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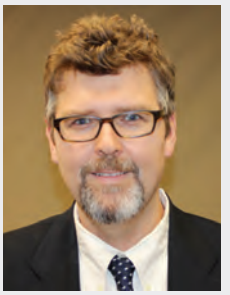

J. Campbell, Editor
Modern Pumping Today

Welcome to the June MPT! In this month's Case Studies section, Paul Davis of Wanner International shares a success story of how, three years on, his company's pumps have saved 23,000 tons of polymer and over a quarter-million dollars in maintenance for an oil and gas company in India (pg. 20). In addition to high performance, the fifteen Hydra-Cell polymer injection API674 pumps have only required oil changes as maintenance during that time.

In our Water & Wastewater Focus section, Mueller Water Products' Dave Johnston offers some insights into how utilities of any size can affordably harness the value of timely digital data from their distribution systems (pg.26). He has good news for small- to medium-size utilities who interpret today's digital revolution as demanding a large investment to reap any benefits.

Plants around the globe have faced increasing shortages of experienced personnel to monitor and manage equipment reliability. In a contribution to this month's Motor Solutions section, Myra Mash explains how Emerson has evolved its AMS Machine Works' condition monitoring technologies for better diagnostics at the industrial edge (pg. 42). This technology helps small teams make the most of limited resources. Enjoy!

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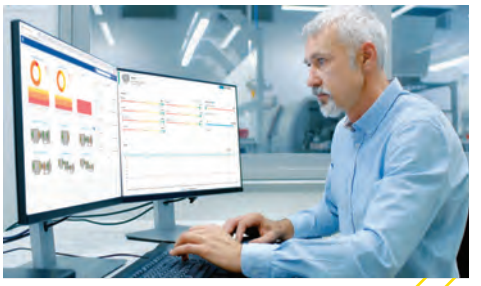
CONTENTS

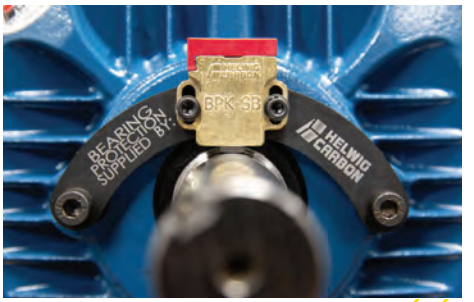
16

30

38



42



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CENTRISYS/CNP WINS WISCONSIN MANUFACTURER OF THE YEAR AWARD

Centrisys/CNP has been named the Grand Award winner of the Annual Manufacturer of the Year Award in the small category. A total of seven winners for various categories out of the twenty-six nominees from around the state were presented awards. Nominees were asked to demonstrate how their commitment to business excellence and manufacturing innovation makes a positive impact in Wisconsin.

The Manufacturer of the Year Awards is sponsored by the advisory firm of Baker Tilly, the law firm of Michael Best and Friedrich LLP, and Wisconsin Manufacturers and Commerce. Centrisys/CNP's recognition represented one of four Grand Award winners, categorized by company size based on the number of employees. Winners are recognized for quality careers, good business practices, financial growth, innovative processes, and reinvestment into local communities. The award is now in its thirty-third year.

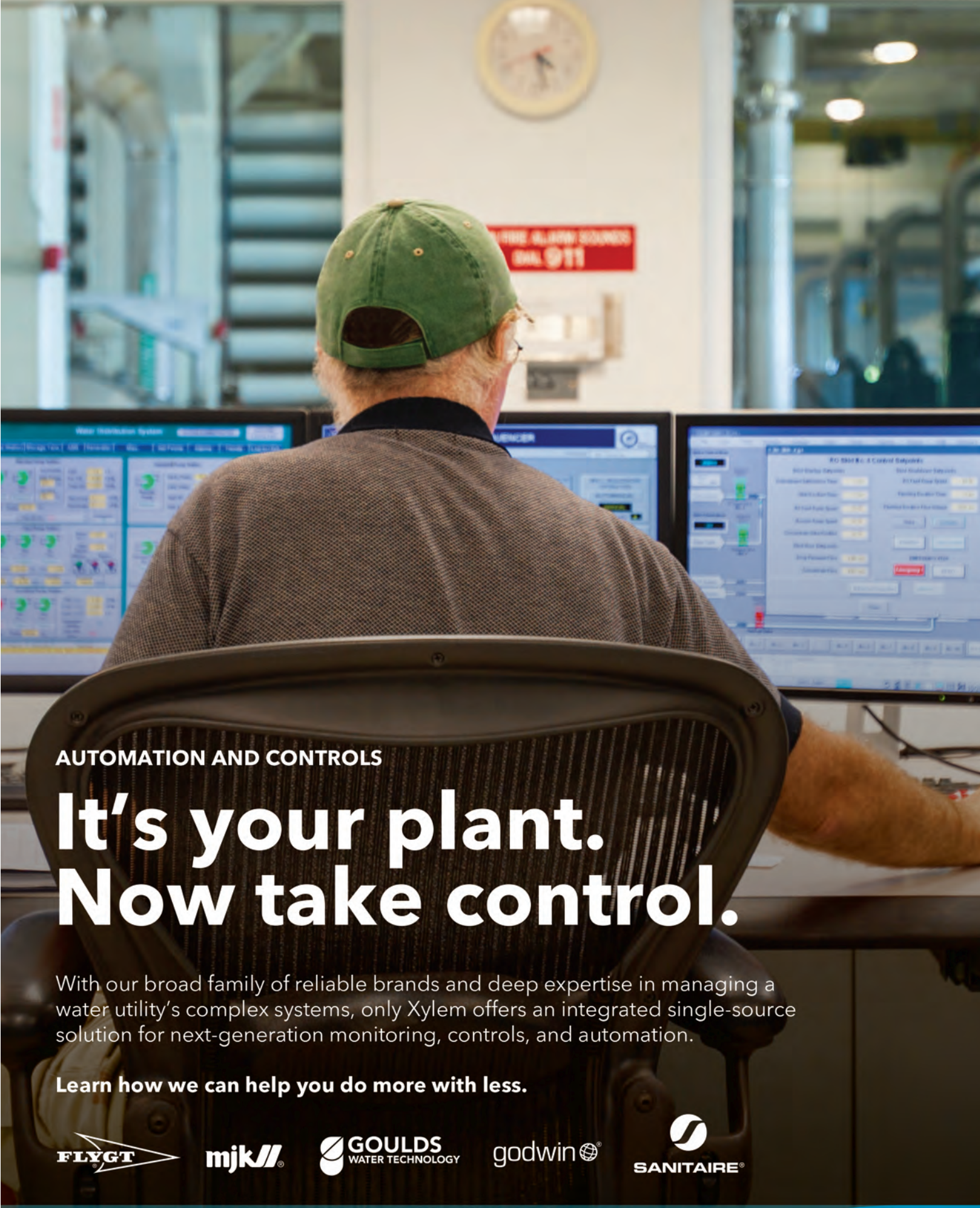
"It is an honor to receive this prestigious award that recognizes our team for their tremendous commitment to driving advancements in our industry, developing an empowering culture of continual improvement, and providing highly customized service," says Michael Kopper, president, and CEO of Centrisys/CNP.

XYLEM WINS FOR "NET ZERO" LEADERSHIP AT GLOBAL WATER AWARDS

Xylem was named "Net Zero Carbon Champion" at the 2022 Global Water Awards, recognizing the company's work to accelerate the decarbonization of the water sector. In addition to its own commitments to achieve net-zero carbon emissions, Xylem is partnering with utilities, businesses, and water managers around the world to help reduce their carbon footprint.

"The water sector is uniquely positioned to make a meaningful contribution to containing climate change," says Austin Alexander, vice president of sustainability and social impact at Xylem. "We could become one of the fastest sectors to decarbonize. This award belongs to our 17,000-strong team at Xylem, and to our customers and partners, who are all making sure we're part of the solution."

The Global Water Award recognizes the work by Xylem and its utility partners to deploy high-efficiency technologies and approaches to reduce greenhouse gas emissions and make progress toward a zero-carbon future. For example, a wastewater treatment plant in Cuxhaven, Germany, has cut aeration energy use by 30 percent by implementing artificial intelligence in its treatment system. Last year, Xylem formalized its commitment to net zero carbon emissions before 2050. Through its technology impacts, Xylem is building awareness of net-zero opportunities.



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WATEREUSE CELEBRATES RECYCLED WATER FUNDING IN STREAM ACT

The WateReuse Association celebrates the introduction of S.4231, the Support to Rehydrate the Environment, Agriculture and Municipalities (STREAM) Act, which authorizes $300 million for water reuse projects through the Bureau of Reclamation's Title XVI-WIIN Water Reuse Grants Program. The bill also raises the per-project funding cap for Title XVI-WIIN projects from $20 million to $50 million and authorizes an additional $150 million for desalination projects. WateReuse worked closely with legislators to craft the bill.

"The STREAM Act, like last year's Infrastructure Investment and Jobs Act, elevates water reuse as an integral tool for addressing the water resource management challenges of today," says Patricia Sinicropi, executive director of the WateReuse Association.

Communities throughout the country are turning to water reuse to build climate resilience, protect water quality, and meet a wide range of water management challenges. In the face of persistent drought in the West, the STREAM Act will help communities generate sustainable water supplies for drinking, irrigation, environmental restoration, and other important uses. The WateReuse Association looks forward to working with Congress to enact this important legislation this year.

VICOR OPENS NATION'S FIRST "ChiP" FABRICATION FACILITY

Last month, Massachusetts state and local officials celebrated the opening of a new, state-of-the-art power module manufacturing facility. The world's first ChiP (converter housed in package) fabrication facility, or "ChiP fab," enables scalable, automated, cost-effective manufacturing of power modules in the United States.

With its new ChiP foundry, Vicor takes a major step toward realizing its vision to enable high-performance, modular power system solutions capable of satisfying demanding power requirements. This new vertically-integrated foundry delivers new capacity to manufacture power modules for artificial intelligence, electrified vehicles, advanced communications, and other high-growth markets

"Our new ChiP fab integrates all of the process steps necessary to manufacture high-density power modules in wafer-like panels with short cycle time and flexible capacity," says Mike McNamara, Vicor vice president of operations.

The new facility comes online as Vicor celebrates forty-one years of expanding its performance leadership within the global power electronics industry with U.S.-based manufacturing. The new, ChiP fab utilizes patented fabrication processes that further differentiate Vicor power modules by enabling the most power-dense and energy efficient solutions.

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INNIO EARNS LOW ESG RISK RATING WITH ITS COMMITMENT TO SUSTAINABILITY

Innio has received an Environmental, Social, and Governance (ESG) rating of 11.0 from Sustainalytics, assessing Innio to be at "Low Risk" of experiencing material financial impacts from ESG factors. Innio's ESG risk rating places it number one out of more than 500 companies in the machinery industry assessed by Sustainalytics. The assessment identifies Innio's strong performance across a broad range of ESG metrics.

"INNIO is relentlessly committed to ensuring that we incorporate effective ESG practices across all our operations. We are proud to have achieved Sustainalytics' rating as the lowest ESG risk ranking in our industry," says Dr. Olaf Berlien, president and CEO of INNIO.

Sustainalytics' ESG risk ratings measure a company's exposure to industry specific material ESG risks.

"Securing a top rating in Sustainalytics' extensive rating process marks a significant milestone and shows that our teams are committed, innovative, and effective in building a sustainable future for our customers, employees, and the environment," adds Berlien. "This clearly demonstrates that Innio is on the right track in contributing to the energy transition and building operational excellence."

