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A NOTE ON THIS ISSUE:

Welcome to June's issue of MPT! As the summer temps rise throughout the country, so too does the pressure placed on municipal wastewater treatment. However, there is a solution for one common culprit, FOG (or fats, oils, and grease). Brian Levine of Greasezilla explains how his company's technology converts costly, sewerclogging mess into biofuel (pg. 16).



J. Campbell, Editor Modern Pumping Today

Next up, we shift focus from municipal to industrial wastewater treatment. Most of the water used or produced in industrial applications contains some level of solid particles, which can lead to exponential costs if not addresses adequately and early. Neptune's Eulis Ester offers up some keys for optimizing performance and addressing this challenge (pg. 20).

Lastly, we head south of the border to see how Vesconite's Hilube bearings are finding success in the Mexican pump industry. Deborah Spicer explains how the upgrade from bronze pump bearings has been roaring success for operators, technicians, and the bottom line (pg. 36). Enjoy!

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CONTENTS

NDUSTRY NEWS	
What's happening in the industry	6
CASE STUDIES	

When the going gets thick	12
Bingham plastic surge analysis informs protections at steel facility	

WATER & WASTEWATER FOCUS

Optimizing performance in industrial
wastewater treatment 20
See the one-stop source for the pumping equipment and polymer makedown systems

MAINTENANCE & RELIABILITY

Addressing cybersecurity threats and
safeguarding the manufacturing sector
Protection from online attacks requires knowledge and commitment Part 1 of 2

High-performance oil soluble cleaner reduces	
cost of operation	28
As bearing temperatures rise, can your equipment take the heat?	

PUMP SOLUTIONS

Giving a boost to a booster system	0
Quick response overcomes pump failure and keeps business humming	

MOTOR SOLUTIONS

Journey	/ through	continuous	improvement	. 3	2

How a 95-year-old motor repair and testing company prepares for Industry 4.0 challenges

SEALING SOLUTIONS

High performance south of the border	36
The rise of Hilube bearings in the Mexican pump industry	

MODERN PUMPING PRODUCTS

Featured Product:	
RUSSELECTRIC ATS Remote Annunciator	. 38

EFFICIENCY POINT

Creating the future of energy	10
At Evolve 2024, Enverus and its customers discuss AI's impact	















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ABB AWARDS \$58,000 IN SCHOLARSHIPS NATIONWIDE

ABB, the leading NEMA motor manufacturer in North America, awarded scholarships to students for the 2024-2025 academic year. A total of \$58,000 was awarded. This initiative supports the educational aspirations of upcoming professionals whose parents are employed by U.S. ABB Motor and Mechanical.

These scholarships, valued between \$3,000 and \$5,000, provide financial aid to students pursuing undergraduate, vocational, or technical school degrees. These scholarships are funded by the Baldor Foundation.

Recipients were selected based on academic achievements, extracurricular involvement, and students' commitment to community service. Each recipient exhibits exceptional potential and a strong desire to attain higher education to make positive contributions to society.

"This scholarship program is one of the many ways we demonstrate our appreciation to our employees," says Jesse Henson, president of ABB's NEMA Motors Division. "Investing in what matters most to them—the future of their children—is a priority for ABB. It is an honor to play a part in helping their children achieve their dreams."

There were sixteen recipients of the 2024 ABB Motor and Mechanical Scholarships.

FORCE CONTROL ADDS WEST COAST MANUFACTURER'S REPRESENTATIVE

Force Control Industries adds DJ Reps, Inc. as their new manufacturer's representative for the West Coast. The firm was started by industrial power transmission veteran Dale Jackson in 2010 and has grown to nine outside and inside sales representative/sales support personnel who work from several sales offices within the territory along with a warehouse in in Rancho Cucamonga, California.

DJ Reps will present Force Control Industries' full lineup of oil shear brakes, clutches, and clutch-brakes to existing and prospective distributors, OEM, and end-user customers within the states of Idaho, Washington, Oregon, California, Arizona, and Nevada.

In addition to Force Control Industries, DJ Reps represents leading manufacturers of power transmission products including Stober gearing solutions, PhyMet solid lubrication, Luff Industries idlers, Carter bearings, Bestorq v-belts, Rosta vibration suppression, P.T. International Corp. bearings, Huskey specialty lubricants, Pobco conveyor components, WC Branham fluid power, US Seal Manufacturing, Shingle Belting, and Keystone Manufacturing shafting, sprockets and flat wire belting. "The team at DJ Reps are well known and well respected for their knowledge," says Tony Stoner, Force Control vicepresident of sales and marketing.





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CSX HONORS CUSTOMERS WITH ANNUAL CHEMICAL SAFETY EXCELLENCE AWARDS

CSX Corp. announces fifty-three customers as winners of the company's Chemical Safety Excellence Award for their outstanding dedication to the safe transportation of hazardous materials throughout 2023.

For thirty years, CSX has acknowledged its chemical customers for their shared commitment to safety with this recognition. The longevity of this distinguished honor highlights the essential role customers play in protecting CSX employees and the communities it serves, and reinforces the position of rail as the safest mode for transporting chemicals over land.

To qualify for the award, a customer must have shipped a minimum of 600 carloads of hazardous materials within the calendar year without any non-accidental releases of regulated hazardous materials.

In total, the fifty-three winners collectively shipped 144,640 carloads across the CSX network in 2023, underscoring the importance of CSX customers' daily commitment to safety.

CSX recognized Cargill as a standout honoree for achieving fifteen consecutive years of excellence. In addition, five-year milestone winners included Arkema Inc., BP, Cornerstone Chemical Co., Dow Chemical, Heritage Environmental Services LLC, Irving Oil, and Methanex Methanol.

