles, each focused on a major product type and written especially for newcomers to the industries that use and make valves and related products.

BY GREG JOHNSON

Ball valves may not bounce very well but they work great at regulating flow. The popular valve is named for its round ball that sits in the interior of the valve body and pushes into a seat to control or provide on/off functions in fluid pipelines.

Floating ball valve

API 6D trunnion ball valves

The heritage of ball valves is much shorter compared to gate, globe and check valve designs. Although the first ball valve patent was issued in 1871, it would take another 85 years for ball valves to become a commercial success. The discovery of polytetrafluoroethylene (PTFE, or "Teflon") during the process design for manufacturing the atomic bomb in World War II, would be the catalyst that started the ball valve industry rolling. Ball valves come in all materials from brass to carbon steel and

stainless steel to zirconium.

There are two basic types: floating ball and trunnion ball. These two designs allow for the construction of effective ball valves from ¼" through 60" and larger. Generally, the floating design is used for smaller and lower-pressure valves, while the trunnion type is used for larger and higher-pressure valve applications.

The reason for the two types of ball valves has to do with the way they seal and how the fluid force is distributed from the line flow to the ball and then to the seat. In the floating ball design, the ball is riding snugly between two seats, one upstream and one downstream. The force of the fluid acts on the ball to push it into the seat located in the downstream valve body. Since the ball covers the entire flow bore, all the force in the stream is pushing against the ball to force it into the seat. If the ball gets to be too large and the pressure too high, the force will be so great on the seat that the valve cannot be operated because the operating torque would be too high.

Floating ball valves come in a variety of body styles, although the two-piece, end entry type is the most popular. Other body styles include three-piece and top entry. Floating ball valves are manufactured in sizes up to 24" and class 300, but the practical realm of the floating ball valve is generally much lower—up to about 12".

Although ball valves are designed primaryily to be on/off or "block" valves, the addition of partial ball and V-port ball designs can make them good choices for control-type applications.

RESILIENT SEATS

The smaller floating ball valves are found in many different applications from household plumbing to those containing the harshest chemicals. The most popular seating material in these valves is some form of thermoplastic, such as PTFE. PTFE seats work very well because they are soft enough to seal well on to the polished metallic ball, yet firm enough not to blow out of the valve. The two primary concerns with these soft-seated valves are that they are susceptible to scratching (and potential leakage) and are limited to temperatures below the melting point of the thermoplastic seats—somewhere around 450°F (232°C) depending on the exact seat material.

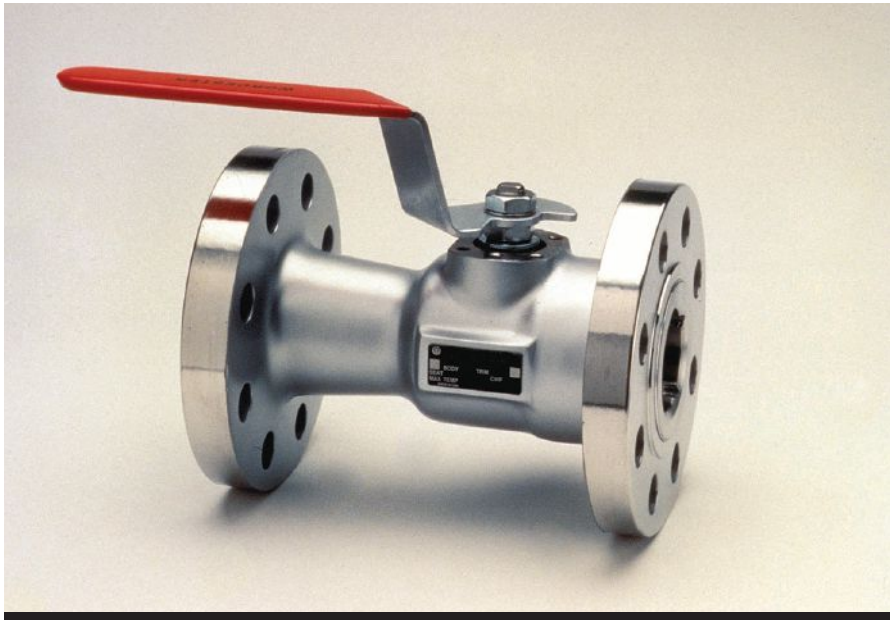
A feature of many resilient-seated floating ball valves is the ability to moderately seal in the event of a fire that causes the primary seats to melt. This is called a fire-safe design; it features a seat pocket that not only holds the resilient seat in place, but also provides a metallic seating surface that can provide a partial seal as it contacts the ball. The fire-safe design is confirmed by testing the valve in accordance with the American Petroleum Institute (API) 607 or 6FA fire-testing standards.

TRUNNION DESIGN

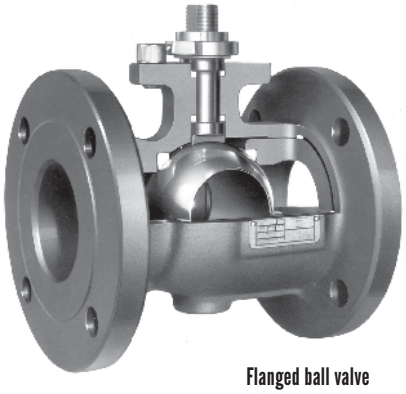
When larger sizes and higher-pressure ball valves are needed, the design shifts to the trunnion style. The trunnion differs from the floating style in that the trunnion ball is held in the body via a trunnion (short, attached stem) in the bottom and by the stem at the top. Since the ball cannot "float" into the seat to attain positive closure, the seat must float to the ball instead. The trunnion seat is designed so that the seat is energized by the upstream pressure and is forced into the ball to seal. Because the ball is held securely in place, except for its 90° rotation, the extraordinary fluid force and pressure does not jam the ball into the seat. Instead, the force acts only on a small area on the periphery of the floating seat.

The trunnion ball valve is the brawny big brother to the floating ball valve and as such it gets to handle the big jobs—high pressures and large pipe diameters. By far the most popular use of trunnion ball valves is for pipeline service. These valves are especially

☐ A ball valve "ball"



☐ End-entry design



Flanged ball valve

Threaded ball valve

Top-entry ball valve

popular in natural gas pipelines in diameters up to 60" and pressures up to class 600. Trunnion ball valves can also be used in higher pressures if required. By using trunnion designs the torque required to open and close the valve is lower, so smaller actuators can be used.

The trunnion design also lends itself well to double block and bleed service since both the upstream and downstream seats float independently and most designs also feature a body or drain connection. Trunnion designs often employ seat lubrication ports where a lubricant can be injected around the seat to assist in closure efficacy.

METAL-SEATED DESIGNS

The biggest advancement in ball valve technology over the past 30 years or so is the metal-seated ball valve. While the idea of metal seats and a metal ball are not new—in fact, the first ball patent in 1871 featured a brass ball and brass seats—the design needed advancements in coating technology to really be perfected.

The metal-seated ball valve design has enabled ball valves to take a big chunk out of the market share dominated for decades by the venerable gate valve. The metal-seated, specialty-coated ball closes tightly against a set of precision coated and lapped seats, providing zero-leakage, if the hardened seating surfaces are not scratched by debris in the line.

BALL VALVE STANDARDS

Several standards apply to ball valves. Table 1 lists the most common ball valve design documents.

Ball valves have made huge inroads in replacing other valve types over the past 40 years. The cost to manufacture the smaller sizes has dropped greatly as well, making them even more competitive. The advances in coatings and metal-seated ball valve technology have created very robust designs that have resulted in an attractive total cost of ownership.

While the overall industrial valve segment is still dominated by gate and globe, linear-valve designs, the relatively young ball valve is steadily making up ground, and the metal-seated types have become the preferred valve design for severe-service applications around the world. VM

Standard #	Title	Organization	Type or service
API 608	Metal ball valves-flanged, threaded and welding ends	API	Refinery
API 6D	Pipeline valves	API	Pipeline
SP72	Ball valves with flanged or butt-welding ends for general service	MSS	General applications
SP110	Ball valves threaded, socket-welding, solder joint, grooved and flared ends	MSS	General applications
SP122	Plastic industrial ball valves	MSS	Plumbing and general applications
507-18	Ball valves, 6 in. through 60 in. (150 mm through 1,500 mm)	AWWA	Waterworks
521-18	Plastic ball valves	AWWA	Waterworks

Table 1. Common ball valve standards

Greg Johnson is president of United Valve (www.unitedvalve.com). He is a contributing editor to VALVE Magazine and a current Valve Repair Council board member. He also serves as chairman of the VALVE Magazine Advisory Board, is a founding member of the VMA Education & Training Committee and is past president of the Manufacturers Standardization Society. Reach him at greg1950@unitedvalve.com.

Masoneilan
a Baker Hughes business

SVI3
Digital Valve Positioner

Smart Control with the New SVI™ 3 Smart Valve Interface Advanced Performance Digital Valve Positioner

Utilizing advanced control and diagnostic algorithms, along with field-proven noncontact position sensing technology, the SVI3 delivers **accurate, responsive, and reliable positioning performance**. It's a natural choice for applications requiring high reliability and scalability.

- **Simple set up and commissioning** - The SVI3 is easy to install, connects safely and does not require special training to get the most out of its operation.
- **Data onboard** - A year's worth of online valve and positioner health data is calculated and stored in the device, ideal for trend identification independent of a DCS.
- **Agnostic design** - The SVI3 is manufacturer and systems agnostic, easily installing on any brand of valve and integrating into existing plant asset management systems, providing advanced analytics and control for your entire valve fleet.

Intelligent control for superior process performance

For more information, contact your local Baker Hughes representative or visit

valves.bakerhughes.com

Baker Hughes

Foreign Recycled Metals: Buyer Beware!