HYUNDAI MATERIAL HANDLING ADDS LEADERSHIP DEPTH WITH NEW APPOINTMENTS

Hyundai Material Handling, North America, has hired three new team members to deepen dealer engagement and expand national sales efforts.

Cecil D'Antignac will join the company as district sales manager for the Southeast region. D'Antignac brings over twenty-eight years of material handling industry experience to Hyundai and will be responsible for dealer development and market share growth.

Jeffrey Mathews brings over twenty years of material handling experience in his new role as national accounts manager. Matthews spent the last ten years in national accounts management with Hyster-Yale Group. He will play a leadership role in helping Hyundai build strong, enduring relationships with key accounts.

As part of the company's efforts to deliver quality dealer service, Jason Taylor will support Hyundai dealers as technical trainer for the brand. Taylor has worked as a professional technician for over twenty years and brings a diverse, first-hand experience to support the business.

"We're excited by the depth of experience these new appointments bring," says Lewis Byers, executive vice president and chief operating officer for Hyundai Material Handling.

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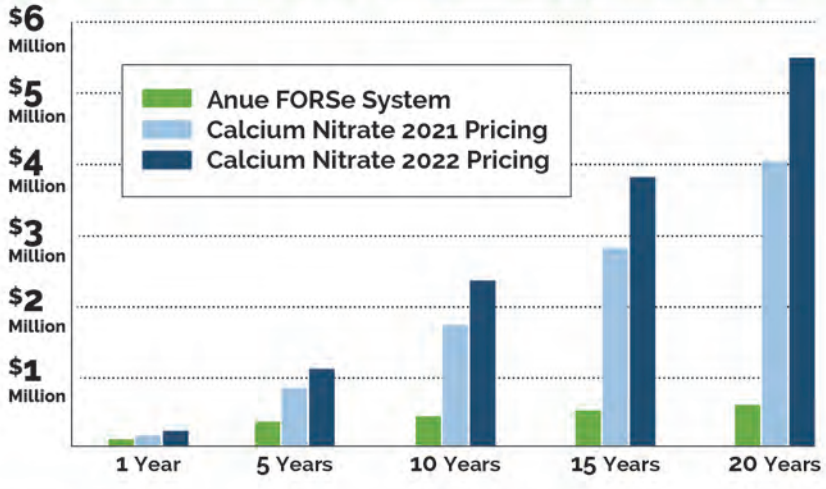

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HYDROVISION INTERNATIONAL 2022

Reconnecting the global community of hydro visionaries

Hydrovision International is the world's largest hydro industry event, typically attracting over 3,000 attendees and more than 300 exhibiting companies from more than fifty countries. The event highlights perspectives on the role of hydropower, explores issues affecting hydro resources, and helps participants develop a vision to meet challenges and ensure the future sustainability of hydro.

WHERE HYDRO VISIONARIES MEET

Boasting nearly ten networking events over its weeklong event, Hydrovision International brings together hydro professionals interested in all aspects of the industry, including power producers, small hydro, pumped storage, dam safety, government agencies, industry associations, service and product suppliers, regulators, lawyers, original equipment manufacturers and engineering, procurement, and construction firms.

In over sixty sessions, the Hydrovision conference program covers topics around operations and maintenance, civil works and dam safety, policies and regulations, equipment and technology, market trends and asset strategies, and more—all taught by industry experts, thought leaders, and innovators.

Attendees can expect to learn the latest in hydro innovation and best practices in any of three different modes: panel discussions, true interactive discussion of a topic by a panel of experts, guided by a moderator; technical paper presentations, individual speakers present more in-depth content of a technical nature; and poster presentations, where attendees the opportunity to learn about a concept in a small group or one-on-one discussion.

MEET YOUR HOSTS

Utilities play a central role in the hydro industry, and Hydrovision International 2022 is proud to have two host utilities for this year's event. Denver Water, which owns and operates seven hydroelectric plants

in Colorado, and Xcel Energy, which delivers electricity in eight U.S. states.

Denver Water was founded in 1918 and is the Colorado's largest and oldest water utility, with a service area of more than 335 square miles. A system of reservoirs networked by tunnels and canals provides water to 1.5 million people in Denver and surrounding suburbs. The company's seven hydroelectric plants generated 52,929 MWh of electricity in 2019. Money from the sale of the power produced is used to offset operating costs, typically saving ratepayers about four million dollars per year. Most of these generators are located at existing water storage facilities, such as Gross Reservoir in Boulder County.

Xcel Energy provides electricity in Colorado, Michigan, Minnesota, New Mexico, North Dakota, South Dakota, Texas, and Wisconsin from a mix of biomass, hydroelectric, nuclear, wind, and solar facilities, along with coal and natural gas. The company's total generating capacity exceeds 18,000 MW, and its hydropower portfolio is twenty-six plants with a capacity of 610 MW.

SUPPORTING THE GLOBAL COMMUNITY OF HYDRO VISIONARIES

Proceeds from multiple events at Hydrovision International go directly back to supporting the hydropower industry. A percentage of the revenue collected from the event's Waterpower Hydro Basics Course will benefit initiatives put forth by the Hydropower Foundation. Additionally, Hydrovision will once again host its popular annual Woman with Hydro Vision luncheon, which promotes inclusion by highlighting women who have been influential for the hydropower and dams industry.

HYDROVISION INTERNATIONAL

HYDROVISION AT A GLANCE

WHEN: July 12-14, 2022

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WEBSITE: www.hydroevent.com

ADVOCATING FOR THE SYSTEMS APPROACH

SWPA's key to effective pump maintenance

BY SWPA EXECUTIVE DIRECTOR ADAM STOLBERG AND CHRIS GRECO, ENVIRONMENT ONE CORPORATION (E/ONE)

For nearly fifty years, the Submersible Wastewater Pump Association has been at the forefront of advocating the systems approach to pump maintenance, sizing, monitoring, and operation. Rather than assessing discrete components of a pumping system for individual performance and efficiency standards, this philosophy encourages operators to evaluate the system as a whole, ensuring that all design elements work in conjunction to achieve maximal efficiency and service life. Below, SWPA Executive Director Adam Stolberg and Chris Greco of Environment One Corporation (E/One) discuss the advantages of the systems approach.

When SWPA began its advocacy of the systems approach, what role did its organizational standards play? How were member contributions included as well?

Advocating for the design, construction, installation, and operation of a pumping system of carefully integrated components (also known as the systems approach) for decades, SWPA has steadfastly promoted proper design in an effort to optimize performance of the pumping system.

Fundamental to this approach was the creation of organizational standards, which were contributed by and collaboratively shaped at various SWPA member committee levels, all with the goal of creating balanced technical publications, standards, system component guidelines, and training and educational programs to further the industry.

What are some of the key benefits of the systems approach in pumping systems?

The systems approach encourages careful analysis of the end-use requirements to determine if the pump and each of the system components is efficiently sized and configured to meet the user requirements; analyzing the system to help optimize improvement opportunities; calculating life-cycle costing for maximum energy efficiency; and finding symptoms that could lead to inefficiencies.

How do the benefits of the systems approach change depending on a person's connection to the pumping system? For example, what concerns are different for a design engineer, a manufacturer, or an end user?

To this day, these organizational standards are vital in helping consulting engineers, specifiers, users, and others gain a better understanding of the pump, valves, control panels, drives, basins, mechanical seals, and other components and how they interact for optimum performance, minimum maintenance, and long life.

Overall, adopting the systems approach brings about an ongoing focus on efficiency and top-level performance and helps maintain a pump operator's outlook on their responsibilities.

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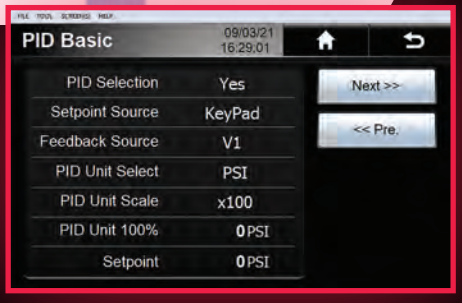

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MANAGING UTILITY OPERATIONS IN ONE PLATFORM

In one New England town, Sedaru proves itself in a timely manner

BY KURT FERRELL, AQUATIC INFORMATICS

The town of Franklin, Massachusetts, has an approximate population of 35,000 residents and a full-service Department of Public Works to manage everything from water and waste, to streets and highways, parks, and everything in between. Like most utilities today, Franklin Public Department of Works (FDPW) is in the process of a digital transformation. It started some years back with a web-based work order system that was used primarily to log customer complaints and requests. The information was kept in either spreadsheets, on paper or simply through verbal communication. Like most journeys, FDPW realized they needed to change course as they were collecting lots of information, but were not able to leverage the information to streamline daily workflows.

"As one would imagine," Kate Sjoberg, GIS coordinator for the town of Franklin, says, "sometimes the information was not given to the correct person or was lost in the shuffle, which meant a repair did not happen or a necessary improvement did not make it into a plan. To really take advantage of data collection, it needs to be delivered to the right person and packaged as an actionable insight, like a work order, or an alert for further action."

Franklin's new water treatment facility.

CENTRALIZING CONTROL OF ASSETS IN ONE PLATFORM

The town of Franklin operates eight booster pump stations, six water storage tanks, twenty-three pump stations, over 2,000 hydrants, 157 miles of water main, and approximately 9,000 water services. The sanitary sewer system has 137 miles of sewer pipe, in

ABOVE: Construction of Franklin's new water treatment plant on Grove Street.
BELOW: Vactor truck to assist in infrastructure maintenance including clearing clogged drainage pipes.

excess of 3,400 manholes, and all these assets, including 1,800 streetlights and signage, are accounted for in Sedaru. All stakeholders have access to the platform from any connected device. Work orders are assigned, scheduled, and tracked in the Sedaru platform, giving field crews timely information on those assets that may include a level of urgency, GIS location, installation date, product specs, maintenance history, images, and more.

"Sedaru is a tremendous asset for the team to use in the field," adds Derek Adams, Frankin's stormwater and environment affairs superintendent. "It allows staff to quickly and accurately identify asset ownership, pipe orientation, manhole location and historical data. Examining data prior to 'breaking ground' on a job site allows the appropriate crew to commence the work. Additionally, the ability to visualize spatial relationships with other town-owned utilities reduces unexpected surprises."

The field crew digitally records the work that was done and can add any missing asset information to build record-keeping or add images if warranted, all while in the field. This gives real time results to administrators and managers enabling them to analyze asset performance or worker productivity, and spot meaningful trends that can help with long-term planning.

GOOD OPERATIONAL DATA KEEPS STORMWATER FLOWING

Franklin's Stormwater Division inspects the functionality of each detention basin/rain garden annually and measures vegetative growth, clearance of intake pipe, headwall location, and other key concerns. Sedaru helps collect and visually organize this data so that it is easy to analyze, track, and generate work orders. The information is then prioritized into a maintenance schedule that helps mitigate potential hazards before they become a threat.

Adams adds, "The town has dedicated significant time and energy into locating, retrofitting, constructing, and maintaining stormwater assets. Our stormwater network includes over 10,000 data points: catch basins, drain pipes, culverts, detention basins, tree wells, stormceptors, and more. Sedaru enables us to organize all this information in a meaningful way."