PATTI ENGINEERING AND ARDUINO TEAM UP FOR INDUSTRY 4.0

Patti Engineering recently joined the Arduino System Integrators Partnership Program as a Platinum Partner, with plans to use Arduino as a cost-effective Edge device for legacy machinery. With a goal of reducing reliance on IO modules and enabling a platform-agnostic approach for end-products, the partnership allows Patti Engineering to assist clients in digitizing plant-floor data by connecting machinery to both Edge and Cloud platforms.

Patti Engineering, Inc. collaborated with Arduino, a global leader in open-source hardware and software, to offer an educational webinar on digitization in manufacturing. The webinar, titled "Digitizing Your Legacy Systems," completed in May.

The webinar featured Patti Engineering CEO Sam Hoff sharing insights into improving performance of legacy systems. Hoff discussed how the Arduino platform can be used to bypass older equipment control systems including legacy PLCs that were never setup for data collection and analysis. This enables the collection of diagnostics data to be retrieved from a machine without having to modify the legacy control system resulting in improvement opportunities for overall equipment effectiveness (OEE). Patti Engineering has deep industry knowledge in updating legacy systems.





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GROWTH IN HYDROGEN PRODUCTION DRIVES WATER MANAGEMENT SPENDING

Green hydrogen has emerged as a key focal point of the global energy transition and is driving opportunities for companies across the water industry, according to a new report from Bluefield Research.

"The scale and success of the hydrogen market also depends on the sometimes-overlooked availability of water supplies," says Bluefield President and CEO Reese Tisdale. "We would certainly expect to see increasing investment in water reuse (i.e., reclaimed wastewater), brackish and seawater desalination, and municipal utility infrastructure to meet scaling water demand, globally."

The nascent hydrogen sector is experiencing unprecedented momentum shaped by new policies, financial incentives, and project developer interests. To date, thirty countries have developed hydrogen strategies and roadmaps with almost 2,000 projects announced on every continent, according to Bluefield's report.

"Whether it be the Inflation Reduction Act in the United States, the EU's regulatory framework for achieving its green hydrogen production goal, China's five-year plan highlighting green development, Japan's investment in fuel cells, or Australia's goal to be a renewable energy exporter, hydrogen investment and interest is at an alltime high." says Tisdale.

BOBCAT INSTALLS INNOVATIVE STATIONARY FUEL CELLS AT TWO FACILITIES

Utilized in a wide range of applications, HyAxiom's PureCell M400 is a proprietary phosphoric acid fuel cell (PAFC) that can use natural gas, hydrogen, LPG, or a blend of fuels to produce rapidly deployable baseload electricity and heat that are also resilient, sustainable, and affordable.

The three fuel cells at the Bismarck facility and the eleven units at the Gwinner location are the first commercial installations of stationary fuel cells in North Dakota. The recently commissioned fuel cells allow Bobcat to diversify its energy sources by supplying a majority of the annual power and heat needs of the Bismarck facility and about half the needs of the Gwinner facility.

"We are proud to be at the forefront of sustainable energy solutions with the installation of these new stationary fuel cells," says Mike Ballweber, president, Doosan Bobcat North America.

"HyAxiom's stationary fuel cell solutions provide efficient combined heat and power that will help Bobcat improve its operations and continue innovating for the smart job site of the future," says David Alonso, chief commercial officer at HyAxiom.

In Bismarck, Bobcat is able to provide power back to the grid as a registered power producer, reducing the demand on local energy providers.







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CASE STUDIES



WHEN THE GOING GETS THICK

Bingham plastic surge analysis informs protections at steel facility

BY NICK VASTINE, APPLIED FLOW TECHNOLOGY

Protton Synergy, a fast-growing company in India's thriving steel industry, needed assistance with a sticky problem. Their engineers assessed pressure surge concerns in a thick paste disposal system. The paste is a byproduct of a steel manufacturing process with Bingham plastic characteristics. Bingham plastic describes fluids that flow only if a yield stress is exceeded, for example toothpaste or peanut butter.

The fluid's non-Newtonian characteristic created uncertainty in



Figure 1: Workspace view of the model highlighting paste disposal points and the series pumps to be evaluated.



applying traditional hand calculation approaches to evaluate maximum and minimum pressures during a transient event. The team selected AFT Impulse to accurately model the unique fluid and system across a range of transient events.

FIRST STEP, ANALYSIS

The paste is piped from a thickener vessel to a series of disposal points via three pumps in series (see figure 1). The basis of the model was imported from a neutral file, using built-in fittings and precise fluid properties to accurately represent the system (see figure 2).

While the client assessed steadystate performance themself using hand calculation spreadsheets, the team confirmed these calculations against their own model results. This comparison reassured the team's confidence in the tool before proceeding to their transient analysis.

The team was to assess a valve closure, pump trip, and pump trip



Figure 2: Viscosity model specification for the Bingham plastic paste.

and restart against ASME B31.3 for maximum pressure and prevent cavitation/vacuum formation as their minimum pressure requirement.

TESTING THE SOLUTION

The initial analysis examined a ten-second valve closure event for

maximum and minimum pressure requirements. While the 37 barg (535 psig) peak pressure remained below B31.3's recommended maximum allowable operating pressure (MAOP), the fluid cavitated downstream of the valve where pressure decreased dramatically.

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CASE STUDIES



Figure 3: Transient graphs demonstrating how a pump's speed, outlet pressure, and flowrate varied during the trip and restart event.

⁶ The detailed fluid properties, which is a top-notch feature of AFT Impulse, helps to determine accurate fluid flow behavior for various viscosity models."

-GAURAV BHENDE, KALPESH BIRLA, AND SAMARTH PAWAR | PROTTON SYNERGY



The unacceptable cavitation and other waterhammer concerns were addressed by sizing and locating a series of air valves, relief valves, and check valves. Subsequent valve closure tests with protection equipment in place eliminated cavitation and its accompanying secondary surge when a vapor pocket collapses.

Next, the team considered a fifteensecond simultaneously pump trip of all three series pumps, as well as a pump trip with restart (see figure 3). In both pump cases the peak pressure was 27 barg (390 psig) and the equipment similarly prevented cavitation throughout the system.