The North American steel-making industry, with its historic record of quality control, is no longer the world's top producer. As a result, the origins of raw materials and components of valves can be lost in a labyrinth of uncertainty.

BY OREST PROTCH

Today a large industrial valve can have its body made in a foundry in Belgium, be machined in Germany, be spray coated in France, be shipped to Canada or the U.S. where both assemble the final components that were made in the U.S., and then finally shipped worldwide. Chain of custody papers can be very challenging to read!

Figure 1 shows a group of valves that came to the oil camp where I once worked. The actuators on the left were counterfeit as the nameplates did not match the invoices and those did not match the shipping chain of custody forms. In addition, internal parts were not correct. For the Canadian oil patch, the wait time for delivery on these types of valves exceeded six months.

Figure 1. Oil field valves, new and used, undergo servicing and inspection in the maintenance shop. A half dozen valves came in one shipment worth $50,000 each—they were unusable. The pressure ratings could not be verified on the paperwork for engineering and insurance code reasons.

These were ordered from the U.S., but the travel history papers indicated Europe. If there is a problem with these products, who is responsible?

Today's valve suppliers have much to consider in terms of metallurgy of the components of their valves. The primary concern is the effect of worldwide recycling of metal on component metallurgy.

THE PROBLEM WITH RECYCLED ALUMINUM

Consider the world of recycled aluminum. Billions of aluminum cans are recycled every year with much of the tonnage recovered going to two places: engine blocks and landfills. Aluminum recycling efficiency is potentially a myth.

When aluminum is continually recycled it loses its quality due to contaminants in the foundry melt furnaces such as oils, paints and other metals. The greatest enemy of recycled aluminum is iron from steel: A product made with

new aluminum will be of higher quality than the recycled product. New aluminum cans need perfect metallurgy to handle the stresses made by stamping while engine blocks are more forgiving. In this case, size matters.

Although a lot of energy is saved in the recycling process since it avoids the need to make new aluminum from raw ore, it turns out that the recycling process, when repeated, creates serious impurities in the end product.

Researchers at MIT have found that unless specific and extremely expensive processes are introduced into the aluminum recycling market, those impurities will continue to add up—which is why landfills are filling up with crushed cans. Middle East countries, for example, are adding new virgin aluminum ore smelters to fulfill their own needs. They do not want the headaches of dealing with recycled aluminum.

Recycled aluminum cans have a limited use. They cannot even be used to make new cans because of the impurities at the molecular level that affect the metal's strength, ductility, tensile strength and toughness values.

Steel coils can have varying physical properties such as strength and ductility even if certified as the same grade.

THE CHALLENGES FACING SCRAP DEALERS

The iron foundry where I worked as a metallurgist bought recycled iron and steel. In the semi-truck unloading bay, a large magnet would pick up a ton at a time of scrap, and then shake it to try and drop out the intertwined scrap chrome, stainless steel and aluminum pieces—not always successfully. The scrap loads would come from metal recyclers that tried to sort out the different metal types but the only way to do so would be to hand sort the scrap.

For a few tons, this might be practical though it would still take a day or so. But for a thousand tons a day being shipped all over the country and beyond, it is an impossible task. Scrap dealers do their best but at one Canadian foundry, about 5 to 10% of the recycled scrap coming in was not iron or steel by itself, and a good percentage of this went into the melt furnaces. Although it was hoped most of the contaminants would come to the surface as slag, some always got through into the various cast iron products. Cast iron really does not like aluminum or stainless-steel contaminates.

At a pipe rolling steel mill in Toronto, Ontario, it was one-third the cost to buy the steel from Brazil, ship it by boat to Montreal, Quebec, on the Saint Lawrence River, process it by slitting to size, and put it on trucks and drive to Toronto, then it was to buy from a steel foundry in Hamilton, Ontario, 1 hour away.

The metallurgy was not nearly as good, but at one-third the price, it was worth discarding the defective loads of the shipments, before or after further processing. Buying lower quality parts and fabrications can make economic sense but cause big headaches for those on the manufacturing front lines.

A supervisor in charge of a quality control department for an automotive company in Ontario, Canada, reported that parts received for just-in-time delivery came from many countries but mostly from Mexico. Every single part was checked for meeting specs by contract inspectors when they come off the supply trains or trucks. Rejection rates were as high as 95% or more per item. Translate this to hundreds of thousands of parts a week. Yet, it was still cheaper than producing the parts at nearby sub-contracting factory suppliers that had closed across southern Ontario due to foreign competition.

The author inspecting one of three 13-ton Brown Boveri Induction furnaces. Before a melt pour that occurred every 20 minutes, molten slag was skimmed off the surface of the furnace.

Scrap steel is an internationally-traded commodity. Foundries really have no idea where their scrap material originates. It can come from scrapped automobiles, shipyards and even decommissioned nuclear power plants. Determining the metallurgy of this scrap can be brutal—and nearly impossible to do once made into valves.

In 2018 a record-breaking end-of-life shipping tonnage was scrapped on South Asian beaches; 744 large ocean-going commercial vessels were sold to the scrap yards in 2018. Of these vessels, 518 were broken down on tidal mudflats in India and Pakistan. This scrap then was sold around the globe to steel foundries. A ship averages out at 100,000 tons. World steel production in 2018 was about 1,800 million tons and the steel recycled from these ships was about 74 million tons. Almost 4.5% of world steel production came from this scrap steel.

Four-and-a-half percent of scrap steel being melted with 1,800 million tons of total steel may not seem like a big deal—but in terms of steel grades and their allowable alloying percentages, it can be a nightmare in terms of quality control and the respective metallurgical chain of custody forms (COCs).

THE DECLINING QUALITY OF STEEL

The U.S. is no longer the world leader in steel production. This is a terrible situation for fabricators worldwide. Quality of steel is important in terms of individual steel grades and their respective physical properties such as tensile strength and ductility, as well as their chemical properties in terms of corrosion and electrical conductivity.

Other countries do not have the same quality control that North American steel producers once had. It is all about the raw tonnage produced and the cost to do so. The adage "You Get What You Pay For" has never been more important than in today's fabricating world.

Fabrication problems with a particular component of a valve may not exist with another piece that comes from another country of origin. Everything comes down to cost to fabricate each component. The metallurgical properties of two components side by side, but coming from two different countries, can make one totally off spec and the other good. Proving this, however, may be outside the capability of a valve supplier.

All steel grades have many specific chemical elements such as iron and carbon and each has upper and lower control limits in terms of percentages allowed. Stainless-steel grades have extra amounts of nickel and chromium to give the stainless the required properties.

If the steel is virgin steel—meaning it contains no recycled steel—then the

TOP 10 STEEL-PRODUCING COUNTRIES

Country	Steel Production (tons)
China	996.3
India	111.2
Japan	99.3
United States	87.9
Russia	71.6
South Korea	71.4
Germany	39.7
Turkey	33.7
Brazil	32.2
Iran	31.9

Source: worldpopulationview.com

CHEMICAL COMPOSITION RANGES AND LIMITS

Type	C	Mn	Si	Cr	Ni	Mo	V
9Cr1Mo+	.15 max	.30/.60	.25/1.00	8.00/10.00	----	.90/1.0	
52100*	.98/1.0	.25/.45	.15/.35	1.30/1.60	----	----	----
ASTM-A485-1(#1 Mod.)*	.90/1.05	.95/1.25	.45/.75	.90/1.2p	----	----	----
ASTM-A485-2(#2 Mod.)	.85/1.00	1.40/1.70	.50/.80	1.40/1.80	----	----	----
ASTM-A485-3(T-1)[a]	.95/1.10	.65/.90	.15/.35	1.10/1.50	----	.20/.30	----
ASTM-A485-4(T-2)[a]	.95/1.10	1.05/1.35	.15/.35	1.10/1.50	----	.45/.60	----
TBS-600™[b]	.95/1.10	.60/.80	.85/1.20	1.25/1.65	----	.25/.35	----
CBS-600™[c]	.16/.22	.40/.70	.90/1.25	1.25/1.65	----	.90/1.10	----
CBS1000M™[d]	.10/.16	.40/.60	.40/.60	.90/1.20	2.75/3.25	4.00/5.00	.25/.50
CBS-50NiL**	.11/.15	.15/.35	.10/.25	4.00/4.25	3.20/3.60	4.00/4.50	1.13/1.33
TBA-2[e]	.70/.80	1.05/1.35	.15/.35	.90/1.20	1.30/1.65	1.20/1.40	----
M-50	.77/.85	.35 max.	.25 max.	3.75/4.25	.10 max.	4.00/4.50	.90/1.10
440C	.95/1.20	1.00 max.	1.00 max.	16.00/18.00	----	.75 max.	----
TBS-9®	.89/1.01	.50/.80	.15/.35	.40/.60	.25 max.	.08/.15	----

+ 52100 shown for reference purposes only. ** Max Cu .10, Co .25, W .25, P .015, S .010* *[a] Deep hardening steels*
[b] Through hardening steel for service up to 600°F. *[c] Carburizing steel for service up to 600°F.* *[d] Carburizing steel for service up to 1,000°F.*
[e] Through hardening steel can be air quenched.

All steels have minimum and maximum percentage limits to their composition to ensure their physical and chemical properties are maintained. Melting scrap steel with virgin steel is now changing these properties.

elemental percentages can be controlled and kept within the specs of each grade, as well as the minor elements.

But with the continuous recycling occurring as steel is made and then eventually recycled as scrap steel, such as with old car bodies, the minor elements are gaining in terms of percentages, often exceeding their maximum allowable amounts. These increases in allowable percentages of what were once considered the minor elements of a grade are now a cause of great concern to the regulating organizations that certify metal grades and the engineering societies that determine codes.

These elements at the parts per billion level can be very worrisome, depending on the item's service use. One fabrication or component of steel or iron from Brazil may have different properties from one made in China. Every country/company has different criteria for QA/QC that they follow.