One of the most important functions for the Stormwater Division is operating an efficient catch basin cleaning program as environmental permitting requires that catch basin sediment levels do not exceed 50 percent of the basin capacity. Therefore, a baseline level of capacity must be determined for each of the 5,700 catch basins. This data is also collected in Sedaru and analyzed by the stormwater team to identify and schedule work orders for cleaning and any necessary structural repair. This program has significantly reduced stormwater contamination, and over time the associated workable data will ensure environmental compliance.

LOOKING FORWARD

One of the most valuable benefits of cloud native software is that it makes the digital journey infinite. FDPW has room to grow and is exploring the possibility of expanding more assets into customized maintenance and inspection programs to streamline operations. There is also the ability to expand modeling capabilities using a digital twin and build in robust predictive asset replacement plans.

The town of Franklin has been evolving its operational and asset management using the Sedaru platform for five years. "Hours and hours have been saved by our shift to Sedaru—not only for our administrative and management staff but also our field crew," says Sjoberg.

Like most utilities that are experiencing a turnover in a largely aging workforce, the town of Franklin sees the new generation of hires naturally embracing digital technology to further optimize municipal operations.

KURT FERRELL is account executive team lead for Aquatic Informatics. Ferrell and his team work with utilities to find solutions that optimize asset and work order management for water distribution, wastewater collection, and public works system using the latest data management technologies. For more information, visit **www.aquaticinformatics.com**.

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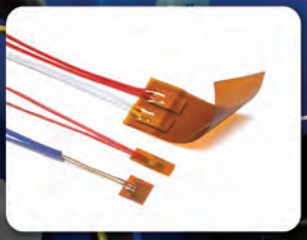

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EFFICIENCY BY THE TON

Three years on, Hydra-Cell pumps save 23,000 tons of polymer and over a quarter-million dollars in maintenance

BY PAUL DAVIS, WANNER INTERNATIONAL

Hydra-Cell pumps are known or their long life-cycle, are very simple to service, and require no special tools for "in-field" inspection.

Each day, nearly 300,000 gallons of ASP slug is injected through fourteen injector wells via two injection manifolds.

Wanner International is celebrating the third anniversary of installing fifteen Hydra-Cell polymer injection API674 pumps to an oil and gas company in India—saving over 23,000 tons of polymer as well as maintenance costs of over $250,000 across their oil fields. The only maintenance required was the recommended oil changes.

The pumps were installed in ten days in June 2019 after a successful pilot. The multinational company is using them for alkali surfactant polymer (ASP) injection for enhanced oil recovery (EOR).

PUMPS HARD AT WORK

Each day, nearly 300,000 gallons of ASP slug is injected through fourteen injector wells via two injection manifolds installed within the oil field. This equates to over 21,000 gallons of ASP per day, per well. Each injection manifold has seven injection lines, with each line using an individual reciprocating pump for injection.

The ASP slug is prepared by mixing 2.5 weight percent soda ash, 0.25 percent surfactant, and 1,500 parts per million polymer in water, and is stirred using an inline mixer before injection.

EFFICIENCY THAT ADDS UP

Because of Hydra-Cell's very low-shear pumping action, polymer consumption is reduced by up to 15percent. Hydra-Cell's unique valve design enables the low-shear pumping action, minimizing the polymer shear, and optimizing the polymer usage.

With no dynamic seals, its sealless design ensures the polymer is 100 percent contained, with no leakage there is no waste and keeps it free from oxygen to stop degradation.

These pumps are known to run for over fifteen years in other applications. They are very simple to service, with no special tools required for "in-field" inspection of diaphragms and to check valve assemblies. Hydra-Cells can run dry indefinitely and are self-priming. They are highly efficient, with more than 90 percent energy delivery from pump shaft to hydraulic power, achieving significant energy savings.

NEW PARTNERS, NEW OPPORTUNITIES

This was Wanner's first project in India using our Hydra-Cell polymer injection API674 pumps, so we're delighted it's proved to be so successful for our customer's enhanced oil recovery application.

Saving over 23,000 tons of polymer and over a quarter-million dollars in maintenance across the field is good news for the environment and for this oil and gas company. Combining this with energy saving and low maintenance is helping to reduce operating costs and delivering huge efficiencies for our customer.

Polymer injection plays an important role in EOR, which is usually the tertiary stage of an oil field after primary production and waterflooding.

PAUL DAVIS is Wanner International's managing director. Wanner International prides itself in supporting customers, personally. With many years of pump and application experience, there is extensive knowledge available in the Wanner technical pump engineers and support network here to help customers at the end of the phone, no matter where they are in the world. For more information, visit **www.hydra-cell.co.uk/oilandgas**.

NEW SMART WASTEWATER TREATMENT SOLUTION CUTS OPERATING COSTS AND REDUCES ENERGY

Xylem Edge Control provides wastewater operators real-time process optimization

BY CHRIS TAYLOR, XYLEM

Wastewater utilities can now achieve compliance targets while cutting energy consumption from aeration by up to 25 percent with Xylem Edge Control. This off-the-shelf suite of digital solutions for conventional activated sludge (CAS) plants marks the latest breakthrough in the digitization of water utilities. With Xylem Edge Control, wastewater operators can now control and monitor their assets, improve nutrient removal, save energy, and reduce costs.

BALANCING PERFORMANCE, EFFICIENCY, AND COST

Wastewater utilities are constantly balancing the need to ensure service reliability and compliance alongside the need to manage costs. Xylem Edge Control helps wastewater utilities confidently walk that line, bringing together our digital innovation expertise and insights from the company's deep bioprocessing experience, in a suite of solutions that maximizes process control while dramatically cutting energy consumption and supporting sustainability goals.

Utilities around the world are well on the way to digitizing their networks and reaping major water, energy and cost efficiencies. Xylem Edge Control is a versatile, multi-functional solution that meets wastewater utilities where they are on that journey—and sets them up to unlock more of the benefits of digital transformation.

REAL-TIME SOLUTIONS

The Edge Control solutions apply analytics to real-time data to provide rapid process recommendations to optimize chemical usage and aeration. As utilities target emissions reductions, Edge Control is the latest high-efficiency technology that can help utilities cut energy-related greenhouse gas (GHG) emissions and make fast progress towards achieving net-zero targets. The platform can operate with any Programmable Logic Controller under various communications protocols and connect to existing hardware, including sensors and probes.

SOLUTIONS READY TO GO

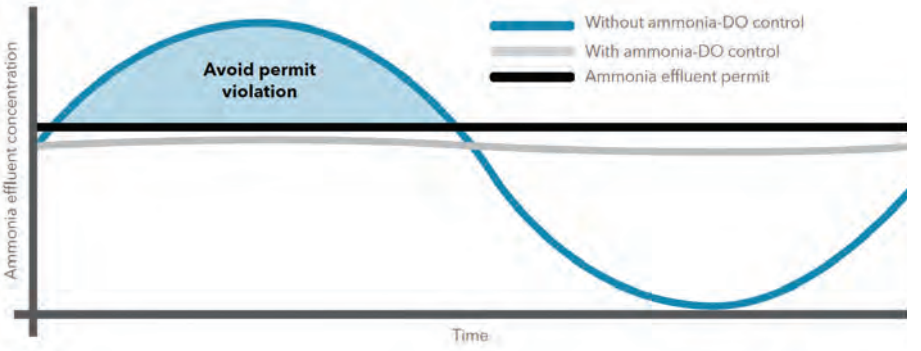
Xylem Edge Control combines four solutions: Xylem Edge Control

Pulsed Aeration, Xylem Edge Control Ammonia Removal, Xylem Edge Control Ammonia + Nitrogen Removal, and Xylem Edge Control P – Removal. Three of the solutions (Xylem Edge Control Pulsed Aeration, Xylem Edge Control Ammonia Removal, and Xylem Edge Control Ammonia + Nitrogen Removal) are now available for customers globally. The fourth, Xylem Edge Control P – Removal, will be available worldwide later this year.

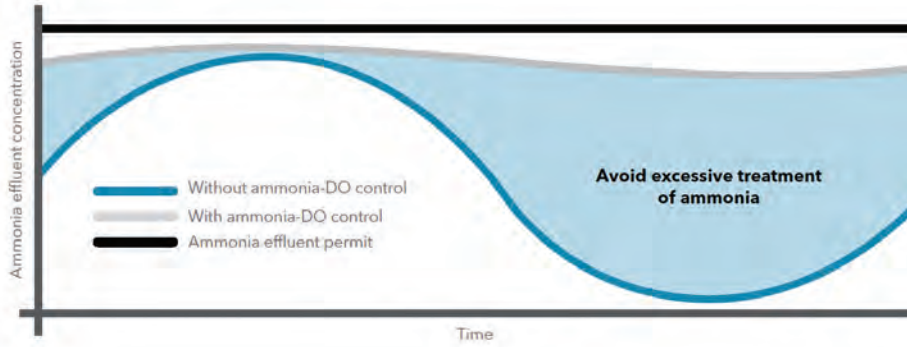
XYLEM EDGE CONTROL PULSED AERATION

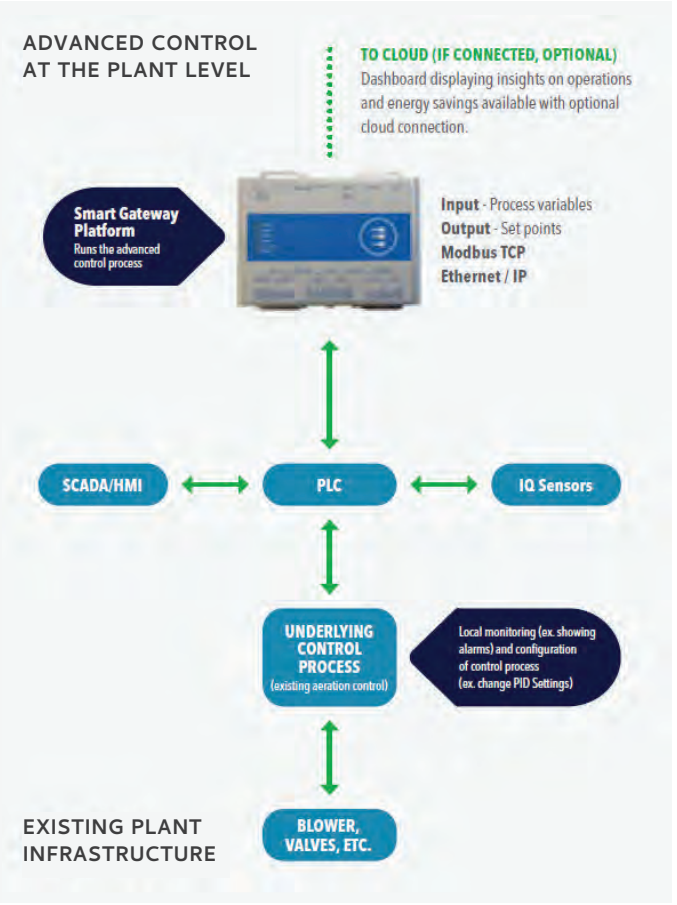
A digital, energy saving solution that can prevent over-aeration of underloaded treatment plants. Pulsed Aeration improves the overall biological process of CAS plants, to provide adequate mixing and ultimately achieving energy savings. Research and implementation of Pulsed Aeration has shown energy savings of approximately 25 percent can be achieved.

STABILIZED PROCESS



ENERGY SAVINGS





Xylem Edge Control Ammonia Removal determines a CAS facility's ammonia target and helps meet its nutrient discharge limits while working to maximize energy savings. It uses an advanced algorithm to match various load conditions, that can provide consistent ammonia removal and further stabilize the biological process.