AFT Impulse was also used to generate unbalanced forces to export for stress analysis, which was used by the civil structural team to design support structures.

CONCLUSION

The team credited AFT Impulse's flexibility to accommodate changes to layout by the design team and using features like Global Edit to mass update components to avoid input error. Visualization tools to demonstrate results to the client made it easy to communicate the problems and mitigation for the surge analysis, ensuring their system will continue to operate safely.

Additionally, the Protton team's unique non-Newtonian fluid, considerations for both highand low-pressure concerns, and equipment recommendations that effectively addressed concerns earned the Protton team an AFT Platinum Pipe Award Honorable Mention.

Founded in 1993, Applied Flow Technology has grown to be a leader in the pipe flow modeling software market. With a primary focus on developing high quality fluid flow analysis software, AFT has a comprehensive line of products for the analysis and design of piping and ducting systems. With channel partners around the world and customers in more than eighty countries, AFT software has helped companies in many industries design safer, more efficient systems and solve operational problems. For more information, visit www.aft.com.





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HOW TO TURN FOG FROM CRISIS TO OPPORTUNITY

Revolutionary new technology converts costly, sewer-clogging mess into biofuel

BY BRIAN LEVINE, GREASEZILLA

eople love to dine out, but there's a dark side to restaurant cooking. Along with refuse from animal product cooking and processing, it forms a thick, heavy mess in our nation's sewers referred to as FOG-fats, oil, and grease. This substance is undeniably a nightmare for municipalities and waste haulers alike. Publicly owned wastewater treatment plants, many already facing the aging out of their infrastructure and pressure from growing populations beyond what they were designed to serve, do not have enough capacity to process it all.

OUR LONG, NATIONAL NIGHTMARE IS JUST BEGINNING

Desperate to stay within compliance for effluent quality, they've been forced to begin turning away haulers who want to dispose of restaurant and animal product processor loads. Not only is this causing hardship for these haulers and processors, it's causing revenue loss for the treatment plants from lost tipping fees.

Even without FOG entering plants from haulers, the amount of it already in sewer systems from overflowing grease traps, faulty interceptors, and residents and businesses just pouring grease and oil down their kitchen drains, is at best straining treatment capacity. At worst, it's crippling the ability of smaller, older facilities (and even some newer ones) to remain compliant with environmental regulations for things such as SSOs and effluent quality.

The need to clean FOG from those sewer systems' infrastructure is taxing the resources—labor, equipment, and funding—of every collection and conveyance system operator. Even the most carefully managed plants will eventually have



to institute ratepayer hikes, which will have a detrimental effect on public goodwill, and possibly even political ramifications.

A SOLUTION IN SIGHT

Greasezilla is a revolutionary hydronic-thermal separation system that ecologically processes FOG into three components: brown grease advanced biofuel (ABF) feedstock; batter for composting and anaerobic digester feedstock; and pasteurized water, which can safely return to the sanitary waste stream. Unlike traditional processes, Greasezilla fully recovers the energy resources of the waste stream, leaving nominal waste to be landfilled, and requiring no chemicals or additives. This makes Greasezilla ABF what we call the "roundest fuel," a solution most fully embodying the tenets of a completely closed/no waste reuse cycle.

By creating their own FOG separation station, wastewater treatment plants can not only solve



The Greasezilla FOG separation process creates a deep layer of pasteurized water, a thin layer of "batter," and a moderately thick layer of brown grease ABF.

their own FOG woes, but also create a new revenue stream by providing a desperately needed new disposal option for haulers that won't put undue pressure on their waste streams. With such FOG pre-treatment in place, municipalities will effectively create higher overall treatment capacity, without having to physically expand their plants. It also

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CASE STUDIES

provides a way to process the massive deposits of FOG—often referred to as "fatbergs"—cleaned from their collection system's infrastructure.

EASY TO INSTALL

Greasezilla's system footprint is a mere 1,000 square feet. Depending on available space, the system is scalable to accommodate any volume, making it the centerpiece of a wastewater treatment plant's onsite FOG receiving station. A standard two-reactor tank system processes six to seven million gallons of FOG waste per year. Greasezilla supplies and installs complete turnkey systems and can build, own and operate them for cities, as well.

The versatile system can be installed and operated outside in

warm-weather locations, with cold-weather locations finding much more ease of

operation inside a building. It is also amazingly efficient and cost-effective. Running on the brown grease biofuel it creates, it's largely self-sustaining, energy-wise. And because it does not require dewatered material, Greasezilla can replace dated dewatering facilities.

PAYS FOR ITSELF WITH A SUSTAINABLE BIOPRODUCT

Aside from being able to reinstate hauler tipping fees, wastewater treatment plants can turn the nightmare of FOG into another new revenue stream, by selling the end product of the Greasezilla FOG separation process: Brown grease ABF. The convergence of waste reduction initiatives, low-carbon biofuel demand, tightening emissions regulations, and environmental sustainability goals have created unprecedented demand for such renewable fuel feedstocks.

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Understanding that not every municipality or plant operator is set up to sell byproducts of their facilities, the manufacturer guarantees the sale of produced brown grease ABF at fair market prices for plants that want that assurance, as well.

FROM LIABILITY TO ASSET

The EPA recently added feedstocks to the Renewable Fuel Standards RIN-qualified pathways. This makes Greasezilla's ABF now eligible for low-carbon fuel credits and RINs, creating another potential revenue stream from the sale of RIN and LCFC credits.

FOG can now realistically be turned from a crippling fiscal and physical problem into a new revenue producer for publicly owned wastewater treatment plants, by creating a FOG receiving station around such technology.