Two of these tablets of pure bismuth, each smaller than a penny, when added to 13 tons of molten white iron, would affect the iron's ability to be transformed to malleable cast iron when put in a 36-hour annealing furnace.

TRACKING THE PARTS

Country of origin matters, not only for composition of metal but also for the quality of the manufacturing process. There will be variations in:

- Quality control
- Heat treatment
- Physical properties
- Chemical properties
- Metal composition at the molecular level

These properties work in unison to give the needed requirements of a particular grade and code when the metal is machined, welded, extruded, pounded, milled, bent and exposed to other physical and chemical attacks. Even subsequent heat-treating processes will be affected.

Valve fabricators and others, for liability protection, need to ensure they have a system to track the parts used from source to the final customer. If multibillion-dollar oil companies are having issues with valves, imagine the difficulty faced by a municipal water treatment plant, for example, that is trying to prevent quality issues. VM

Orest Protch has worked as a foreman in a steel rolling pipe mill and as a metallurgist/melt foreman in an iron foundry. He recently retired from a position as a senior lab technologist for an oil company. He now conducts metallurgy classes and writes on a variety of topics. Protch resides in West Kelowna, British Columbia, and can be reached at oprotch@gmail.com.

The Final Control Element: Controlling Energy Transformation

When selecting control valves, be sure to thoroughly evaluate the process conditions to identify potential issues and select the proper management techniques.

BY BRANNON GANT AND MARK GRAESSER

Though digital instrumentation and process control systems have greatly improved over the years, process fluids are ultimately controlled by mechanical components. The control valve acts as the final element in a process control loop that influences process variables like pressure, temperature and flowrate. These are designed to modulate on a continuous basis in response to a variable command signal from the control system. This continuous control subjects them to more rigorous wear than on/off valves or isolation valves, which have different design details. Theoretically, any valve, actuator and positioner combination can adjust its position in response to a control signal that will affect the fluid stream. Depending on the process control loop, consider duty cycle, stroke speed, sensitivity, resolution, installed gain and the conservation of energy. Choosing the wrong control valve can lead to an unstable process control loop, process variability, excessive wear and catastrophic failure.

CONTROL VALVE ACTUATION

Actuation is generally selected according to the valve type and is sized by the vendor. A pneumatic calculation is used based on valve requirements and minimum available air pressure. A safety factor of up to 50% is usually included based on characteristics of the service and the likelihood of restricted movement. The valve positioner is the device that modulates (strokes) the valve, moving it to the desired point of travel based on the command/input signal. The positioner is chosen by input type and desired diagnostics. High performance is often available for applications when position accuracy and response time are critical. Additional instruments such as limit switches, switching valves and solenoids may be included for feedback or failure mode.

MANAGING ENERGY TRANSFORMATION

The law of conversation of energy means that energy can neither be created nor destroyed; rather, it can only be transformed or transferred from one form to another. A fluid stream contains both potential energy in the form of pressure and temperature as well as kinetic energy in the form of motion. When the fluid stream goes through a restriction in the flow path—the control valve—potential energy is converted to kinetic energy. Potential energy is decreased by a reduction in pressure, and possibly temperature. Kinetic energy is increased through an increase in average velocity. Additional potential energy is expended on the production of vibration and possibly a phase change in the fluid. The internal trim components of the control valve must have the appropriate geometry and materials to manage the energy transformation. A properly selected control valve will manage the energy transformation, preventing excessive noise and vibration, and managing or eliminating a fluid phase change.

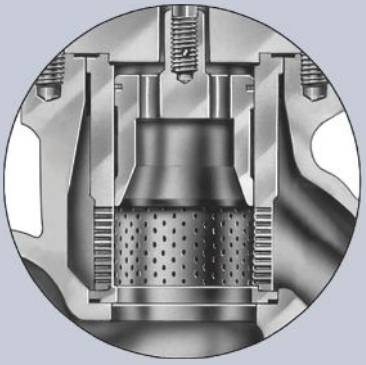


Figure 1. Single-stage compressible fluid

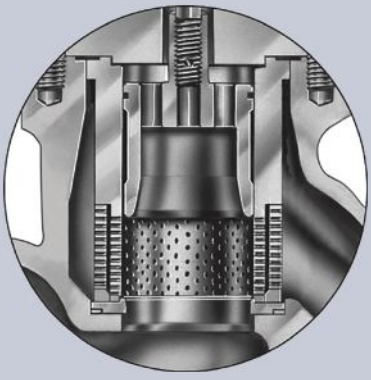


Figure 2. Stage compressible fluid

MANAGING CLEAN AND DIRTY COMPRESSIBLE FLUIDS

In the case of high-pressure drop with compressible fluids aerodynamic, noise can be generated across the control valve causing vibration, which leads to metal fatigue. Broken valve stems, actuator yokes, and accessory mounting hardware failures can result from damaging vibration generated by aerodynamic noise. Also, Occupational Safety and Health Administration (OSHA) regulations may require the use of additional PPE (personal protection equipment)—hearing protection—if sound levels are excessive.

Source control of aerodynamic noise can be accomplished through flow division. One example of this is "drilled hole technology," which is a design that many control valve manufacturers use to control or eliminate the generation of aerodynamic noise when the fluid moves through the valve trim (Figure 1). Flow division means that instead of having the flow pass through a single opening, the flow is divided into multiple smaller flow streams by passing through several openings in parallel. Every time you double the number of openings, you reduce the noise by approximately 3 dBA. The noise reduction occurs primarily because the smaller openings shift the noise to a higher frequency. Higher frequencies are attenuated more than lower frequencies as the sound passes through the pipe wall. The smaller the diameter of the holes the higher the frequency shift. Also, because the human ear (and the "A" weighting curve on noise meters) attenuate higher frequencies, both the measured and perceived noise is decreased. Additional sound reduction can be obtained by staging the pressure drop (Figure 2). Since each stage will take only a portion of the total pressure drop, each will produce less vibration. The sum of the vibration from the total stages will be less than the vibration from a single stage.

In the case of high-pressure drop with a dirty compressible fluid, the typical drilled hole method would potentially clog, so pressure drop staging is the only method of source control of aerodynamic noise. As noted above, in pressure drop staging instead of taking the entire pressure drop in one step, the pressure drop is divided up into multiple steps (Figure 3). When the pressure drop is taken in more than one step, the individual velocity peaks are smaller than the velocity peak that would result from a single stage pressure drop. Because of the strong relationship between noise and velocity, small reductions in velocity can have a large effect on reducing the noise. For dirty fluids, an axial flow design is more typical. The flow passes down the valve taking numerous turns around the multiple stages on the plug. Since the design does not incorporate any small holes, particulate can pass unimpeded. Generally, it is necessary for the stages to increase in a cross-sectional area as the volume of the flow increases with each pressure drop (Figure 4).

Pressure drop staging can be obtained through multiple methods. For clean fluids, the typical radial flow pattern can be maintained with multiple concentric drilled hole cages. For applications with large mass flow rates and high differential pressures drilled hole trim designs no longer provides an adequate solution. Higher numbers of stages, and thus higher levels of noise reduction, can be obtained through stacked plate designs that incorporate a combination of fluid turning losses and contracting/expanding areas in the stack. Fluid paths can be a single plane or multiplanar and use as many as 36 stages depending on the manufacturer (Figure 5). Laser cutting of plates provides a large degree of design flexibility for staging and Cv requirements as well as a cost-effective means of machining the cutouts and notches that form the flow passages required (Figure 6).

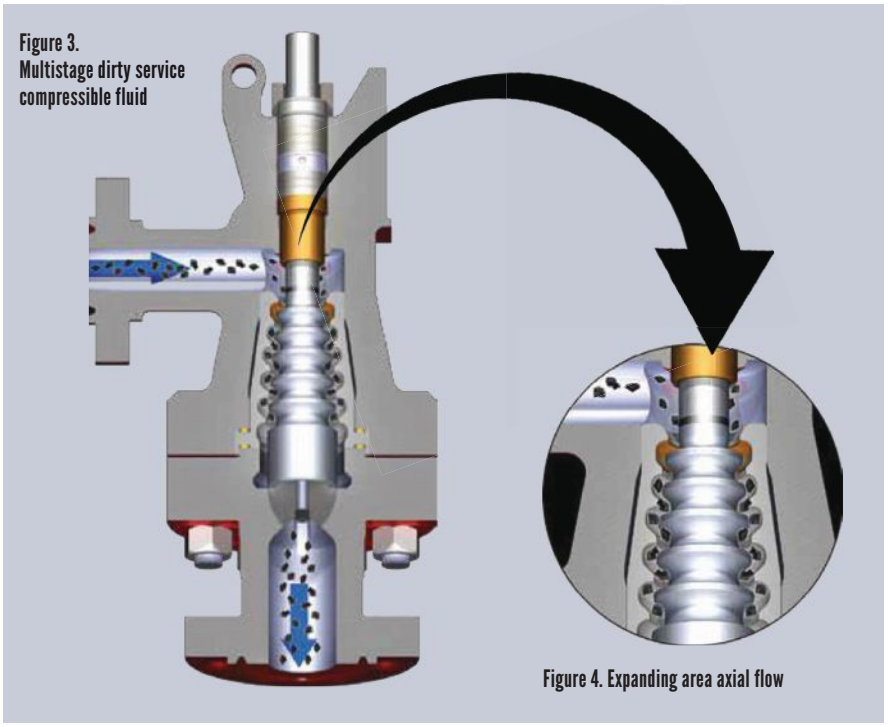


Figure 3.
Multistage dirty service compressible fluid

Figure 4. Expanding area axial flow

Figure 5.
Multi-stack plate clean compressible fluid

Figure 6. Laser-cut stack disks

MANAGING CLEAN AND DIRTY NON-COMPRESSIBLE FLUIDS

For non-compressible fluids, if the pressure drop is a high percentage of the inlet pressure, or the outlet pressure is close to or below the vapor pressure, there is potential for the fluid to change phase. Phase changes include cavitation and flashing. Fluid phase changes can cause significant damage to the control valve internals and downstream piping leading to reduced time between maintenance intervals and catastrophic failure.