XYLEM EDGE CONTROL AMMONIA + NITROGEN REMOVAL

The solution offers wastewater utilities the potential to save energy while reducing nitrate and ammonia concentrations. It uses an advanced algorithm which communicates with CAS facilities' existing assets to optimize the achievement of nutrient compliance targets. Its patented, one-of-a-kind, wastewater treatment process] has the ability to create a biological environment unlike anything the wastewater treatment industry has seen with its capacity to create a Nitrite shunt. This can allow for an expedited denitrification process and ultimately, increased energy savings. Research and implementation of Ammonia + Nitrogen Removal has shown energy savings of approximately 25 percent in addition to a reduction in total inorganic nitrogen (TIN) concentration of approximately 30 percent.

XYLEM EDGE CONTROL P – REMOVAL

This solution controls chemical feed pumps based on real-time phosphorus concentrations to reduce chemical usage

while meeting today's stricter phosphorus limits. This option will be available globally by the end of 2022.

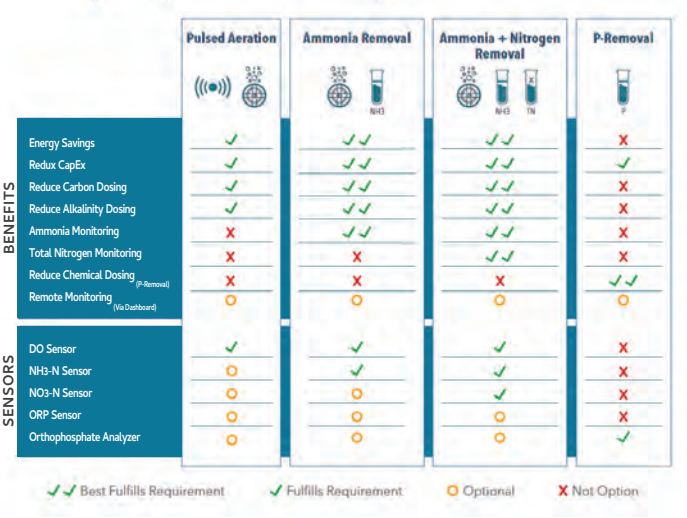
CASE STUDY CLOSE-UP: MUNCIE, INDIANA

The launch of Xylem Edge Control follows rigorous field testing across North America, including Washington and Indiana, including the wastewater treatment operations serving the city of Muncie, Indiana.

"With Muncie being the home to Ball State University, the city undergoes a major swing in population from around 70,000 people while school is in session to approximately 48,000 when school is out of session," says Jason Ingram, plant superintendent at Muncie Wastewater Treatment Plant in Muncie, Indiana, where Xylem Edge Control Pulsed Aeration has been installed.

"That's a decrease in population of over 30 percent. It is during these months of decreased load where we benefit from Pulsed Aeration most. With our upgrades from Xylem's Pulsed Aeration, we are able to save $5,000 a month on energy costs," concludes Ingram.

WHICH XYLEM EDGE CONTROL SOLUTION IS RIGHT FOR YOU?



ANOTHER TOOL IN THE GLOBAL "RACE TO ZERO"

Global water utilities account for approximately 2 percent of global GHG emissions—the equivalent of the world's shipping industry. However, innovative solutions like Edge Control can help mitigate a substantial portion of the emissions generated by inefficient wastewater operations, quickly and affordably. Furthermore, by deploying readily available advanced solutions, utilities could cut the water industry's GHG emissions by 50 percent across both clean water and wastewater activities.

Xylem Edge Control can be used as a stand-alone process or as a connected, subscription-based enterprise with fees based on efficiency and savings. When connected via the cloud, Xylem Edge Control provides data visualization, allowing the customer to see the energy savings on a monthly basis; real-time data trending reports, showing details such as ammonia and TIN concentrations and alert and alarm texts/email notifications, displaying instrumentation and software status.

CHRIS TAYLOR is global product manager at Xylem. Xylem is a leading global water technology company committed to solving critical water and infrastructure challenges with innovation. The company's 17,000 diverse employees delivered revenue of $5.2 billion in 2021. Xylem is creating a more sustainable world by enabling its customers to optimize water and resource management, and helping communities in more than 150 countries become water secure. For more information, visit **www.xylem.com**.

Having a versatile monitoring platform that can support small start-up installations, yet grow as a utility's applications grow, can provide affordability from the very first project. First-time users should look for a platform with intuitive dashboards for quick and easy adoption, sustainability for growing applications, and flexibility to handle independent or bundled metering, pressure-detection, and/or leak-detection capabilities across a variety of web-accessible devices.

AN AFFORDABLE APPROACH TO SMART TECHNOLOGY

In modern infrastructure, hydrants are communications hubs that any municipality can afford

BY DAVE JOHNSTON, MUELLER WATER PRODUCTS

Water-industry press naturally covers the broadest and brightest promises of the digital revolution. Unfortunately, that big-picture view can often intimidate or mislead small- to medium-size utilities who interpret it as demanding a large investment to reap the benefits. Here are some insights into how utilities of any size can affordably harness the value of timely digital data from their distribution systems.

FULFILLING THE PROMISE WITHOUT OVERDOING THE INVESTMENT

With the right sensors and systems, utilities can start realizing the benefits of digitalization—saving money, extending the life of existing infrastructure, and making better informed operational decisions—without having to make an all-or-nothing investment.

First, utility water-resource and asset managers can use such systems to improve reliable data collection from the field, minimize distribution system breaks and non-revenue-water (NRW) losses, improve asset management, and extend asset life. Also, financial personnel can use their data for budgeting, capital planning, asset valuation, financial performance analysis, and public outreach. Finally, contractors can also leverage that data to project work schedules, monitor equipment status, and budgeting future projects.

DEMYSTIFYING DIGITAL-TECHNOLOGY MYTHS IN WATER DISTRIBUTION

Here are four myths that can be shattered with just a modest initial investment in the right technology:

1. DIGITAL TECHNOLOGY IS ONLY FOR LARGE UTILITIES.
Advancements in sensors, sensor placement, and cloud-based management platforms have made the cost, accessibility, and implementation of pressure and leak detection technologies more affordable than ever. Cloud-based solutions make data access and analytics as readily accessible as any smartphone app.

2. DIGITAL TECHNOLOGY IS TOO EXPENSIVE.
Easy-to-retrofit solutions minimize the cost of installation and eliminate the need for special skilled labor. They often surprise new users in how quickly they achieve their return on investment by simply monitoring a few hydrants for operating pressure/leaks throughout the system.

3. SMART HYDRANTS REQUIRE FULL-SYSTEM REPLACEMENT.
Only a select number of hydrants need to be equipped with sensors, and even those can be existing hydrants.

4. ACOUSTIC TECHNOLOGY IS UNRELIABLE "BLACK MAGIC."
In just the past five years, the accuracy behind acoustic leak detection has improved by 50 percent. Some technologies, like Echologics, are now achieving 74-percent classification accuracy (i.e., 74 percent of events labeled as leaks are, in fact, leaks). New technologies in development are scheduled to improve that to 93-percent classification.

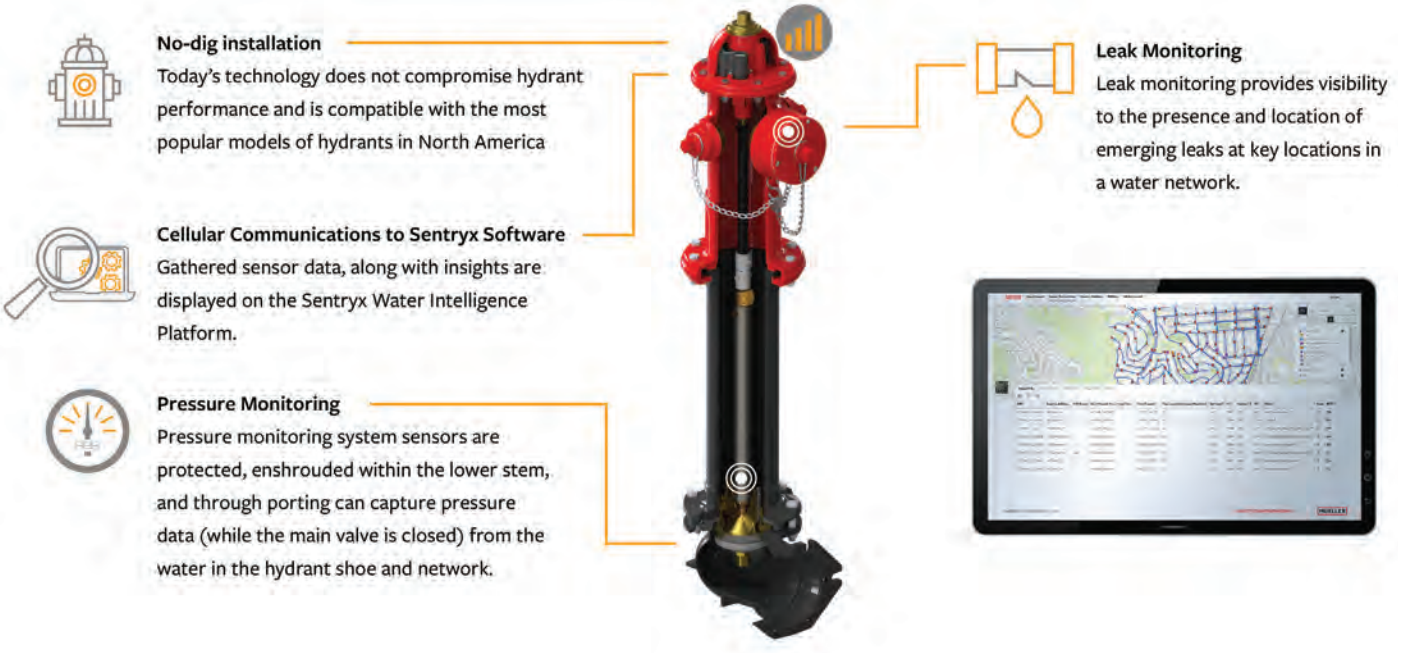
The good news is that leak-noise-correlation technology has advanced so far in recent years, that even small installations can benefit enough from early leak detection and resulting savings to pay for the investment in as little as a year.

A QUICKER, MORE AFFORDABLE PATH TO DIGITAL PRODUCTIVITY

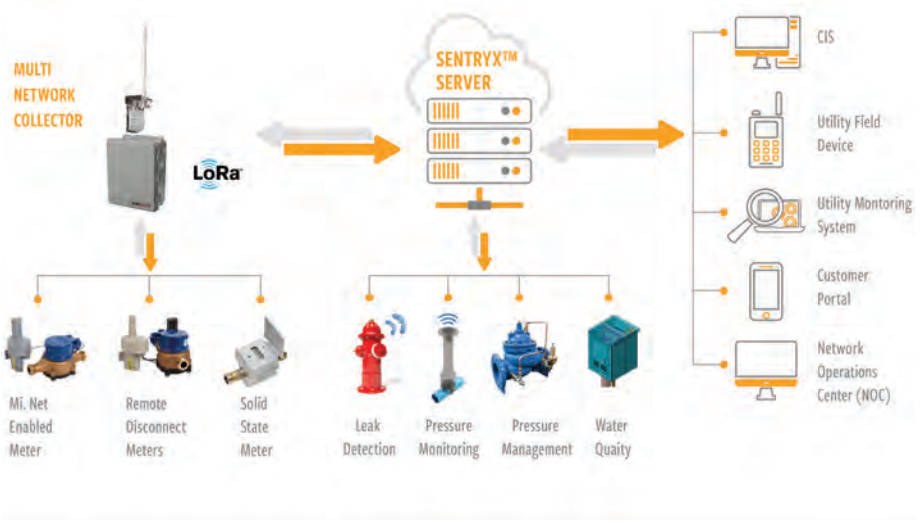
As impressive as acoustic leak sensing and pressure monitoring have been for cutting NRW losses, small- to medium-size utilities want solutions that can scale down to their unique budget and physical requirements, without sacrificing the ability for a quick payback. Newer retrofit capabilities are doing exactly that.

