

The background of the entire page is a detailed white line drawing on a blue background. It depicts a complex industrial system, likely a pump or a large valve assembly. The drawing shows various components such as flanges, bolts, pipes, and a large spherical vessel in the upper right. The lines are clean and technical, typical of an engineering blueprint.

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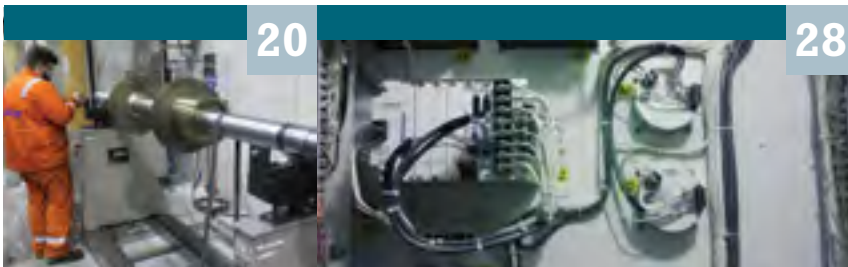
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## 2020 Top Products

### A NOTE ON THIS ISSUE:

Happy holidays, and thank you for closing out this unprecedented year with MPT. Starting things off in our Case Studies section (pg. 12), Isabelle Chenier of Aquatic Informatics shows how her company improved the City of Orlando's Streets and Stormwater Division's ability to protect citizens from flash flooding with its Aquarius intelligent data management system.

Changes to pump performance in the oil and gas sector may be required for a number of reasons. In this month's Maintenance & Reliability section (pg. 20), we share the success story of a pump retrofit that increased performance and savings. Sulzer's Daniela Haldenwang has the details in her article, "Optimizing Offshore Pump Performance and Reliability."

Lastly, each December, the staff at MPT looks back on the year that was and presents our choices for the Top Products of the year (pg. 36). Our selections span the industrial pump and rotary equipment markets and speak to the sector's needs for efficiency, reliability, and innovation. The products range from large multinationals you're likely familiar with to smaller, regional suppliers worthy of your attention—all offering value you can take into the new year. Enjoy!



J. Campbell, Editor  
*Modern Pumping Today*

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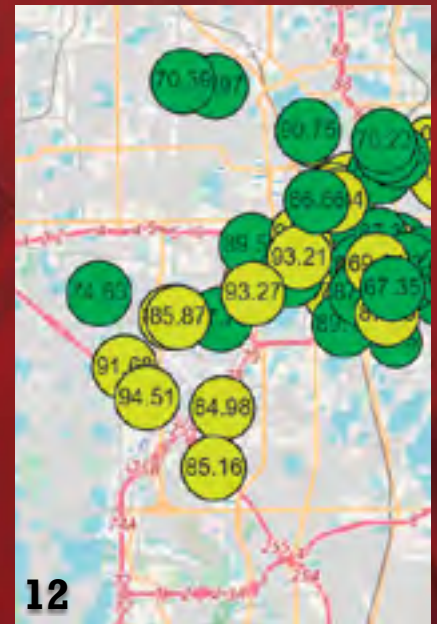
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## ARMSTRONG MOVES EUROPEAN PRODUCTION FACILITY IN ROMANIA

Armstrong Fluid Technology announces that the company has moved to a new expanded facility for European production and warehousing of circulator products. The new facility, located in Jimbolia, Romania, offers greater capacity for the production of Armstrong high-efficiency and standard wet rotor circulators. Supported by Armstrong's global supply chain, the site will employ sixty-five team members dedicated to producing circulators for customers worldwide.



Reflecting on the expansion, Joachim Schulz, global commercial director of building business, comments, "This new facility in Europe is a significant step towards

greater production output and a faster pace of innovation. Increased production capacity will help with time-critical installations and service to global customers looking for high-quality, high-efficiency circulators."

## UNIVAR SOLUTIONS ENTERS DISTRIBUTION AGREEMENT WITH ZHUHAI TECHI CHEM

Univar Solutions Inc., via its wholly owned subsidiary Univar Solutions China Co. Ltd., has reached an agreement with Zhuhai Techi Chem Silicone Industry Corporation to distribute innovative specialty silicone solutions used primarily for the coatings, adhesives, sealants, and elastomers (CASE) market. The agreement is expected to close in mid-December.

This agreement aligns to the company's global approach to its dedicated end market verticals as it provides new opportunities for growth by further positioning Univar Solutions to bring differential value to customers and suppliers within the CASE market. With a focus on offering innovative solutions to meet market needs and trends, Univar Solutions intends to deliver a consistent global approach across key industries through a worldwide footprint of industry-leading capabilities, technical solution centers and market knowledge, as well as a premier line of products and comprehensive solutions.

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services to assist in their pursuit of growth and we are very excited to add the depth and breadth of Tech Chem's leading specialty silicone solutions within the China marketplace," says Nick Powell, president, specialty chemicals and ingredients and president EMEA and APAC for Univar Solutions.

## ANUE WATER NAMES J.H. WRIGHT AS EXCLUSIVE SOUTHEASTERN CHANNEL PARTNER

J.H. Wright and Associates is the exclusive new channel partner for the sales and distribution of Anue Water Technologies' eco-friendly product line throughout the gulf states of Louisiana, Mississippi, Alabama, the Florida panhandle, and Georgia.

According to Greg Bock, Anue Water VP and general manager, "We are happy and excited to have J.H. Wright and Associates as our exclusive channel partner throughout this large and important region. J.H. Wright has a sixty-year history of leadership in the wastewater treatment industry, a truly great team of process technology experts and a high-level of energy and enthusiasm for solving customer problems."

Mark Wright, president of J.H. Wright, adds, "Taking on Anue Water's clean-tech product line is an important milestone in J.H. Wright's long history of service to the municipal, industrial, and process water industry. Partnering with Anue Water Technologies enables us

to offer clean oxygen/ozone injection systems that pay for themselves in terms of chemical, labor, and other operating cost-savings over a two- to three-year period."

## MAZZEI INJECTOR COMPANY AND BEAVER EQUIPMENT JOIN FORCES

Mazzei Injector Company has completed its search for a firm to represent them in Washington and Oregon, choosing Beaver Equipment, LLC. Beaver Equipment has been a representative firm for water and wastewater equipment since 1972 and has an experienced staff providing planning and pre-design through startup and operation.

"We are hesitant to add product lines to our portfolio unless we are certain that they are mechanically sound, economically feasible, and able to perform exceptionally. In addition, the customer must come first... business must be conducted with honesty, integrity, and responsiveness," says Ken Black, president of Beaver Equipment. "And Mazzei meets these requirements easily."

"With computational fluid analysis, Mazzei is continuously working to enhance our products and systems, but it is the excellent customer service and advice that we provide which we are most proud. And we require our reps to meet these same high standards—and Beaver Equipment does just that," adds Jim Lauria, VP of Mazzei Injector. "We each strive to make certain



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### SCHNEIDER ELECTRIC CEO ELECTED AS NEMA BOARD OF GOVERNORS CHAIR

The National Electrical Manufacturers Association (NEMA) announces Annette Clayton, chief executive officer and president, North America, Schneider Electric, was elected chair of the NEMA Board of Governors. Clayton joined Schneider Electric in 2011, after serving as vice president of global operations at Dell for five years.

"We have faced many new challenges this year, and we saw accelerated demand for a digital world. It's clear there is a need for new electrical infrastructure that is intelligent and supportive of renewable and sustainable environments," says Clayton.

"It's time to move NEMA beyond efficiency," she adds. "Together, we can move to a holistic energy system that is connected, cybersecure, renewable, sustainable, and intelligent."

"We are very pleased to have Annette as chair," says NEMA president and CEO Kevin J. Cosgriff. "Her industry experience and keen insight will be especially important to incorporating the economic and other lessons of 2020 as we plot a course to enhance further the lives of citizens, the health of our businesses, and the well-being of our country in the years ahead."

### UL JOINS THE WORLD ECONOMIC FORUM

Global safety science leader UL has joined the World Economic Forum (WEF) as a Platform Partner and will work to develop systemic solutions to key global challenges and serve as a driving force behind WEF's programs.

UL's participation within WEF includes membership of the organization's Advanced Manufacturing and Production Platform, a group dedicated to accelerating inclusive technology while stimulating innovation, sustainability, and advanced manufacturing and production. UL will harness its safety, scientific, and sustainability expertise to address carbon reduction in manufacturing, digital traceability, and enhancing resilience in supply systems and manufacturing.

"Anticipating how advanced manufacturing technologies, innovative business models and new ecosystems are transforming business's ability to drive economic and societal impact is a challenge globally," says Jennifer Scanlon, president and CEO of UL, Inc. "UL is honored to have an active role in helping businesses boldly reimagine manufacturing in the digital era."

As the only testing, inspection, and certification organization member of WEF, UL joins other global companies to provide strategic insights, scientific evidence, and multidisciplinary understanding of major issues that will shape the post-COVID world. ♦



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# Optimizing Data Intelligence Helps Orlando Protect Its Citizens During Heavy Rain Events

By Isabelle Chenier, Aquatic Informatics

The City of Orlando Streets and Stormwater Division is responsible for maintaining and improving drainage facilities to prevent flooding and ensure all receiving water bodies meet state and federal water quality standards.



## PUBLIC DATA FOR THE PUBLIC GOOD

The data is easily accessible in real-time through an online dashboard for all stakeholders to prioritize and focus their efforts where needed. To broaden the sharing of data, in 2019 the city chose to make rainfall and stage information available to the public through the website [hydrology.orlando.gov](http://hydrology.orlando.gov).

They oversee upwards of 100 lakes within the city and approximately 147 drainage wells with seventy monitoring stations for lakes and waterways, and have twenty-three rainfall stations collecting data by telemetry over a cellular network. The Streets and Stormwater Division keeps two million people safe from flooding during heavy summer rainfalls and periodic tropical events.

## COLLECTING DATA TO MAKE BETTER DECISIONS

As cities move to more electronic monitoring and automation there is an enormous amount of water data received on a daily basis, which can be extremely cumbersome to access and manage across all the departments. The City of Orlando's existing data management was largely done in Excel and lacked any form of data defensibility. Additionally, the current system and quality assurance/quality control (QA/QC) process were labor intensive, preventing capacity for program expansion.

