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VALVE

MAGAZINE

SPRING 2023
VOL. 35, NO. 2

Recycled Paper & Pulp Plants Demand Rugged Valve and Actuator Solutions

: ZERO-
: EMISSIONS
: ACTUATORS
:

: TOP
: CYBERSECURITY
: THREATS TO
: PLANT OT

: VALVES
: HELP ATTAIN
: SUSTAINABILITY
: GOALS

: UPDATED
: PIPING
: CODES
:

Forward together – Neles is now part of Valmet



Neles was merged into Valmet on April 1, 2022 and is now Valmet's Flow Control business line. Valmet now offers an extensive flow control portfolio of industry-leading valves, valve automation solutions and related services, including the renowned Neles, Neles Easyflow, Jamesbury, Stonel, Valvcon and Flowrox solutions.

Valmet is now an even stronger, globally leading company with a unique and competitive offering of process technologies, services, automation systems and flow control solutions for process industries.

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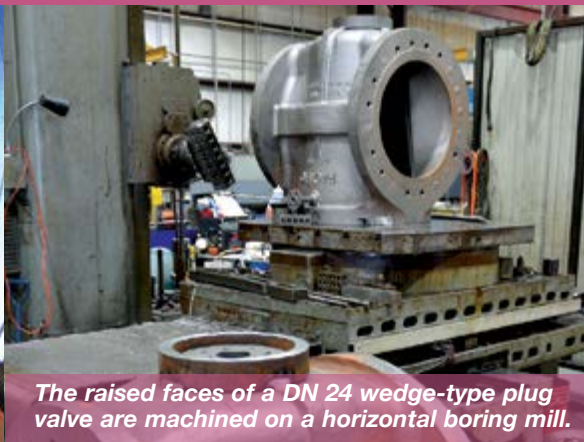
For more information, visit valmet.com/flowcontrol



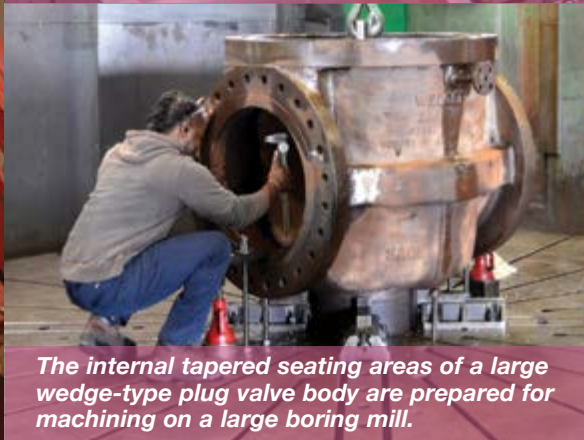
Rising-Rotating Plug Valve Repair & Service



The seating areas of a DN 30, wedge-type plug valve are weld-repaired, prior to machining and grinding.



The raised faces of a DN 24 wedge-type plug valve are machined on a horizontal boring mill.



The internal tapered seating areas of a large wedge-type plug valve body are prepared for machining on a large boring mill.

United Valve is fully equipped to handle repairs and modifications on all types and brands of rising-rotating metallic plug valves. These valves are mainstays of Coker-valve block service as well as many other critical fluid control applications, such as overhead vapor lines and ethylene cracking units. We offer in-shop or field-service repair on these valves and their associated actuators.

The largest boring mills in our machine tool inventory can machine plug valve components of any size or material, while our grinding machinery is capable of handling valves of up to NPS 24 for both internal and external grinding. The machining department features 20-ton cranes, while the adjacent assembly area is served by a 40-ton crane.

Weld repairs are often required on these plug-type metallic valves. The United Valve welding department is led by our in-house welding engineer and features both manual and mechanical welding processes. All of our 200+ welding procedures are created and qualified in accordance with ASME Section IX, as well as approved by many, even stricter end-user specifications.



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Erosive Pulp & Paper Systems Require Proper Valve Selection

As new recycled paper plants are built, companies should partner with their vendors for the best results.

BY HEATHER GAYNOR

PHOTO CREDIT: GETTY IMAGES

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ZERO-EMISSIONS HIGH POWER DEMAND ACTUATORS IN OFF-GRID LOCATIONS

Alternatives to using process gas and electrically powered actuators are available, with different benefits and limitations.

BY MARIA AGUIRRE

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THE FOUR OT CYBERSECURITY THREATS TO FOCUS ON IN 2023

The convergence of IT and OT security with the growth of the Industrial Internet of Things (IIoT) in manufacturing facilities is not a surprise to those in the know.

BY PETER LUND

28

ACHIEVING SUSTAINABILITY GOALS THROUGH EFFICIENT VALVE TECHNOLOGY

From low-power valves to cloud devices, smart valve technologies are a critical part of net-zero strategies to reduce industrial emissions and energy costs.

BY ANDY DUFFY

PRODUCTS

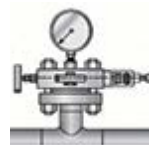
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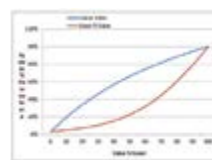
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Differences Between Double Block & Bleed and Double Isolation



The Rationale Behind Valve Characteristics



The Different Types of Solenoid Valves and How They Work



Hardfacing for Valves: Materials and Processes

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www.vma.org

Sustainability, Security and Standards for Our Industry



This spring, VMA convened members, nonmembers and the entire value chain in San Antonio at the VMA Valve Forum: Conference and Exhibits. It's a great way to keep engaged on the latest trends regarding the use of industrial valves in a variety of industries, as well as the overall industrial valve industry. For those that couldn't make it, many of the topics being discussed around the industry and at the Valve Forum are covered in this issue of VALVE Magazine as well.

Keeping up with all the various standards for valves across markets and applications is no easy task. Updates to piping codes and standards are covered in this issue to help our readers. Throughout the year, VMA offers webinars on standards updates and proposed changes. Also, the VALVE Magazine website has a repository of articles on standards.

Two issues affecting companies large and small and in all industries are cybersecurity and sustainability. Valves and actuators can play a critical role in helping companies address their sustainability goals. You'll find articles on how actuators can help reduce emissions, and how valves can help companies save energy. Check out the articles on pages **20** and **28**.

Plants are always susceptible to OT threats so companies must stay vigilant. To see what the top threats predicted for 2023 are for plant OT, see the article on page **24**.

Also in this issue of VALVE Magazine, in the VMA News section, some focus areas for this term's Board of Directors are reviewed, as well as a review of the 2nd Annual VMA Fly-In to DC. With many changes affecting not just industrial valve industry but the entire value chain being proposed, it is more important than ever that VMA raises its voice. I'm proud to work alongside our members to do this.

Thank you for reading VALVE Magazine, and as always, if your company isn't a member and would like more information, please contact me.

Heather
Heather Rhoderick, CAE
President



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ACQUISITIONS, MERGERS & PARTNERSHIPS

Victaulic Acquires Horizon Metals Inc.

On March 30, 2023, Victaulic, a manufacturer of mechanical pipe joining, fire protection and flow control solutions, acquired Horizon Metals Inc. The acquisition supports the company's growth in the infrastructure and waterworks market by increasing capacity for large-diameter piping solutions and is aligned with the strategy to manufacture these products in the United States.

Victaulic continues to demonstrate its commitment to meeting the growing needs of its North American customer base by adding foundry and manufacturing capacity. With this acquisition, Victaulic has added over 1.4 million square feet of foundry and manufacturing capacity in North America since 2011.

Victaulic was founded in 1919 and offers solutions and design services to increase construction productivity and reduce risk, ensuring projects are completed safely, on time and within budget. The company has more than 4,500 employees across its 40 international facilities. Learn more at www.victaulic.com.

Horizon Metals, Inc. is a family-owned and operated iron and steel foundry located in Nephi, Utah.

Flowserve and Hydrogen Optimized Announce Green Hydrogen Partnership

Flowserve Corporation, a leading provider of flow control products and services for the global infrastructure markets, and Hydrogen Optimized, a developer and manufacturer of large-scale green hydrogen production systems, announced that the companies entered into



a memorandum of understanding (MOU) to advance hydrogen production with innovative technologies and applications.

Hydrogen Optimized's patented RuggedCell water electrolyzers are designed to achieve the lowest levelized cost of clean hydrogen at large scale. They convert renewable energy such as solar and wind power into green hydrogen, utilizing a high-power architecture that enables 50 MW+ single modules to serve the clean energy requirements of major industrial applications such as steel making, ammonia production and e-fuels.

Under the MOU, Flowserve will provide its SIHI liquid ring compressor to Hydrogen Optimized for use with a RuggedCell system at its High-Power Demonstration Facility in Ontario. In addition, Flowserve will provide engineering support to assist in flow equipment selection, specification and standardization to help optimize the efficiency of the back end of its hydrogen production. Through this collaboration, Hydrogen Optimized seeks

to accelerate the commercialization of its RuggedCell system. Additionally, it will enable Flowserve to review critical performance data on its products which is expected to result in a leading technology to meet the needs of future decarbonization efforts.

Majority Interest in FloWorks Sold to Wynnchurch

Clearlake Capital Group, L.P. has completed the sale of a majority interest in FloWorks International, LLC, to Wynnchurch Capital, L.P. Clearlake will retain a minority stake in the business going forward. Financial terms of the transaction were not disclosed.



FloWorks is a specialty flow control distribution platform providing solutions focused on non-discretionary maintenance, repair and replacement activities. Under Clearlake's ownership, FloWorks has completed seven strategic acquisitions, further expanding its flow control product portfolio. The new investment and recapitalization by Wynnchurch will enable the company to continue executing on its organic and acquisition growth plans.

Flowserve to Acquire Velan in All Cash Offer

Flowserve Corporation, a provider of flow control products and services for the global infrastructure markets, and Velan Inc., a manufacturer of highly engineered industrial valves, have entered into a definitive agreement under which

Flowserve will acquire Velan in an all-cash transaction valued at approximately \$245 million (Canadian \$329 million), including the purchase of all of the issued and outstanding Velan equity, the assumption of outstanding gross debt as of November 30, 2022. Flowserve will also assume Velan's \$31.4 million (Canadian \$42.2 million) of cash and cash equivalents, also as of November 30, 2022. The transaction is expected to close by the end of the second quarter of 2023.

Founded in Montreal in 1950, Velan is a leading manufacturer of industrial valves with a strong presence in the nuclear, cryogenic and defense markets. Upon completion of the transaction, Velan will become part of Flowserve's Flow Control Division (FCD) segment.

Management Buyout of Cowan Dynamics Complete

Cowan Dynamics CEO and president, Rene Wenker, announced that the company has concluded a management buyout. Ana Munteanu and Aymen Ghorbal acquired the company in a phased-in transaction. The transition completes a process that took place over a number of years. Munteanu is now executive vice president of corporate finance, and Ghorbal is executive vice president of global business development. Wenker will stay on as president and CEO.

Munteanu joined the company in 2016, after senior financial experience. Since joining Cowan she has been actively involved in all aspects of operations, focusing on improving

efficiencies.

Ghorbal joined Cowan in 2014, in the automation and testing division. He has built a reputation for his deep technical knowledge and hands-on problem-solving approach while always supporting clients. He was promoted to director of engineering and director of sales for major accounts prior to his most recent role.

Cowan Dynamics was founded in 1957 in Montreal and acquired by Rene Wenker in 1997.