In cavitation, the pressure drops below the fluid vapor pressure as it exits the port and changes from a liquid to a gas. On subsequent pressure recovery, as the fluid velocity decreases in the body gallery or downstream pipe, the fluid changes back into a liquid. The collapse of the bubbles releases a significant amount of energy that can be extremely damaging if it occurs in contact with the valve or pipe surfaces.

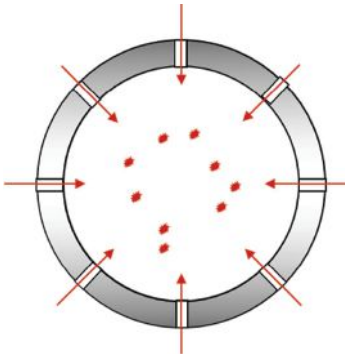


Figure 7. Single-stage cavitation containment

As with aerodynamic noise reduction, the most common method for cavitation control with a clean fluid is "drilled hole" technology. The fluid is divided into multiple discrete flow paths, constricted, expanded and collided into diametrically opposed flow paths that prevent the damaging effects of cavitation (Figure 7). Dividing the flow through multiple holes with a small diameter limits the size of the cavitation bubbles. The smaller bubbles individually contain significantly less energy and collapse sooner than larger bubbles. By managing the trim velocity and directing the bubbles into the center of the flow stream they will collapse before they can impinge on any surfaces. By collapsing in the middle of the flow stream they will not damage any components and the generated noise will be muffled. Multiple concentric cages can be used to reduce the energy drop across the last stage, also reducing the energy level of any potential cavitation (Figure 8).

In dirty service non-compressible fluids, a source treatment is needed to eliminate cavitation while allowing particulate to pass unimpeded (Figure 9). In these cases, small holes cannot be used to minimize the energy of the bubbles. A multi-stage axial flow technology is designed to stage the pressure drop so the line pressure on the final stage stays above the fluid vapor pressure, thus eliminating cavitation entirely. Flow is divided, recombined, turned, constricted and expanded, thereby reducing fluid velocity, reducing static pressure loss and energy conversion on each stage (Figure 10).

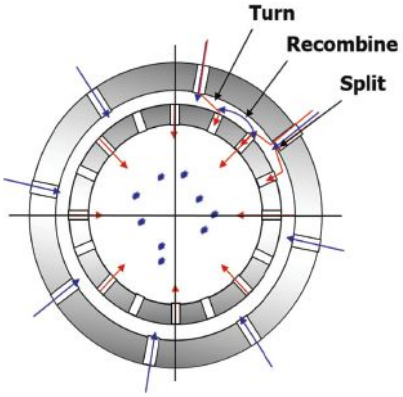


Figure 8. Double-stage cavitation containment

MANAGING FLUID PHASE CHANGE

In non-compressible fluid applications where the outlet pressure is below the vapor pressure, a phase change cannot be avoided. As the fluid passes the restriction it will convert from a liquid to a gas. The energy required for the phase change will reduce the temperature of the fluid, thus reducing the vapor pressure, and a balance will be achieved where only a percentage of the fluid will change phase. If the outlet pressure is close to the vapor pressure only a small percentage will convert to gas. In these instances, damage can generally be minimized simply by using hardened materials.

In applications where the outlet pressure is considerably lower than the vapor pressure, such as boiler blowdown, the percentage of flashing will be significant. In these instances, hardened materials will be insufficient to provide proper protection but a different valve geometry can be applied to reduce or eliminate damage due to the flashing in the fluid stream. With a standard globe valve the fluid will change phase as it passes through the port and generate a high-velocity stream directed into the wall of the valve body. The geometry of angle

Figure 9. Non-compressible dirty service cavitation elimination

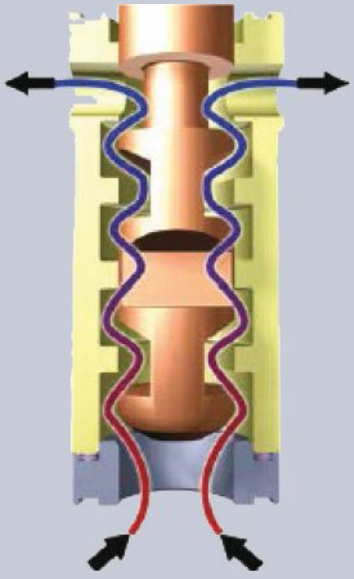


Figure 10. Non-compressible cavitation elimination

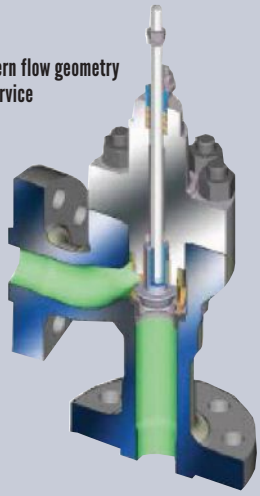


Figure 11.
Angle pattern flow geometry
flashing service

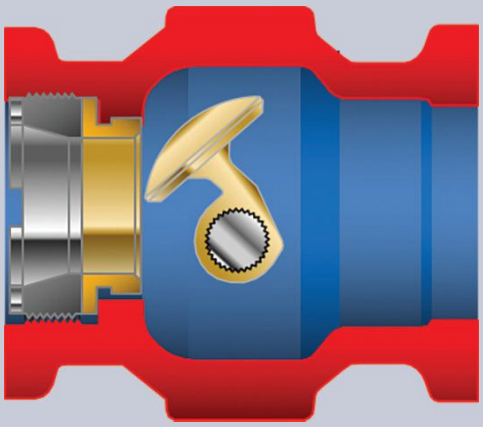


Figure 12. Eccentric rotary control valve flashing service

valves and eccentric plug valves allows the fluid to exit directly from the valve without any turns (Figures 11 and 12). These eliminate the potential for valve body damage by allowing the fluid to flash directly into the downstream piping.

For more severe applications, using a Venturi outlet will reduce turbulence at the outlet, directing the highest velocity into the center of the flow stream. The reduced velocity along the outside of the flow stream reduces the potential for pipe erosion. For both management techniques, a significant straight run of pipe may be required to prevent erosion from the high-velocity fluid impinging on a pipe elbow.

CONTROL VALVE FINAL SELECTION

Control valve selection is part science, part experience and part preference. Proper evaluation of the process conditions allows for identification of the potential issues associated with the process and selection of the proper management techniques. Combine control valve selection best practices with historical runtime performance in similar applications under similar operating conditions to determine the appropriate management technique. This will allow for a balance between initial capital expense and long-term maintenance costs, as well as prevent unpredictable disruption to the process. VM

Brannon Gant is sales director of control valves for Setpoint Integrated Solutions in Baton Rouge, LA. Reach him at bgant@setpointis.com.

Mark Graesser is senior application engineer for Setpoint Integrated Solutions. Reach him at mgraesser@setpointis.com.

Coping with Supply Disruption and Demand Volatility

BY BARBARA DONOHUE

Manufacturers are experiencing unprecedented disruption of the supply chain on both the supplier side and the customer side. Sources of raw materials and parts have become unreliable, and shipments have been delayed during the pandemic. Shipping costs have skyrocketed. Customer expectations for delivery and service rise higher and higher, while demand often has become volatile.

Consultant Lisa Anderson, president of LMA Consulting Group, Inc., works with manufacturers and distributors to develop strategies for supply chain management. In this interview, she offers guidance on coping with the current turmoil and its effect on manufacturers, their suppliers and their customers.

Lisa Anderson

VALVE MAGAZINE: What is the supply chain?
LISA ANDERSON: The supply chain connects the manufacturing, transportation and distribution processes that get product from the initial suppliers through manufacturing—which may include multiple steps—to the final customer. So, if you're a manufacturer, the supply chain starts with your supplier's supplier and goes through you to your customer's customer.

VM: What new ways of working are coming to the fore in a post-COVID-19 world?
LA: Manufacturers must be more resilient, innovative and responsive with regard to changing conditions, including customers' shifting needs for products and levels of service.

To adapt, some folks are looking at producing closer to the customer so they can be more responsive to fluctuating customer conditions.

We're also looking at utilizing more technology that gives visibility into our supply chains. Part of becoming more resilient is having better knowledge of your suppliers, processes and customers.

VM: What kind of technology are we talking about?
LA: AI—artificial intelligence—is hot and so is the Industrial Internet of Things (IIoT). At a manufacturing company these technologies can enable a transition to predictive maintenance rather than preventive maintenance, for example.

A company's ERP (enterprise resource planning) system, a necessity in manufacturing today, allows visibility of your whole operation and aids in making purchasing and other decisions. An ERP system can take advantage of those other technologies, as well.

To anticipate customer demand, we could look at historical demand, but then the pandemic changed everything. But we can look at predictions: our sales forecasts and predictive analytics. Those relate to AI, and somewhat to IIoT if we're able to connect with customers at that level.

VM: How do you get visibility into your supply and what your customers need?
LA: On the supply side, you want to know if your materials are on the way to you. Where are they? You could have access to GPS data about the truck or the boat carrying the materials. Maybe they got sidetracked—everything is getting rerouted lately.

On the customer side, let's say you're a valve manufacturer and your customer is an oil refinery. The refinery would be connected by IIoT and use an ERP system. With access to data, you could see that this customer is going to need a new valve, how many valves they have in inventory or how many valves they are using on a weekly basis. That's giving a better picture of the demand.