Greasezilla provides services and technology that significantly reduce or eliminate costs associated with dewatering, drying, lagooning, land applying, composting, incinerating, hauling, tipping, or any further treatment of wastewater and grease trap output. In the process, Greasezilla creates a biofuel feedstock sold on commodity exchanges for competitive rates. For more information, visit www.greasezilla.com.



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OPTIMIZING PERFORMANCE IN INDUSTRIAL WASTEWATER TREATMENT

See the one-stop source for the pumping equipment and polymer makedown systems

S ince the beginning of time, people have had the need to treat the water they consume, and use for cooking, bathing and washing their homes and cooking utensils. They have also needed to find ways to properly treat and dispose of the water that has been fouled through the course of its use—in latter centuries most commonly during industrial production activities. This need helped the water/wastewatertreatment industry grow to billions in revenue in the United States, and to

an annual rate of growth anywhere between 3.0 and 4.5 percent.

When people hear the phrase "water treatment," however, the first thought that comes to mind is taking water that will be used in domestic settings and removing any impurities, in the process making it safe to drink, cook with, bathe in and wash clothes with; in other words, "municipal" water treatment. But from a broader perspective, the term water treatment can have a number of completely different meanings. In industrial applications, for instance, water can be taken from a nearby river and used for boiler or cooling-tower makeups. In the oilfield, water that is used or produced during the drilling and recovery process can be treated and sold to farmers for use in field-irrigation activities. In other words, there's a whole lot of water being treated at all times, and not just so a loving parent can whip up a pitcher of lemonade for the kids.

This article will illustrate how an integrated wastewater treatment



system, with many different types of equipment working hand-in-hand specifically metering and peristaltic (hose) pumps, and polymer makedown systems—can be used in a straight-line treatment process. This will deliver the most cost-effective and efficient way to treat industrial wastewater, all while making it safe for disposal or reuse in any number of additional activities.

THE CHALLENGE

Most of the water used or produced in industrial applications contains some level of solid particles. It goes without saying that these particles should not be consumed, but particle-laden water also can't be used, for example, in a boiler that provides steam to a turbine during power generation, lest the turbine become fouled and damaged.

Recognizing the presence of particulates in water and successfully removing them, however, are two different things. Some of the particles—which can be anything from bacteria and plant material to dirt or minuscule pieces of crushed stoneare so small that their response to gravity is very low. In other words, they don't fall through water at a consistent rate because their mass is so small and not impacted by gravity. This means that it may take many hours, days or even weeks for the particles to settle as little as a foot. This is an unacceptable, and unpredictable, settling rate for a water or wastewater treatment system, so the particles need some help in settling or clumping.

To speed along the settling or clumping process, the water treatment facility must turn to the introduction of a coagulant or flocculant that helps the tiny particles clump together in a mass that is called a "floc," which is easier to remove. Two of the more popular types of coagulants/ flocculants that are used in water/ wastewater treatment are:

• ALUM: A more economical way to say "hydrated potassium aluminum sulfate," alum has been used since Roman times to aid in the purification of drinking and industrial-process water. Alum coaxes negatively charged colloidal particles to clump together so they will be able to be more easily removed from settling basins.

• FERRIC CHLORIDE:

Another name for Iron (III) chloride, ferric chloride undergoes hydrolysis when dissolved in water, which gives it the ability to sufficiently form suspended solid particles into flocs.



Electrical bearing damage causes unplanned downtime

Variable frequency drives (VFDs) are used to control pumping systems. But VFDs create a motor shaft voltage that discharges through the bearings, blasting millions of pits in bearing surfaces. Both motor and pump bearings are at risk. These discharges oxidize the bearing grease and cause bearing fluting, premature failure, and costly downtime.

Protect motor bearings with AEGIS® Shaft Grounding Rings

By channeling VFD-induced discharges safely to ground, AEGIS[®] Shaft Grounding Rings prevent electrical bearing damage. Proven in millions of installations worldwide, AEGIS[®] Rings provide unmatched protection of motors against electrical bearing damage, motor failure, and unplanned downtime.





WATER & WASTEWATER FOCUS

Neptune MP7000 and MP7100 Series Mechanical Diaphragm Metering Pumps are ideal for dosing alum and ferric chloride because they do not feature contour plates on the liquid side of the diaphragm, resulting in a simple, straight-through valve and head design that allows improved flow characteristics.

While quite effective in creating flocs, the flocs that are formed by alum and ferric chloride are held together rather loosely, which means that they can break apart if agitated as they settle in the clarifier or settling basin. Eliminating this breakup potential requires the introduction of a polymer solution that helps form more efficient flocs. The polymer takes the neutralized solid particle clumps and binds them together more tightly.

Removing the sludge from the water requires a pump that can run dry and won't be bothered by abrasive materials. In other words, a pump that has the capability to take whatever flows into it—no matter its makeup—and deliver it out the discharge side in that same form.

THE SOLUTION

Industrial water or wastewater treatment, then, is a three- stage

process that must work hand-inhand: initial floc formation with alum and ferric chloride, clumpstrengthening with polymer, and removal and disposal of the sludge. Not all manufacturers of wastewatertreatment equipment are able to offer full lines of pumping and polymer- blending technology for the required watertreatment applications. However, Neptune[®], a brand of PSG[®], a Dover company, does feature full lines of pumping and polymerblending technology for industrial water or wastewater-treatment applications. This allows the watertreatment facility access to a "One Company. One Source." solution that covers its needs from start to finish. Specific watertreatment technology from Neptune includes:

Neptune MP7000 Series Mechanical Metering Pumps

Ideal for dosing alum and ferric chloride, these mechanically actuated pumps eliminate the use of contour plates on the liquid side of the diaphragm, resulting in a



Neptune blending system features mechanical mixing through our Gatlin distribution head. Gatlin provides a rapid, high energy initial introduction of polymer to water followed by a gentle low shear mixing in a multistage static mixer. Used when activating all types of liquid polymer in water or wastewater treatment. simple, straight-through valve and head design that allows improved flow characteristics.