AWARDS, HONORS & ANNIVERSARIES

Gilmore Celebrates 60-Year Anniversary

VMA member company Gilmore is celebrating 60 years of the design, manufacture and service delivery of critical flow control solutions for the toughest environments.

Already providing reliable flow control solutions to the energy markets, Gilmore continues to collaborate, research and innovate to adapt and accommodate new challenges. Its latest Agiliti product line consists of flow control products and safety systems that expand Gilmore's technology for the unconventional market. These products improve efficiencies, reduce operational costs across the Frac spread, dramatically extend service life and boost Gilmore's customer profitability.

Headquartered in Houston, Texas, Gilmore has established a distribution partner network that supports global markets.

Valmet and Metsä Group Awarded Quality Innovation Award

The Quality Innovation Award competition is an international, prestigious innovation competition, which recognizes the best innovations of the year. The demo plant previously won the Finnish Quality Innovation Award competition organized by Excellent Finland, after which the innovation was able to participate in the international competition.

The joint development project competed in the category of potential innovations. The evaluation criteria were novelty value, usability, learning, customer orientation and effectiveness. The official award ceremony took place in Kazakhstan on February 24, 2023.

The demo plant was inaugurated in August 2022 with the goal to develop a competitive and recyclable fiber-based package to replace plastics. The products, called Muoto, are manufactured ready-to-use for different end uses. Valmet 3D Fiber technology combines the production process of both

the packaging material and the packaging into the same production line resource-efficiently. After the currently ongoing demo phase is completed, market testing of the products with pilot customers will follow.

"This award is a recognition for Valmet's forward-looking innovation mindset as well as for the hard work and dedication of the development team of Valmet, Metsä Group and our co-operation partners. The award serves as a testament to our commitment to pushing the boundaries of what is possible and driving technology forward in our field," says Sampo Immonen, R&D Director, Board and Paper Mills, Valmet.

Baker Hughes Foundation Contributes to Employee-Nominated Charities

The Baker Hughes Foundation announced a total of \$270,000 in grants to nonprofit organizations (NPO) that promote diversity, equity and inclusion (DEI). The recipient NPOs were nominated by Baker Hughes global employee



Darren Johnson, VP Ops, David Nemetz, CEO, and Ryan Bludau, CTO of Gilmore.

Photo Credit: Gilmore

MAY/JUNE

May 31 – June 2 Valve Repair Seminar

Pasadena, TX
Vma.org/RepairSeminar

AUGUST

3-4 VMA/HI Market Outlook Workshop

Rosemont, IL
Vma.org/marketoutlook

SEPTEMBER

27-29 VMA/VRC Annual Meeting (VMA Members only)

Savannah, GA
Vma.org/AnnualMeeting

ALL YEAR LONG

Valve Basics

Virtual: Available all year
Vma.org/VirtualBasics

OTHER VMA EVENTS

Please visit vma.org/calendar for additional programs as they are scheduled.

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

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VALVE Magazine welcomes articles, proposals, manuscripts, photographs and ideas from our readers. For a copy of the magazine's Author's Guidelines, contact Heather Gaynor, Editor-in-Chief, at hgaynor@gardnerweb.com

Photo Credit: Baker Hughes Foundation



resource groups (ERG), who have joined together based on shared interests, characteristics or life experiences. The charities selected include: MySkills Foundation; Junior Achievement of Southeast Texas; Easter Seals Greater Houston; Un TECHO Para Mi País; The Trevor Project;

Folds of Honor Foundation, and GiGi's Playhouse.

"Giving our employees a voice is critical and drives change by elevating the conversation, creating awareness, and engaging with the communities where we conduct business," said Baker Hughes' chief culture and diversity equity &

inclusion officer Nicole Durham. "We strive to be an inclusive workplace where employees know their voices are heard."

This is the second consecutive year that the Baker Hughes Foundation has

issued grants to charities nominated by ERGs with the goal to promote education, opportunity, diversity, equity and inclusion. This donation also supports Baker Hughes' commitment to advancing the United Nations' Sustainable Development Goals (SDGs).

PEOPLE IN THE NEWS



Scott Allard

Conval Appoints Scott Allard as President

Chairman and owner Frank Siver announced the hiring of Scott Allard as president of Conval, Inc. Allard joined Conval with a wide range of experience, garnered from a number of different valve manufacturers in managerial roles ranging from engineering to general management to product/project management and sales. He replaces Don Curtin, who retired after 25 years of service.

Victaulic Promotes Gary Moore to Executive VP and CRO

Victaulic announced the promotion of Gary Moore to executive vice president and chief revenue officer. Moore began his Victaulic career 35 years ago in sales for Canada and progressed to the role of president of Victaulic Company of Canada, Limited. Later he joined the executive team at Victaulic's U.S. corporate headquarters and served as the executive vice president responsible for building and driving the global sales team.

Kitz Corporation of America Announces New President

KITZ Corporation of America has appointed Mike Chamberlain to president and board member effective April 1, 2023. Chamberlain joined KCA in 2020 following a 31-year career at MRC Global, leaving as vice president of business development. Chamberlain will replace Jim Walther, a 36-year KCA employee who spent the past 17 years as its president. Walther will assume the role of chairman of the company.

KCA also promoted Erik Andrews from general manager of its commercial division to vice president and board member, beginning April 1. He began his KITZ career in 2008.



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VMA Board of Directors Meet and Address Critical Industry Issues

Led by Chairman Matt Thiel, President, AUMA Actuators USA, VMA's Board of Directors held its first meeting of 2023 in March, with a few critical issues on the agenda including PFAS (per- and polyfluoroalkyl), ESG (Environmental, Social and Governance) and sustainability, government affairs, industry education and networking, along with general Association business issues.



Chairman Matt Thiel, President, AUMA Actuators USA, VMA's Board of Directors

Both here in the U.S. and globally, there is a focus on a grouping of chemicals called PFAS due to some of the harmful, cancer-causing chemicals in that grouping found in drinking water. There are possible implications for

the industrial valve industry, and more information on those can be found in VALVE Magazine's Winter 2022 issue. Because of this and the recent actions, VMA's Technical and Government Affairs Committees will continue to work on this issue on behalf of the industry.

Working to help customers reduce fugitive emissions, running safe and compliant plants through environmental, health and safety programs, and being a good corporate citizen are not new to the valve industry, with many companies including these activities as part of their ESG or sustainability efforts. However, the terms ESG and sustainability have risen in visibility recently with the global focus on reducing car-

bon, community and workforce interest in the environment, and social justice as well as the call for more public reporting from companies on these topics.

VMA's Board of Directors agreed to develop a VMA and industry message on ESG to demonstrate the value our industry provides and to define our view of ESG. Additionally, as member companies choose to define what ESG and sustainability mean to them, VMA will be developing a tool kit on considerations for this process, as well as examples and benchmarks of what other companies in the industry are doing.

With many end-use market customers also asking for information on ESG activities, ways to approach setting a baseline to measure against will also be included, especially on the environmental activities related to ESG. VMA's Sustainability Task Force will lead this effort.

The Board of Directors also discussed VMA's current educational, networking and event offerings and reiterated the importance of these activities. The continued opportunities in projects related to hydrogen, energy transition and security, the change in workforce with retirements, geopolitical implications to our industry, reshoring, and supply chain — along with the other critical issues addressed earlier — all underscore the need for VMA members and the entire industrial valve and flow control industry value chain to convene. Other Association business items, such as a review of the organization's financial standing and membership, were also discussed.

VMA continues all its efforts to develop more comprehensive industry statistics and information, work on manufacturing and workforce development, technical issues and more.

If you're interested in becoming a VMA member, check out our membership ad on page 31 and learn how to join!

VMA Fly-In Returns to Capitol Hill for the Second Year

Also in March, VMA member company representatives joined together to meet with six House of Representatives offices, where they educated the offices on the need to reinstate the R&D tax credit, continue support of workforce/training legislation and closely monitor the EPA's focus on PFAS.

The day started at the U.S. Chamber of Commerce where participants received in-depth briefings from Chamber senior staff who provided the business community's view on legislative implications of some top policy issues including:

- Infrastructure Spending
- Supply Chain Challenges
- Tax Policy – Including the R&D Tax Credit
- Federal Legislative and Political Update
- Macro-Economic Outlook



Market Outlook Workshop Returns In-Person

VMA, VRC and Hydraulic Institute (HI) members will convene August 2-3 in Rosemont, Ill., for the 2023 Market Outlook Workshop.

The event brings together global and national economic experts, as well as the experts who research and follow the

“After four years of hosting the event virtually, VMA, VRC and HI members are excited for another opportunity to meet, connect and build long-lasting partnerships with each other,” said Heather Rhoderick, VMA president.

“With the addition of the renewables and LNG markets to this year’s program, the Market Outlook Workshop is truly a can’t-miss event for professionals responsible for business development, sales or marketing strategies and forecasts. Anyone in the flow control or fluid handling industries looking for a greater understanding of how

economic, societal and other implications impact different market segments and their business should plan to attend and participate in the event.”

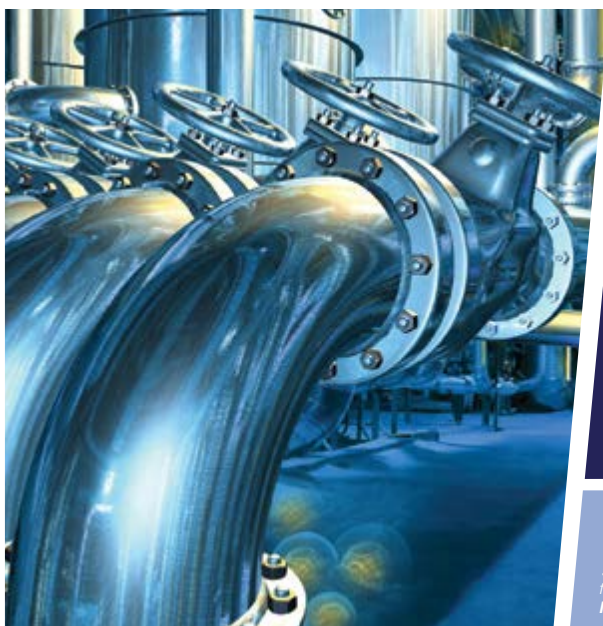
The Market Outlook Workshop is open *only* to VMA, VRC and HI members. Learn more and register at www.vma.org/MarketOutlook.



economic indicators for end-use markets important to the valve and pump industries, including oil and gas, hydropower, chemical, mining, water/wastewater and many more.

New markets for 2023 will include the renewables and liquified natural gas sectors, respectively. With the event being in-person again, attendees will also have the chance to network during special events and between sessions.

Manufacturers
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OF THE VALVE AND FITTINGS INDUSTRY



MSS IS PROUD TO ANNOUNCE RECENT PUBLICATIONS!

Revised ANSI/MSS SP-138-2023, Quality Standard Practice for Oxygen Cleaning of Valves and Fittings
Standard Practice (SP)-138 has been meeting oxygen service industry needs for over 15 years! This ANSI-approved American National Standard provides general requirements for cleaning, inspection, testing, and packaging of valves and fittings intended to be used for oxygen service.

Revised SP-117-2023, Bellows Seals for Globe and Gate Valves
Standard Practice (SP)-117 has served the industry for over 27 years; specifying requirements for design, materials, fabrication, installation, qualification, examination, testing, marking, ordering, and shipment of metal bellows and/or bellows assemblies to be installed in manual and automated on-off globe and gate valves.

Both of these Revised Standards are now available from authorized distributors.