VM: Are customers willing to share that kind of data?
LA: I think the answer is yes. It depends on how you position the conversation, of course. You can say, "I'd really like to understand more about what you have in inventory and get regular updates because I want to be resilient on my end and communicate with my suppliers so I can better serve you." If you say it like that, then the answer is likely to be yes. How would you get the information? It could be through electronic data interchange (EDI) or through a portal. But the information could be sent in an email, if all else fails.

VM: In a post-COVID-19 world, what traditional techniques or ways of working will we have to put aside?
LA: From a supply chain point of view, if you were already utilizing best practices, probably not much needs to change. But, in my experience, most manufacturers have not been using those best practices.

Supply chain disruptions are now commonplace. We have to think about how we're going to account for and adapt to those risks in our supply

chain design, whether it's sourcing differently, partnering with other companies or using other approaches.

VM: Are supply chain professionals going to look at expanding their local supply base again, after the previous push to buy from China and other low-cost-production countries?
LA: There's definitely a surge in terms of reshoring and producing in a local or regional way, for a lot of reasons. We need to keep up with customers' changing demand. If possible, you want to be closer to the customer to reduce lead times. Then, there's a trend toward clusters where suppliers and manufacturers are located more closely together in a region. The region could be very small or it could be large, like North America.

> **Supply chain disruptions are now commonplace. We have to think about how we're going to account for and adapt to those risks in our supply chain design, whether it's sourcing differently, partnering with other companies or using other approaches.**

VM: How can supply chain teams manage the balance between achieving greater cost savings without compromising on quality?
LA: That is definitely an issue with sourcing components from faraway suppliers. It's not even just the quality. It's also the lead time and the ability to make changes. Companies are finding that the labor cost component is not as significant as it used to be, especially taking into consideration the recent tenfold increase in ocean freight costs. Except for commodity products, there are more and more reasons to look for sources closer to home. The question is: Who can you partner with? You may find suppliers in Mexico, if you are a U.S. manufacturer, or even within your own state.

VM: How can a company increase its resilience in the face of all the chaos?
LA: I think those that are going to be successful coming out of this pandemic are the ones that actually have the raw material and parts because lead times are going way out—what used to take four weeks is taking 14 and what used to take 14 weeks is taking 26. It can come down to sourcing items closer or holding inventory. However, these days, suppliers don't even have the time to build inventory.

If you're dependent on a faraway vendor for a key material, a key casting or any vital supply, get on top of that right away. Find out what resources your suppliers have because you may need to find some additional sources. What I'm hearing across the board is that a lot of companies are in deep trouble. The ones that are succeeding find innovative ways to cope: locate new sources, produce in house, partner with another company. It's not simple, but it needs to be done.

If you continue to use a faraway supplier, make sure that you have a backup source of supply that's not located in the same place as your primary supplier. For example, if both your primary and backup suppliers had been in Wuhan, China, that would obviously have been bad. On the other hand, for some of my clients whose primary source was in China, having a backup source in India didn't help, either.

Be sure to have a backup source in a location not affected by the same kinds of problems as your primary supplier's area. Then, you also need to treat the backup not like a backup. You have to get at least 20% of your volume from the backup supplier all along, to make sure they're ready for you when you need them. VM

LISA ANDERSON, MBA, CSCP, CLTD, is ranked #16 in SAP's Supply Chain Influencers. She is the founder and president of LMA Consulting Group Inc., a consulting firm that specializes in manufacturing strategy and end-to-end supply chain transformation that maximizes the customer experience and enables profitable, scalable, dramatic business growth.

BARBARA DONOHUE is a freelance technical journalist and served as web editor of VALVE Magazine. Reach her at info@the-engineer-who-writes.com.

"Is my company eligible to join the Valve Manufacturers Association of America?"

VMA is the only association that exclusively supports and represents the interests of the U.S. and Canadian industrial valve, actuator and controls industry.

We offer four types of membership for companies based in the U.S. or Canada, and that meet other criteria.*

- **FULL MEMBERSHIP** U.S. and Canadian manufacturers of valves, actuators and controls
- **ASSOCIATE – SUPPLIERS** Companies that supply products and services to U.S. and Canadian manufacturers of valves, actuators and controls
- **ASSOCIATE – DISTRIBUTORS/CHANNEL PARTNERS** Companies that take title to and stock valves, actuators and controls manufactured by at least one VMA member
- **VALVE REPAIR COUNCIL** OEM-certified service, repair and maintenance firms for U.S. and Canadian manufactured valves, actuators and controls

If your company does qualify, here are some of the benefits you will enjoy:

- **Significant discount off of advertising in VALVE Magazine**, on VALVEMagazine.com, VALVE eNews and other VMA publications!
- **Free listing in VMA's Product Finders** (located on VMA.org).
- **Invitations to an array of VMA meetings and networking events** open only to members, including the VMA/VRC Annual Meeting, Valve Industry Leadership Forum, Market Outlook Workshop and Manufacturers Workshop. Plus, reduced rates for exhibits at the Valve Basics and Technical seminars, and the biennial Valve Repair Conference.
- **VMA's popular members-only newsletter, QuickRead**, delivered to your computer every Friday!
- **Participation in VMA's statistical and economic programs**, providing you with data not available anywhere else.

VMA VALVE MANUFACTURERS ASSOCIATION OF AMERICA
The voice of the flow control industry

Join today and you'll find out why 95% of VMA members renew each year!

**To determine if you qualify to join VMA, go to: VMA.org > About VMA > Qualifications.*
To determine eligibility for the Valve Repair Council, go to: VMA.org > Valve Repair Council.

VMA DOUBLE FEATURE

Whether you are new to the valve industry or an experienced professional, the Valve Manufacturers Association offers great programs for you and your team to learn, meet and connect.

VMA VALVE FORUM

Learn more and register at vma.org/valveforum

The most comprehensive virtual gathering place for all those in the valve industry value chain, the VMA Valve Forum offers solutions, content and business opportunities for the valve, valve actuator and valve automation industry.

Thought leaders will present on manufacturing, technical, repair, marketing and business management. Business opportunities with networking and industry suppliers, distributors and others will showcase their products and services.

2021: Offered virtually, September - December
2022: April 5-7, San Antonio

VMA VALVE BASICS

Learn more and register at vma.org/valvebasics

Valve Basics is your gateway into the world of valves and actuators. Split into two programs, Valve Basics provides an overview of valves, valve actuators and valve automation, and how they are used in various applications.

Offered virtually throughout 2021, registration includes 24/7 access to:

- **Valves 101** – covering the major valve types, including linear, check, quarter-turn and pressure-relief, plus actuation basics.
- **Valves 201** – offered for those who want to take the next step in learning more about critical flow control products.
- **Live Town Halls** – interactive Q&As with Valve Basics instructors and discussions on the latest developments and new trends on specific topics.

VMA VALVE MANUFACTURERS ASSOCIATION OF AMERICA

Advanced Couplers Can Help Optimize the Handling of Hazardous Chemicals

BY DAVID MORROW

Without the chemical butadiene, people wouldn't be able to drive their cars, cover their floors with carpet or go scuba diving. In other words, butadiene is one of those substances that most people haven't heard of, but without it, we would not have the synthetic rubbers and elastomers that are integral components in the manufacture of so many consumer goods that list butadiene as one of their ingredients.

At the same time, butadiene is also a chemical that must be handled with care at all times. Butadiene is a colorless, non-corrosive gas with a mild, gasoline-like aromatic odor. As such, it is listed as a potential occupational carcinogen by the National Institute for Occupational Safety and Health (NIOSH), and both short- and long-term exposure to it can cause a host of health issues. It is also extremely flammable in both its liquid and vapor forms.

Butadiene is one of many chemicals that must be produced, transported and stored in the safest manner possible, with no risk of physical exposure to technicians or release to the environment. In this article, we illustrate how advanced dry-disconnect coupler technology can help reduce, or even eliminate, the risk that a chemical-release incident might occur during or at the conclusion of the loading and unloading of transport vehicles—most often railcars and tank trucks—into a storage vessel.

THE CHEMICAL TRANSPORT CHALLENGE

As noted, the main challenge in transporting chemicals is keeping them adequately contained. This is especially true if the chemical is transported as a liquefied compressed gas in a pressurized railcar. If any of these substances exceed their boiling point and revert to a gaseous state, they will expand, thereby putting the ability of the transport vehicle to contain the chemical at risk. This could lead to a product release and/or explosion.

Therefore, the overriding challenge for the transporters of chemical substances is to prevent them from 1) escaping the transport vehicle, whether in liquid or gaseous form, and 2) reverting to a gaseous state, if applicable, during transport.

Even so, many chemical transporters continue to rely on outdated coupler technology and "open-loop" systems to connect transfer hoses from the transport vehicle to the storage vessel. Often, this technology is simply a technician inserting a "stabber" pipe at the transfer point with a pipe wrench. These connections have operational shortcomings that prohibit them from being the best dry-disconnect choice, mainly that they cannot ensure a leak-free connection has been made or that any residual product will be prevented from remaining in the coupling when disconnected.

Today's advanced dry disconnects have been designed to reduce connection time from 30-40 minutes to just 30-40 seconds.

A better alternative to an open-loop system is the "closed-loop" system. In the closed-loop system, there is significantly less risk that product will remain in the coupler as it is disconnected, which lowers the exposure risk to almost zero, resulting in a safer chemical-transfer process.

There are two main obstacles to getting chemical manufacturers and transporters to convert from an open to a closed system of product transfer. The first one involves the "this is the way we've always done it" mindset that hampers efforts to convince people to adopt a better way. The second is physical: Most of the railcars that transport chemicals are owned and operated by third-party carriers, not the manufacturer. This means the storage terminal must adapt its operations to meet the needs of each individual railcar. Since the product-transfer connections "live" on the railcars, the challenge is to get users to buy into the benefits of closed-loop systems, thereby making advanced dry-disconnect equipment standard on their fleets.