They have been designed to handle clear liquids with viscosities ranging from water-like to 2,500 cPs, making them ideal for use in industrial water and wastewater treatment applications. The capacity of the MP7000 and MP7100 Series pumps is manually adjustable via micrometer dial while the pump is running. This allows the pump to produce flow rates ranging from 2 to 300 gallons per hour at head pressures up to 235 psi (16 bar). The pump's liquid ends are constructed of PVC, 316 stainless steel or Kynar. Washdown-duty and explosionproof motors, as well as variable frequency drive options, are also available. The pumps are also self-priming.

Neptune Polymaster Polymer Activation and Blending System

The Neptune Polymaster is a simple, automatic and economical solution for effectively diluting, mixing and thoroughly activating emulsion, dispersion and solution polymers, including new-highmolecular-weight products. With the patented, motorized Gatlin Mixer and Distribution Head,

Polymaster provides better mixing capabilities and a higher degree of activation compared to similar machines.

By hydraulically segmenting the polymer into ultra-thin film platelets, the polymer surface area exposed to the dilution water is maximized without affecting the degree of activation. Offering manual stroke length control, automatic 4-20 mA speed control and models available

for up to 50 gallons per minute dilute solution at concentrations from 0.1 to 2.0 percent, Polymaster provides a dynamic solution for polymer activation and blending without any blades to damage the fragile polymer chains. With a compact, lightweight design,



Abaque Peristaltic (Hose) Pumps play a pivotal role in sludge removal during a wastewater-treatment operation thanks to their ability to run dry and effectively handle abrasive, particle-laden materials.

accessible front panel components and automatic shutdown and alarm prompted by the loss of dilution water, the Polymaster is designed for easy installation, operation and maintenance.

Abaque Series Peristaltic (Hose) Pumps

Featuring a design that ensures that "whatever goes into the pump comes out of the pump," Abaque pumps can handle solid particles up to 0.59 inches and soft particles as large as 0.98 inches, making them a top choice for sludge removal. They feature a seal-free design that eliminates leaks, which enables them to handle the wastewater industry's toughest pumping applications, from abrasive and aggressive fluids to shear-sensitive and viscous materials. The pumps, which can run in either forward or reverse, are self-priming, dryrunning and offer suction-lift capabilities to 30 feet, as well as the ability to run dry continuously without adversely affecting the pump's performance. Ductile-iron and steel construction lets the pump produce discharge pressures as high as 217 psi (15 bar). The Abaque's pump hoses are available in four materials of construction: natural rubber, EPDM, Buna N, and Hypalon.

CONCLUSION

A wide variety of industries use untold millions of gallons of water and produce untold millions of gallons of wastewater each and every day. Properly handling and disposing (or reusing) this wastewater requires a number of stages that must work together seamlessly, from alum and ferric chloride introduction, to polymer injection, to sludge removal. Each stage requires a different type of technology, which can often have the wastewater-plant operator moving in many different directions to identify a solution. Neptune offers a onestop shop for industrial wastewater treatment, with a ready supply of metering pumps, polymer makedown systems and peristaltic pumps, all of which have been designed to work in hand- in-hand to create the most efficient and cost-effective industrial wastewater-treatment process.

EULIS ESTER is product manager for Neptune® and Abaque and can be reached at eulis.ester@psgdover.com. Abaque is a brand of PSG®, a Dover company. PSG is comprised of several leading pump brands, including Abaque®, All-Flo™, Almatec®, Blackmer®, Ebsray®, em-tec®, Griswold®, Hydro™, Malema™, Mouvex®, Neptune®, PSG® Biotech, Quantex™, Quattroflow®, and Wilden®. For more information, visit **www.psgdover.com**.



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MAINTENANCE & RELIABILITY



ADDRESSING CYBERSECURITY THREATS AND SAFEGUARDING THE MANUFACTURING SECTOR

Protection from online attacks requires knowledge and commitment Part 1 of 2

BY KYLE SALEEBY, GEORGIA TECH MANUFACTURING INSTITUTE, AND REBECCA TAYLOR, NCMS

ffective cybersecurity for critical infrastructure may pose one of the most significant threats to modern society. While local, state, and national policies address threats both foreign and domestic, the

ability to effectively protect against cyberattacks is severely lacking across many industries. In 2022, nearly 25 percent of all cyberattacks targeted the manufacturing sector, closely followed by the finance and consumer services industries. The pace of attacks is only increasing, with small and medium enterprises standing to lose the most due to a lack of time, expertise, or awareness of cybersecurity practices. As the



most targeted nation for cyberattacks, the United States experienced 57 percent more cyberattacks in 2022 than in 2021. Globally, cyberattacks in 2022 increased 38 percent over the previous year. The result is that many small and medium enterprises which rely heavily on technology for production—do not have a cyber protection plan that protects their critical assets.

Cybersecurity attacks can take many forms, but all intend to cause a loss in operations, wealth, or capability. At its core, cybersecurity is a balance of risk tolerance (just like investing), strategic initiatives, or recruiting. Unfortunately, in the connected landscape of modern software, it is not possible to be 100 percent secure and guarantee with complete confidence that access and data will never be compromised. On one hand, an organization could operate in a completely closed environment, with zero transfer of information to or from any system.

CYBERSECURITY RESOURCE: CYMANII

To help secure our country's cyberinfrastructure, NCMS partners with the Cybersecurity Manufacturing Innovation Institute (CyManII), an inclusive national institute with twenty-four major leading universities. Funded by the DOE, CyManII aggregates the most advanced institutions in smart and advanced manufacturing, securing automation and supply chains, workforce development, and cybersecurity.

This is not practical in most cases and would certainly lead to the company's collapse. On the other hand, a fully open system with unfettered access to any information is not feasible, either. An appropriate balance must be struck, especially in the manufacturing sector, to foster efficient operations with secure practices.