About MSS

The Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. is a non-profit technical association organized for development and improvement of industry, national and international codes and standards. Since its establishment in 1924, MSS has been dedicated to developing voluntary standards for national and global application, in cooperation with other standardizing bodies and regulatory authorities. MSS is an American National Standards Institute (ANSI)-accredited standards developer.



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VMA Welcomes New Member

VMA WOULD LIKE TO WELCOME ITS NEWEST MEMBER, CADENAS PARTSOLUTIONS!

CADENAS PARTSolutions is a leading provider of digital catalog services, helping component manufacturers increase qualified leads by delivering a streamlined, digital customer experience, on-demand access to 3D product configuration, instant product previews and free 3D CAD model downloads.



Valve Repair Seminar Program Focuses on Critical Issues in the Industry

The Valve Repair Seminar takes place May 31-June 2 in Pasadena, Texas. It is produced by the Valve Repair Council, however, this year it is open to anyone in the industry. This seminar is unique in that it focuses on issues specific to repairing valve assemblies and keeping them operating at peak efficiency, as well as addressing high-level concerns about what is happening in the industry, what pressures it faces and where it is headed. Small tabletop exhibits are also offered.



The event kicks off with a lunch and then a tour of the local SetPoint Integrated Solutions facility, which is always a highlight and provides a great opportunity for attendees to see another shop and network. Following that, topical presentations begin. After a five-year hiatus, there's a lot to cover at this year's seminar.

The program contains experts on the most critical issues affecting our industry, including:

- Latest Advancements in PMI and Field Applications using XRF and LIBS Technologies
- Achieving Low Fugitive Emissions Compliance
- 3D Scanning and Printing
- Repairing Pipeline Valves
- Base Metal Repair
- MOV Repair
- Training and Talent Retention
- and more!

Plus, connect and build relationships with key valve repair

industry professionals during a reception and in the tabletop exhibit area.

The event takes place at the Houston Area Safety Council in Pasadena, Texas. It is easily accessible to Houston Hobby Airport, and also an easy drive from anywhere in the Houston area. Registration rates include all the presentations, lunch and a reception. Member and non-member rates are offered and start at \$525. Rates increase on May 4th.

Learn more about the Valve Repair Seminar and register at www.vma.org/RepairSeminar

VMA Valve Forum Held in San Antonio

On April 17, the VMA Valve Forum kicked off in San Antonio, Texas. With more than 120 people in attendance, up more than 20%, the event opened with a networking reception in a ballroom with nearly 20 exhibitors participating.

The conference began on Tuesday with a general session covering manufacturing industry trends. After that, attendees could choose from a variety of offerings in four different tracks: Technical, Valve Fundamentals, Manufacturing and Management & Marketing. Within the tracks sessions included topics including: a case study on a 168-inch diameter butterfly valve installation; nondestructive valve evaluation; additive manufacturing; using social media in your marketing mix; potential implications surrounding PFAS chemicals and becoming a data-driven organization.

Also this year a variety of roundtables were held where attendees had a chance to discuss topics in each of the tracks. Two students and a professor from Texas A&M's Industrial Distribution program shared information about their coursework, what they are looking for in their careers from employers and more. Industry attendees also asked questions of the students and asked for their feedback on a number of topics.

Attendees had plenty of time for networking and reconnecting with each other, and had the chance to tour the San Antonio River Tunnel Facility.

Sponsors included EFCO USA, ETI Systems and Setpoint Integrated Solutions. **■**



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Erosive Pulp & Paper Systems Require Proper Valve Selection

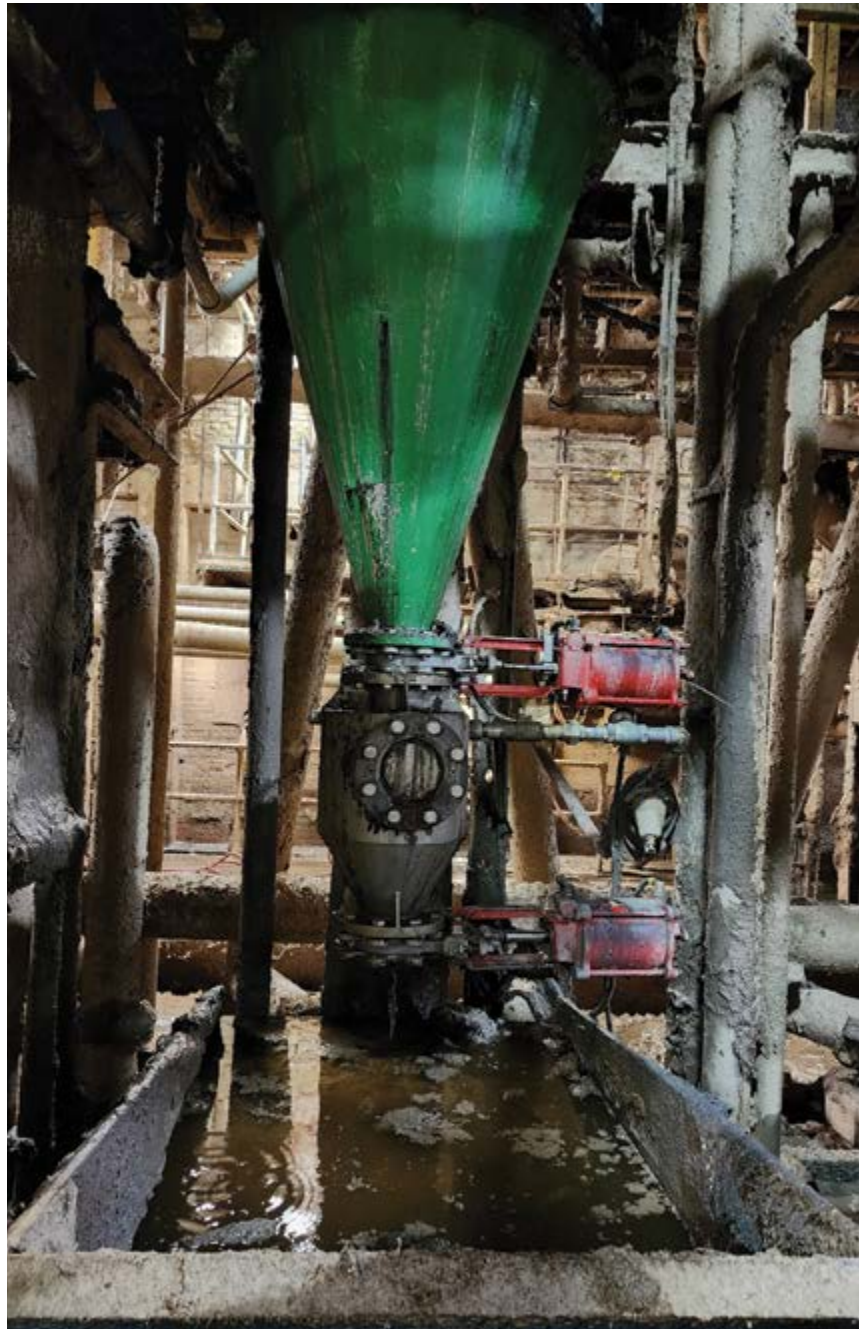
As new recycled paper plants are being built for the first time in decades, paper companies should partner with their valve and actuator suppliers for best results.

BY HEATHER GAYNOR

As a member of the valve industry, you likely recognize the number of valves we encounter in our everyday lives. They are prolific, in everything from our water taps to helping power our homes in energy applications. But have you ever stopped to think about how much paper you consume? This includes so many things we interact with and use every single day — office printing paper, toilet paper, labels, product packaging and shipping boxes, just to name a few.

During the height of the pandemic when many people were ordering items for home delivery, the pulp and paper industry shifted much of its production

Each cyclone in the recycled pulping process expels rejects through a gate or knife valve that experiences high erosion.



All photos courtesy of Bray International.

to paperboard and corrugated papers used to make packaging for consumer goods and final boxes to ship them. There was less demand for writing and printing paper as people worked from home, so paper companies used their inventory to meet the lower demands. Today, three years later, ongoing shortages affect all markets that use paper, including the printing industry which produces this magazine. This has led to several new paper plants coming online, and the retrofitting of existing plants to manufacture recycled paper to meet the market needs.

In mid-2021, Green Bay Packaging inaugurated a new plant in Wisconsin — the first new paper mill in the U.S. in 30 years. Graphic Packaging in Waco, Texas, is currently converting a recycled corrugated plant to a paperboard plant at an expected cost of \$1 billion USD. And Pratt Paper is opening new recycled paper mills in Ohio and Kentucky, and a co-located corrugated box factory at the same site in Kentucky to manufacture market-ready corrugated products from the mill's output. There is a lot of investment going into mills across the U.S. and around the world, and myriad opportunities for valve manufacturers to sell to and service valves in this industry.

Another reason why more recycled paper plants are coming online is consumer demand for recycled materials, with paper being high on the list. The pulp and paper industry contributes not only to municipal waste but has an environmental impact. Many paper companies are now reforestation thousands of acres of land to replace the trees removed in the past, and they have shifted to using specific wood that is easily regrown and processed. Pulp and paper processing also uses an extraordinary amount of water. The United Nations estimates that 12% of water withdrawals globally are for pulp and paper plants. With global droughts and climate change at the forefront of many, recycling paper just makes sense.

Much of our trash stream is also paper and other products that could be recycled. Consumers are getting more conscientious about recycling their paper, more than other products, according to recent statistics. The EPA estimated in the U.S. in 2018 that 23.1% of municipal solid waste (MSW) was paper products that could have been recycled. However, they also estimate that approximately 46 million tons of paper and paperboard were recycled in 2018 for a recycling rate of



Bray knife gate valve Series 942 featuring replaceable vortex breaker with A36 steel and tungsten carbide overlay for extended duty.

68.2%, higher than all other materials in MSW. Many U.S. municipalities are making recycling a compulsory part of their waste collection, which should only help these numbers continue to improve.

But recycled paper plants consist of systems that see extraordinary amounts of erosive and abrasive materials processed every day. Proper valve selection is critical to ensuring the plant can run as efficiently as possible and avoid unnecessary stoppages due to equipment failure. Unlike large processing plants such as power or chemical which have scheduled maintenance shutdowns that may last for weeks and are planned for many months or years in advance, paper plants are much smaller operations and work on much shorter timelines in duration and frequency, with maintenance shutdowns happening as often as every eight to 10 weeks, or sometimes a few months, depending on volume.

We spoke with Shahrum Iqbal, vice president of control valves and automation at Bray International Inc., to learn more about the process of making recycled paper, the valves involved, and the necessity to use valves made of the right materials and at the right size to withstand the harsh environment of a paper mill.

PROCESS OF RECYCLED PAPERMAKING

For this article, we are only going to focus on the first phases of recycling paper into pulp. There are several

downstream processes that occur which we won't cover in this article but will look to explore in future content.

To make recycled paper, the feedstock or starting paper needs to be broken down back to a fiber state. This process shortens and weakens the fiber each time it is recycled, which is possible an average of 5-7 times before it becomes unusable.

The paper manufacturing process is very challenging as the pulp is very viscous, and a variety of abrasive materials are filtered out through the manufacturing process that is very damaging to fluid systems, particularly in recycled paper as it contains what the industry calls "rejects," or foreign objects that make their way into the processing.

Manufacturing recycled paper starts when consumers put waste paper and other recyclable items into their recycling bins. From here, the materials are sent to re-sorting facilities which remove non-recyclable materials and sort what's left

into the appropriate stream. Paper bales are created, often sorted by type of paper such as brown and corrugated, white writing paper, etc., and delivered to recycled paper plants.