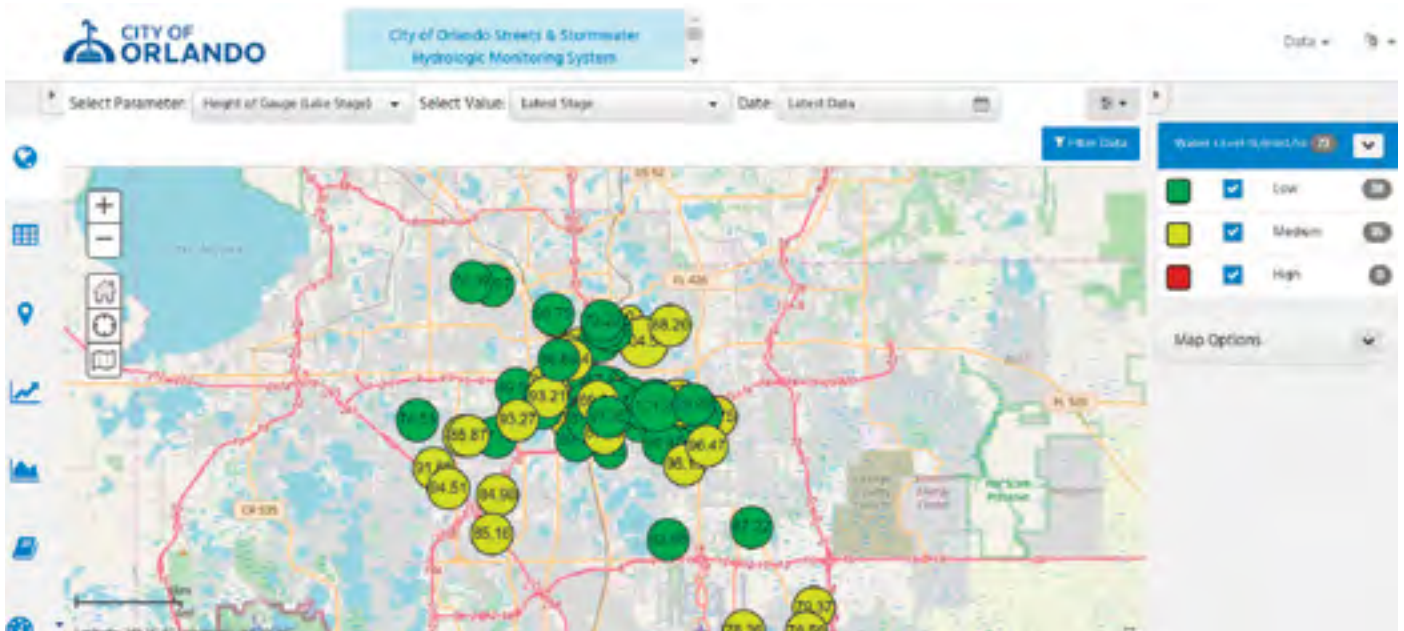
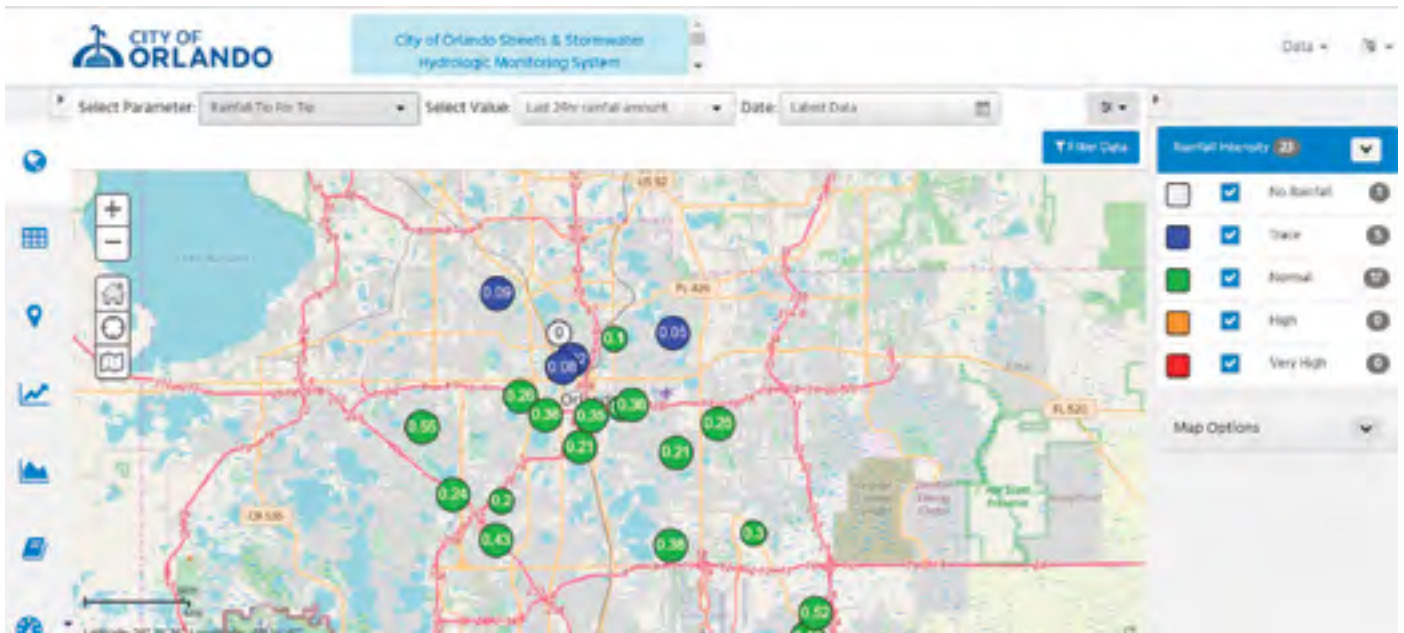
In recent years, the city has experienced more high-intensity rain events that have caused localized flooding during the summer rain

season. These events coincide with an increase in the number of customer complaints that demand immediate response to ensure citizen safety and welfare. As the city was able to measure these rainfall events, they began to look for ways to turn this data into an actionable asset. To do this they would need a robust data management and decision support system that would allow them to expand their monitoring program, provide data defensibility, streamline data management and QA/QC, and help them turn their data into practical insights.

## EVALUATING FLOOD DATA WITHOUT THE DELAY

The city implemented Aquarius to manage their data and publish information to all stakeholders. By connecting to sensors in real time, the software automatically imports and integrates data, giving operators a continuous stream of central intelligence without manual input. The platform keeps permanent records of original data and data quality is tracked with qualifiers and quality grades, giving operators the ability to compare raw and corrected data on a single chart and defend





or retrace data with an automatic audit log. Operators can centrally manage data from all monitoring network locations, ensuring a single source of truth from disparate data sources.

Hensley Henry, Aquarius administrator for the city, who was responsible for setting up and configuring the system, says, "In the past, evaluating the impact of these heavy rain events required multiple spreadsheets and hours of manual effort. Now, with the push of a button, the software can create and retrieve customized intensities to evaluate isolated street flooding and protect the city against liability."

The program can calculate derived data in real-time and run rating curves, calculate aggregates, and fill gaps

in a matter of seconds. It is also capable of building more sophisticated multi-input time-series models. Aquarius pulls historical statistics and can visualize all types of data in different forms, including meteorological data.

"The new platform has boosted the value of our monitoring operations by making it easy to share data with citizens and actionable to professionals", says Richard Lee, stormwater assistant division manager for the City of Orlando. Meaningful context (e.g., lake elevation criteria) and comparisons with historical data help transform current data into information and provide better insights during episodic events to guide management actions. By utilizing alerts and notifications based on custom levels, the city is proactively forecasting potential problems.



### ESTIMATION REPLACED WITH EFFICIENCY

Internally, this means the overall efficiency for the team has improved. "We are able to trust the timely delivery of data, enabling us to be proactive, not reactive, and eliminate ad hoc data requests," says Lee. Efficiency has improved as the guesswork is removed from field visits.

"We now know what to look for and how to respond based on the data. For example, a lot of rain in a certain area is likely to cause street flooding because of debris obstructing storm drains. Reviewing the data allows us to determine if the flooding is caused by an under designed system, or if it is simply an occurrence due to mother nature. For this case, we will dispatch crews to the area before we get customer complaints," concludes Lee.

Flooding can also give rise to water quality issues. The city is in the process of expanding its water quality data management through the same platform which will then give stakeholders and citizens access to things like nutrient levels, bacteria counts and turbidity. At a glance citizen will be able to assess the health of Orlando's water bodies. Alerts can be set so stakeholders

can react to elevated E. coli values and be made aware of nitrogen, phosphorus, and chlorophyll concentrations that exceed the state's surface water quality standards. Stakeholders will be able to evaluate the system quicker and develop management tools to help improve the water quality.

### WORKING FAST MEANS WORKING SMART

The city's team now has time to catch up on important administrative tasks and work on plans to incorporate stormwater flow data into Time-Series. This tool allows the city to centralize vast amounts of hydrologic time series data, discrete measurement data and complex river gauging measurements from various locations. It makes it easy to integrate, import, and enter data quickly, so they can effectively manage all their environmental information on one platform. Aquarius has a unique portfolio of features for real-time sanity checking, error detection, data cleaning, and rating shift management.

"At some point in the future, we would also like to add contour elevations in order to correlate lake stages with topographic, bathymetric, and basic water quality information

for general purposes. Having this information will allow us to set the flooding levels at each location and have a better handle on the stage, area and discharge characteristics for each lake," says Lee.

Maintaining and operating the city's roadways and right-of-ways and ensuring efficient and safe transit on all city streets and pedestrian ways, as well as maintaining and improving the city's drainage facilities, all falls on the shoulders of the Streets and Stormwater Division. Having timely and accurate information to empower better, faster decision-making helps guarantee public safety and government compliance. ♦

**Isabelle Chenier** is strategic accounts manager at Aquatic Informatics. Aquatic Informatics provides software solutions that address critical water data management, analytics, and compliance challenges for the rapidly growing water industry. Water monitoring agencies worldwide trust Aquatic Informatics to acquire, process, model, and publish water information in real time. For more information, visit [www.aquaticinformatics.com](http://www.aquaticinformatics.com).



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# Keeping the Big Apple Clean

Centrisys completes wastewater resource recovery efficiency updates in two New York locations

*By Michael Kopper, Centrisys*





It takes big ambition to tackle big projects and make them a success. A leading North American manufacturer of decanter and thickening centrifuges and dewatering systems, Centrisys Corporation was eager to take on the \$67 million comprehensive energy-efficient upgrade at two of New York City's largest wastewater treatment plants. As part of a series designed to improve pollution control and treatment efficiency, the NYC Department of Environmental Protection chose to install thirty-two American-made CS26-4 Centrisys decanter centrifuges.