THE DRY-DISCONNECT SOLUTION

Aiding the cause in convincing chemical manufacturers and transporters to upgrade to a closed-loop system is a comprehensive portfolio of advanced dry-disconnect couplers, which includes innovative, flat-face poppet and double-ball-valve designs. These methods of construction help reduce the risk that residual fluid will be trapped within the coupler, lowering the chance that spills will occur and giving the liquid virtually no place to collect, which eases cleaning. Typically, there will be less than 0.5 ml (0.02 ounces) of fluid left on the face seal of the coupler upon disconnection.

These couplers feature multiple safety interlocks that allow the valve to open and close only through deliberate user action, helping prevent accidental opening. For extremely sensitive applications, an optional keyed interface locks out and isolates transfer lines so that only a specific coupler can be used with a corresponding hose or loading arm, preventing cross-contamination.

Finally, the couplers are quick and easy to maintain because they have fewer parts. This allows them to be repaired onsite with no time-consuming and costly returns to the manufacturer needed or interpretation of complicated maintenance instructions.

Here's a look at three specific advanced dry-disconnect technologies, along with the benefits each can offer to chemical transporters:

- Flat-Face Poppet Dry Disconnects: These couplers are the most commonly used advanced coupler technology because they feature a rugged design, excellent flow characteristics and heightened product control. The flat-face poppet ensures minimal product loss at disconnection, while the fully interlocked double-safety connection system prevents opening if the coupler is not mated properly. Some models allow closure from both the coupler and adaptor side, which further reduces the risk of retention and spillage of any residual product at disconnection. Many models have been approved for use by the Association of American Railroads (AAR) and Canadian Registration Number (CRN) regulating authorities.
- Double-Ball-Valve Dry Disconnects: This design gives the coupler double-shutoff reliability, allowing them to deliver the industry's lowest product-loss rates. Integrated interlocks help eliminate unintentional disconnects that can threaten worker safety and damage the environment. The coupler's unrestricted flow path creates no turbulence during product transfer for full-flow optimization.
- Quick-Connect Dry Disconnects: These couplers are extremely user-friendly due to quick, easy connection capabilities while also delivering minimal product loss at disconnection. They have also been designed to be interchangeable with other dry-disconnect models. Optional keyed couplings minimize the risk of product cross-contamination occurring when the same transport vessels are used to ship different chemicals.

CONCLUSION

Hazardous chemicals are indispensable ingredients in many products that are ever-present in our daily lives. At the same time, these chemicals must be handled with extreme care, lest the user or environment become harmed as a result of a leak, spill or catastrophic release. Integral components in the handling of industrial chemicals are the couplers that facilitate connection points between transport vehicles and storage vessels. In this case, the use of advanced dry-disconnect technologies can greatly reduce the risk that hazardous chemicals will leak, drip or nest within the coupler during a transfer operation, resulting in a safer handling process for some of the world's most significant raw materials. VM

Butadiene is an indispensable component in many common products, but its hazardous nature means it must be carefully handled at all times. Advanced dry-disconnect technology can aid in that task.

David Morrow is director of sales for OPW Engineered Systems, Lebanon, OH, part of Dover Corporation's OPW division. Reach him at 800-547-9393 or David.Morrow@opwglobal.com. For more information, please go to opw-es.com.

Pressure Relief Valves: What Makes Them Different?

BY GABE SALWAN

Facilities use many different types of valves to keep themselves operating, and each valve within a plant serves a different function. A typical plant may have an installed base of gates, globes, butterfly, plug and other types of valves, each specifically designed to function based on process conditions. Some valves are manually operated, others may be controlled by air, electric, hydraulic, and even weights or springs. Most valves in a plant can be categorized into one of the following three types: control, on/off or pressure relief. One of these three valve types looks and operates differently than most others—the pressure relief valve.

Pressure relief valves (PRV) have been referred to as the "silent sentinel," meaning, they act as a soldier or guard whose job is to stand and keep watch—an accurate statement of what a PRV does in a protected system. Anywhere a plant has flow and pressure through a pipe or vessel there is a risk of over pressure. Depending on the type of process, whether it is compressible or not, there can be a major risk to people, equipment, buildings and the environment. When looking at the pieces of equipment in a protected system, typically you will find a pressure source such as a pump or boiler—and even the sun in thermal expansion scenarios. These systems are normally operated by a control panel, computers, mechanical controls, a human operator or some combination of these.

Anywhere a plant has flow and pressure through a pipe or vessel there is a risk of over pressure, and when such an event occurs, the PRV comes into play.

READY TO SPRING INTO ACTION

In a perfectly designed plant where nothing ever changes, wears, breaks or goes wrong a pressure relief valve would be unnecessary. Yet nothing is perfect or remains perfect indefinitely, which is why the last line of defense in a protected system—the PRV—is needed. A PRV sits idle and if everything else is doing its job as designed it never gets called into action. When other systems fail and pressure builds, the PRV comes into action and relieves the excess pressure safely protecting people and assets.

There are many codes and standards around the design of a typical valve, and the PRV is no different. The purpose of this article is not to drill down how PRVs differ from other valves. Rather, the intent is to focus on how manufacturers or their supporting sales networks bring a PRV to market.

The American Society of Mechanical Engineers (ASME) along with the National Board (NB) write and enforce the rules, regulations and requirements that drive the application, manufacturing and testing of a PRV. There are specifications on how quickly the valve must open when it reaches full lift and how quickly it recloses. Terms like simmer, set pressure, blow down, full lift, rated capacity and others are a result of these ASME requirements. Various sections within ASME are directly related to PRVs. The most common ones are: Section I, which pertains to a fired vessel, boiler or economizer; Section III, for nuclear applications; and Section VIII, covering process applications.

A RIGOROUS PROCESS

An ASME certified manufacturer, assembler or valve repair facility must live by these codes and standards; they must be fully understood and compliance is mandatory. These companies go through a rigorous certification process and must make a major investment in people, equipment and development of work processes to ensure compliance is met, as well as maintained. The barriers to entry to become a PRV assembler or PRV repair facility are much greater than other valves operating in a plant

 **RELIEF VALVE FOR VAPOR/ GAS SERVICE**	 **SAFETY VALVE FOR VAPOR/GAS SERVICE**	 **SAFETY RELIEF VALVE FOR LIQUID OR VAPOR/GAS SERVICE**
• Non-compressible fluids • Automatically actuated by static inlet pressure • Characterized by gradual lift in proportion to the pressure over the system opening pressure • Typically has closed bonnet	• Compressible fluids • Automatically actuated by static inlet pressure • Characterized by rapid full opening or pop action • Typically has exposed spring • Media goes through valve (won't damage spring) • Non-toxic/non-corrosive service	• Compressible or non-compressible fluids • Opening mechanism: rapid opening or pop action • Two designs: conventional and balanced • Typically has closed bonnet

due to reasons stated earlier—when all else fails the PRV needs to work.

Before one can even approach the National Board to apply for certification an investment in a test stand is required. The size of the valve being assembled or repaired will dictate the capacity requirements of the test stand as well as whether the valve is vapor or liquid certified. Another major hurdle is steam: The equipment needed for a steam valve is vastly different than one needed for air or liquid. The most common PRV sizes range from 0.5-inch inlet all the way to 8 inches. Having the ability to set/test the entire range for air, liquid and steam requires an investment well into the six figures; ASME/NB certifications and recertification bring additional recurring expenses as well. This is not the type of business any valve repair facility can just jump into—very specialized equipment, facilities and certifications are required.

KNOWLEDGE IS KEY

Assuming the hurdles of equipment, investment, etc., have been achieved, next comes knowledge. Each facility must have a certified individual with extensive knowledge of the valve being worked on; this person must sign off on the required QC documents to be in compliance with industry codes and standards.

Many types of PRVs exist, but the most common are spring or pilot operated. Other types include weighted, buckling pin and bursting products. For the purposes of this article, we are focusing on spring and pilot operated. Spring-type valves can be conventional or bellows sealed, depending on process fluid or conditions, and pilot valves are either snap acting or modulating. A snap-acting pilot is a quick open/quick close pilot operated valve while a modulating pilot has a more controlled open/close that functions in proportion to the upset condition, relieving only the process fluid greater than standard operating design conditions.

Many options and special materials are available to tailor the valve for the specific application in which it is being used. To know exactly what the customer needs and be able to quote, sell, build, set/test and ship adds another layer of expertise above and beyond the asset investment of a PRV assembly facility. Further, access to data is required; the facility performing PRV assembly needs manufacturer spring charts for new valves and when doing service or repair, critical seat dimensions are a must. To maintain compliance with applicable code requirements, all replacement parts must be OEM components purchased through proper channels.

PRVs do indeed serve a much different purpose in a plant than any other type of valve. Other valves are bought to be opened and closed, some of them constantly. A PRV is bought in the hopes it never needs to open. Manufacturers and their representatives, along with certified valve repair facilities and distributors of valves and parts, are crucial to ensure that when a PRV is called into action it will operate without fail. VM

Gabe Salwan is VP of sales and marketing for Quality Valves (www.qualityvalves.com) in Mobile, AL. He has 22 years of experience in the relief valve industry and previously worked with Farris Engineering. Salwan is an instructor for the PRV lesson of VMA's Valve Basics program (vma.org/valvebasics). Reach him at gabe@qualityvalves.com.