Once the bales arrive, they are broken up and placed into a large vessel called a pulper that contains water, and in some cases chemicals, to break the materials down to the fiber level turning it into a paste-like consistency. From the pulper, the slurry goes into a cyclone. A spinning blade mechanically assists the chemicals and water to help form the cyclonic action. Within this vessel there are often residual metal staples, glass, sand and other abrasive contaminants, called rejects, are being agitated and sorted from the fibers. It's also heated to burn off lingering contaminants and grease, particularly from food packaging. The output is called brown stock or paper pulp, which then is expelled from the vessel through large control valves, 10- to 16-inch valves.

Next are multiple steps of cleaning and filtration. The steps consecutively remove finer and finer particles. The pulp stock enters a series of cleaners and cyclonic machines that spin the stock to remove rejects that fall to the bottom into a screen. At the bottom of the cyclone is often a butterfly valve or gate valve, but because of the harsh environment, it may only last a few weeks. This is why it is critical for users to order valves with the right packing and materials to extend the life of the valve. Typically, the valve packing would be made of PTFE or graphite, which would have significant shortcomings in this application. Valve manufacturers offer solutions specific to this application, including one from Bray that has a copper scraper with high-performance packing made from Kevlar, a material that is more durable and resistant to erosion. This specific valve also has purge ports on the valve body to make it possible for operators to use high-pressure water to clean the valve and further extend its life. The stock is further cleaned with a series of cleaners to remove the finer rejects. Control valves in these applications see high wear and tear from the abrasive media. These valves are typically designed knife gate or segmented control valves with abrasion-resistant coatings and extremely hard material of construction to withstand the sand, glass, staples, and other metal fragments often flowing in the media.

Next, once the pulp is made, it is run through a series of machines to dry it to convert it to sheets of material that can be sent to paper mills and converted into various types of paper products — from corrugated cardboard to paperboard

used in consumer goods packaging. But throughout this system, the pulp material runs through a series of pipes, tubing, valves and other process control systems, putting a great strain on these components because of the solids that abrade and degrade the controls. Iqbal says this is where the material selection becomes critical.

"It's not just the packing material of the valve, or the trim materials that see the main flow through them, but also the area around the stem that you have to consider," Iqbal shares. "The design of the valves is also critically important because some valves have more cavities than others and the more cavities they contain, the higher the risk of breakdown or failure. As the rejects or solids flow through the system, they have a chance to build up on the internals of the valve and the valve drive train, jamming them and preventing them from operating properly or at all."

Paper manufacturing and recycling are completely reliant on fluid systems as each phase involves an addition or subtraction of liquid from the pulp. Iqbal says, depending on the size of the plant, the number of valves can number in the thousands, and these are just the process valves. If you work in one of these plants as a maintenance or reliability engi-



Large holes formed in the body of this valve after a few weeks in service.

neer, you already know this and spend your days very busy repairing and replacing components.

"For a 1,500-ton-per-day plant, you've probably got about 2,000 to 2,300 valves, in a combination of manually operated, electrical, pneumatic, etc., and different types of valves. Critical valves are always going to be actuated and controlled with automation."

Of these control valves, Iqbal says, large numbers of mills



Internal photo of the same valve with holes highlighted, and erosion shown throughout on the ball of the valve.

use a segmented ball valve that is optimized for this application. These valves were designed to reduce the impact of the abrasive environment in pulp and paper plants. The design offers a shearing action to cut through pulp fibers and precise controllability, which is often required in this process. The other valves used in automated applications in pulp and paper plants are knife gate valves and ball valves.

MATERIALS SELECTION

Iqbal says: "I've been in several plants and seen the valve body blow out, and lots of other failures in various mechanisms including valve leaks, jamming and more. This creates a lot of maintenance headaches at these plants and stops processing altogether." This can be due to several factors: the abrasive nature of the process, improper materials selection, improper valve selection and improper sizing are among the most common.

There are solutions on the market that are more durable that may be used in some of these applications, including ceramic valves or chrome iron valves. It's critical that the internals of the valve, including the entire fluid path and the ball or disk, be made with these materials. These options are typically costly.

Ceramic valves can withstand a lot of abrasion but are

more susceptible to cracking and failure from excess vibration, mechanical or hydraulic shock or pressure. They are better suited for processes where the fluids are highly abrasive, and slurries are thicker and heavier. They may be used in the harshest part of the stock preparation process but aren't frequently used. Chrome iron internals are more durable than ceramic. In virgin paper manufacturing, you are more likely to see these valves because of the caustic chemicals used in bleaching and processing the pulp. They may also use valves made of alloys or exotics such as Hastelloy, Titanium or Monel.

Iqbal says one successful deployment he's seen for control valves on rejects in recycled paper plants is the use of standard stainless steel valve bodies with abrasion-resistant, thermally coated internals and specialty alloy seats and

How Does Pulp Become Paper?

Once the pulp is created from recycled paper, it's many steps away from becoming a new final paper product. The dried sheets of pulp arrive at the paper plant for conversion back to a pulp slurry and continue through another series of processes. Once at the paper plant, water is again introduced along with chemicals to give the paper traits such as water resistance or fire retardance. The mix is almost 90% water at this point and is fed through a series of pipes and tubes called an octopus into a head box.

From this box, it is sprayed onto rotating drums that are covered with fine nylon mesh screens and vacuum pumps inside them to remove the liquid and force the pulp to stick to the outside of the drums. Throughout this process, chemicals for binding and whitening or ensuring consistent color of the paper are also added. Once this is complete, it goes through a series of rubber or metal drums that compress the fibers into sheets and remove any remaining water.

It is then run through a series of machines called vat formers which each deposit very fine layers of fibers to create the final paper products, in various thicknesses, depending on how many layers are applied and how thickly they are applied.

There are then several drying stations consisting of steam-heated cylinders where the paper is dried to specific moisture levels. During this process, additional chemicals for whitening or ensuring consistent color of the paper may be added. Sensors are run over the paper to determine moisture level and if needed, it goes through an additional drying process. Once this is complete, the paper is wound onto reels and either cut to its final size or sent to another facility or area of the plant for final sizing and packaging of the recycled paper product.

downstream bore liners. For example, when using a ball valve, he recommends the entire bore of the valve be coated with the abrasion-resistant coating including the ball. This is also a more cost-effective solution for a market with very tight operating budgets.

The valves at the bottom of the cyclones are typically knife gate valves. He's seen these fail very commonly. One reason can be that the cyclonic action can be enough to bore through the gate of the valve. He's also seen many of these valves leak through the packing and the seats because of improper materials selection. Jamming is a common failure as the rejects/junk from the media builds up in the pockets leading to valves getting stuck. Bray offers a knife gate valve that has a proprietary coated vortex breaker in it to break the cyclonic effect to prevent the rejects from creating a drill-through problem. They also use harder materials for the gate to allow for more strength and abrasion resistance. In addition, the Bray valve has a copper scraper to prevent damage to the packing. The purge ports allow the customers to use high-pressure water and flush the rejects/junks from the valve preventing jamming.

PROPER SIZING AND ACTUATION

With these valves often cycling up to 1,500 times a day, users need to consider not just the valve but the durability of the actuators. With dust and debris inherent to the atmosphere of a pulp and paper plant, seals can fail in fluid-powered actuators because they are made from soft materials and the actuators develop leaks, leading to pressure blowby. "As you're trying to build up pressure in the actuator to move the valve, your seal integrity has been compromised due to foreign particles inside the actuator housing and the actuator is not able to move the valve," Iqbal says. "One thing to keep in mind is the importance of the type of actuator seal selected. Most actuators have O-rings, but we use Quad rings as standard for better seal integrity and reliability." Bray's standard design also has internal wipers for actuators that remove dust and debris that may have been ingested in the actuator assembly. Bray also offers a closed-loop pneumatic circuit that prevents ingesting outside dust and debris — enhancing the life of the actuator.

Iqbal also recommends the use of chrome plating on the inside of the actuators. "Chrome plating allows mul-



Actuator covered in pulp in application at a pulp recycling plant.

iple benefits. There is also a lot of moisture in the air and sometimes instrument air can have moisture as well at these plants, so having chrome-plated internals helps with corrosion resistance.

Utilizing appropriate safety factors for actuator sizing is critical as mentioned by Iqbal and his team so that the actuator has enough torque or thrust to account for the buildup of pulp, debris and scale from the media and the ability to handle the high cycles often found in paper plants.

Valve sizing is another area where users should work with their suppliers closely. When customers say they are having repeated failures, computational fluid dynamics (CFD) can be used to analyze the processes and make recommendations. Using process flow conditions, angles of opening and other relevant details, they can then recommend the best solutions.

"We use ISA control valve sizing standards with the CFD analysis and recommend sizing, sometimes upsizing, sometimes downsizing, to help them last longer. We see valves being undersized or oversized all the time, usually oversized, which leads to premature wear and failure," he says. "Failures happen most where you have constrictions, such as valves or other components to restrict flow. Proper valve sizing helps reduce the constriction for flow upstream and downstream, eliminating high velocities and preventing premature failure."

Another consideration is the ease of repairability and replacement for the maintenance teams. "All of these valves are eventually going to wear out – there's no bulletproof solution," Iqbal says. "So, giving customers a valve solution that is repairable and can be easily fixed versus replaced."

Manufacturers have embraced videos to train their customers on how to repair and replace their own valves. They post them on YouTube or other easily accessible sites so that the maintenance team isn't flipping through a 60-page manual but watching a short step-by-step repair video. "We need to make it easier for those in the field to understand what the problems are, diagnose and repair them. If you can do that in a five- or six-minute video, it's a great solution," Iqbal says.