#### OUT WITH THE OLD, IN WITH THE BEST

Centrifuges are used in the wastewater treatment process to dewater solids (sometimes called "sludge") after anaerobic digestion. The older centrifuges were removed and replaced with newer models in groups of four to

ensure the continued operation of the plant throughout the project that began in 2015. The new Centrisys centrifuges will consume 60 percent less electricity, and reduce 826 metric tons of greenhouse gases annually between the two plants. To date, the upgrade has resulted in savings of \$1.1 million per year in power, polymer, and biosolids disposal costs and have greatly improved New York City's dewatering operational efficiencies.





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With more than thirty years in business, the NYC project exemplifies what our team of engineers can do. As a company, Centrisys takes great pride in our technology. Putting systems in place that have an evolving impact on the communities it serves while reducing the environmental footprint and cost of the wastewater treatment process, is of utmost importance.

The Centrisys engineering team integrated a centrifuge stand, diverter gate, and interconnecting pipework into the NYC plant design. These design elements created a

“drop-in-place” centrifuge system, allowing for easy integration with only a few minor modifications to the existing floor plan.

In July 2017, the Wards Island Process Control Laboratory conducted a test that showed Centrisys's CS26-4 centrifuge installation demonstrated better than specification performance results.

Field acceptance test results at Hunts Point Wastewater Treatment Plant from spring of last year also show the benefits of the Centrisys CS26-4 centrifuge.

Additional plant updates included:

- Ancillary equipment, including sludge and polymer feed pumps with associated instrumentation and controls.
- A new build of an operator

workstation equipped with an online solid monitoring system and a new motor control center.

- Replacement of piping, specialized pumps, valves, and other wastewater equipment that work in direct support of the centrifuges.
- Additionally, lighting fixtures in the centrifuge room, the control room, the conveyor room, and the polymer bulk storage area will be upgraded to more energy-efficient models.

## AN IDEAL SOLUTION

Andy Torres is the Centrisys NYC project manager who assisted with the project upgrade and worked most closely with the municipality.

“Although this was a challenging project due to the age of the older



## PROJECT OVERVIEW

Midwest-based Centrisys Corporation provided the New York City Department of Environmental Protection with thirty-two CS26-4 Centrisys decanter centrifuges to improve the efficiency of the wastewater treatment process at two high-use locations:

- The Wards Island Wastewater Treatment Plant is the second largest of the fourteen wastewater treatment facilities in New York City, serving nearly one million people.
- Hunts Point Wastewater Resource Recovery Facility in the south Bronx cleans more than 200 million gallons of wastewater produced by 700,000 residents every day of the year.

## WARDS ISLAND WASTEWATER TREATMENT PLANT

### Performance Test (July 12-13, 2017)

	FLOW RATE (GPM)	CAKE SOLIDS (PERCENT TS)	POLYMER DOSE (1 LB/DRY TON)	CAPTURE RATE (PERCENT W/W)	TOTAL POWER (KW)
<b>BID SPECS</b>	<b>250</b>	<b>26%</b>	<b>36</b>	<b>95%</b>	<b>67</b>
<b>Centrisys 5703</b>	252.5	26.7%	29.8	99%	62.53
<b>Centrisys 5705</b>	252.5	27.1%	28.2	99%	62.47
<b>Previous Centrifuge</b>	191.5	25.15%	17.63	0	118.56

The data acquired is from the Wards Island Process Control Laboratory. The New York DEP randomly selected two Centrisys CS26-4 decanter centrifuges #5703 and #5705, from the 10 installed centrifuges at the time, to conduct the 48-hour performance test.

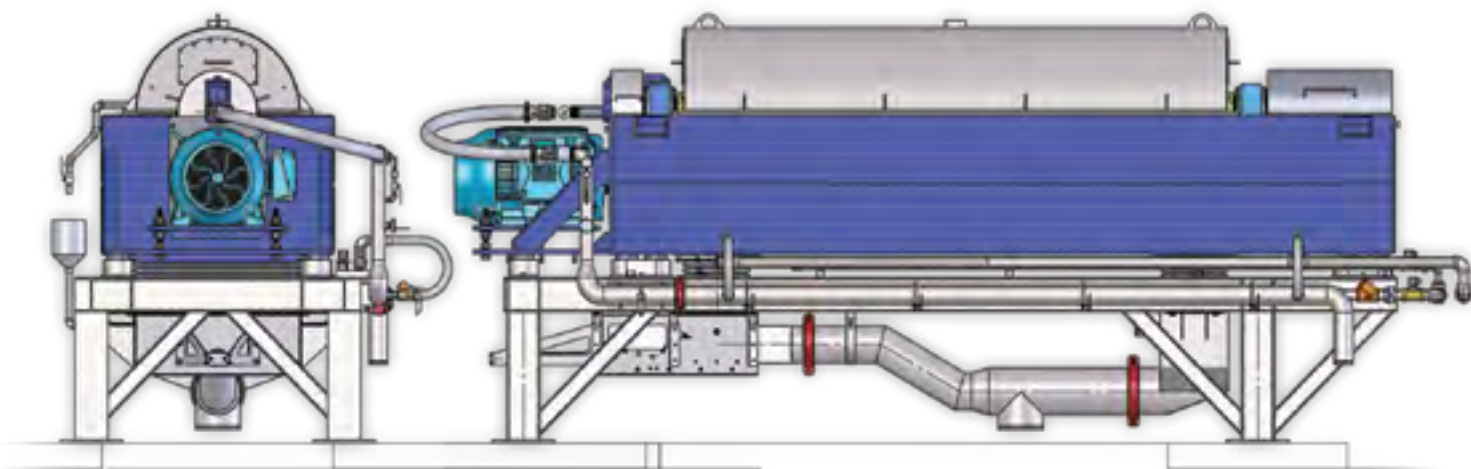
## HUNTS POINT WASTEWATER TREATMENT PLANT

### Field Acceptance Test (April 8, 2019)

	FLOW RATE (GPM)	CAKE SOLIDS (PERCENT TS)	POLYMER DOSE (1 LB/DRY TON)	CAPTURE RATE (PERCENT W/W)	TOTAL POWER (KW)
<b>BID SPECS</b>	<b>175</b>	<b>29%</b>	<b>25</b>	<b>94%</b>	<b>60</b>
<b>Centrisys 5707</b>	176	30.7%	22.8	98.3%	53.7
<b>Centrisys 5708</b>	175	30.1%	22.5	97.9%	54
<b>Previous Centrifuge</b>	146	27.5%	23.6	92%	102.1

Prior to the field acceptance test, it was agreed to run only one Centrisys CS26-4 decanter centrifuge #5707 to validate previous acceptance testing. The previously installed centrifuge was also operating.





The Centrisys engineering team integrated a centrifuge stand, diverter gate, and interconnecting pipework into the plant design. These design elements created a "drop in place" centrifuge system, allowing for easy integration with only few minor modifications to the existing floor plan.

system, design of the facilities, the amount of energy required, and the sheer number of individuals dependent on the technology to continue working throughout upgrades, we knew our decanter centrifuges were the ideal solution for NYC," says Torres. ♦

**Michael Kopper** is president and CEO of Centrisys/CNP. Centrisys is a USA manufacturer of dewatering centrifuges, sludge thickeners, and provides global centrifuge service, repair, and parts for all decanter centrifuge brands. CNP, a division of Centrisys, supplies nutrient recovery and advanced biosolids treatment systems for phosphorus recovery and thermal hydrolysis processes. For more information, visit [www.centrisys-cnp.com](http://www.centrisys-cnp.com).

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# Optimizing Offshore Pump Performance and Reliability

Assessing the benefits of pump retrofit projects that deliver improvements and savings

By Daniela Haldenwang, Sulzer

Asset reliability and performance are the two most important factors for the oil and gas sector but as processes change and equipment ages, optimizing uptime can become a greater challenge. For pumping assets, a retrofit project has the potential to increase productivity and reliability, while at the same time reducing energy costs.

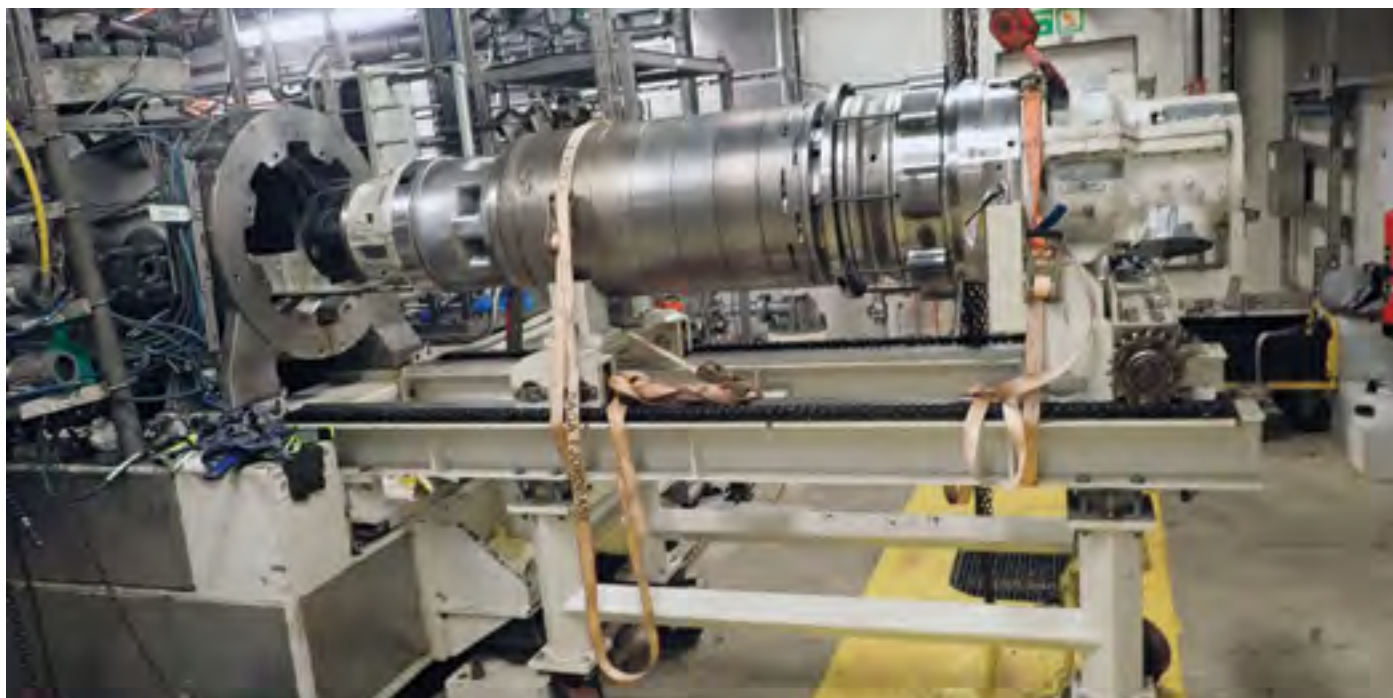
Changes to pump performance may be required for a number of reasons. For instance, refineries looking to increase production will examine the assets involved and identify any bottlenecks. In some cases, flowrates will need to be increased beyond the existing capabilities of the equipment; a drilling well may need to increase water

injection rates, or the reliability of certain assets may need to be improved to meet the new targets.