EASY-TO-RETROFIT HARDWARE
Having affordable sensor and communication configurations that can be added to existing hydrants, like the Mueller dry-barrel Super Centurion or wet-barrel Jones hydrants in an hour or two—without excavation headaches or attendant costs, and without compromising functionality—are important considerations for easy retrofit applications.

MULTI-PURPOSE CAPABILITIES
Individual fire hydrants can house state-of-the-art pressure monitoring and leak detection sensors that communicate data to a scalable network monitoring platform like Sentryx, via cellular signals. The



Adding leak-detection and pressure sensors to new or existing hydrants can be a small investment that pays big dividends.



Smart water networks are connecting more infrastructure every day with powerful wireless networks like LoRaWAN giving operators eyes and ears on their system.

hydrant becomes a communications hub for the entire water distribution system. Being able to access that network platform from any web-accessible device enables all utility employees to benefit from timely data being collected.

MULTI-PARAMETER ANALYTICS

Being able to combine flow data from residential water meters along with leak-detection and pressure readings from distribution system sensors gives distribution managers greater ability to understand what is happening than each individual reading does. For example, acoustic leak detection can identify and track slow-growing leaks that start small, while pressure monitoring does a better job of detecting sudden bursts. Analyzed together, they can help water distribution utilities have a better appreciation and understanding of system changes and of developing problems over time. Be sure to incorporate pressure sensing that can automatically capture the detailed data needed to document transient pressure-spike problems when they suddenly occur.

IMPROVED INSIGHTS

Having the status of all sensors monitored by a network operations center with individual readings readily available through a web-accessible dashboard gives utilities 24/7 confidence in system visibility. This can be done in-house or some manufacturers like Mueller will offer to oversee for you. This provides the opportunity to monitor suspicious signals, tend to small leaks proactively before they become big problems, and respond to pipe-burst emergencies before they trigger boil-water advisories. It also enables early identification of NRW losses and managing of aging infrastructure assets more cost-effectively through the best combinations of leak detection and monitoring, pressure relief valve operation, and advanced metering infrastructure.

EXPERIENCED CONSULTATION

Even with the right hardware, it is important to know how to configure it for optimal insight into distribution system performance. Consulting a knowledgeable supplier experienced with factors such as system age, water main materials, elevation changes, and operating pressure profiles can all impact ideal sensor placement for the best insights into systemwide performance.

GETTING STARTED

Exploring the ability to retrofit leak-detection and pressure monitoring into a small system or a controlled segment of a larger system does not have to be expensive or time consuming. It is often easiest to start with a pilot project for proof of concept to monitor performance and calculate payback benefits in a problematic neighborhood before rolling out to the entire utility infrastructure. Requesting a demo of a small-system pressure and leak-detection solution including guidance on sensor placement for optimum efficiency within the infrastructure is an ideal first step for calculating available efficiency gains and cost savings.

DAVE JOHNSTON is director of smart infrastructure for Mueller Water Products. Mueller Water Products is a leading manufacturer and marketer of products and services used in the transmission, distribution, and measurement of water in North America. The company's broad product and service portfolio includes engineered valves, fire hydrants, metering products and systems, leak detection, and pipe condition assessment. It helps municipalities increase operational efficiencies, improve customer service, and prioritize capital spending, demonstrating why Mueller Water Products is "Where Intelligence Meets Infrastructure." For more information, visit **www.muellerwaterproducts.com**.

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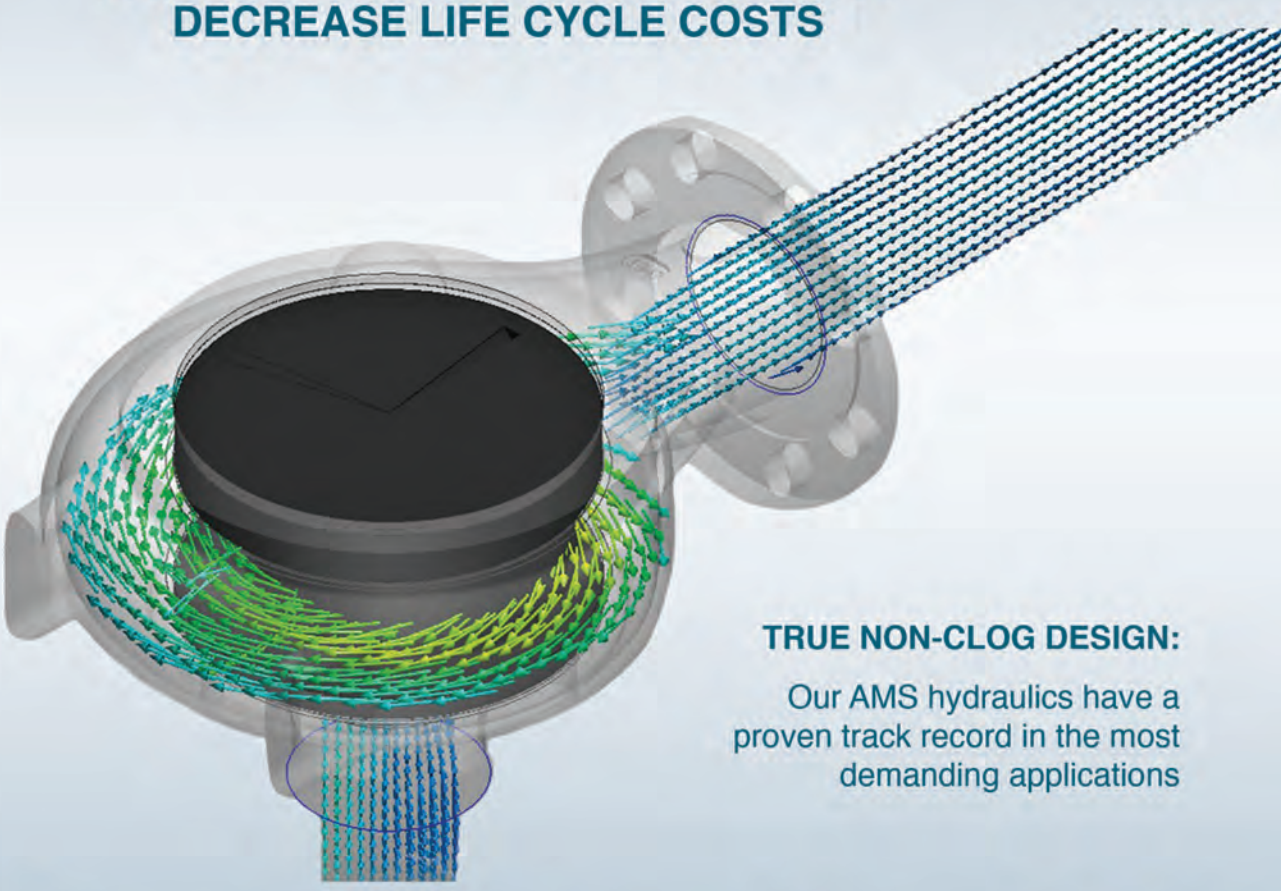

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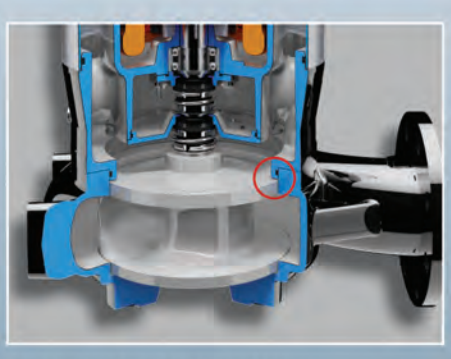

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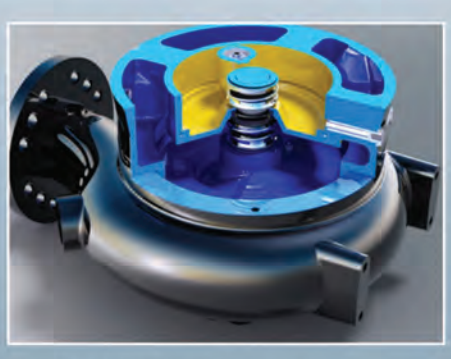

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POWER QUALITY IS CRUCIAL TO SUCCESSFULLY IMPLEMENT AUTOMATION

Testing and monitoring your facility to prevent downtime

BY EMILY NEWTON

Fluctuations in the local utility power grid can lead to a variety of power quality issues, including voltage surges, outages, and noise. While these challenges may be a minor inconvenience for some facilities, they can cause serious problems for automated technology, which is naturally susceptible to power quality issues. Managing power quality is essential for facilities that want to invest in automation. The right testing and monitoring solutions will be necessary for companies to protect their automation systems.

HOW CAN POWER QUALITY ISSUES IMPACT AUTOMATION?

There are several main types of power-quality issues that can arise from both within equipment and due to grid power fluctuations. These include electrical noise and electrical harmonics.

Electrical noise refers to high-frequency voltage variations. ''High-frequency'' is always relative to frequencies considered normal for a particular system. Over time, an AC system's current should appear as a smooth sinusoidal wave. Electrical noise will make this wave ragged and rough.

Electrical harmonics are voltage and current disturbances that are integer multiples of the system's AC frequency. These harmonics are caused by non-linear loads including:

- Variable-speed electric motors
- Rectifiers
- Computer power supplies
- Fluorescent lights

Current harmonics tend to be larger than voltage harmonics and often drive voltage harmonics.

Both types of harmonics can induce heat generation, degrading the efficiency, performance, and lifespan of electronics. These harmonics can also cause vibrations and torque pulsations in the output of electric motors, which can stress and shorten the lifespan of the motor's mechanical components.

In addition to harmonics and noise, both transient or temporary over-voltage and under-voltage can cause issues for sensitive automated electronic systems. Other issues, like voltage dropouts and frequency variations, can cause similar problems for sensitive electronics.

Like harmonics and noise, these problems can cause overheating and reduce the performance of electronic systems. They may also cause system resets.

OTHER TYPES OF DAMAGE CAUSED BY POWER QUALITY ISSUES

Older electromechanical equipment was not as sensitive to changes in voltage or current. Modern electrical automation systems are more sensitive to voltage changes and may have limited tolerances for sudden surges, outages, or noise.

Particularly complex automated systems, like hyper-automation systems, may contain many interlocking parts that can all be vulnerable to power issues. Surges, outages, and other issues may lead to cascading failures in these systems.

In general, power quality issues can lead to a few different issues with sensitive automated systems, including overheating, component or system failure, and a full system reset.

These resets can cause issues with system data and software, potentially corrupting files or deleting important information. In some cases, technicians may need to fully reconfigure the automated system's underlying software.

The greater the extent of automation within a facility, the more these power quality issues can have an impact. Disruptions in power quality can lead to disruption in automated systems, impacting overall facility performance and reliability.

When systems fail, components can also sustain damage, leading to potentially expensive repairs and maintenance.