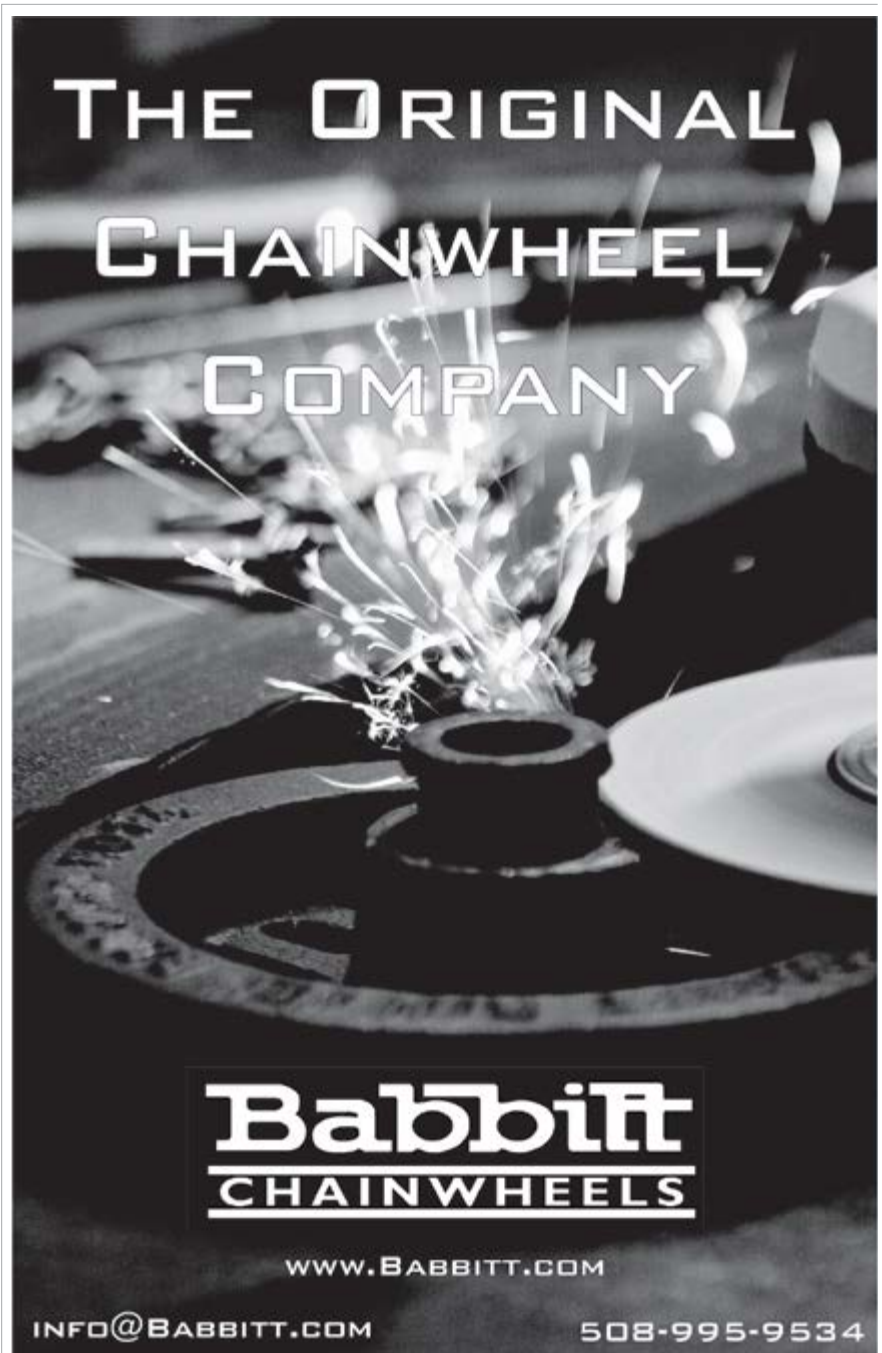
Most suppliers also offer training to their customers. Bray offers different options for employees in different roles and can do the training at one of their facilities or on-site at the plant. Training includes valve sizing and selection geared toward plant engineers, as well as a focus for instrumentation and reliability techs and maintenance geared toward diagnosing and repairing issues as they occur. Reach out to your supplier directly for information on the training offered.

FINAL RECOMMENDATIONS

At the end of the day, valve companies want to do all they can to help their customers control their total cost of ownership. If you work at a plant, involving your suppliers early and often can help your operations be more efficient and avoid unnecessary costs, wasted pulp due to leaking valves or unplanned shutdowns. Iqbal recommends engaging directly with valve companies that have the technical and

application depth when possible to allow for a strong technical partnership between the teams, resulting in maximized productivity and efficiency for the plants. **VM**

HEATHER GAYNOR is the editor of VALVE Magazine.



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All photos courtesy of Cowan Dynamics.

Zero-Emissions, High-Power Demand Actuators in Off-Grid Locations

Alternatives to using process gas and electrically powered actuators are available.

BY MARIA AGUIRRE

As the EPA's (Environmental Protection Agency) upcoming restrictions for VOCs (volatile organic compounds) come into force in the coming months, users are evaluating different options to reduce or eliminate emissions from pneumatic controllers that have either a continuous or an intermittent bleed. This is relevant

specifically to methane emissions from pneumatic controllers, including valve actuators. These emissions include those occurring from leaking equipment (also referred to as fugitive emissions) in all parts of the infrastructure, including primary production and processing equipment (e.g., separators or storage vessels) and individual components

(e.g., valves or connectors). Although regulations are not the only factor for users to consider when looking for alternatives to reduce or eliminate emissions, operators' safety in using these systems has always been a concern. Some process gases can be toxic or harmful to human health, and exposure to these gases can lead to respiratory problems, eye irritation and other health issues. In addition, accidents of injured operators have been reported because of explosions due to vented process gas from these controllers.

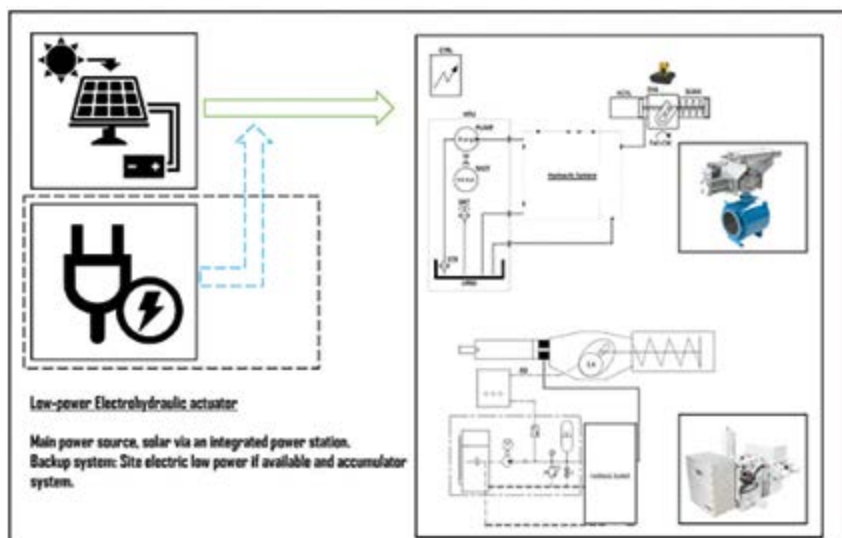
WHY USE PROCESS GAS TO POWER VALVE ACTUATORS?

The oil and gas sector extensively uses process gas as an energy source to power pneumatic controllers. Pneumatic controllers are widely used in these production facilities to control the operation of pumps, actuators and other equipment. These controllers utilize compressed air or process gas to function. Using process gas to pneumatically power controllers offers several advantages:

- The need for external air compressors or other compressed air sources, which can be expensive and require additional equipment and maintenance, can be eliminated.
- It helps reduce the facility's overall energy consumption and, most importantly, provides an energy source in remote locations where no other source is readily available.

ALTERNATIVES TO GAS-POWERED VALVE ACTUATOR EMISSIONS

The industry offers several alternatives to replace or retrofit these actuators to reduce or eliminate the venting of methane emissions into the atmosphere. To choose one of these



Solar-powered, low-power electrohydraulic actuators.

existing technologies or to develop a new technology to address this challenge, one must consider the multiple factors impacting the change to zero-emission controllers.

One of the least invasive alternatives to reduce emissions from pneumatic actuators is collecting and recirculating the exhausted gas. In systems like gas-over-oil actuators, the process gas is used to pressurize hydraulic fluid, which is later used to operate the actuator and also the valve. After the actuator is stroked, the gas is exhausted into the atmosphere.

An alternative solution is a system to capture and pressurize the exhausted gas so it is injected back into the process line. From an energy consumption point of view, this alternative does not provide an advantage. As stated previously, one of the main reasons for using process gas to power pneumatic controllers is that it eliminates the need for external power sources. In these actuator systems, energy is needed not only to pressurize the gas but also to pressurize it to a higher pressure so it can be reinjected into the pipeline. Why not use this energy to power the actuator directly? Moreover, such systems are complex, they require regular maintenance to ensure constant effective operation. This can be time consuming and costly, particularly for large-scale systems. If not appropriately maintained, these systems are still susceptible to gas emissions since they use process gas as a primary energy source.

COMPRESSED AIR

In locations with a high pneumatic controller count, replacing the process gas with compressed dry clean air or another inert gas is perhaps the best alternative. The pressurization system requires a power source, preparation and storage system, which can lead to a high overall initial cost. However, the maintenance cost may be minimal compared to other alternatives, and almost no modifications would be needed to install the existing pneumatic controllers. In addition,



Cowan Dynamics Series E2H90 electrohydraulic actuator (solar power station not shown).

Comparison of industry alternatives to eliminate or reduce emissions from gas-powered valve actuators

Available solution	Zero Emissions	Off-grid	Min. Power Limitations	Scalable	Fail-Safe	Low Maintenance	Energy-efficient Design
Gas-over-oil actuators c/w recirculation of exhaust gas	X	X	X		X		
Electric Actuators — High power	X		X			X	X
Electric Actuators — Low power	X	X				X	X
Conversion. Gas generator. Compressed air systems		X	X	X	X		
Electrohydraulic — High power	X		X		X	X	X
Electrohydraulic — Low Power - Solar	X	X	X		X	X	X

changing from gas to clean air will prolong the service life and reliability of the pneumatic controllers. Different power sources, including electric utility power, can be used, but this will increase the overall power consumption and lead to higher operational costs.

For off-grid locations, one alternative is to use a gas generator to power the compressed air system. Even when the emissions are minimal, they may not be 100% eliminated. Using a generator will also have a higher initial cost and require regular maintenance to ensure proper operation and prevent emissions due to leaks in the system.

Moving away from using the process gas as the primary energy source will be a safer way to ensure a zero-emissions system. An alternative reliable energy source is needed to achieve this.

ELECTRIC ACTUATORS

In locations with a medium to low count of pneumatic actuators, using an electric power source to operate electric actuators is a cost-effective solution and provides other advantages, such as remote monitoring. This alternative presents

limitations in some applications, depending on the available electric power supply. Electric valve actuators may not be practical in facilities with limited electrical capacity or remote locations where access to electricity is limited, for example, via solar panels. Additionally, power outages or other disruptions to the electrical supply could cause a failure of valve control. Electric actuators have torque limitations, and because they depend on the electrical power supply, they are less reliable in the case of a power outage.

By contrast, pneumatic or hydraulic actuators use pressurized fluid to generate force. This allows them to have a larger output capacity, especially in hydraulic actuators, and more reliable energy backup systems when power fails and actions cannot be achieved mechanically (springs).

ZERO-EMISSIONS ACTUATORS IN OFF-GRID LOCATIONS

Based on these considerations, the biggest challenge is finding a zero-emissions valve actuator for high power consumption applications in off-grid locations — the ideal candi-



date for process gas-powered actuators such as gas-over-oil actuators. An excellent example of these applications is emergency shutdown (ESD) valves.

Used in a variety of industries to quickly shut down a process in an emergency, ESD valves are typically spaced along a pipeline at intervals that are sufficient to provide an effective shutdown while also minimizing the potential impact on the overall operation. Because of the remoteness of these valves, applying large-scale solutions would not be the most cost-effective approach in these applications. Instead, the answer to finding zero-emissions valve actuators relies on a system capable of providing the force capacity, reliability, and simplicity of fluid-powered actuators with low power consumption, while using a reliable and available power source.

LOW-POWER ELECTROHYDRAULIC ACTUATORS

Low-power electrohydraulic actuators use a low-consumption hydraulic power unit to drive the valve directly or to pressurize hydraulic fluid in accumulators, which allows for large force capacities. Actions during a power or signal failure are driven mechanically using springs. When the force required surpasses the capacities of the springs, a hydraulic spring system is added. Unlike a conventional accumulator backup system for failure action, the hydraulic spring uses the actuator movement to restore the hydraulic pressure. This eliminates downtime to recharge the accumulators, ensuring the valve action immediately upon failure.

For off-grid locations, the hydraulic power unit of the actuator is powered by the actuator's solar power station. Because of the reliability concerns of solar power, the power supply system can be backed-up with site electric power, or energy can be stored in accumulator systems to drive the actuator in case the power is not available or fails.