## NEW FOR OLD

The first, and most straightforward, solution is to replace the existing pumps with new equipment that has been specified for the new production rates. This has many advantages in terms of reliability, performance and efficiency; using the latest materials and design technology will ensure a long-lasting and effective solution.

There are, however, some drawbacks—the time to complete the project, the lost production while the work



Retrofits can improve cartridge designs reducing downtime by leaving the casing in place.



is completed, and the overall capital expenditure. Together, these will nearly always rule this option out.

### ADAPT AND SURVIVE

A more favorable option is to modify the existing assets to enable them to deliver the new targets. There are many challenges that can be resolved to some degree by implementing a retrofit project. Reliability issues can be improved through a change in materials to resolve erosion or corrosion; performance can be enhanced by altering the hydraulic design of the pump.

Retrofit projects are a very cost-effective alternative to replacing large assets when a production site requires a change in performance or an improvement in reliability. By minimizing the number of components being modified, both the time and the cost involved in the project are kept to a minimum.

For example, in Norway, the government offers support to the oil and gas industry to reduce its carbon footprint. One of the biggest gains can be achieved by reducing the energy consumption of pumping assets. Using a retrofit project to optimize pump

performance to each application, operators have made significant savings in running costs, which help to meet national carbon targets.

### OPTIMIZED PERFORMANCE

One of the major areas of pump operation is water injection systems, which are used to maximize the productivity of the oil wells. As the oil field matures, there is a need to increase the water injection rates to maximize oil production. This requires the capacity of the injection pumps to be increased without affecting the layout of the plant or the existing pipework.

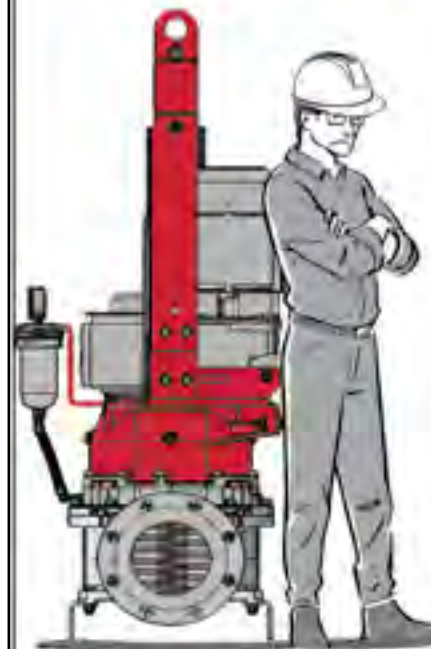
In this case, the flowrate needs to increase while maintaining the head, which means that the power demand will rise and the pump design will need to be altered. By working closely with the platform engineers and establishing the limits of the motor or turbine, pump designers can draw up a modified hydraulic proposal that will improve both performance and efficiency.

In an alternative scenario, the system pressure may need to be reduced, while maintaining the original flowrate. Reducing the pressure generated by



Setting up the de-staged rotor from the main pump for balancing before reassembly.

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a pump can be achieved by removing a number of stages from the pump rotor, which will significantly decrease the energy requirement of the pump. In some cases, the rerate solution may include a variable speed drive, which can deliver more flexibility in the output from the pump.

Rerating a pump's hydraulic conditions to the new duty point, a combination of flow and head, will enable the system to operate more efficiently. Based on the downstream requirements, the pump characteristics can be redesigned so that it delivers the necessary flow and pressure while operating at or close to its best efficiency point (BEP).

## CASE IN POINT

One of the largest offshore oil fields in the Middle East uses five BB5 injection pumps, four 9 MW pumps, and a 14 MW Sulzer HPCp pump, all of which are powered by gas turbines. The proposal was to increase production from the oil field, which would require the gas turbines to be upgraded to provide their maximum achievable power output. Having achieved this, all five pumps would be rerated to deliver the maximum possible injection flow rates using the increased power capacity.

As both a pump original equipment manufacturer (OEM) and an independent maintenance provider, Sulzer was awarded the contract to upgrade all five pumps. The objective was to achieve the best possible flow rates using as many existing components as possible, and with minimal disruption to the production schedule.

Sulzer had access to a complete, spare cartridge for the 9 MW pumps, from which all the necessary design information could be gathered and used as a base to modify the cartridge design. The proposal was to change the original four-stage design for a three-stage alternative with a similar diameter impeller. This allowed the existing pipework, lube systems, mechanical seals, bearing housings, and site interfaces to be retained.



*Re-machined internal components optimize pump performance.*

## INCREASING PRODUCTIVITY

Using the spare cartridge, Sulzer implemented the new barrel design and delivered it back to the platform where it took the place of one of the operational pumps. The whole process to remove and install the new barrel only took two to three days to complete, including commissioning. The original cartridge that had been removed was taken back to Sulzer's engineering center where it underwent the same design rerate process.

Following this implementation plan ensured that operations on the platform were unaffected by the rerate project, eliminating any lost production costs and minimizing the amount of work that needed to be completed on the platform. The upgraded cartridges delivered a 25 percent increase in flow over the original design of the four pumps, with the total injection capacity rising by 30 percent.

This project was also extremely cost-effective. When compared to a project to procure new pumping equipment to do the same task, the rerate program saved the platform operator a total of \$150 million, as well as avoiding all of the disruption that a new installation would create.

## ONGOING SUPPORT

Oil and gas production facilities are driven by performance and

equipment reliability, which can be enhanced by engineering expertise and design experience. By working with an engineering partner such as Sulzer that has a worldwide network of service centers as well as decades of experience in pump design, specifically in the offshore and oil and gas sectors, platform operators can optimize their business.

Rerate projects offer an opportunity to increase uptime, reliability, and therefore productivity. In some applications it is possible to improve efficiency, which reduces energy costs as well as the carbon footprint of the business. Whatever the goal, when it comes to pump performance, the retrofit project should always be considered as one of the prime options. ♦

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# New Cloud-based, Remote Performance Monitoring and Alert System for AODD Pumps

Innovative AODD pump-monitoring technology tracks pump performance to prevent costly failures

*By Erik Solfelt, Wilden*

Despite their appearance, manufacturing systems are delicate ecosystems that must be kept in tune at all times if they are to operate effectively, efficiently, and safely. Key to ensuring the expected level of operation are the pumps that are used to transfer liquids through the manufacturing process. Therefore, it is imperative that these pumps are able to reliably meet their required demands, but at the same time, each individual pump is a unique beast. This makes monitoring pump performance a critical consideration for facility operators but staying on top of that is often easier said than done, even when the most tightly considered maintenance plans are developed and put in place.

Knowing that, here are some of the common performance-related worries that can keep manufacturing-facility operators tossing and turning at night:

- A pump in a far-off corner of the facility fails without the knowledge of the operator. The result is 1,000 gallons of product (which may or may not be hazardous) spilled on the floor, or a ruined product batch that will cost thousands of dollars to replace. The outcome in either instance is system downtime, along with associated cleanup, repair, maintenance and—in the worst-case scenario—replacement costs.
- An unmonitored pump begins operating abnormally, but this change in performance is not readily recognizable to the operator. The possible negative

outcomes from a pump that is operating outside of its optimal range are many. They can range from a ruined product batch to a compromised production process that takes more time and cost to complete to a catastrophic failure.

- A facility with a preventative-maintenance schedule in place still has pumps that malfunction outside of the maintenance-plan window. Preventative-maintenance plans can also be overly conservative, calling, for example, the changing out of diaphragms that still





have life in them. The schedules themselves could also be inaccurate or not account for the varying life cycles of different pump styles, increasing the chance of unplanned breakdowns or failures.

In truth, the list of potential pump disruptions and their outcomes is innumerable. Operators must live with the fact that all pumps, no matter their method of design or operation, can (or will) fail at some point, and they must take steps to ensure that those failures are not catastrophic.

#### AODD IS A-OK

That being said, all pump technologies are different, with varying requirements regarding monitoring, maintenance, repair, and replacement. This leads to the fashioning of different reputations for the various technologies, with the air-operated double-diaphragm (AODD) pump having built a reputation since

its invention in 1955 as a reliable, durable, and flexible option for difficult pumping applications.

In many ways, the AODD pump has become a victim of its own success. It's true that AODD pumps are highly flexible, reliable, and resilient in even the toughest pumping environments; in fact, they are routinely trusted for use in many critical and potentially hazardous applications because of their ability to handle solids, deadhead, self-prime, and run dry.

However, because of its simple method of operation, few moving parts, easy maintenance, and relatively low purchase cost when compared to other pump technologies, the AODD pump has been an afterthought in the development and installation of advanced diagnostics and cloud-based performance monitoring. In reality, many of the same pump-performance concerns—including high cost of downtime, repairs, lost product, and product cleanup—that