MONITORING AND TESTING TO MANAGE POWER QUALITY ISSUES

Once detected and identified, it's generally possible to solve most power

quality issues. However, system users will first need to figure out why an issue occurred before troubleshooting can begin. The troubleshooting process usually involves a few distinct steps: information gathering, measuring and testing, then long-term measurements or audits.

Information gathering is a preliminary step that occurs when an end-user believes power quality issues are damaging an automated system or causing it to behave unusually. The end-user will review existing monitoring solutions for irregularities or fluctuations in variables like machine performance or current.

The end-user may also survey employees and staff or review documentation to identify potential causes of machine issues—like recent maintenance, the removal of important equipment, or changes to the machine's power supply.

If the end-user determines the machine may be subject to power quality issues, they can begin testing the machine's power supply for irregularities. Using instruments that measure voltage and current, like a power quality analyzer, the end-user can monitor for fluctuations, variations, outages, and other power quality issues.

Information from these measurements allows the end-user to characterize a system's power supply and identify potential problems. With this information, they can move on to adopting power supply components that will protect sensitive electronics from these quality issues.

DESIGNING AUTOMATED SOLUTIONS TO MITIGATE POWER QUALITY ISSUES

This information will help the system users determine how they can solve the power quality issue. For example, a replacement power generation system may be a potential solution for grid noise or surges.

Careful consideration of the power generation specifications will be required. The system owner should pay attention to power generation system variables like reliability, size,

maintenance needs, and power source.

A business may also need to invest in components that can protect systems from power surges, outages, and other current or voltage variations.

Surge protection devices (SPDs), filters, line conditions, isolation transformers, and uninterruptable power supplies (USPs) are five common devices that businesses use to manage specific power quality issues.

For example, SPDs help mitigate the impact of power surges by either blocking or shorting current (or a combination blocking-and-shorting measure). If a particular automated solution is vulnerable to power surges, these devices can help to damp out sudden current or voltage changes. Key characteristics of SPDs include clamping voltage, response time, and energy rating.

Properly sizing SPDs can sometimes be a challenging task, but the process will almost always be much easier with the right information and pre-planning. The use of multiple SPDs at all levels of a system's electrical distribution—or "protection at depth"—will also help ensure these devices can effectively protect an automated solution.

Even before power quality issues emerge, best practices can help end-users design automated solutions to be more resilient to power quality issues or to prevent these issues from emerging in the first place.

Information from power quality audits and previous troubleshooting processes can tell an end-user what kind of issues they should expect to manage in a new automated system. With this information, they can pre-emptively employ devices like SPDs, USPs, and filters to improve the reliability and performance of an automated solution.

OPTIMIZING POWER QUALITY FOR SUCCESSFUL AUTOMATED SOLUTIONS

Automation is a powerful tool for improving productivity and streamlining processes in a variety of industries. The sensitive electronics in many automated solutions, however, can be vulnerable to normal utility grid power fluctuations.

Testing, monitoring, and implementing devices that can protect automation electronics will help end-users implement automation without risking downtime or higher maintenance costs due to electrical power quality issues.

By identifying facility power quality challenges and using the appropriate tools, it's often possible to resolve the most common power issues.

EMILY NEWTON is a technology and industrial journalist. She is the editor-in-chief of Revolutionized, a publication dedicated to exploring the latest industrial innovations.

IMPROVING MACHINE UPTIME WHILE MAINTAINING SAFETY STANDARDS

Gravity metal detectors add tighter food security layer

BY CHRISTINA DUCEY, FORTRESS TECHNOLOGY

Fortress Technology has engineered a retractable reject unit to facilitate faster and deeper cleans of gravity pipes and working parts

The industrial automation market in food safety and inspection is set to grow by $648.69 million between 2021 and 2025, accelerating at a compound annual growth rate of over 5 percent. Factors such as significant cost savings in operations due to process control and the growing benefits of inspecting bulk foods inline are anticipated to drive the most growth, says a report by Technavio Research, suggesting that demand for high performance gravity metal detectors will continue unabated.

A critical part of most food production processes, inspecting and removing metal contaminants in upstream free-falling dry product applications, Fortress Technology draws attention to several recent enhancements to its robust Stealth Gravity Metal Detector. All designed to advance productivity, enhance safety and maintain HACCP compliance in the busiest of food processing plants.

With productivity being such a critical measurement of output per hour, machine uptime on any fast-moving gravity inspection line is critical. Custom manufactured to accommodate different food factory layouts, including mezzanine floors, ceiling mounts, and between product chutes and hoppers, the Fortress Stealth Gravity Metal Detector is packed full of useful labor- and time-saving features—including automatic testing to eliminate production downtime, plus accurate, high speed reject capabilities.

ADDING VALUE THROUGH SPEED AND SAFETY

Offering best-in-class detection of magnetic and non-magnetic metals, Fortress Gravity Metal Detectors are an everyday sight on North American flour, rice, cereal, sugar, powder, and grain production lines.

"There is always value to be gained from adding upstream detection systems to most processes," explains Regional Sales Manager Eric Garr. "Upstream detection often makes it easier to detect contaminants, trace to their source and potentially alert staff to equipment failures before they become catastrophic and potentially trigger huge recalls."

Scanning raw materials as ingredients come into the factory is prudent for many reasons. Although in most instances these ingredients would be inspected by the supplier, a reinspection will help to doubly ensure that suppliers are complying and hold them accountable for ingredient quality, reaffirms Garr "Of course, the most notable benefit is preventing metal from entering the production process in the first instance. Rejecting at the end of the line is typically the most expensive phase."

For hazardous locations, such as flour factories or chemical plants where the application presents a combustible explosion risk, Fortress supplies clear ratings to meet the defined hazardous location standards. Always mindful of real factory conditions, the robust Stealth Gravity

Often mounted at height, testing access of gravity metal detectors can be challenging without an automated solution

Metal Detector is built to be sturdy and stable enough to withstand vibrations and temperature changes without compromising performance.

Available in a selection of food-grade anti-static in-feed pipe standard sizes, including 3, 6, and 8 inches, Fortress Gravity Metal Detectors apply powerful digital signal processing technology to identify the smallest of metal fragments. Operatives are instantly alerted to any detection by an audible and visual alarm. A reject confirmation alert verifies that the reject device has operated correctly during every reject.

SMARTER ABOUT SAFETY

To remove metal contaminants from good product flow, many Fortress customers now specify the company's roll-out easy clean diverter valve reject system. Much faster to sanitize, this design overcomes a longstanding challenge with gravity systems—gaining access to the enclosed flap-style reject mechanism and removing from service for deep cleans and maintenance. By placing on a carriage, processing operatives can quickly disconnect, slide out, gain access to working parts, clean, and slot back into place, with minimal business disruption.

To successfully comply with application-specific production standards, food plants also need an appropriate and effective testing system. Defined by the audit process of industrial metal detectors, tests are typically scheduled throughout the day at hourly intervals to confirm the gravity inspection system is repeatedly identifying all potential metal contaminants.

Manually performing these regular tests on gravity metal detectors can be especially time consuming. Mainly due to challenges of accessing machinery positioned at height. "It is virtually impossible to time and again replicate a metal contaminant passing through the exact center of the product flow within the aperture in free-flowing applications," notes Garr.

"One of the biggest pitfalls of manual testing in gravity applications is dropping the test sample from a height, through the center of the product flow where the signal is the least sensitive," he highlights. With many gravity metal detectors located near product silos above production lines, climbing up to perform this task manually is usually a two-person task and brings with it some significant safety risks.

To solve this dilemma, Fortress created Halo Automatic Testing. An alternative to manual performance testing, Halo mimics the signal disturbance in the center of the aperture, without having to physically pass a metal contaminant through the metal detector or flush out a sample. In addition to reducing operational costs, Halo testing is proven to reduce waste and product rework.

Through the incorporation of all these innovative features, Fortress asserts that its popular process-centric inline gravity applications are now internationally regarded among the safest to operate and maintain.

CHRISTINA DUCEY can be reached at 416.752.2898 ext. 312 or cducey@fortresstechnology.com. Fortress Technology Ltd. is a privately-owned Toronto-based company and is the only metal detection manufacturer that, since its inception in 1996, custom manufactures metal detectors to suit its customers' needs, application, and specification while ensuring optimal performance. Fortress systems are used widely within a range of food industry sectors including bakery, meats, ready meals, dairy, confectionery, fresh foods, and frozen foods. In addition to product manufacture, the company offers a range of before and after sales service and support services. For more information, visit **www.fortresstechnology.com**.

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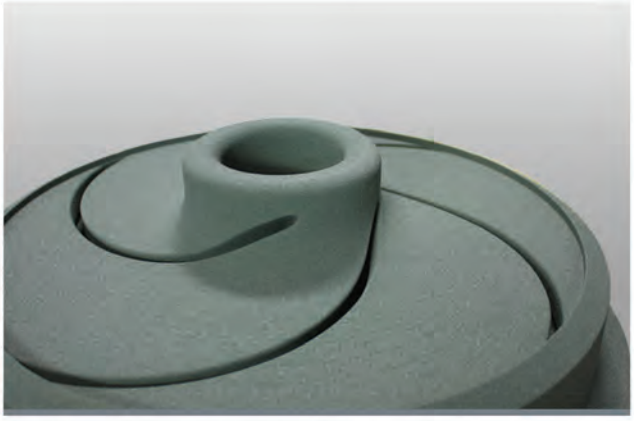

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The hydraulic scrapers in the HRS Unicus Series are hygienically designed.

RECIPROCATING ACTION SOLVES TOUGH HEAT EXCHANGE CHALLENGES

The right technology comes from careful design

BY MATT HALE, HRS HEAT EXCHANGERS

Scraped surface heat exchangers have been used for difficult heat transfer applications involving viscous fluids or where fouling is an issue, such as evaporation processes. The most common type of scraped surface heat exchanger (SSHE) uses a rotating shaft with blades or augers which scrape the surface of the tube. The popular HRS R Series is based on this approach. However, the design is not optimal for every situation, and so HRS developed the Unicus Series of reciprocating scraped surface heat exchangers.

IT STARTS WITH DESIGN

The HRS Unicus Series is specifically designed to provide the improved heat transfer of a traditional SSHE, but with a gentle action to preserve the quality and integrity of delicate food products such as cheese, yoghurt, ice cream, meat paste, and products containing whole pieces of fruits or vegetables. Over the years, a number of different scraper designs have been developed, meaning that every application, from processing curds to heating sauce or pasteurizing fruit compotes can be handled in the most efficient yet gentle way possible. Other applications where the Unicus Series has been beneficial include handling meat slurry and mince, and processing yeast-malt extracts.