These systems offer several advantages because they are true zero-emissions actuators that completely replace the use of process gas as the source of energy. They have force capacities equal to or greater than a gas-over-oil system. They use solar power as the primary source of energy to drive a high-capacity hydraulic system, which ensures reliability of actuation upon power or signal failure. Implementing these systems may have a higher initial investment than the collection and recirculation systems previously discussed, however, they provide an energy-efficient design and a long-term solution.

FACTORS:

- Zero emissions: There is no risk of emission. The system completely moves away from the use of process gas.
- Off-grid: No source of power is readily available. Low power for control systems may be available.
- Minimum power limitations: Actuators with high force capacities.
- Scalable: Solutions that focus on the source or energy and not on the replacement of the controllers.
- Fail-safe: Actuators with a backup system for operation after power supply failures.
- Low maintenance: Simpler systems, lower risk of failure.
- Energy-efficient design: Less energy consumption to provide the same levels of output force capacities. VM



MARIA AGUIRRE is a certified professional mechanical engineer with a master's degree in mechanical engineering and a master's degree in environmental engineering. She is the director of business and product development for Cowan Dynamics and is a VALVE Magazine editorial advisory board member.

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The Four OT Cybersecurity Threats to Focus on in 2023

The premise that information technology (IT), operational technology (OT) environments and the industrial internet of things (IIoT) overall are converging is nothing new to professionals in the cybersecurity world.

BY PETER LUND The premise that information technology (IT) and operational technology (OT) environments, and the industrial internet of things (IIoT) overall, are converging is nothing new to professionals in the cybersecurity world. The same goes for the state of the threat landscape — one that's always evolving and is keen on striking where critical networks are most vulnerable. There is a lot of money to be made for the bad actors targeting the critical networks that help us maintain our modern way of life. Think for a moment about the recent attacks on the Colonial Oil Pipeline, or various water processing facilities; by holding fuel and water hostage through ransomware and

other nefarious hacks, cybercriminals know precisely where their actions will be felt the most. This, along with the convergence, challenges that are growing exponentially in complexity, the widening skills gap, frequently changing regulatory oversight, and inadequately designed and implemented cybersecurity solutions only exacerbate the overall problem, spotlighting those vulnerabilities.

While these threats and the challenges they present are industry agnostic, some of the 16 pre-defined critical infrastructure sectors stand to face greater pressure from evolving threat vectors. For instance, the manufacturing sector is increasingly reliant on OT to manage processes, improve

efficiency and reduce costs. However, the increased digitalization of OT environments in the manufacturing sector also brings with it new cybersecurity risks.

The pandemic pushed many manufacturers to accelerate their adoption and implementation of digital technologies simply to remain in business. Factories that had no ability to run remotely or adjust production lines based on rapidly changing supply and demand requirements shut down until they could become more agile. Many adopted intelligent digital worker solutions, such as software robots or AI-powered assistants, to support production lines and still protect employees from COVID-19. These solutions helped manufacturers survive a rough period, while simultaneously increasing the complexity of software within their organizations. New and legacy software need to be maintained and secured, but the challenges of doing so are different in ICS/OT environments than they are in traditional IT environments.

The integration of these digital technologies with the vast amount of data available is ultimately what has led to the digitalization of manufacturing. Despite the introduction of AI and machine learning, like others across the spectrum of critical sectors, many manufacturers still face challenges in ensuring effective cybersecurity due to the complexity of their legacy software and removable media threats. To continue adopting new technologies and meeting demand, it is critical for manufacturers to implement comprehensive security controls that address these challenges in 2023.

With all these complexities to consider, it can be disorienting to know where to start regardless of what industry you're protecting. Many find themselves looking for a "silver bullet," the end-all, be-all to solving a mess of cybersecurity woes. I won't be the first to say it, but hopefully, I'll be the last you'll need to hear it from: there is no silver bullet. However, that doesn't mean that there isn't a clear answer. The way forward when it comes to comprehensively dealing with these threats is by considering your organization's cybersecurity maturity as a whole and moreover, identifying areas of opportunity to advance it.

WHAT IS CYBERSECURITY MATURITY?

The simplest way to think of cybersecurity maturity is by looking at how well your current strategy spans across passive defense and active defense, beginning with solutions for asset visibility, network security, and endpoint protection on the passive side, and threat detection, response, and recovery on the active side, with connectivity security between them. As your cybersecurity human power, solutions and technology implementation grow in sophistication, so too does your advancement along the path of cybersecurity maturation.

So where do you begin? Let's look at four different areas of OT cybersecurity organizations should focus on in 2023.



1. MAINTAINING SECURITY PERIMETERS

Ensuring you've established a strong security perimeter around your OT environment is foundational to any defense-in-depth cybersecurity strategy, and a great first step in cybersecurity maturation. With ever-increasing communications between IT and OT environments, implementing a security gateway that ensures guaranteed lossless, one-way dataflow. Security gateways provide protection that no firewall can match; they are simple to deploy and configure, highly scalable, and as an added benefit, keep you compliant with industrial cyber security standards such as NIST ICS/CSF/800-82/800-53 and more.

Additionally, some security gateways offer additional protection; with built-in technologies that implement added layers of security, data is scanned for threats before it passes through to your critical environment.

Simply put, you can't protect what you can't see – and seeing your entire OT inventory in a meaningful way is no small feat.



2. REMOTE ACCESS MANAGEMENT

Living in a post-pandemic world has vastly increased the number of bring-your-own-device (BYOD) and remote access endpoints in working environments across the spectrum. Protecting your critical assets from BYOD and remote-borne cyberthreats is also critical. Implementing a strong remote access security strategy for OT goes beyond the typical firewalls and VPNs that have long been the go-to to protect IT. With a VPN, once a user gains access to the OT network, they can inspect any asset without supervision. Should something go wrong, you have no option to end their session.

A purpose-built remote access security solution eliminates this risk. The right solution can enforce logical line-of-sight protection wherein users can only access what the policies allow them to see and nothing else. This allows you to effectively establish granular visibility and control down to the asset, protocol and the users themselves.



3. OT NETWORK VISIBILITY

Simply put, you can't protect what you can't see — and seeing your entire OT inventory in a meaningful way is no small feat. Many OT environments comprise a wide variety of devices with different operating systems and firmware versions, different makes and models, different countries of origin, and different communication roles and patterns.

You need a “smart” solution to navigate the complexities of this challenge. Look for an asset inventory and OT network visibility solution that can map your OT network infrastructure and display it in a way that’s easy to understand, and one that learns what’s normal behavior so it can alert you clearly and promptly when anomalies and potential threats are present. You want a solution that is easy for OT operators to use too; a single pane of glass with a dashboard that gives valuable insight into what’s happening and what needs to be done.

More than just providing visibility and asset management, this challenge also comes with the task of compliance enforcement. Are devices with non-compliant countries of origin trying to interact with devices on your network? When you put a solution in place for OT network visibility and asset management, you should be considering this benefit as well.



4. REMOVABLE MEDIA PROTECTION

Building data trust at the point of entry is critical to protecting your networks and the devices on them. Data from removable media enters your OT environment for a variety of necessary reasons, for instance, updating PLCs and other devices on air-gapped networks. These devices exist in different types of locations, each requiring different needs when it comes to protecting them. Being able to trust that data means implementing the right kiosk and/or media fire-wall and storage solutions to protect these devices is crucial to keeping them secure.

Look for a multi-faceted, removable media security that goes beyond basic needs. Do you need it to be mobile? Does it accept all the necessary media types? How thoroughly is it scanning the media? Is the data at rest secure? These are just a few examples of the questions you should ask before choosing your solution.

The maturation of your cybersecurity strategy isn’t something that happens overnight. It’s something that takes careful planning. After all, you are solving a complex set of challenges here. Consider how the solutions you put in place ladder into each other to build a comprehensive, in-depth defensive strategy that gives you peace of mind that your business is best protected from the threats that aim to disrupt it.

Your organization’s success ultimately depends on its ability to reputably deliver on its promises. This means that comprehensive cybersecurity is far beyond being a luxury. Maturing your organization’s cybersecurity is a necessity, and something that needs to be wisely invested in to ensure that cyberthreats don’t stand in the way of delivering on the promises you intend on keeping to those you serve. **WM**

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Achieving Sustainability Goals Through Efficient Valve Technology

From low-power valves to cloud devices, smart valve technologies are a critical part of net-zero strategies that can help reduce energy use and industrial emissions.

BY ANDY DUFFY

While every industry is feeling pressure to decarbonize and improve the sustainability of their operations, some sectors have a greater opportunity than others to make a significant impact. According to the U.S. Department of Energy (DOE), 30% of primary energy-related carbon dioxide emissions are caused by industry, and just over half of that percentage is attributed to five industries: refining, chemicals, iron and steel, cement and food and beverage.

To reduce emissions, companies from these industries are setting decarbonization goals and developing strategies to achieve these goals. As they assess sustainable technologies, many companies are integrating efficient valve technologies.

As a component used in applications across industrial plants, valves might seem like a small piece of the net-zero puzzle. However, their prevalence, as well as advancements in smart valve technologies, makes them key opportunities to reduce energy use and overall emissions. Smart valve technologies are proven solutions that can reliably reduce industrial emissions and help organizations achieve net-zero goals.

INCORPORATING LOW-POWER VALVES

Reducing emissions often starts in a fundamental way: using devices that draw less power, in this case, solenoid valves (SOVs). Process plants worldwide rely on SOVs, using them as pilot valves to open and close larger ball or butterfly valves, as well as control valves for fail-safe air release during power outages.

While a single SOV uses only 6 watts (W) or less, the energy consumption of the total number of SOVs across a plant can be considerable. It's in the best interest of a plant and the planet to use SOVs that consume the least amount of electricity possible while maintaining performance. Although low-power SOVs first debuted in the 1980s and significantly reduced power draw, they were difficult to manufacture and had low flow and low pressure ratings.

In contrast, the latest low power SOVs offer high performance as well as greater efficiency. These SOVs operate with as little as 0.55 W and feature larger orifices and standard filters that prevent clogging and allow valves to handle higher flows. Low power, high-performance SOVs are constructed

with tighter tolerances and other mechanical and magnetic optimizations to further improve performance.

UNLOCKING ENERGY INSIGHTS THROUGH SMART VALVE SYSTEMS

While reducing energy use through low-power devices is the first step to greater sustainability, organizations can go even further by unlocking data across the plant floor to gain insights into equipment efficiency and health. Old and worn valves can go unnoticed until there is failure and pull more amperage than needed for processes in the interim. The digitalization of valve manifolds allows organizations to continuously track valve performance and device health to identify issues before failure, optimize energy use and improve sustainability. Smart valve platforms can help digitally transform processes by providing the connectivity that helps operators access device data to track real-time equipment efficiency and health.

While digital transformation may be familiar to some organizations, it may be new to others. It's a process that a facility, system

or piece of equipment undergoes that allows operators to access real-time data and use it to make decisions and act based on those decisions, improving the speed and accuracy of decision-making. For sustainability, digital transformation of valve systems can allow operators to access

insights about energy use and take actions that improve efficiency and reduce emissions.

Smart valve systems come in a range of options that can effectively scale connectivity to meet an organization's needs and communicate with an existing industrial internet of things (IIoT) system. Valve systems that support IO-Link can easily connect to a process control architecture and act as a hub that provides operational data and diagnostics to upper systems for visualization. Some systems include a graphic interface that makes configuration and commissioning easy. Such systems also allow operators to troubleshoot and access diagnostic data at the device as well as within the greater IIoT system.