In response to current cybersecurity threats, NCMS has partnered with public agencies such as the Cybersecurity Innovation Institute (CyManII), the Department of Homeland Security (DHS), and the National Institute of Standards and Technology (NIST), along with private sector cybersecurity stakeholders, to help identify key issues, opportunities, and mitigation solutions, as these attacks threaten the production capabilities of every connected manufacturing firm. NCMS's Cybersecurity Strategic Initiative helps manufacturers address









Distribution of Cyber Attacks Across Worldwide Industries in 2022

cybersecurity issues and convenes technical experts in operational technology and cybersecurity to help companies identify, mitigate, and close security and resilience gaps.

CURRENT CYBERSECURITY CHALLENGES

The goal of cybersecurity has become harder to reach every year. America's critical infrastructure sectors rely on internet-connected devices and systems to deliver essential services. The astronomical increase in Internet of Things (IoT) devices, digital manufacturing initiatives, and paperless business services across all industry sectors poses a significant cybersecurity challenge.

By 2025, there will be an estimated 41.6 billion IoT devices, capable of generating an astronomical 79.4 zettabytes (ZB) of data, as forecasted by the International Data Corporation (IDC). These devices include smartphones, home security systems, health monitoring devices, autonomous vehicles, and digital control systems, to name just a few.

In an IBM-sponsored study of companies in 17 countries, the average cost of a data breach reached an all-time high of \$4.35 million in 2022, and of 550 companies that reported a data breach in 2022, 83 percent experienced more than one breach. Insider threats, which are difficult to detect, account for an estimated 60 percent of cyberattacks. Most cases go unnoticed for months or even years. The remaining cyberattacks are perpetrated by organized criminals, amateurs, and professional hackers, including statesponsored actors. The motives of cyberattacks generally fall into three categories: seeking access to data,

CYBERSECURITY RESOURCE: NIST

The National Institute of Standards and Technology (NIST)'s cybersecurity framework was developed to improve cybersecurity risk management for critical infrastructure, but it can be used by organizations in any sector of the economy—including companies, government agencies, and nonprofit organizations—regardless of their focus or size.

usually for financial gain; espionage, to monitor the activities of targets; and sabotage, to seek the destruction, defamation, or blackmail of targets.

COMMON TYPES OF ATTACKS

A cyberattack of any scale can be disastrous for small and medium enterprises. Loss of access to data and information only compounds supply chain issues, cycle time efficiency, and shortages in the skilled workforce. In 2022, the average time of recovery from a cyberattack in the manufacturing sector rose to 23 business days, resulting in many affected shops closing their doors.

One recent study found that other than IT failures, such as cloud misconfiguration—the most common data breaches were caused by:

Compromised Credentials and Phishing

In 2022, stolen or compromised credentials cost companies an average of \$4.5 million. These breaches had the longest life cycle: 243 days to identify the breach, and another 84 days to contain the breach.

Phishing attempts to steal users' credentials or sensitive data such as credit card numbers. Scammers send emails or text messages designed to look as though they're coming from a legitimate source, using fake hyperlinks. In 2022, phishing attacks cost companies an average of \$4.91 million.

Supply Chain Attacks

In 2022, an alarming 47 percent of attacks on manufacturing were caused due to vulnerabilities that victim organizations had not yet or could not patch, highlighting the need for organizations to prioritize vulnerability management.

Malware

Destructive malware—malicious software—is designed perform an unauthorized process that will adversely impact the confidentiality, integrity, or availability of an information system. Malware has the



capability to render affected systems inoperable. Most malware causes destruction through the deletion of files that are critical to the operating system's ability to run. There are many types of malware:

- Viruses infect programs to delete files or steal information, then self-replicate.
- Zero-Day malware is unknown to current antivirus software, which forces antivirus developers to work quickly to eliminate these viruses, all while hackers are quickly programming new strains of malware.
- Worms are programs that can replicate themselves over a network without any user interaction.
- Trojan Horses appear to be useful software, or a fun game, but have malicious programs hidden inside, usually spyware and adware, which can steal usernames and passwords.
- Drive-by downloads are websites that infect users' computers after clicking on a link. Cybercriminals use search engine optimization (SEO) to make these sites popular on search engines.
- Bots take control of computers without the user's knowledge.

Ransomware

While all types of malware can cause serious damage, the threat from ransomware has grown exponentially over the past few years. Ransomware

CYBERSECURITY RESOURCE: CISA

The Cybersecurity and Infrastructure Security Agency provides the Critical Manufacturing Sector Cybersecurity Framework Implementation Guidance, which was developed to help Critical Manufacturing Sector owners and operators use the cybersecurity framework developed by the National Institute of Standards and Technology (NIST).

encrypts important files and demands the user to pay a ransom to have the files unencrypted. Phishing emails are the most used for ransomware attacks. In 2021, ransomware accounted for 23 percent of attacks on manufacturing companies. The average cost of a ransomware attack was \$4.54 million in 2022.

A concerning new trend in ransomware is the expansion of "triple extortion" tactics. In this type of attack, threat actors encrypt and steal data, and also threaten to engage in a distributed denial of service (DDoS) attack against the affected organization. Moreover, cybercriminals often pressure the primary victim's business partners into paying a ransom to prevent their own data leakages or business disruptions caused by a ransomware attack.

A LOOK AHEAD

In part 2 of this series, we'll breakdown actionable steps you can take to minimize these above-stated risks and improve your overall cybersecurity. In the expansive and increasingly digitally integrated manufacturing sector, it may be impossible to eliminate cyberattacks, but with proper preparation and committed oversite, the damage from these attacks can be greatly minimized.

The National Center for Manufacturing Sciences (NCMS) has been working with our partners for several years to develop appropriate and cost-effective methods to protect information assets. Obtaining the appropriate level of Cybersecurity Maturity Model Certification (CMMC) is increasingly required for government contractors. For more information, www.ncms.org.