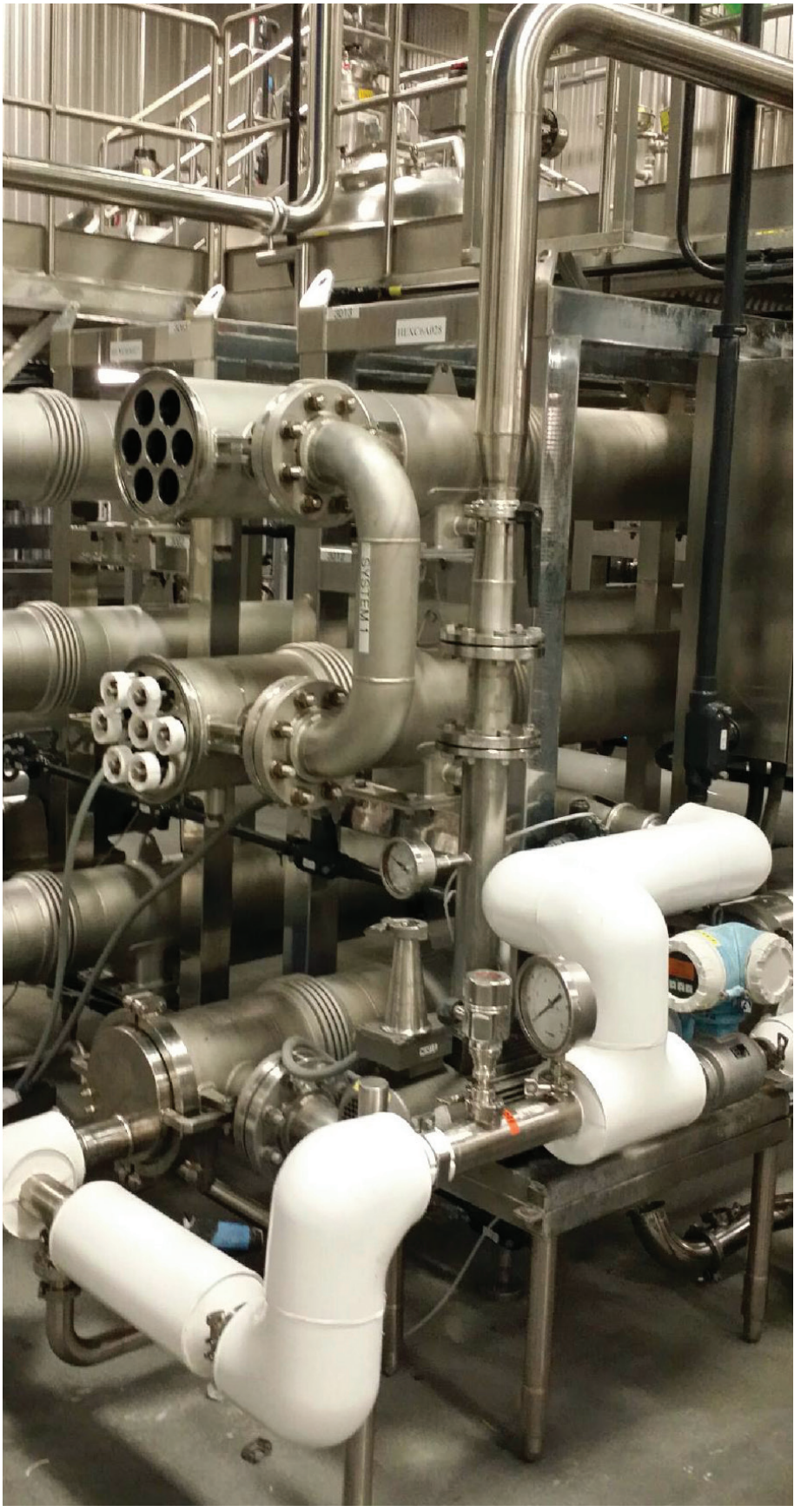
The hygienic design uses a patented stainless-steel scraping mechanism that moves hydraulically back and forth within each interior tube. The movement performs two key functions: it minimizes potential fouling by keeping the tube wall clean and also creates turbulence within the material. Together, these actions increase the rate of heat transfer in the material, creating a highly efficient process that is ideal for viscous and high fouling materials.

Since they are controlled separately, the speed of the scrapers can be optimized for a particular product being processed, so that materials which are susceptible to shear stress or pressure damage (such as creams and custards) can be handled delicately to prevent damage while still providing high levels of heat transfer. The Unicus Series has proven particularly useful in handling viscous food products where texture and consistency are important attributes. For example, some creams or sauces may shear when subjected to excess pressure, making them unusable. The Unicus means that effective heat transfer can be carried out at low pressures which overcomes these problems.

HRS UNICUS SERIES UP CLOSE

Each Unicus SSHE consists of three elements: a hydraulic cylinder and power pack (although in smaller units a pneumatic cylinder can be supplied instead), a separation chamber to ensure hygiene and preserve product separation from the motor, and the heat exchanger itself. The heat exchanger consists of a number of tubes, each of which contains a stainless-steel rod to which the appropriate scraping elements are fitted. Using a range of food-safe materials including Teflon and PEEK (polyether ether ketone), these provide different internal geometry setups according to the application, such as 120-degree scrapers for large particulates and 360-degree scrapers for viscous fluids without particulates.

The Unicus Series is also fully scalable by increasing the shell diameter and adding more interior tubes from a single tube up to eighty in one shell. A key feature is the specially designed seals which separate the inner tube from the separation chamber, tailored to the product application. These seals prevent leakage of the product and



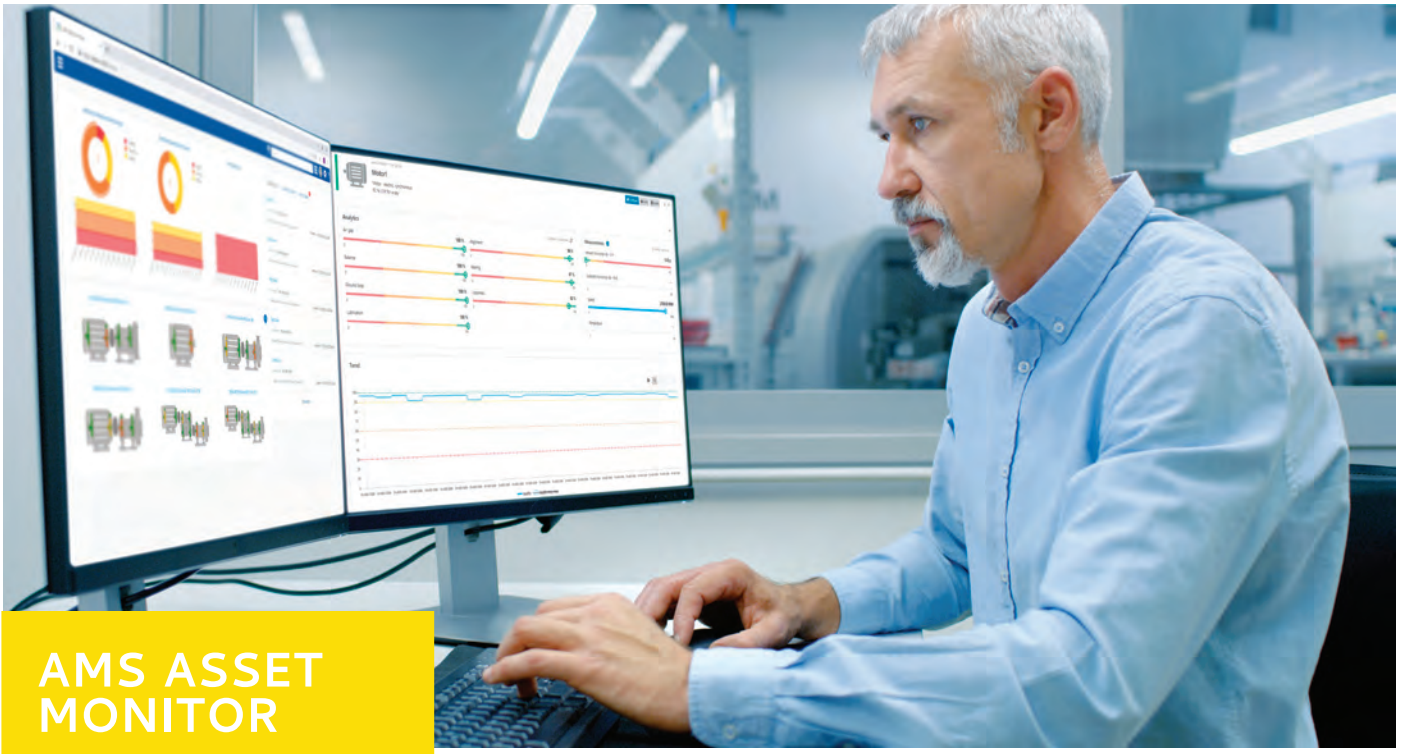
The Unicus Series of reciprocating scraped surface heat exchangers is ideal for viscous products such as cream and tomato juice, as well as products containing fruit pieces or particles.

ensure internal and external hygiene. A standard range of models for food processing provide heat transfer areas from 7 to 107 square feet, while larger models up to nearly 1,300 square feet can be made for specific uses.

EXCELLENCE IN ACTION

One area where the Unicus Series excels is in evaporation applications, where the prevention of fouling is particularly important. HRS has a specific version of the Unicus for use in evaporation units where volume reduction of the material is essential. The scraping action keeps the heat transfer surfaces clean so that Unicus evaporators can concentrate materials to a level that is unattainable using traditional technologies. Unicus evaporators can be used in multi-effect setups or in combination with mechanical vapor recompression.

MATT HALE is international sales and marketing director for HRS Heat Exchangers. Located in Atlanta, Georgia, HRS Heat Exchangers is part of the HRS Group, which operates at the forefront of thermal technology, offering innovative heat transfer solutions worldwide across a diverse range of industries. With forty years' experience in the food and beverage sector, specializing in the design and manufacture of an extensive range of turnkey systems and components, incorporating corrugated tubular, and scraped surface heat exchanger technology, HRS units are compliant with global design and industry standards. For more information, visit **www.hrs-heatexchangers.com**.



AMS ASSET MONITOR

The AMS Asset Monitor manages pervasive sensing while providing prediction, protection, and process monitoring capabilities. It is designed to mount at the asset, reducing cabling requirements and other installation costs. It accommodates up to twelve CHARMs including Vibration as well as DeltaV CHARMs for process inputs. For larger systems, multiple units can be daisy-chained together to extend the asset coverage. This monitor features an internal Logic Studio with multiple pre-programmed application solutions for easy-to-understand analysis and alert reporting. The AMS Asset Monitor can be configured to send overall asset health status and alerts to Emerson's Plantweb Optics asset performance platform and detailed asset data by OPC UA. Detailed asset information is also available on a user's mobile device or desktop thin client from the monitors internal web-served Asset Studio interface.

HOLISTIC CONDITION MONITORING PROGRAMS FOR CRITICAL ASSETS

Emerson condition monitoring software expands visibility to asset health

BY MYRA MASH, EMERSON

Plants around the globe have faced increasing shortages of experienced personnel to monitor and manage equipment reliability. Today, 58 percent of multinational manufacturers are having difficulty acquiring skilled talent according to a 2021 study from Workforce Institute at Ultimate Kronos Group. To help small teams make the most of limited resources, Emerson has continuously evolved AMS Machine Works' condition monitoring technologies for better diagnostics at the industrial edge.

CREATING NEW SOLUTIONS

Global software and technology leader Emerson is updating its

machinery health platform to enable customers to migrate to a more holistic, modern interface for condition monitoring. New support brings data from edge analytics devices directly to key personnel inside and outside the control room to help them more quickly identify and address a wide range of common equipment faults before they impact plant availability. In some industries, Emerson estimates every 1 percent gain in availability is worth approximately $8.4 million of additional profit margin per year.

Increased connectivity to external systems provides personnel with an intuitive, holistic asset health score supported by maintenance recommendations to help reliability teams quickly see what is wrong and how to fix it. Intuitive information and alerts are delivered directly to workstations or mobile devices to provide decision support, helping maintenance personnel make the best use of their time.

"As smaller groups of experienced reliability personnel are tasked with supporting an increasing scope of work, they need access to immediate insights and faster, more comprehensive information to prevent downtime and keep plants running at peak performance," says Erik Lindhjem, vice president of reliability solutions at Emerson.