Some advanced valve systems have integrated Open Platform Communications Unified Architecture (OPC UA) functionality. OPC UA is a platform-independent, information technology standard for sensor-to-cloud exchange that features integrated security. Valve systems with this functionality can simplify communication with upper systems and help

organizations solve interoperability challenges since data and analytics are received via the valve system and can be communicated directly to an organization's existing cloud systems and software. No gateway is necessary unless an organization requires deeper analysis or local dashboards, which means that engineers don't have to change a whole system or architecture to access valve data, resulting in cost savings.

OPC UA functionality can also expand the connected capabilities of a valve system and make it easier for organizations to monitor the valve system in real-time. Valve systems with integrated OPC UA capability can also allow for the integration of a digital twin. By using a digital twin, organizations can assess potential outcomes without affecting running processes, to optimize operations and improve efficiency and productivity.

OPTIMIZING COMPRESSED AIR USE WITH SMART SENSORS

Compressed air monitoring is a significant opportunity for organizations to optimize energy use and reduce carbon



Photo courtesy of Getty Images

emissions. Compressed air powers equipment and processes through many plants, and up to a third of the compressed air produced is wasted due to leakage. When leaks occur in pneumatic systems, the large compressors that produce compressed air must run continuously to supply enough air to power processes.

Many organizations check for leaks one machine at a time according to a schedule. This manual, periodic process gives leaks an opportunity to grow — and release compressed air — before they're identified and addressed. This not only wastes energy, but it also comes with high labor costs of technicians and engineers to check each machine. Compressed air monitoring allows operators to remotely see what's happening in a compressed air circuit in real time, quickly detect leaks and address them before much energy is lost.

Some smart pneumatic sensors can continuously monitor airflow in pneumatic systems and large air lines, measuring up to eight process parameters, including energy use. These

advanced sensors can act as stand-alone devices, providing actionable insights and detecting leaks in real-time, or connect to larger IIoT systems. When data is sent to hardware, such as an edge device, to be collected and contextualized and then visualized in a dashboard, operators can see trends, statistics and insights, as well as receive alerts when process parameters deviate from preset limits.

In addition to preventing leaks, organizations can also use compressed air monitoring to balance pneumatic devices to run more efficiently. Pneumatic devices have an optimal ratio of pressure to airflow, yet that ratio is often off, and processes consume more compressed air than required. By identifying that ratio and balancing pneumatic devices, processes only use the energy they need. As well as saving energy and improving sustainability, this kind of optimization can also improve production quality.

For organizations wanting to reduce consumption of additional resources, there are multimedia monitoring solutions for other utilities, including water, steam, other gases and electricity, as well.



Smart pneumatic air flow sensors optimize energy consumption, prevent machine downtime and cut costs.

Photo courtesy of Emerson

ACHIEVING GREATER CONTROL – FROM DEVICE TO THE CLOUD

If organizations have machines without monitoring, they have no way to track and understand how much energy is being used and why. If organizations have sensors that produce data but no way to contextualize it, that data doesn't have much meaning. To see what's happening on the plant floor, as well as understand why and how it affects an organization's overall environmental impact, requires a device-to-cloud approach.

A device-to-cloud approach includes on-machine valves connected to industrial edge solutions and automation software. These scalable solutions can collect and combine multiple data streams, analyze them, present performance

data and analytics through dashboards, and help organizations solve operational problems, from the machine level to plantwide.

A comprehensive device-to-cloud approach allows companies to access data and gain visibility into an operation or device that can predetermine its future state and provide clear insights into critical applications. Organizations can easily identify devices that are out of tolerance or need maintenance and quickly calibrate or service them before greater issues or failure can occur. Not only can this reduce resource use, but it can also improve OEE and safety.

As these smart technologies are highly scalable, organizations of all sizes and stages of digital transformation can begin optimizing from the device level up. A manageable yet meaningful approach is to start small. Companies can first identify the most critical applications with the greatest opportunity to improve sustainability. Then, they can install sensors to monitor performance and hardware, such as IO-link capable and OPC UA capable edge devices, to collect and report on operational activity, provide notification about inefficient operations, identify predetermined failures and more. Companies can then optimize accordingly, prove return on investment and scale up to meet their needs and sustainability goals.

WORKING TOGETHER TOWARD A MORE SUSTAINABLE FUTURE

As companies set ambitious decarbonization targets and other sustainability goals, they require energy-efficient technologies and smart strategies to reach them. A comprehensive approach that starts at the valve and goes to the cloud provides great opportunity for organizations to gain a clear understanding about how their operations use energy and produce emissions and identify reliable ways to reduce their environmental impact.

Organizations ready to improve sustainability from the valve up can start by partnering with an experienced technology supplier with proven experience and a comprehensive portfolio of devices, hardware and software. That way, they can receive a solution scaled to their needs and goals, as well as expert support every step of the way.

There is no single solution on the journey to a more sustainable planet. To achieve meaningful results across a plant requires multiple valve technologies working together to improve energy efficiency and reduce emissions. From low-power solenoids to smart valve islands, from compressed air monitoring to edge solutions, every technology plays a critical part that can ensure continued success — and a more sustainable future. **WM**



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Piping Codes and Valve Standards

As with every intended use for valves, piping carries its own set of standards that valve companies and users need to understand.

THE CODES

The typical piping codes used in the valve industry (excluding the water industry) are ASME B31.1 for Power Piping 2014, ASME B31.3 for Process Piping 2014, ASME B31.4 for Pipeline Transportation Systems for Liquids and Slurries 2012, and ASME B31.8 for Gas Transmission and Distribution Piping Systems 2014.

In each of these codes, valves are listed in tables. When that's the case, no additional requirements are generally placed on the valve manufacturer and supplier besides the valve product standards (e.g., API 6D, ASME B16.34, etc.). Although special cases exist, such as class M in B31.3, they are not discussed in this general overview.

The question also arises about what happens in situations that call for non-listed valves. These situations vary from piping code to code so they should be examined on a case-by-case basis.

ASME B31.1

The ASME B31.1 code lists three valve standards, excluding cast iron and bronze valves. The standards are: 1) ASME B16.34, Valves-Flanged, Threaded, and Weld End; 2) MSS SP67-Butterfly Valves; and 3) MSS SP68-High Pressure Butterfly Valves with Offset Design. As stated in B31.1, para 107.1, "Valves not complying with above [the list] shall be of a design, or equal to the design, that the manufacturer recommends for the service as stipulated in para. 102.2.2. Such valves shall be pressure tested in accordance with MSS SP-61."

This puts the responsibility on the valve manufacturer to recommend the design for the service and compounds the issue when valves are supplied through distribution. Rarely will the valve manufacturer know the actual service, since that manufacturer is not responsible for the piping system. Therefore, it is essential that the designer of the piping system clearly understands what is offered when the valve is unlisted. This is especially important with respect to pressure/temperature ratings. The piping designer should always check the suitability of the valve for the service.

ASME B31.3

The ASME B31.3 code lists several valve standards, again excluding cast iron and bronze valves. The standards are: 1)

- ASME B16.34, Valves-Flanged, Threaded and Welding End
- MSS SP72-Ball Valves with Flanged or Butt-Welding Ends for General Service
- API 6D-Specification for Pipeline and Piping Valves
- API 594- Check Valves: Flanged, Lug, Wafer and Butt-welding
- API 599- Metal Plug Valves: Flanged, Threaded, & Welding Ends
- API 600- Steel Gate Valves: Flanged & Butt-Welding Ends, Bolted Bonnets
- API 602- Gate, Globe & Check Valves for Sizes DN 100 and Smaller for the Petroleum & Natural Gas Industries
- API 603- Corrosion-resistant, Bolted-bonnet Gate Valves- Flanged and Butt-Welding Ends



- API 608–Metal Ball Valves with Flanged, Threaded and Welding Ends
- API 609- Butterfly Valves: Double-flanged, Lug and Wafer-type, and Butt-Welding Ends

The API 6D standard was added in the 2014 edition of this code with a caveat that the design of valves comply with ASME B16.34. (Therefore, it does not really add anything to the 2012 edition list).

Valves that are not listed may be used only in accordance with paragraph 302.2.3. Unless pressure/temperature ratings are established by the method set forth in ASME B16.34, pressure design is qualified as required by paragraph 304.7.2.

In the 2014 edition of ASME B31.3, the designer has to be satisfied that composition, mechanical properties, method of manufacture and design are suitable for the intended service. The pressure/temperature ratings should be established in accordance with rules in paragraph 304. The change from the 2012 edition to the 2014 edition caused the onus to fall on designers. This is because the 2012 edition states that pressure design shall be verified in accordance with paragraph 304 of the code; however, the latest edition states the designer has to be satisfied the design is suitable for the intended service. The situation is similar to what happens with B31.1 since the manufacturer rarely knows the service.

ASME B31.4

ASME B31.4 lists eight valve standards, once again excluding cast iron and bronze valves.

These valve standards, which are more comprehensive than the previous codes, are:

- ASME B16.34, Valves–Flanged, Threaded, and Welding End
- API 600–Steel Gate Valves–Flanged and Butt-Welding Ends, Bolted Bonnets
- API 602–Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries
- API 603–Corrosion-resistant, Bolted Bonnet Gate Valves–Flanged and Butt-Welding Ends
- API 6D–Specification for Pipeline and Piping Valves
- API 6A–Specification for Wellhead and Christmas Tree Equipment

In this code, special valves not on the list are permitted, provided the valve design is of at least equal strength and tightness, the valves are capable of withstanding the same test requirements as covered in the above standards, and the valve’s structural features satisfy the material specification and test procedures of the valves in similar service set forth in the standards. These requirements are stricter than previous codes, requiring the designer to make the valve with equal strength and tightness.

ASME B31.8

The ASME B31.8 code lists several valve standards, excluding cast iron and thermoplastic valves. These standards are:

- ASME B16.33–Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 175 psi (Sizes NPS1/2 Through NPS 2)
- ASME B16.34 Valves–Flanged, Threaded and Welding End
- ASME B16.38–Large Metallic Valves for Gas Distribution: Manually Operated, NPS 21 .2 (DN 65) to NPS 12 (DN 300), 125 psig (8.6 bar) Maximum
- API 6A–Specification for Wellhead and Christmas Tree Equipment
- API 6D–Specification for Pipeline and Piping Valves
- API 599- Metal Plug Valves: Flanged, Threaded, & Welding Ends
- API 600- Steel Gate Valves: Flanged & Butt-Welding Ends, Bolted Bonnets

- API 602- Gate, Globe & Check Valves for Sizes DN 100 and Smaller for the Petroleum & Natural Gas Industries
- API 603- Corrosion-resistant, Bolted-bonnet Gate Valves- Flanged and Butt-Welding Ends
- API 608-Metal Ball Valves with Flanged, Threaded and Welding Ends

ASME B31.8 does not have criteria for unlisted valves. It states that “Valves shall conform to standards and specifications referenced in this Code and shall be used only in accordance with the service recommendations of the manufacturer.” This means that with the 31.8 code, one must only use valves that are listed.

CONCLUSION

The common standard for valves is ASME B16.34. While this standard has several aspects that are positive, it is not really a design code like ASME BPVC section VIII, where material strength, corrosion allowance and formula for irregular shapes are taken into account. For this reason, designs should be cross-checked against a pressure vessel code.

While compliance with the piping codes is necessary in almost all cases, compliance with national and federal laws is obligatory. In the U.S., federal codes on oil and gas transportation add restrictions to the valve standards in the piping codes.