MAINTENANCE & RELIABILITY

HIGH-PERFORMANCE OIL-SOLUBLE CLEANER REDUCES COST OF OPERATION

As bearing temperatures rise, can your equipment take the heat?

BY KAREN MCKEE, EXXONMOBIL

cross an array of industrial applications, the performance of gas or steam turbines, compressors, and hydraulic systems is a critical factor for maintaining reliability and the bottom line. One way to ensure performance adheres to the standards of your application is to prevent unwanted deposits and buildup from adhering to these systems.

Mobil[™] Solvancer[®] is a costeffective, oil-soluble cleaner that can be added to in-service oils to quickly dissolve varnish and organic deposits from within gas or steam turbines, compressors, and hydraulic systems, ultimately helping to improve reliability and reduce overall cost of operation. Specifically, the product helps address issues such as escalating bearing temperatures and avoid issues such as re-adhesion, transfer of deposits, filter plugging, oil line flow blockage and more.

EXTENDING YOUR SYSTEM'S LIFE-CYCLE

Designed for operators in the power generation and petrochemical industries, Mobil Solvancer supports



oil conversions, alleviates operational issues due to varnish, and helps with oil life extension. In addition to helping improve equipment reliability, it can help operators reach extended overhaul-to-overhaul goals and help reduce total cost of ownership.

Mobil Solvancer is a customized oil soluble cleaner developed by Fluitec[®] using their proven DECON™ technology. The oil-soluble cleaner is gentle on systems and compatible with lubricants and hydraulic oils formulated with API group I to IV base stocks with no adverse impact on in-service oil or additive performance. Mobil Solvancer also offers one of the industry's lowest treat rate—3 to 5 percent compared to the average treat rate of 10 to 15 percent—and extended protection of more than one







PROPERTIES		
APPEARANCE	CLEAR AND BRIGHT, WATER WHITE	
Flash Point, Cleveland Open Cup, ASTM D92	217 Celsius / 422 Fahrenheit	
Kinematic Viscosity @ 40 cSt, mm2/s, ASTM D445	51	
Specific Gravity, 25 cSt/25 cSt, ASTM D1298	0.846	

year, exceeding the performance of many competitive products.

SUITABLE FOR MYRIAD APPLICATIONS

Mobil Solvancer is recommended by ExxonMobil for use in the following applications:

- Turbines (excluding aero derivatives)
- Compressors
- Hydraulic systems
- Gear boxes
- Paper machines
- Heat transfer

Furthermore, use of Mobil Solvancer does not require systems to be taken offline in many cases such as when used to eliminate minor deposits or in support of oil life extensions and works quickly to dissolve varnish and sludge from circulating lubrication systems, bearings, hydraulic systems, etc.; resists deposit re-adhesion when cooled.

IMPROVES EQUIPMENT RELIABILITY

Mobil Solvancer's unique property enables conversions and helps



with elevated bearing temperature troubleshooting, which supports oil life extension and thus helps reduce operating costs. As mentioned above, its comparably low treat rate of 3 to 5 percent may provide cost effective alternatives to costly flushing and system cleaning. Elimination of flushing means less product is needed to deliver the same performance.

All this leads to extended protection of up to one year, exceeding the longevity of most competitive products, and helps operators achieve extended overhaul-to-overhaul goals.

GENTLE ON SYSTEMS

Since Mobil Solvancer does not require system flushing after use, it can be used safely for extended use with no adverse effects to in-service oils and affords operator improved flexibility.

Specifically, Solvancer is compatible with lubricants and hydraulic oils formulated with API group I to IV base stocks and does not adversely impact lubricant performance including oxidation stability, anti-wear, gear loading, demulsibility, foam, and air release. It also does not adversely impact testing on OEM or industry specifications/approvals and is completely benign towards in-service oils, seals, paints and, coatings commonly used in systems.

ExxonMobil, one of the largest publicly traded international energy companies, uses technology and innovation to help meet the world's growing energy needs. ExxonMobil holds an industryleading inventory of resources, is one of the largest refiners and marketers of petroleum products, and its chemical company is one of the largest in the world. For more information, visit **www.exxonmobil.com**.



PUMP SOLUTIONS

GIVING A BOOST TO A BOOSTER SYSTEM

Quick response overcomes pump failure and keeps business humming

BY BRADLEY CLARKE, DURA PUMP

Replacing underperforming or failed pumps can be a costly exercise—not only the upfront cost, but the potential losses that comes from unexpected downtime in facility operations. On a recent jobsite, one Dura Pump customer was able to sidestep these issues thanks to speedy and steady work from our team of pump experts.

MINIMIZING DISRUPTION TO THE WATER SUPPLY

Dura Pump was contacted by a customer in the education sector who was experiencing a series of issues with their pump system. Having experienced booster failures on a couple of the pumps, our customer was left vulnerable to losing their water supply completely should the last pump have failed.

With these challenges in mind, the customer contacted Dura Pump and requested that our team replace three of the pumps and inverters on their triple booster set.

Given their busy day-to-day work, it was imperative that this job was completed in a way that would minimize downtime and potential disruption.

BESPOKE SOLUTIONS TO CUSTOMER NEEDS

The team at Dura Pump kicked the project off by carrying out a series of consultations with the customer, taking time to understand the customer's unique pump requirements. Following this initial process, our team was in a position to propose a solution that would resolve these issues quickly and effectively.

Dura Pump proposed supplying and installing three Lowara SV Pumps, featuring motor-mounted Hydrovar inverters. This was down to the fact that the system's existing inverters had been superseded by a newer, more advanced model. Because of this, Dura Pump got to work in reconfiguring the system's settings, reprogramming it onto the new inverters.

GETTING RIGHT TO WORK

To begin this process, our engineers replaced the two failed pumps in order to ensure the system remained fully operational, whilst also ensuring that the building wasn't at risk of losing water. Once the brand new Lowara SV Pumps had been fully installed and commissioned, the Dura Pump team then replaced the final pump, which was previously the only pump supplying water to the building.