VMA MEMBER ROSTER » Go to www.VMA.org for additional information on VMA members

Admiral Valve (dba CPV Manufacturing)
Kennett Square, PA
www.cpvmfg.com

Allagash International Group, LLC
Portland, ME
www.allagashinternational.com
- **Nor'East Controls**
  www.noreastcontrols.com

American Valve, Inc.
Greensboro, NC
www.americanvalve.com

ASCO Valve, Inc. - Emerson Industrial Automation
Florham Park, NJ
www.ascovalve.com

A-T Controls
Cincinnati, OH
www.a-tcontrols.com

AUMA Actuators, Inc.
Canonsburg, PA
www.auma-usa.com

Automation Technology, Inc.
Houston, TX
www.atiactuators.com

Babbitt Chainwheels
New Bedford, MA
www.babbitt.com

Harold Beck & Sons, Inc.
Newtown, PA
www.haroldbeck.com

Bernard Controls, Inc.
Houston, TX
www.bernardcontrols.com

BHGE
Houston, TX
www.valves.bhge.com
- **Consolidated Safety and Safety Relief Valves**
- **Masoneilan Control Valves**
- **Becker & Mooney Regulation & Control**
  Jacksonville, FL; Houston

Bray International, Inc.
Houston, TX
www.bray.com
- **Bray Controls**
  Houston, TX
  www.bray.com
- **Flow-Tek, Inc.**
  Houston, TX
  www.bray.com/Flow.Tek
- **Bray/Rite Corporation**
  Montreal, QC, Canada
  www.ritepro.com
- **Bray/VAAS**
  Houston, TX
  www.bray.com
- **Amresist**
  Houston, TX
  www.amresist.com
- **Ultraflo Corporation**
  Ste. Genevieve, MO
  www.ultraflo.com
- **Bray Commercial**
  Houston, TX
  www.braycommercial.com
- **Rite Pro Corporation**
  Montreal, QC, Canada
  www.ritepro.com

Champion Valves, Inc.
Wilmington, NC
www.wafercheck.com

Check-All Valve Mfg. Co.
Des Moines, IA
www.checkall.com

Conval, Inc.
Enfield, CT
www.conval.com

Cowan Dynamics, Inc.
Montreal, QC, Canada
www.cowandynamics.com

Crane Co.
Stamford, CT
www.cranecpe.com
- **Crane Energy Flow Solutions**
  The Woodlands, TX
- **Crane ChemPharma Flow Solutions**
  Cincinnati, OH

Curtiss-Wright Valve Group - Industrial Division
www.cw-industrial.com
- **Enertech**
  Brea, CA
- **Exlar**
  Chanhassen, MN
- **Farris Engineering**
  Brecksville, OH
- **Target Rock**
  East Farmingdale, NY

DeZURIK/APCO/HILTON and Willamette
Sartell, MN
www.dezurik.com
- **DeZURIK Sartell**
  Sartell, MN
- **DeZURIK Cambridge**
  Cambridge, ON, Canada
- **DeZURIK/Hilton Valve**
  Redmond, WA
- **DeZURIK/APCO Rapid Fulfillment Center**
  Houston, TX

DFT Inc.
Exton, PA
www.dft-valves.com

Drillmax Inc.
Houston, TX
www.drillmax.com

Emerson
Corporate Headquarters
St. Louis, MO
www.emerson.com/FinalControl

Actuation Technologies
- **Bettis, EIM actuators**
  Houston, TX
- **Morin actuators**
  Pelham, AL

Flow Controls
- **Fisher control valves**
  Marshalltown, IA

Fluid and Motion Control
- **ASCO solenoid and pneumatic valves, cylinders & air preparation equipment**
  Florham Park, NJ
  www.asco.com
- **TESCOM pressure regulators, valves & systems**
  Elk River, MN
- **Anderson Greenwood instrumentation valves and manifolds**
  Elk River, MN
- **TopWorx valve position indicators, switches & sensors**
  Louisville, KY

Isolation Valves
- **Keystone, KTM, Vanessa valves**
  Houston, TX

Pressure Management
- **Anderson Greenwood and Crosby pressure relief valves**
  Stafford, TX
- **Fisher regulators**
  McKinney, TX

Everlasting Valve Company, Inc.
South Plainfield, NJ
www.everlastingvalveusa.com

Fetterolf Corp.
Skippack, PA
www.fetterolfvalves.com

Flowserve Corporation HQ
Irving, TX
www.flowserve.com
- **Flowserve Durco, Automax, Worcester**
  Cookeville, TN
  www.flowserve.com
- **Flowserve Valtek Control Valves**
  Springville, UT
  www.flowserve.com
- **Flowserve Edward and Anchor/Darling**
  Raleigh, NC
  www.flowserve.com
- **Flowserve Limitorque**
  Lynchburg, VA
  www.limitorque.com
- **Flowserve Gestra Steam Traps & Systems**
  Louisville, KY
  www.gestra.com
- **Flowserve Nordstrom and Vogt**
  Sulphur Springs, TX
  www.flowserve.com
- **Flowserve Valbart**
  Houston, TX
  www.flowserve.com

Gilmore, a Proserv company
Houston
www.gilmore.com

Groth Corporation
Liberty, MO
www.grothcorp.com

Hunt Valve
Salem, OH
www.huntvalve.com

Indelac Controls, Inc.
Florence, KY
www.indelac.com

ITT Engineered Valves
Lancaster, PA
www.engvalves.com

Kingston Valves
Torrance, CA
www.kingstonvalves.com

Kitz Corporation of America
Stafford, TX
www.kitz.com

Koso America, Inc.
West Bridgewater, MA
www.kosohd.com

Moog Flo-Tork, Inc.
Orrville, OH
www.moog.com

Mueller Water Products
Atlanta, GA
www.muellerwaterproducts.com
- **Henry Pratt Company**
  Aurora, IL
  www.henrypratt.com
- **Henry Pratt, Hydro Gate**
  Denver
  www.hydrogate.com
- **Henry Pratt, Lined Valve**
  Woodland, WA
  www.knifegatevalves.com
- **Milliken Valve Company**
  Bethlehem, PA
  www.millikenvalve.com
- **Mueller Co.**
  Chattanooga, TN
  www.muellercompany.com

Neles USA Inc. (formerly Metso)
Shrewsbury, MA
www.neles.com

PBM, Inc.
Irwin, PA
www.pbmvalve.com

The Wm. Powell Company
Cincinnati
www.powellvalves.com

Process Development & Control, Inc.
Coraopolis, PA
www.pdcvalve.com

ProMation Engineering
Brooksville, FL
www.promationei.com

QTRCO, Inc.
Tomball, TX
www.qtrco.com

REXA
West Bridgewater, MA
www.rexa.com

Richards Industrials
Cincinnati, OH
www.richardsind.com
- **Jordan Valve**
  Cincinnati, OH
  www.jordanvalve.com
- **Steriflow Valve**
  Cincinnati, OH
  www.steriflowvalve.com
- **LowFlow Valve**
  Cincinnati, OH
  www.lowflowvalve.com
- **Marwin Valve**
  Cincinnati, OH
  www.marwinvalve.com
- **Hex Valve**
  Cincinnati, OH
  www.hexvalve.com
- **Bestobell Steam Traps**
  Cincinnati, OH
  www.bestobellsteamtraps.com
- **Equilibar LLC**
  Fletcher, NC
  www.equilibar.com

RF Valves, Inc.
Hanover, MD
www.rfvalve.com

R.S.V.P. Actuators & Controls
Hempstead, TX
www.rsvpactuators.com

SAMSON Controls, Inc. - Canada
Markham, ON, Canada
www.samsongroup.com

Score Valves
Edmonton, AB, Canada
www.scorevalves.com

Spirax Sarco, Inc.
Blythewood, SC
www.spiraxsarco-usa.com
- **Spirax Sarco Canada Ltd.**
  Concord, ON, Canada

Total Valve Systems
Broken Arrow, OK
www.totalvalve.com

Townley Engineering & Manufacturing Company, Inc.
Candler, FL
www.townley.net

Trillium Flow Technologies
Houston, TX
www.trilliumflow.com

Trimteck, LLC
Coral Springs, FL
www.trimteck.com

Union Tech Co., LLC
Houston, TX
www.uniontechmfg.com

UniTorq Actuators & Controls
Duluth, GA
www.unitorq.com

Val-Matic Valve and Mfg. Corp.
Elmhurst, IL
www.valmatic.com

ValvTechnologies, Inc.
Houston, TX
www.valv.com

VanAire, Inc.
Gladstone, MI
www.vanaireinc.com

Velan Valve Corporation
Montreal, QC, Canada
www.velan.com

Victaulic
Easton, PA
www.victaulic.com

Western Valve, Inc.
Bakersfield, CA
www.westernvalve.com

WEY Valve
Nettleton, MS
www.weyvalve.com

Zwick Valves NA LLC
La Porte, TX
www.zwick-valves.com

ASSOCIATE MEMBERS

DISTRIBUTOR/CHANNEL PARTNERS

Advanced Valve & Instrument, Inc.
Statesboro, GA
www.advancedvalve.net
www.digestervalves.com