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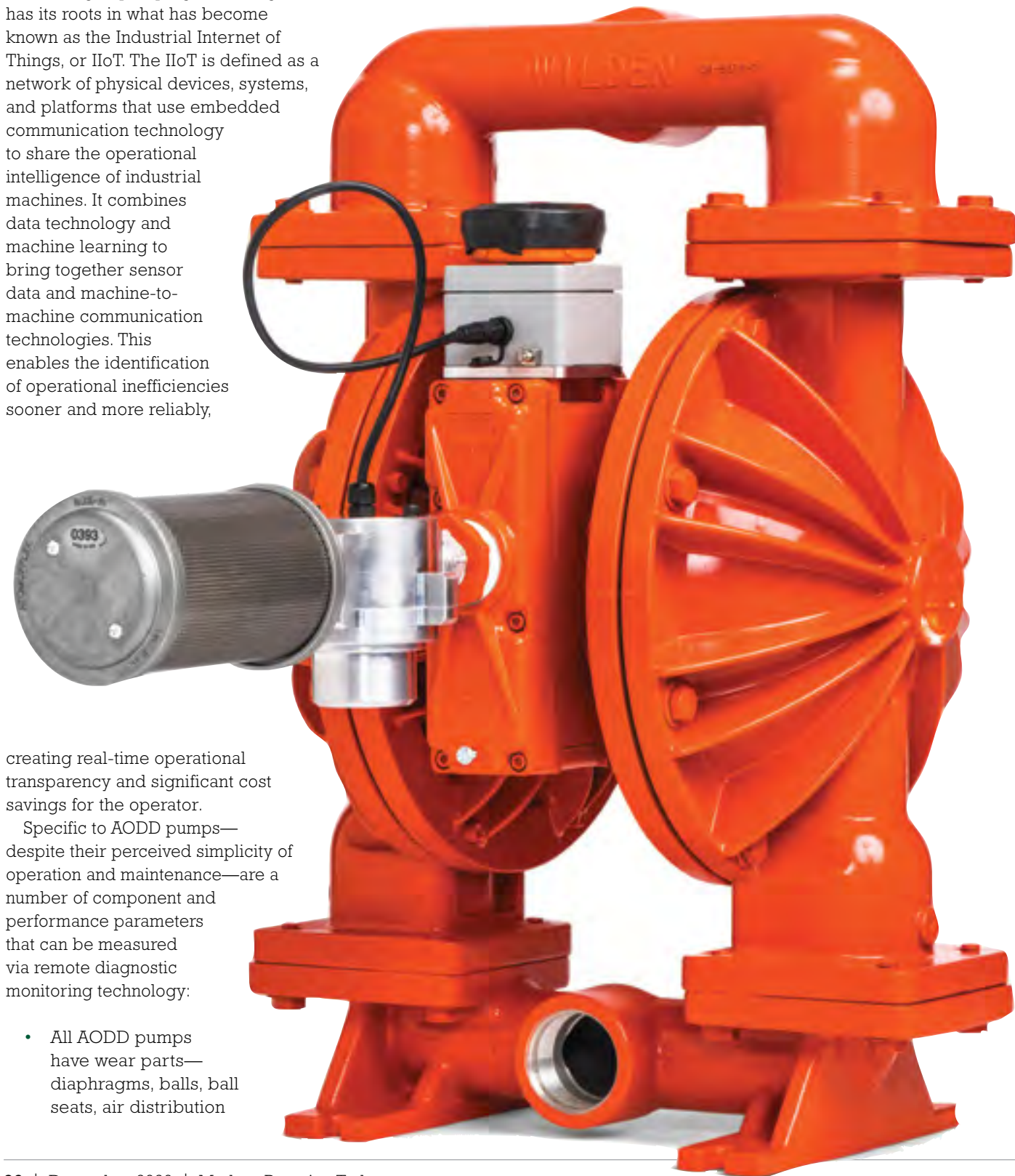
mark other pump technologies can be managed through the advanced monitoring of AODD pumps.

## SEEING INTO THE FUTURE

The science behind the drive to improve the remote diagnostic monitoring of pumping technologies has its roots in what has become known as the Industrial Internet of Things, or IIoT. The IIoT is defined as a network of physical devices, systems, and platforms that use embedded communication technology to share the operational intelligence of industrial machines. It combines data technology and machine learning to bring together sensor data and machine-to-machine communication technologies. This enables the identification of operational inefficiencies sooner and more reliably,

system (ADS) components—that can break down or fail over time.

- Diaphragm failures need to be sensed and reported as soon as possible in order to prevent catastrophic product leaks.
- Predicting a diaphragm failure is critical in ensuring that downtime is minimized.
- Identifying the window for a potential failure is critical and can be the difference between total loss of the pump or a



creating real-time operational transparency and significant cost savings for the operator.

Specific to AODD pumps—despite their perceived simplicity of operation and maintenance—are a number of component and performance parameters that can be measured via remote diagnostic monitoring technology:

- All AODD pumps have wear parts—diaphragms, balls, ball seats, air distribution



less costly repair/replacement operation.

- Excessive dry-run conditions that will compromise the pump's performance and its overall lifespan.
- Operational impediments such as clogged pipes, air leaks, and closed or faulty valves that can adversely affect the pump's expected performance.

Anticipating potential failure conditions is not the only benefit of remote diagnostic technology. Since pump performance is likely to change over time, whether by normal wear or through outside system influence, monitoring indicators such as stroke rate or stroke count can be an invaluable tool for the operator. Any variance can be noted and recorded, letting the operator know if a failure may be imminent or if a proactive maintenance check may be needed.

From a big-picture perspective, measuring total pump strokes also allows the operator to better construct and implement a more targeted and robust preventative-maintenance plan. Since each system and installation is different, crafting an effective maintenance plan requires that special and specific attention be paid to a unique set of operational variables.

Things to consider in this area include:

- The age of the AODD pump, along with a history of how long pumps have typically performed in the specific application.
- How long do the diaphragms typically last before failing? Whether it be three, six or nine months, the operator can use past history as a gauge when constructing a maintenance plan.
- What are the typical costs for spare parts? Having a well-documented history of pump and component performance can help streamline spare-part inventory requirements, which helps lower capital costs.

## GAINING A DIGITAL EDGE

Until now, the users of AODD pumps only had manual or analog solutions for their pump-monitoring needs—if they even chose to monitor their AODD pumps at all. That, however, is about to change as Wilden® has created a simple diagnostic and monitoring technology for its lines of AODD pumps. Called Wilden SafeGuard™, it allows the AODD pump to be remotely monitored 24/7 via continuous cloud connectivity. Wilden SafeGuard promises to be a true game-changer in optimizing AODD-pump performance, reliability, and cost of operation and maintenance.

Wilden SafeGuard is an all-inclusive pump-monitoring system that tracks, records, and alerts customers to key performance indicators of AODD pumps at all times of operation via cellular access. The SafeGuard system consists of a battery-powered stroke sensor and transmitter (called an Edge device) that is installed on the pump. The sensor collects and analyzes pump-performance data in real-time and transmits it to a central gateway for encryption and transmission to the cloud. Once stored on the cloud, real-time and historic operational information can be accessed by the user anywhere in the world through a secure smartphone app or an online portal.

The design and operation of the SafeGuard system allows for complete monitoring and real-time alerts related to a number of critical performance parameters for the pump (diaphragms, balls, seats). These readings can show the user such things as:

- Leak detection to indicate diaphragm leaks and failures, preventing product loss and safety hazards.
- Stroke rates to monitor changes to highlight performance abnormalities.
- Stroke count for batching and setting maintenance schedules.
- Real-time alerts via SMS or email to indicate any

noteworthy change in operation that may be a precursor to pump or component failure.

- Maintenance records that can indicate patterns and help manage preventative maintenance plans.
- Management of an entire fleet of AODD pumps within one dedicated software system.

## CONCLUSION

Pump breakdowns and compromised performance, no matter how comprehensive the maintenance schedule, are always possible, making it imperative that the operators of manufacturing facilities know how their pumps have been performing. Advances in digital-monitoring technology and the growth and acceptance of IIoT principles have opened the door for users of AODD pumps to better inform themselves of the capabilities and potential shortcomings of the technology. Recognizing this, Wilden has created SafeGuard, a digital, cloud-based pump-monitoring tool that relies on cutting-edge diagnostics that give AODD pump users the ability to observe exactly how—at any moment in time—their pumps are operating and if any performance-related issues may occur in the foreseeable future. ♦

**Erik Solfelt** is the diaphragm pump product manager for Wilden®, a leading manufacturer of air-operated double-diaphragm (AODD) pumps. He can be reached at 909.422.1741 or [erik.solfelt@psgdover.com](mailto:erik.solfelt@psgdover.com). Wilden is a product brand of PSG®, a Dover company. PSG is comprised of several leading pump companies, including Abaque™, All-Flo, Almatec®, Blackmer®, Ebsray®, Em-tec, EnviroGear®, Griswold®, Hydro Systems, Mouvéx®, Neptune™, Quattroflow™, RedScrew™, and Wilden®. For more information, visit [www.wildenpump.com](http://www.wildenpump.com) or [www.psgdover.com](http://www.psgdover.com).

# Building on the Past to Create the Future

Advances in disturbance monitoring equipment provide utilities with an economical retrofit solution

By Bryan Gehringer, NovaTech

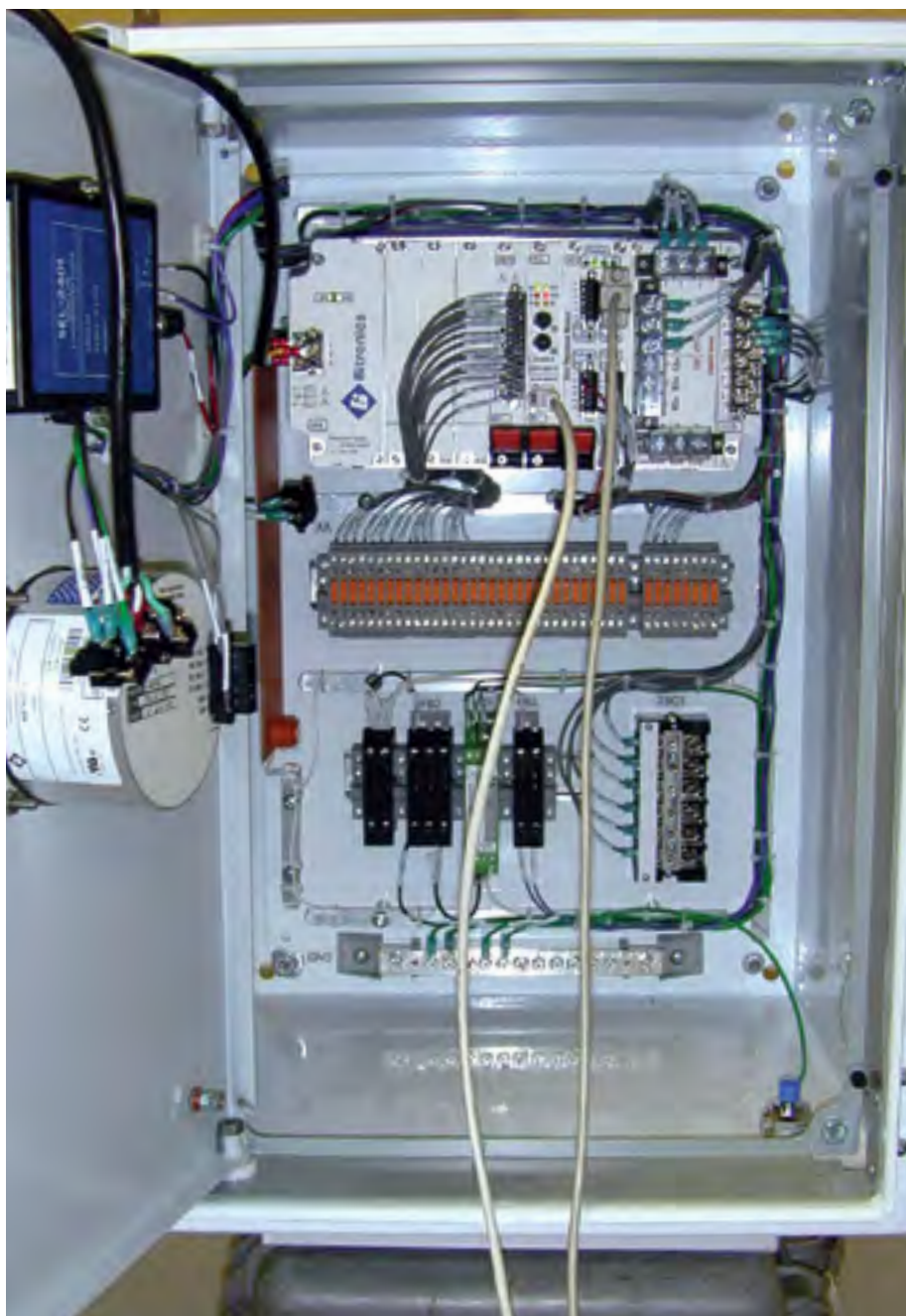
Utilities are facing an upcoming 2022 deadline from the North American Electric Reliability Corporation (NERC) to fully comply with an updated protection and control standard (PRC-002-2) for disturbance monitoring and reporting requirements for transmission and generation systems. The first milestone is 50 percent compliance by January 1, 2021, followed by 100 percent compliance by July 1, 2022.