CLOSING THE LOOP ON PLANT SUPPORT

The newest version of AMS Machine Works adds support for Emerson's AMS Asset Monitor, which provides embedded, automatic analytics at the edge using patented PeakVue technology to alert personnel to the most common faults associated with a wide range of assets.

"The newest version of AMS Machine Works seamlessly interfaces with edge analytics devices to help teams of any size stay aware of the health of all plant production assets, from critical to balance-of-plant, no matter where they may be," Lindhjem adds.

AMS Machine Works also supports open connectivity using the OPC UA protocol to make it easier to connect to external systems such as historians, computerized maintenance management systems, and more to help close the loop on plant support from identification to repair and documentation.

Emerson, headquartered in St. Louis, Missouri, is a global technology and engineering company providing innovative solutions for customers in industrial, commercial, and residential markets. Emerson's Automation Solutions business helps process, hybrid, and discrete manufacturers maximize production, protect personnel, and the environment while optimizing their energy and operating costs. Emerson's Commercial and Residential Solutions business helps ensure human comfort and health, protect food quality and safety, advance energy efficiency, and create sustainable infrastructure. For more information, visit **www.emerson.com**.

NEW DRAIN VALVE SAVES UP TO 95 PERCENT IN CLEANING-IN-PLACE LIQUID

ThinkTop pulse seat save time and money for processing plants

BY MARIANNE HOJBY, ALFA LAVAL

Drain valves comprise up to 20 percent of all valves in a typical processing plant. But cleaning them is costly, difficult, and time-consuming due to long cleaning cycles and the risk of pressure shocks. The new Alfa Laval ThinkTop pulse seat clean addresses all these issues, quickly and effectively making drain valves spotless while delivering savings of up to 95 percent in cleaning-in-place (CIP) liquid.

ThinkTop is raising the bar on water savings yet again. The new pulse seat clean feature does for drain valves what the burst seat clean did in 2019 for mix-proof valves. While burst seat clean reduces CIP liquid for mix-proof valves by up to 90 percent, the pulse seat clean cuts drain valve CIP liquid consumption by up to 95 percent.

MORE SAVINGS, MORE UPTIME

Imagine the savings made possible by using this standard automated valve-position feature, triggered by a rising programmable logic controller (PLC) signal and controlled by the Alfa Laval ThinkTop V50 and V70 sensing and control units.

"The ThinkTop pulse seat clean brings unheard-of savings in CIP liquid to process plant owners and operators compared to conventional PLC timer-controlled seat cleaning," says René Stietz, product portfolio manager, valves and automation, Alfa Laval. "Alfa Laval is the first and only valve automation solutions provider to deliver significant savings in CIP liquid for drain valves."

FASTER, MORE EFFECTIVE PULSE CLEANING

Short bursts, or pulses, drive the valve cleaning process, activating the valve when shear forces peak. Each position-based pulse takes less than a second, preventing pressure shocks in the system. The pulse creates high turbulent flow as the liquid passes through the narrow gap between the valve house and valve seat, effectively removing all residuals for spotless drain valves.

100 PERCENT CLEANING VALIDATION OF DRAIN VALVES

The pulse seat clean makes control and validation of valve cleaning cycles easy. The valve position is not controlled by the PLC timer but by the Alfa Laval ThinkTop. Besides reducing the volume of CIP liquid used, programming the sensor to open and close the seat quickly ensures faster, more rigorous cleaning and hygiene than timer-controlled cleaning. The ThinkTop also verifies that valve cleaning has been completed.

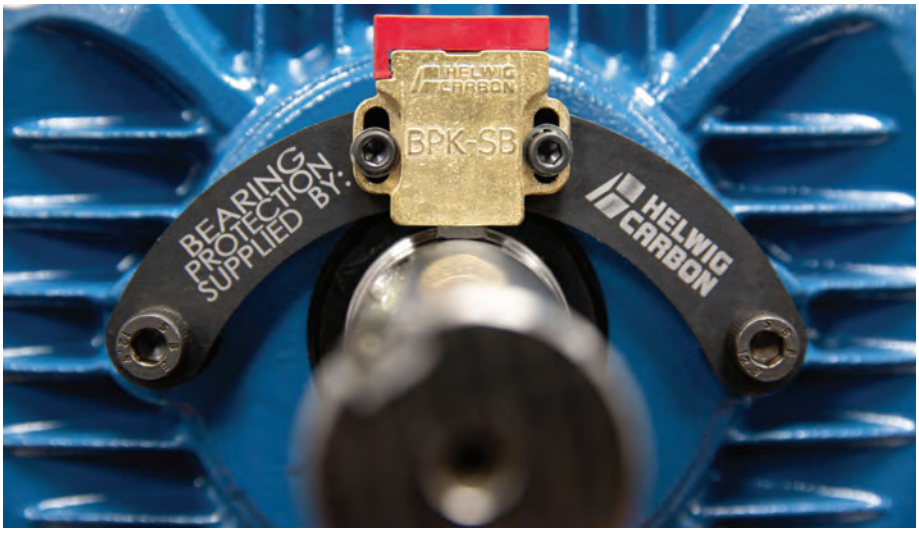
Intended for use with single-seat valves or butterfly valves used as drain valves, pulse seat clean is a standard feature of ThinkTop V50 and V70 sensing and control units with one solenoid valve. Regardless of actuator mode, the drain valve may be configured as a normally open or normally closed shutoff or changeover valve. The pulse seat clean simplifies valve commissioning, prevents pressure shocks, and reduces CIP liquid and time.

Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day. For more information, visit **www.alfalaval.com**

FEATURED PRODUCT

HELWIG CARBON

BPK: ULTIMATE SOLUTION TO SHAFT GROUNDING



Bearing failure is the number one cause of electric motor failure and it can be avoided. Many pumps utilize a variable frequency drive (VFD) to increase pump motor efficiency. While VFDs lower power consumption, they also induce currents onto the motor shaft. These shaft currents will often discharge through the motor bearings causing fluting, burnt grease, and eventual bearing failure. Downtime, repairs, and warranty claims can be the result of bearing failure and can be extremely costly to any company.

Helwig's BPKs (Bearing Protection Kits) have been leading the industry in shaft grounding solutions for years. Our proven silver graphite brush technology, K007, is unlike other shaft grounding systems because it eliminates the need for maintenance and will keep bearings protected year-after-year. Helwig BPKs effectively divert induced electrical currents away from the bearings. The result is the lowest shaft voltage and maximum discharge to ground through the kit rather than through the bearings, protecting them from damage and failure.

From small pumps and motors to large industrial applications, the BPK's versatile shape and size have made shaft-grounding solutions possible for motors across all industries. BPKs have also proven to be effective in contaminated and harsh environments. The constant force spring provides a self-cleaning track that is undeterred by grease and other contaminates. Additionally, our MultiFit Bracket mounting system allows for a BPK to be attached to multiple bolt designs while keeping constant contact on the motor shaft. The MultiFit Bracket system can be used with existing bolts, which eliminates the need for drilling and tapping.

Helwig Carbon's Shaft Voltage Detection Device, otherwise known as the BPK-Probe™, is an instrument designed to measure common mode voltage on a motor shaft. Test results from the BPK-Probe will show if there is current present on the motor shaft, and the level of risk of bearing damage due to electrical discharges. The BPK-Probe is an excellent tool for any engineer, technician, or preventive maintenance professional that needs to evaluate motor health on a regular basis.

From diagnosis to resolution, Helwig Carbon is the world's leading expert on shaft grounding.

For more information, visit

WWW.HELWIGCARBON.COM

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High-pressure valve technologies, control valves, and pumps from Circor are all made for use in the hydrogen economy. Circor's primary isolation valves, certified in accordance with the European Transportable Pressure Equipment Directive 2010/35/EU / UKCA, are utilized in the transportation of compressed hydrogen on tank solutions and refuellers throughout Europe and beyond. Other high-pressure valve technologies such as pressure regulators, slam shut valves, residual pressure valves, and filters are used to control the delivery of high-pressure gas to end-user applications. For more information, visit **www.circor.com**.

SKF

SKF AXIOS

Manufacturers want to use simple and affordable wireless technology to monitor more equipment in their facilities. SKF Axios is a fully automated condition monitoring solution that fulfills this need. It is comprised of sensors, gateways, and a machine learning service that is easy to install, commission, and scale with no experience necessary, allowing sensors and apps to be operational within minutes. It detects anomalies and pushes notifications allowing for quick action to avoid unexpected machine failures. For more information, visit **www.skf.com/axios**.

CONTRINEX

TRU-C23 UV PHOTOELECTRIC SENSORS

The Contrinex TRU-C23 UV photoelectric sensors are designed for detecting transparent objects, such as those made with plastic or glass. Since transparent materials absorb large amounts of polarized UV light, it is very easy to set the threshold at which these sensors switch. Select models are IO-Link compatible, providing continuous diagnostic information and easy remote sensor mode selection along with accurate object detection data. All sensor outputs are complementary, allowing them to be used as a light-on or dark-on sensor. For more information, visit **www.contrinex.com**.

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WHEN EXPERTS WEIGH IN, OVERSIGHT CAN SAVE CONSUMERS MONEY AND CUT CLIMATE EMISSIONS

ASAP's Marianne DiMascio on New York's new efficiency guidelines

Since 2008, Marianne DiMascio has been working to advance the goals of the American Council for an Energy-Efficient Economy's (ACEEE) Appliance Standards Awareness Project (ASAP). As the project's state policy manager, she creates awareness of and builds support for appliance efficiency standards on both the federal and state level, building a coalition of supporters through outreach, education, and advocacy. She is also co-author of *The Efficiency Boom: Cashing In on the Savings from Appliance Standards.* Below, she shares some of her insight on recent regulatory actions that can benefit both the climate and consumers.

MPT: ***Please tell our readers a bit about the new efficiency standards New York will be implementing.***

MARIANNE DIMASCIO: The New York legislature passed a sweeping bill this month to slash climate-change emissions and save New Yorkers hundreds of millions of dollars annually on their utility bills by requiring appliances to be more energy efficient. The bill, the most expansive of any recently passed by a state, now goes to Governor Kathy Hochul for her signature.

The bill will apply to many common household products, including computers and televisions. It calls for the New York State Energy Research and Development Authority (NYSERDA) to update energy and water efficiency standards for seven products already regulated by the state and to set new standards for another thirty, including air purifiers, electric vehicle chargers, and restaurant equipment.

MPT: ***Do you expect appliance standards like these to be adopted in other states or even at the federal level?***

MARIANNE DIMASCIO: In just the past few years, thirteen states plus DC have adopted new appliance efficiency standards, including Maine, Massachusetts, New Jersey, Rhode Island, and Vermont.

MPT: ***How will these new standards be put into action?***

MARIANNE DIMASCIO: New York will be one of three states, along with California and Connecticut, to give a state agency broad regulatory authority to ensure appliance standards keep pace with technological advancements. In addition to directing NYSERDA to consider standards for a long list of specific products, the bill empowers the agency to establish new efficiency standards and promulgate regulations, including for products not listed. The California Energy Commission has used its authority to issue nation-leading standards, and NYSERDA could do the same for New York with this new bill.

The bill directs NYSERDA to consider energy reduction, water conservation, greenhouse gas reductions, and increased demand flexibility when setting appliance standards. Demand flexibility requirements could ensure that water heaters, for example, come factory-equipped with technology enabling them to preheat water when electricity is cheapest, such as at night. ■

To listen to an extended version of this interview, be sure to subscribe to MPT's podcast, The Efficiency Point.

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