AIV, LP
Houston, TX
www.aivinc.com

Andrews Industrial Controls
Carnegie, PA
www.andrewsic.com

CGIS
Vancouver, BC, Canada
www.cgis.ca

Charbonneau Industries, Inc.
Houston, TX
www.ciactuation.com

Classic Controls, Inc.
Lakeland, FL
www.classiccontrols.com

FCX Performance
Stafford, TX
www.fcxperformance.com

FloWorks
Pasadena, TX
www.floworkspvf.com

Industrial Valve Sales & Service
Eight Mile, AL
www.indvalve.com

MRC Global
Houston, TX
www.mrcglobal.com

QRC Valve Distributors
Stafford, TX
www.qrcvalves.com

Setpoint Integrated Systems
Baton Rouge, LA
www.setpointis.com

TRIFLOW Corp.
West Berlin, NJ
www.triflowcorp.com

Wolseley Industrial Group
Newport News, VA
www.wolseleyindustrialgroup.com

SUPPLIERS

A.W. Chesterton
Groveland, MA
www.chesterton.com

alliantgroup
Houston, TX
www.alliantgroup.com

All-Pro Fasteners, Inc.
Arlington, TX
www.all-profasteners.com

American Foundry Group
Bixby, OK
www.americanfoundry.com

AVK Carbo-Bond/Bi-Torq Inc.
LaFox, IL
www.bitorq.com

Badger Alloys, Inc.
Milwaukee, WI
www.badgeralloys.com

Bradken, Inc. - Specialty Products
Kansas City, MO
https://bradken.com

The Eagle Group
Muskegon, MI
www.eaglegroupmanufacturers.com

EGC Enterprises, Inc.
Chardon, OH
www.egcflexiblegraphitesolutions.com

The Flexitallic Group, Inc.
Houston, TX
www.flexitallic.com

Garlock Sealing Technologies
Palmyra, NY
www.garlock.com

Highland Foundry Limited
Surrey, BC, Canada
www.highlandfoundry.com

Key Bellevilles, Inc.
Leechburg, PA
www.keybellevilles.com

Matrix Metals, LLC
Richmond, TX
www.matrixmetalsllc.com

Optimation Technology, Inc.
Rush, NY
www.optimation.us

Rayson Company
Houston, TX
www.raysoncompany.com

Scientific Linings & Coatings
San Antonio, TX
www.weathercap.com

Siemens Industry, Inc.
Spring House, PA
www.usa.siemens.com

Solon Manufacturing Co.
Chardon, OH
www.solonmfg.com

Teadit North America
Pasadena, TX
www.teadit-na.com

For information on joining the Valve Manufacturers Association, contact Heather Rhoderick at 202.331.8105 (hrhoderick@vma.org).

MEMBERS OF THE VALVE REPAIR COUNCIL *An affiliate of the Valve Manufacturers Association*

Allagash International Group, LLC
Portland, ME
www.allagashinternational.com

Allied Valve
Chicago, IL
www.alliedvalveinc.com

AVP Valve, Inc.
Lakeland, FL
www.avpvalve.com

AWC, Inc.
Corpus Christi, TX
www.awc-inc.com

Bay Valve
Seattle, WA
www.bay-valve.com

John H. Carter Company
Baton Rouge, LA
www.johnhcarter.com

Classic Controls, Inc.
Lakeland, FL
www.classiccontrols.com

Control Southern Inc.
Suwanee, GA
www.controlsouthern.com

Curtiss-Wright Industrial Division
Brecksville, OH
www.cw-industrial.com

Custom Valve Solutions
Vallejo, CA
www.customvalvesolutions.com

Dowco Valve Company
Hastings, MN
www.dowcovalve.com

Eastern Controls, Inc.
Philadelphia, PA
www.easterncontrols.com

Emerson
Corporate Headquarters
St.Louis, MO
www.emerson.com/FinalControl
Emerson Lifecycle Services
- Actuators
- Control valves
- Isolation valves
- Pressure relief
- Regulators

Marshalltown, IA

Flotech, Inc.
Jacksonville, FL
www.flotechinc.com

Formosa Plastics USA
Point Comfort, TX
www.fpcusa.com

Gulf Coast Modification, LP
Houston, TX
www.gulfcoastmod.com

Gulf Coast Valve, Inc.
Corpus Christi, TX
www.gulfcoastvalve.net

J~S Machine and Valve, Inc.
Nowata, OK
www.jsvalve.com

Kirksey Machine
Houston, TX
www.kirkseymachine.com

Midwest Valve Services, Inc.
Minooka, IL
www.mwvalve.com

Neles
Shrewsbury, MA
www.neles.com

Pioneer Industrial Corporation
St. Louis, MO
www.pioneerindustrial.com

Precision Fitting and Gauge
Tulsa, OK
www.pfandg.com

Precision Pump & Valve Service
Charleston, WV
www.ppvs.com

Precision Valve Group
Monroe, NC
www.precisionvalvegroup.com

Puffer-Sweiven
Houston, TX
www.puffer.com

Renew Valve & Cleveland Valve — FCX Performance Companies
Carleton, MI/Cleveland, OH
www.renewvalve.com
www.clevelandvalve.com

Riggio Valve
Bayonne, NJ
www.riggiovalve.com

Setpoint Integrated Solutions
Baton Rouge, LA
www.SetpointIS.com

Southeast Valve Inc.
Charlotte, NC
www.sevalve.com

Southern Valve Service, Inc.
Baton Rouge, LA
www.southernvalve.com

TEAM Industrial Services
Houston, TX
www.teaminc.com

United Valve
South Houston, TX
www.unitedvalve.com

Universe Machine Corporation
Edmonton, AB Canada
www.umcorp.com

Valve Reconditioning Service Co.
Melvindale, MI
www.vrsinc.net

ValvTechnologies
Houston, TX
www.valv.com

VRC ASSOCIATE MEMBERS

EFCO
Charlotte, NC
www.efcousa.com

Quality Valve
Mobile, AL
www.qualityvalves.com

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

EDITOR'S PRODUCT PICKS

Cowan Dynamics' new E2HR Electro-hydraulic Rotary Actuator packs high performance into the smallest possible installation envelope for quarter-turn valve actuating applications. All hydraulic components and sensors are integrated into a single compact manifold block that also houses the actuator and integral oil reservoir.

The control panel can be mounted directly to the manifold block or installed remotely to run multiple units from a single control panel. This self-contained actuator can be installed either vertically or horizontally and has no external piping.

Moog has introduced its new D936 Series Servo-Proportional Valve. The direct-operated, analog valve is driven by a proportional solenoid and equipped with integrated electronics and closed-loop position control of the spool.

The valves are suitable for electrohydraulic control of position, speed, pressure and force in open and closed-loop control systems. Standard features include a 4/4-way design with a failsafe position, electronics on the solenoid for a reduced envelope size and added vibration resistance, and exact replacement capabilities when switching from other valves on the market.

Mueller has released the compact and lightweight EZ-TAP drilling machine, designed specifically for water taps; it is primarily used with service saddles and corporation stops up to 2" thanks to its 9½" travel and 300 psi working pressure. It is now easier to make service connections on mains with or without pressure. It's available with two kit options: The Machine Kit, designed for ¾" and 1" corporation stops, and the Large Diameter Kit, designed for 1¼", 1½" and 2" corporation stops.

ProMation Engineering is expanding its direct-mounting options for valves by adding multiple patterns to existing actuators and introducing new imperial mount patterns for its quarter-turn actuators. The new valve mounting options will allow for more economical assemblies of valves and electric actuators by reducing the need for valve/actuator adaptor hardware.

Emerson's new Clarkson KS1 Knife Gate Valve is designed to help mine, oil sands, and pulp and paper operators achieve increased availability of their most challenging slurry processes. The new knife gate valve features a patented gate edge seal design that creates a continuous seal around the gate, together with a precision-molded elastomer seat. This heavy-duty seat increases the contact area and resilient sealing ability of the valve compared to standard O-ring designs, resulting in superior isolation performance over an extended lifecycle.

Flowserve has a new IoT service suite to help production facilities monitor their assets remotely, predict equipment failures before they happen and take preventive measures to avoid business disruptions. Called RedRaven, the new platform supports any flow control equipment regardless of manufacturer, opening the door for companies to quickly realize the full benefits of IoT and predictive analytics without major infrastructure changes.

ADVERTISER Index

WOLSELEY
INDUSTRIAL GROUP

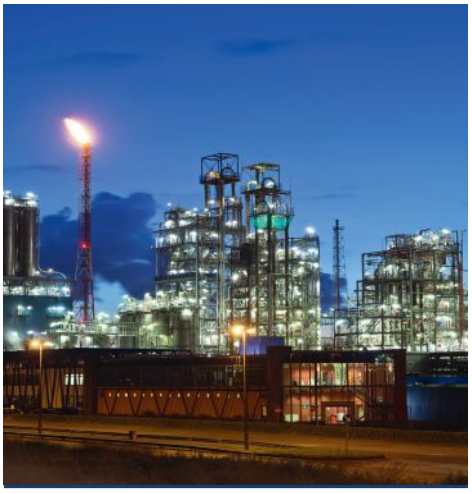
NATIONAL REACH. LOCAL FOCUS.

Using trusted brands of valves, actuators and accessories, our expert valve specialists offer automation solutions for projects of any size, any scope, in any place.

For more information on our valve automation capabilities, visit us at **wolseleyind.com**

WESTLOCK
CONTROLS

NEW! DIGITAL EPIC D200
POSITION TRANSMITTER
EPIC PERFORMANCE IN ANY CONDITION



Westlock is a global leader in innovative and emerging technologies in the Valve Position Monitor, Digital Control Monitor, Network Control Monitor, Position Transmitter and Smart Positioner segments of the Flow Control Industry

NON-CONTACT POSITION FEEDBACK
Offers greater reliability and longer operational life, better plant availability and less maintenance up to 70%*

EASE OF COMMISSIONING
With simple push button calibration and local digital display and lower installation time up to 80%

VERSATILE, GLOBALLY CERTIFIED
For use in hazardous areas, the D200 transmitter is available in a range of enclosure material options for global use**

EASE OF CONFIGURATION
Calibration and diagnostics utilizing the latest communication technology, HART® 7 protocol with DD/FDT® DTM

Intertek

HART COMMUNICATION PROTOCOL

UP TO **70% LESS** MAINTENANCE COST

HART® is a registered trademark of FieldComm Group
See ordering guide for available switch options
*vs Use of gears and potentiometer
**ATEX/IEC/NEC/CEC: Explosionproof/Flameproof, Intrinsically Safe & Non-Incendive

CRANE

www.westlockcontrols.com
A BUSINESS OF CRANE CO.