The objective is to be able to standardize regional reliability requirements and requires utilities to install disturbance monitoring equipment (DME). The data collected by this equipment enables NERC to conduct forensic analyses of power failures to detect the causes in order to improve the safety and reliability of power delivery management.

The NERC standard requires a continuous, high resolution, ten-day recording of up to nine measurements per line of per-phase volts and amps, total MW and MVARs, and frequency. In addition, disturbances of interest must be archived for three years.

## **DISTURBANCE MONITORING EQUIPMENT: UP CLOSE**

DME, as defined in the PRC002-02, must monitor sequence of events recording (SER), fault recording (FR), and dynamic disturbance recording (DDR) data. SER and FR functions are already well understood and





widely deployed throughout the industry, but the DDR function is relatively new and generally available in more expensive digital fault recorders (DFRs).

Although the majority of 230kV and higher voltage substations are likely already constructed with DFRs, the requirement for DME placement is based on the MVA short-circuit capacity of the bus, and so includes some lines down to 100kV. That is a voltage level where DFRs are not typically part of the original design.

In those locations, it may be necessary to add recording capability to an operational substation where there may not be room to retrofit a traditional DFR, and where pulling new CT, PT, and I/O cables to one location would be a major undertaking.

#### STEPPING TOWARD SIMPLICITY

Traditional microprocessor-based protective relays are also able

to perform fault recording, but typically do not have the memory to monitor and store continuous flows of information for ten days as required by the PRC standard.

Depending on protective relays to provide DDR data is clunky, expensive, and maintenance intensive. Even if a utility could stream all the data from the relays to



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a central computer in real-time, the bandwidth required is massive and the amount of storage space needed would add to the cost.

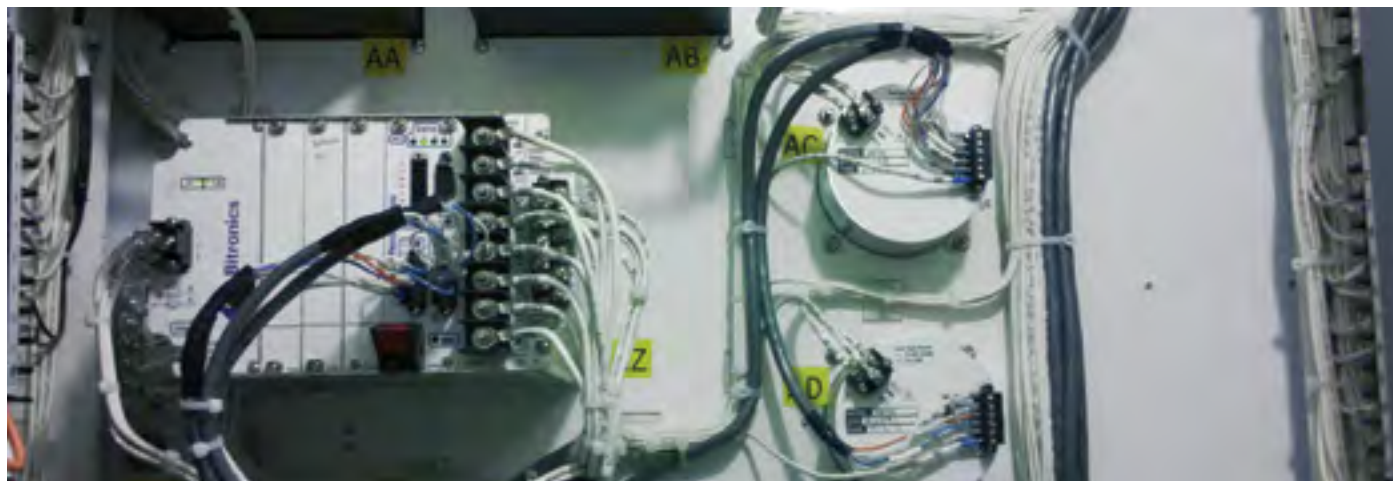
Utilities, therefore, have a need for simplified, economical solutions that can be retrofitted into existing substations to ensure compliance with PRC-002-2. One solution between relay-based recording and DFRs are small, three-phase single-line devices that can utilize existing CTs and PTs that are already routed to protective relays. This is an attractive retrofit option that is more cost effective than installing full-size DFRs.

## AN INTELLIGENT SOLUTION

These intelligent electronic devices (IEDs) are purpose built for this task and only require the space of a relay. One solution on the market, the 70 Series made by Bitronics, is compliant with NERC standards in SER, FR, and DDR recording. Operating at a rate of thirty samples per second, it captures frequency, total watts and VARs and all three phases of volt and phase amps.

One of the specific challenges of the new NERC standard is preserving ten days of continuous DDR recording data. R8 in the PRC-002 distinguishes continuous DDR recording from triggered DDR recording. Continuous is preferred.

The Bitronics M871 resolves this issue by supporting multiple logical recording functions in each unit.





Each logical recorder includes two independent fault recorders, two independent disturbance recorders, a trend recorder, and a SER recorder.

The various logical recorders in the unit can capture data often with a different duration, range, and resolution. They can also be triggered by entirely different criteria and can be programmed to operate simultaneously or independently. Because each logical recorder requires a few seconds to convert the data and store it in non-volatile memory, the disturbance recorders are run in alternating hours producing a sequence of COMTRADE (common format for transient data exchange) files that are each one hour in duration.

By allocating sufficient memory to store 240 one-hour-long COMTRADE files, no data is lost and a circular buffer is created that resides on the M871 with new data overwriting old data after ten days. In other words, the DDR data doesn't need to be streamed in real time across a network to a separate computer. It does not even need to be downloaded, organized, or archived, except when NERC requests the data. At that point, only the data in the range of time NERC requests needs to be downloaded.

#### MORE INFORMATION, MORE CONTROL

In addition to providing all the recorded data required for PRC-002-2, the IEDs are expandable and can also provide additional real-time data to supervisory control and data acquisition (SCADA) systems with tremendous accuracy. The IEDs can be configured to perform power quality functions not available in a protective relay, thereby effectively operating as a substation SCADA recorder device. In this way, the unit can provide more information on current and power than a power quality meter, which is usually focused mostly on voltage anomalies.

As utilities assess their options for compliance with the NERC standard,

the emergence of the IED-based distributed event recording model sits between protective relays and DFRs on the recording spectrum offering better recording capabilities than relays and lower costs and easier deployment than DFRs. ♦

**Bryan Gehringer** is senior application engineer at NovaTech, provider of the Bitronics meters and IED solutions deployed in over 1,200 U.S. utilities. For more information, call 844.668.2832 or visit [www.novatechweb.com/bitronics](http://www.novatechweb.com/bitronics).

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# Protecting Landfill Gas Wellheads and Collection Hoses from Subzero Temperatures

New technology helps landfill operators get the most value out of their gas field

*By Eric Nielson and Valerie Nielsen, Q.E.D. Environmental Systems*

*PolarGuard insulating wellhead covers can be left on for the winter or rotated around to high value wells.*



When the temperatures at a landfill drop well below freezing levels, frozen condensation on wellheads and gas collection hoses can wreak havoc. Sub-zero temperatures and heavy winds can lead to freezing condensation in wellheads and landfill gas hoses, affecting gas extraction levels and causing unnecessary delays and expense. Landfill operators have a variety of options for protecting wellheads, including simple HVAC pipe insulation, heat tracing lines, chambers, and vaults. Now a new technology is available, a relatively low-cost insulating cover that protects the wells and keeps them aboveground, easy to access, and available all year round for easy maintenance.

## **FROZEN CONDENSATION RESTRICTS GAS FLOW AND MAY LEAD TO FALSE READINGS**

Winter weather can cause many problems for landfill operators and landfill gas technicians. Often gas flow from the well is restricted. Then, if temperatures drop even lower, gas flow can be totally cut off and gas may be emitted to the atmosphere.



Under the positive pressures that may occur with these conditions, the well cap can pop off, or the well can even pull apart, causing an air leak when temperatures rise.

Condensate blocking the gas wellhead may also lead to false and inaccurate gas level readings, which makes it more difficult for gas technicians to balance well fields to optimize gas collection. Freezing wellheads can also result in regulatory issues if gas is emitted, especially for United States landfills subject to Municipal Solid Waste Landfills: New Source Performance Standards (NSPS) requirements.

To protect wells from frozen condensation, many operators are up-sizing their wells to accommodate possible freezing. For example, an operator may select a 3-inch wellhead when there is not enough flow to merit that size. Wellheads should always be sized for the specific gas flow range conditions; up-sizing to provide more space results in a loss of accuracy in gas analyzer readings. When taking readings, most gas analyzers are looking to read a specific differential pressure range, usually between 0.5 inches and 5 inches. If a wrongly-sized wellhead is used, it will be difficult to get the differential pressure to fall in the proper range. Operators up-sizing wellheads to prevent freezing may end up spending double on the wellhead—for a far less accurate result.

There are a variety of methods available for protecting landfill gas wells from the effects of freezing conditions. Options range from simple low-tech solutions to expensive options that may not be in the budget of most sites.

## RANGE OF AVAILABLE METHODS FOR PROTECTING WELLHEADS AND GAS COLLECTION HOSES

### HVAC Insulation Sleeve

Landfill technicians are a hardy and resourceful lot. Over the years they have offered several creative



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solutions; while not perfect, they have gotten the job done. One example is a temporary, one-time use solution that involves wrapping an HVAC insulation sleeve (the type usually used to wrap pipes) around the wellhead and the gas hose. While the material cost is a fraction of that of other options, the sleeve must be replaced every winter and comes with a high labor cost. Also, the insulated sleeve does not prevent freezing. It simply gives operators a few more degrees before freezing occurs.