The U.S. federal code for Transportation of Natural and Other Gas by Pipeline in section 49 CFR 192.145 states:

Except for cast iron and plastic valves, each valve must meet the minimum requirements of API 6D (incorporated by reference, see 192.7), or to a national or international standard that provides an equivalent performance level. A valve may not be used under operating conditions that exceed the applicable pressure-temperature ratings contained in those requirements.

This federal code mandates the requirements of API 6D for minimum requirements for pipelines designed per ASME B31.8, which rules out a number of the valve standards listed. For others, it adds substantial additional features and testing over and above the requirements of those standards (e.g., ASME B16.34).

Meanwhile, the U.S. Federal Code for Transportation of Hazardous Liquids by Pipeline in section 49 CFR 195.116 states each valve installed in a pipeline system must comply with the following:

- The valve must be of a sound engineering design.
- Materials subject to the internal pressure of the pipeline system, including welded and flanged ends, must be compatible with the pipe or fittings to which the valve is attached.
- Each part of the valve that will be in contact with the carbon dioxide or hazardous liquid stream must be made of materials that are compatible with carbon dioxide or each hazardous liquid that it is anticipated will flow through the pipeline system.
- Each valve must be both hydrostatically shell tested and hydrostatically seat tested without leakage to at least the requirements set forth in section 11 of API Standard 6D (incorporated by reference, see 195.3).

While the federal code for transportation of hazardous liquids does not follow all of the guidelines of API 6D, it does follow that standard’s testing requirements for pipelines designed per ASME B31.4. The main differences from the other listed codes are that test durations are longer and that metal-seated valves are allowed a larger leakage rate because the code was created mainly for larger valves.

Other regulatory bodies, such as the U.S. Coast Guard and the Occupational Safety and Health Administration, do not prescribe additional requirements on top of the piping codes.

In summary, for the product transportation codes ASME B31.4 and B31.8, when the valves are intended for use in the U.S., the sensible valve manufacturer would ensure that design, manufacture and testing encompass ASME B16.34 and API 6D. In the case of ASME B31.1 and B31.3 codes, if the valve is not listed on the table, the piping system designer has to check the suitability of the valve for service or has to clearly advise the manufacturer of intended service conditions. **WM**

This article was originally written by Ron Manson, Cameron Valves and Measurement, but has been edited and updated by Greg Johnson, United Valve president and VALVE Magazine editorial advisory board member.

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SIEMENS AND MICROSOFT DRIVE INDUSTRIAL PRODUCTIVITY AI

Siemens and Microsoft are harnessing the collaborative power of generative artificial intelligence (AI) to help industrial companies drive innovation and efficiency across the design, engineering, manufacturing and operational lifecycle of products. To enhance cross-functional collaboration, the companies are integrating Siemens' Teamcenter software for product lifecycle management (PLM) with Microsoft's collaboration platform



Teams and the language models in Azure OpenAI Service as well as other Azure AI capabilities

With the new Teamcenter app for Microsoft Teams, anticipated later in 2023, the companies are enabling design engineers, frontline workers and teams across business functions to close feedback loops faster and solve challenges together.

For example, service engineers or production operatives can use mobile devices to document and report product design or quality concerns using natural speech. Through Azure OpenAI Service, the app can parse that informal speech data, automatically creating a summarized report and routing it within Teamcenter to the appropriate design, engineering or manufacturing expert.

Siemens and Microsoft are also collaborating to help software developers and automation engineers accelerate the code generation for programmable logic controllers (PLCs). The collaboration will allow engineering teams to reduce time and the probability of errors by generating PLC code through natural language inputs. These capabilities can also enable maintenance teams to identify errors and generate step-by-step solutions more quickly.

Industrial AI like computer vision enables quality management teams to scale quality control, identify product variances easier and make real-time adjustments even faster. siemens.com

NEW DIGITAL OPERATIONS SOLUTIONS FROM BAKER HUGHES

Baker Hughes announced multiple new digital solutions and investments to advance more intelligent and energy-efficient operations. The solutions focus on improving efficiency and performance while reducing emissions, helping to drive the long-term sustainability of customer operations.

"Digital is redefining the limits of how the energy and industrial sectors can increase efficiency, operate predictably and ensure lower emissions in a sustainable manner," says Lorenzo Simonelli, chairman and CEO of Baker Hughes. "We have long recognized digital is a critical capability in taking energy forward and leading in the energy transition, and we are continuing to invest and innovate for our customers."

Leucipa is a public and private cloud-based automated field production software solution designed to help oil and gas operators proactively manage production and reduce carbon emissions. It focuses first on the specific outcome an operator wants to achieve, harnessing and leveraging data to drive intelligent operations.

Cordant is an integrated suite of solutions supporting industrial asset performance management and process optimization. Cordant will combine existing digital offerings for hardware, software and services capabilities into one integrated and simplified user interface. bakerhughes.com

FLOWERVE INTRODUCES REDUCED PORT FLANGED BALL VALVES

The quarter-turn, floating ball valves have been re-engineered for global availability by standardizing design, materials, construction and product certifications. Target applications for the valves include controlling the flow of liquids or gases in the following industries: chemical processing, petrochemicals, energy, defense, food and beverage, industrial gases, pharmaceuticals and water.

The bubble-tight shutoff design and robust, live-loading packing in these valves minimize fugitive emissions, enhance safety, and maximize regulatory and standards compliance. Featuring a redesigned end plug, the valves ensure positive retention and greatly reduce blowout risk.

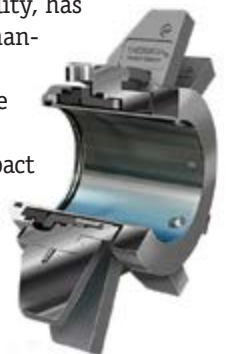
In addition to improving safety for workers, process fluids and equipment, customers will benefit from lower total cost of ownership thanks to the interchangeability of widely available parts.

To learn more about the Worcester 51/52 flanged ball valves, visit the company's website. flowserve.com

CHESTERTON SINGLE CARTRIDGE SEAL OFFERS INCREASED RELIABILITY

Chesterton, a global leader in equipment sealing and reliability, has released its newest mechanical seal product — the 1510 general duty, single cartridge seal.

Designed with a compact cartridge profile and utilizing the Chesterton T.A.B.S (tapered adjustable bolting system) field proven on the 155 and 442 split seals, the 1510 is designed to fit and install easily on process equipment throughout industry. The unique resettable centering strap allows for impeller adjustments even after the seal has been fitted. Incorporating Chesterton's five features of good mechanical seal design, the 1510 sets a new standard for general duty cartridge seals.



chesterton.com

BI-TORQ FIRE-SAFE BALL VALVES

A selection of API 607-certified fire-safe ball valves (FSV) in both automated and manual configurations are available from Bi-Torq. FSVs are offered as part of a complete thermal shut-off package to shut down tanks or piping in the event of a fire.

The automated product line includes pneumatic double-acting, spring-return and electric actuators in both AC and DC voltages and in two-way port configurations. Customization is possible by adding modulating positioners, NAMUR solenoids, and other options tailored for a specific application from 1/4-inch to 6-inches. Bodies are available in stainless or carbon steel, with NPT, socket weld or flanged end connections, with temperature ratings from -20°F to 400°F, depending on the series. The manual series offers spring-return, dead-man handles, and limit switches can be mounted to the valve. Most come with ISO mounting pads for easy field retrofitting. strathmangroup.com



HIGH-PRESSURE CHAINWHEELS FROM BABBITT

Babbitt's Hammer-Blows products make it easy to control high-pressure valves from the floor in out-of-reach locations. The "hammer" action makes opening or closing sticky valves easier for an operator of any size without damaging the chainwheel or valve.

The product is available in ductile iron, a more shock-resistant material than cast iron necessary for hammer-blow style wheels. Standard components include: a chainwheel; guide arm and cap; zinc-plated carbon steel attachment set to clamp to the valve hand wheel; the Hammer-Blow mechanism that attaches to the spokes of the chainwheel and provides the hammer action that facilitates the opening and closing of sticky valves. babbitt.com

SAFETY RELIEF VALVE TESTERS FROM DVT

Dunn's Valve Testers (DVT) offer a range of valve testing equipment including Relief Valve (RV) Testers Set. Pressures on relief valves are important to the safe and effective operation of all refineries and plants. The RV series high-volume pressure storage and piping allows users to achieve significant valve disc lift and reseal without damage. A secondary regulated high-pressure line allows for seat tightness tests. DVT's table securely locks the valve in place with a dedicated 10K hydraulic system and interlock to prevent release under pressure.

Four clamping arms quickly lock the valves in place with rapid advance feature stainless steel seal plate/adapters seal on bottom connection. Hydraulic rams provide clamping force and a safety interlock prevents accidental release.



An integrated control panel for filling, seat tightness and set pressure testing. More information on this system and others are available on the company's website. dvt.tech

CORROSION RESISTANT COATINGS FOR VALVES

ZPEX, from Ecoat, is a finishing process designed specifically to protect against corrosion and abrasion in extreme environments, making it a perfect candidate for valve applications in the oil and gas industry. Instead of using costly stainless steel or special overlays for pipes, pumps, valves and more, ZPEX is a highly effective and cost-efficient metal coating process, often saving customers up to 70% of the cost of using pricier materials.

ZPEX can tackle challenges in about 80% of the oil and gas industry, including upstream, midstream, downstream, production and saltwater disposal. Parts treated with the ZPEX process are resistant to more than 120 chemicals — even carbonic acid, hydrochloric acid and hydrogen sulfide — and are heat resistant up to 600 degrees. ZPEX extends the life of equipment and eliminates the need to frequently replace damaged parts. ecoat.us

EMERSON LAUNCHES NEW ASCO ALUMINUM FILTER REGULATORS

Able to handle the highest flow rates in their class, the regulators provide precise pressure regulation in downstream instruments.

Emerson has launched its new ASCO Series 641, 642 and 643 Aluminum Filter Regulators, which maximize process efficiency and reduce unplanned downtime in a broad range of process applications. This line of durable, aluminum filter regulators can handle the highest flow rates of any regulators in their class and provides precise pressure regulation to downstream instruments.



An alternative to stainless steel filter regulators, ASCO Series 641, 642 and 643 Aluminum Filter Regulators complete Emerson's full suite of valve piloting technologies which includes total valve piloting solutions, including solenoid valves, switch boxes, filter regulators and accessories.

With flow rate capabilities of up to 370.8 standard cubic feet per minute (10,500 liters per minute), the aluminum filter regulators improve process efficiency and ensure that stringent process valve opening/closing requirements like those for emergency shutdown valves are met. Higher flow rates provide more air to the valve actuator, which increases the opening and closing speed of process valves as needed.

These filter regulators feature rugged construction and advanced engineering that enhance safety and maintain plant uptime, while a specialized powder coating finish ensures reliable operation in harsh, corrosive process environments. Effective mois-

ture removal keeps media dry to protect downstream devices, and sophisticated media filtration prevents downstream process contamination.

This three-tiered regulator line provides a 0.25-inch to 1-inch coverage and is highly customizable. Process manufacturers can choose advanced features such as quick relief, which enhances safety and operational certainty by exhausting downstream pressure if supply air pressure is lost, as well as low-temperature and low-copper variants, manual and automatic draining, global certifications and many other options that serve specific applications, in the chemical, oil and gas, energy and utilities, food and beverage and water and wastewater industries.

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