## Electrically Powered Heat Tracing Lines

Some sites may employ electrically powered heat tracing lines to attempt to keep their wellheads and gas lines from freezing. This is only possible at sites where electricity is readily available at the wellhead location. Also, it is far from a perfect solution, since one must also place a piece of insulation around the line; the heat

tracing alone will not be enough to keep the well from freezing.

## Aboveground Chambers

Building a chamber encases the wellhead in an aboveground building or structure to keep it warm. Chambers are costly and they also present safety issues; technicians must follow proper confined space methods when opening the chamber and entering it to work on a gas wellhead. In addition, a chamber is not mobile, so it cannot be moved to another wellhead.

The chamber approach was used to great artistic effect at Montréal's Parc Frédéric-Back, which is installing biogas capture spheres on 255 landfill biogas capture wells that sit on top of the 72-hectare former landfill. Victoria Taylor, in a report commissioned by the Ontario Association of Landscape Architects, notes, "By day, the spheres read like a pop-up field of white bubbles that appear to have just emerged from

the gaseous depths below. By night, a self-illuminated lighting scheme uses a special surface paint made of phosphorescent fibers to store solar energy that is released as light."

## Underground Vaults

This is the highest cost option—at \$50,000 to \$100,000 apiece, vaults for a well field could easily cost hundreds of thousands of dollars. While commonly used, one disadvantage is that vaults are considered confined spaces, so safety for maintenance is a real concern.

## NEW TECHNOLOGY ENTERS THE (FROZEN) FIELD

A new technology now available is QED's PolarGuard Insulating Wellhead Cover, designed to be placed on and off wellheads easily using Velcro® closures and web buckle straps. The cover was developed based on requests and feedback from customers. Convinced



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that there was a real need in colder climate areas for something to prevent freezing of wellheads, QED engineers began researching possible solutions and came out with the PolarGuard design, which was recently released to the market.

A landfill in Ontario conducted a pilot demonstration of the covers last winter with excellent results. The site was on top of a steep hill that was pummeled by wind, with many very cold days perfect for testing out the new cover.

Says the gas technician, "We tried the PolarGuard wellhead insulator on one of our toughest wells in the field; one which had consistently been frozen solid every time we went to take readings. Since installing the PolarGuard, we haven't had the wellhead freeze once and taking readings has been a breeze."

Once installed, the cover can be left for the winter—or moved to another well. Depending on the site requirements and the value placed on the gas collected, operators may opt to purchase a few insulating covers and rotate them among their highest value wells or those that face the worst snow and wind conditions. They can then purchase additional covers when it fits in their expense budget.

#### **COVERS PROMOTE EFFICIENCY AND EASE OF GAS REMOVAL**

While many options exist, using the new PolarGuard covers is a low-cost way to guarantee accurate and efficient gas flow. The covers can be reused year after year and can serve as an insurance policy for high value wells in the most extreme environmental locations on sites where freezing problems may have occurred in the past. ♦

Q.E.D. Environmental Systems, a subsidiary of Graco Inc., is a leading manufacturer of innovative environmental pumping systems, landfill products, landfill gas products, and air strippers for use at landfills, mines, oil refineries, and other industrial sites, as well as hazardous waste cleanup sites. QED serves customers from support centers in Michigan and California. For more information, visit [www.qedenv.com](http://www.qedenv.com), call 734.995.2547, or email [info@qedenv.com](mailto:info@qedenv.com).



### **HMD Kontro's Modular CSA/CSI Pumps Offer Flexibility & Quick Delivery**

Since introducing the first sealless magnetic drive pump in 1947 – HMD has leveraged 70+ years of experience to build sealless pumps that exceed ISO and ASME standards.

The CSA/CSI line features interchangeable parts that enable a few models to cover a wide range of Chemical Processing applications.

#### **Key Design Features**

- **Interchangeable Components** – enables fewer pumps to handle more applications.
- **Minimal Lead Time** – Modular design enables fast delivery.
- **Economical** – No seals or support systems minimizes CAPEX and OPEX.
- **Safety** – no potential leak points.
- **Robust design** – unique containment shell enhances tolerance to system upsets.



**For more information,  
please visit [hmdkontro.com/csa](http://hmdkontro.com/csa).**

# 2020 Top Products

Whether it's at product launches, factory tours, or trade shows, the staff at MPT is afforded an up-close look at the newest offerings for our industry, and each December, we look back on the year that was and present our choices for the Top Products spanning the industrial pump and rotary equipment markets.

In the pages that follow, MPT shares its selections for the products that speak to the industry's needs for efficiency, reliability, and innovation. Each of our Top Products was chosen through submissions from our staff, advertisers, and readers like you. The products range from large multinationals you're likely familiar with to smaller, regional suppliers worthy of your attention.

Regardless of their size or reputation, they all offer value you can take into the new year. Enjoy!



# LIBERTY PUMPS

## Model 404 and 405

As regions in the United States and Canada begin to re-open for business, they are doing so with some new requirements and restrictions on how they operate. To provide better sanitization, many are being required to add additional wash station areas for their employees and customers. The Liberty 404 and commercial model 405 are the perfect solution for these additions and remodels!

The opportunities exist in manufacturing facilities, restaurants, schools, health care facilities, and almost all public and commercial buildings!

Liberty's model 405 is one of the few models made here in the U.S. that features high-temperature capability along with higher-head

pumping (max head 34 feet). The 2-inch inlet, discharge, and vent allow it to be installed commercially on multi-compartment sinks, and it arrives fully assembled saving valuable labor time. Keep in mind we offer new versions with pre-installed alarms and NightEye® (Wi-Fi) enabled options for both the 404 and 405!

Our QuickTree® Technology provides a separate access cover for easy switch inspection. For gray wastewater applications, the 405 is perfect for laundry trays, multi-compartment sinks, bar sinks, utility sinks, dishwashers, and allows you the freedom to install fixtures where gravity drain lines are not available. The system arrives fully assembled and ready to install.



For more information, visit [www.libertypumps.com](http://www.libertypumps.com).

## MOD-TRONIC

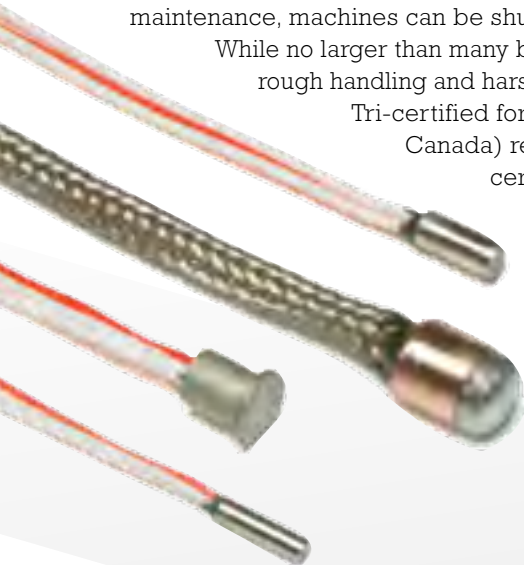
### Minco Miniature Embedment Temperature Sensors

**M**inco Miniature RTD and Thermocouple temperature sensors can be configured for best fit to your application. Install miniature sensors in or beneath the babbitt layer of bearing shoes. They monitor metal temperature—the most reliable indicator of bearing condition—to give early warning of oil film breakdown. With predictive maintenance, machines can be shut down and the problem corrected before catastrophic failure occurs.

While no larger than many bare ceramic elements, these RTDs have metal cases and insulated leads to withstand rough handling and harsh environments. They are easy to install in drilled holes for general purpose sensing.

Tri-certified for use in hazardous areas to IECEx, ATEX, and North American (CSA, USA, and CSA Canada) requirements, these wide-ranging certifications allow users to cover many potential certification requirements with one sensor product, thus increasing flexibility and reducing inventory.

For more information, visit [www.mod-tronic.com](http://www.mod-tronic.com).



## HELWIG CARBON PRODUCTS, INC.

### BPK-Probe™ Shaft Voltage Detection Device

**H**elwig Carbon Products, Inc. has developed the BPK-Probe Shaft Voltage Detection Device. The new device will provide a tool for pump technicians to test a pump motor for the potential for bearing failures from induced shaft currents.

When a VFD controls a pump motor, there is a strong possibility that induced shaft currents are present. These induced shaft currents will seek a path of least resistance to ground, and that typically will be through the motor bearings. These damaging shaft currents will cause fluting and frosting of the bearing raceway and cause premature failure and a costly replacement.

The Bearing Protection Kits from Helwig Carbon Products are easily installed by pump motor OEM's, pump technicians, and end-users. They can be installed in the field on most pump motors with

### BPK-Probe™

Determine The Risk  
To Your Bearings



an accessible shaft or coupling. Many end-users are willing to apply this kind of maintenance practice to their pump motors to protect their investment and reduce downtime.

For more information, visit  
[www.helwigcarbon.com/shaft-voltage-detection-device](http://www.helwigcarbon.com/shaft-voltage-detection-device).



# BLACOH SURGE CONTROL

## SurgeWave™ Defender™

Finally, transient pressure monitoring that makes sense. The patented Blacoh™ SurgeWave™ Defender™ is the latest generation pressure monitoring device from Blacoh Surge Control. This patented device can monitor and record transient pressures up to 100 times per second which is not possible with gauges and traditional SCADA systems. High frequency recording is the best way to capture high speed events occurring within your piping system. The SurgeWave Defender™ monitors your pumping and pipelines 24/7 with fast 4G LTE cellular connectivity. This allows you to fine tune your piping system and access critical data at any time. You can also configure your device and calibrate remotely from anywhere using your PC or smartphone.

The SurgeWave Defender™ is simple to set up and easy to use. There are two inputs to capture pressure, flow, level, etc. If a pressure transient occurs, the unit will store the high-speed data that you need to understand what is happening in your system. If nothing of interest is detected, it stores minimal data needed to observe overall trends. Transient thresholds and sensitivity can be adjusted remotely, and the system will generate automatic alerts when events are detected.

Liquid level in your surge vessel or pulsation dampener can be monitored using a differential pressure transducer. You can remotely monitor the

performance of the vessel and view overall trends. All data captured is GPS time stamped and stored on a cloud server which can hold years of data, so you never have to worry about storage. The time stamp allows you to precisely compare data to other systems or devices. You can use a backup battery to capture pump trips and events during power outages. The SurgeWave Defender™ also features an external cellular antenna which can be extended for installations below grade.

When considering protection and recording equipment for your system, keep in mind how fast pressure can change and fluctuate. Pipe breaks are most often associated with pressure surges or fatigue. Eliminate expensive damage and repairs with 24/7 constant monitoring. The SurgeWave Defender™ can help detect leaks, ruptures, faulty actuators, insufficient air valves, and more. You do not have to choose between too much data and not enough data, and the easy to use interface takes the stress out of accessing your data anytime from anywhere.



For more information,  
visit [www.blacohsurge.com](http://www.blacohsurge.com).

## AUTOMATIONDIRECT

### High Bus Voltage (AC Input) Stepper Drives and Motors

**A**utomationDirect has added a high voltage AC drive and compatible high torque motors to its stepping system motion control product offering. The AC stepper drive is powered from 90 to 240VAC and is intended for use with step motors designed to handle a high bus voltage of 340VDC. MTRAC motors are specially designed to work with high bus voltages, providing much higher torque, especially at higher speeds. Stepper drive auto-setup measures motor parameters and configures motor current control and anti-resonance gain settings. The high voltage drive uses AC input 90 to 240VAC and output current is selectable from 0.6-2.5A/phase (peak of sine). Microstep resolution is switch selectable with sixteen settings from 200 to 25,600 steps/rev.



For more information, visit [www.automationdirect.com/ac-stepper-motors](http://www.automationdirect.com/ac-stepper-motors).



## BASETEK

### Polymer Concrete Baseplates

**A**leeping your rotating equipment level is essential. BaseTek polymer concrete baseplates offer precision flatness while providing significant vibration damping and superior corrosion resistance. Installation time and cost is greatly reduced by eliminating or reducing typical grouting activities in comparison with typical steel designs. Upkeep and preventative maintenance no longer required.

Off-the-shelf available for most ANSI/ASME pump products along with a complete range of custom configurations including the patented GreenShield Foundation Systems.

For more information, visit [www.basetek.com](http://www.basetek.com).

## WILDEN PUMP AND ENGINEERING COMPANY

### SafeGuard Pump-Monitoring System

**T**he Wilden SafeGuard all-inclusive pump-monitoring system remotely tracks, records, and alerts customers to key performance indicators—such as leak detection, stroke rate, and total stroke count—of AODD pumps during operation. It provides real-time alerts via SMS or email to indicate any noteworthy change in operations that may be a precursor to or indicators of component failure. Wilden SafeGuard also provides the ability to store maintenance records to help identify patterns to further enhance preventative maintenance plans. The Wilden SafeGuard solution has been designed to monitor a single pump or a fleet of AODD pumps within one dedicated software system.



For more information, visit [www.wildenpump.com](http://www.wildenpump.com).



# MEGAlert

## MotorGuard

**M**egAlert manufactures the MotorGuard patented testing and protection systems designed to detect insulation breakdown in critical motors. The system senses when the pump motor is offline and then performs a continuous dielectric test on the winding insulation until the equipment is started again. When an abnormal condition is detected the equipment can be locked out and a warning signal sent, indicating that the pump motor needs maintenance.

Reduce risk to save lives! The testing is done with a current limited non-destructive DC voltage from 500 to 5,000 VDC, which is safe for both personnel and the equipment. By automatically testing offline equipment customers can now predict and prevent impending failures, reduce unscheduled downtime repairs, and increase plant safety by not exposing maintenance personnel to dangerous Arc Flash conditions experienced when performing manual testing.

MotorGuard applies a current limited, fixed DC voltage to the motor windings during idle periods. A solid-state comparator circuit monitors measured leakage current to the ground. Two adjustable set points, factory preset to customer specifications, can be programmed to signal a pre-alarm, alarm, and lockout the equipment from operating if the low set point is exceeded. The manual reset feature enables a return to operational status only after the alarm condition has been corrected. MotorGuard will not impair normal operation of the equipment being monitored.

For over three decades, MegAlert has offered this patented, cost-effective, and proven technology with almost unlimited applications to multiple industries in both the private and government sectors.



For more information,  
visit [www.megalert.com](http://www.megalert.com).

## YASKAWA AMERICA, INC.

### GA500 Industrial Microdrive

In 2020, the Drives & Motion division of Yaskawa America, Inc. introduced the GA500 Industrial Microdrive, reflecting Yaskawa's continued customer commitment to providing sustainable, flexible, and easy-to-use products. The easy-to-use GA500 is designed to maximize one of the most valuable user resources, time. The GA500 can be programmed without main power applied, which means users can set up the drive so it is ready to run before main power is available.

A highly visual LED status ring provides drive status at a glance. Yaskawa's mobile app, DriveWizard Mobile, provides the ability to program and/or monitor the GA500 through mobile devices like a smartphone or tablet. DriveWizard Mobile instantly accesses the Yaskawa Drive Cloud, providing a safe location to store drive information with instant access anywhere.



For more information, visit [www.yaskawa.com/GA500](http://www.yaskawa.com/GA500).

## HMD KONTRO

### CSA/CSI Pumps

HMD Kontro's CSA/CSI line of magnetic drive sealless chemical service pumps features interchangeable parts that enable a few models to cover a wide range of chemical applications. For the safe and efficient transfer of toxic, corrosive, carcinogenic, and aggressive liquids, CSA/CSI pumps are designed of stainless steel with silicon carbide internal bearings, which enables them to withstand extremely high temperatures.

Most pump failures start with seal leaks. Upfront CAPEX for seal support systems is considerable, and OPEX for seal maintenance is unavoidable. But CSA/CSI pumps eliminate seals and associated support systems, providing an economical, reliable, and leak-free solution for handling toxic or hazardous liquids.

CSA/CSI pumps are easy to maintain, have fewer parts, no potential leak paths, and numerous other features designed to enhance reliability, safety, and environmental friendliness.



For more information, visit [www.hmdkontro.com/csa](http://www.hmdkontro.com/csa).



# JWC ENVIRONMENTAL

## Monster Metal® Grinders

**J**WC Environmental relaunches its Monster Metal® grinders featuring a trade secret alloy and industry-leading five-year warranty.

Wastewater is tough on grinder cutters. Damaging abrasion wear and metal corrosion are caused by daily gritty material and acidic conditions in sewage. The combination of an abrasive and corrosive environment accelerates the loss of cutter material, resulting in the loss of cutter thickness and tooth edges.

Traditionally, there is a trade-off between choosing a material for abrasive environments and corrosive environments. Hard alloy steel has been the traditional choice of material for abrasive environments. Unfortunately, alloy steel is not a corrosion-resistant metal. The corrosion-resistant metal choice has been stainless steel but unfortunately, it has low abrasion resistance. Cutter material is typically selected based on the environment to which it will be exposed to optimize its performance and maximize cutter life. Regrettably, choosing a material suitable for one environment but not the other often leads to dissatisfaction with the cutter life.

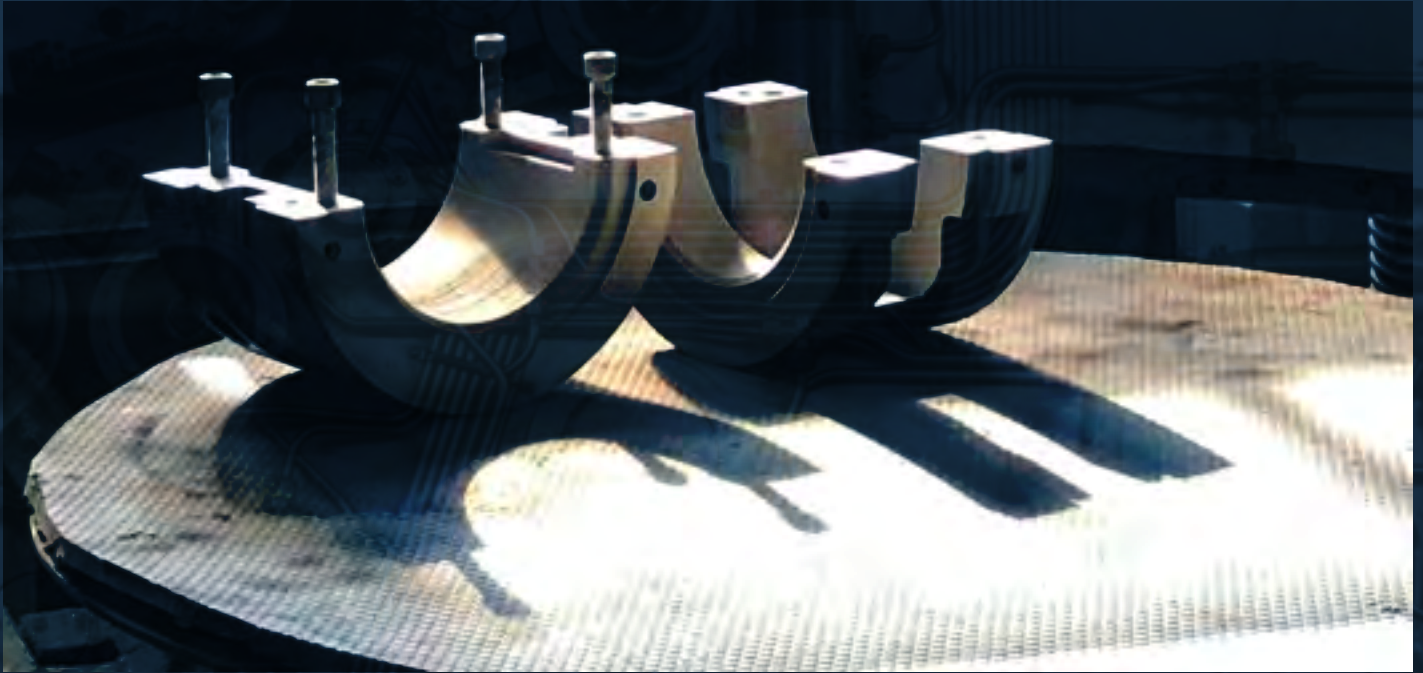
Monster Metal is JWC's solution to this problem. Monster Metal grinders feature cutters that last twice as long as typical industry cutters and work in both abrasive and corrosive environments commonly found in wastewater treatment plants. JWC conducted intensive in-house and field testing to validate that the proprietary material and design outperformed other cutters in wear resistance and corrosion.

"We're excited to bring back Monster Metal to the wastewater treatment market. Previously, operators had to choose between corrosion resistance or abrasion resistance. With Monster Metal, they no longer have to compromise," says Greg Queen, president of JWC Environmental. "And they can rely on a five-year warranty to increase the longevity of their grinder cutters."

Monster Metal is available on select Muffin Monster®, Channel Monster®, and Channel Monster® FLEX units. A five-year warranty covering the cartridge and wear components is included on Muffin Monster units while a three-year warranty is available for Channel Monster and Channel Monster FLEX units.



For more information, visit [www.jwce.com/knowledge-center/monster-metal](http://www.jwce.com/knowledge-center/monster-metal).



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