Given the customer's busy day-to-day work, it was imperative that the old pumps were replace quickly and efficiently.



The Dura Pump team recommended Xylem's Lowara SV Pumps, featuring motormounted Hydrovar inverters.





The new pumps were communicating together to share the duty required and provide a constant water pressure to the building.

At this point, all three pumps had been replaced as specified. Following this stage, Dura Pump engineers installed link wires between each inverter before programming them to the correct set pressure; as well as to alternate duty between each pump. By taking this action, our team ensured that the pumps were communicating together to share the duty required and provide a constant water pressure to the building.

SUCCESS IN THE SHORT AND LONG TERM

Following the completion of this project, Dura Pump was pleased to see the customer enjoy a number of positive results.

The customer was now able to benefit from an upgraded system, with the installation of that upgraded system not compromising their water supply. Beyond this major benefit, the customer's system was now up-to-date and fully supported by a twelve-month warranty. Plus in the event of a future failure, spares would be available.



Dura Pump supplies, installs, repairs, and maintains pumps, pump systems, valves, packaged pump stations, booster sets, and pressurization sets to all major industries including facilities management and construction. Dura Pump is the fluid control specialist that guarantees increased productivity and profitability for our clients through reliable and efficient solutions. For more information, visit www.durapump.co.uk.



J. Campbell (jay@mptmag.com) visit our website mptmag.com



MOTOR SOLUTIONS



Repaired synchronous motor.

JOURNEY THROUGH CONTINUOUS IMPROVEMENT

How a 95-year-old motor repair and testing company prepares for Industry 4.0 challenges

BY NIEN VAN AND SAYYADAIN FAROOQUI, BRADLEYS

Bradleys, a service center that specializes in electric motor repair and testing, is about to mark its 95th anniversary as a family-owned and operated business. What's more impressive is that the company has successfully navigated five generations of employees, which presents its own unique set of

challenges. The ability to persevere through six wars, epidemics, pandemics, and several hurricanes is a testament to strength and adaptability. In addition to striving to survive, it is apparent that the team at Bradleys has a strong foundation to manage any obstacle that comes their way.

EMBEDDING INDUSTRIALLY RECOGNIZED STANDARDS

Industries, products, and speed of services are constantly evolving and so are the concepts of quality assurance. In response to these challenges, Bradleys has taken significant steps to improve their Quality Assurance approach in



response to the constantly evolving industry, products, and speed of service. The company has phased out 'tribal knowledge' and implemented institutional knowledge, allowing it to deliver the best value to customers in a timely and reliable manner.

To ensure the highest quality of service, Bradleys' teams are trained to maximize the usage of proven guidelines, industrial standards, and testing methods, including EASA, IEEE, NEMA, SAE, and customerspecified standards. This has enriched Bradleys' service quality and eliminated the hindrance of the so-called silo system, thanks to the induction of well-selected craftsmen and professionals with diversified knowledge bases and experience.

PATH TO RELIABILITY: RISK ANALYSIS AND MITIGATION

The focus on quality is not just a buzzword, but a fundamental principle that drives their business. By prioritizing processes, standards, and prevention, the company can consistently deliver high-quality results to its clients and partners. Bradleys' commitment to meeting the evolving needs of its clients is reflected in their ISO 9001:2015



Bradleys PMI Analyzer identifies metal specification and composition.

certification, which demonstrates their dedication to excellence. Transparency and honesty are core values that guide the company's actions, and it is dedicated to building and maintaining strong relationships based on trust and collaboration. These concepts also prioritize the voice of the customer, which is data-driven, and includes continuous improvement in which Bradleys strives to deliver highquality results to their clients and partners. Additionally, reliability and reproducibility of gauges are employed at Bradleys. When implemented correctly and promptly, quality translates to product and service reliability for all stakeholders.

Bradleys' team of professionals has undergone a transformation by integrating experienced craftsmen, engineers, as well as seasoned and young professionals to deliver exceptional results. The team is committed to enhancing customers' experience by not merely replacing faulty components but by analyzing the motor's diagnosis and operations to identify the root cause of failure.

Generator load testing.

Precision via CMM.

MOTOR SOLUTIONS

Bradleys has the largest capabilities to load test vertical and horizontal motors in the United States.

The team establishes a failure-point relationship and works towards resolving every customer motor case, thus delivering greater value for their motor repair and testing costs.

INTERNAL PROCESS IMPROVEMENT

As no company or system is infallible, Bradleys provides its employees with an app to flag any issues that require correction. This tool empowers staff to express their thoughts and ideas, which is the ultimate goal of enhancing efficiency, elevating service levels, and boosting productivity. The app is open to all Bradleys team members who can use it to highlight areas for improvement, gaps, or near-misses. Modern management recognizes that employees are a valuable resource for continuous improvement, and Bradleys' management team reviews all suggestions put forth

Table 1_ Major Findings			
Finding	Figure	Observation	Requirement
Stator – Winding Failure- Poor Visual Condition with Insulation Failure	58	Motor Megged 0	Complete Rewind of Stator
Stator Core Damaged from Rotor Contact	5B	Rotor Rubbed Stator Causing Damage	Perform Core Loss Test to Determine if Iron Work is Needed
Replace Bearings with New	4A/B	Bearings Found to Have Water and Moisture Visible	Replace With New
Machine Drive End Inner Lab Fit	6A		Recommended clearance .007"014"
Machine and Metallize Drive End Bearing Fit	6A	Tolerance: 3.6789 Recommended: 3.7403-3.7409	Repair to Recommended Tolerance
Provide New Fan	ЗA	Fan Blades are Broken	Provide and Install New Fan
Bore and Broach New Fan	3A	Fan Blades are Broken	
Skim Shaft Fan Fit	6B	Rust Buildup on Shaft Fan Fit	

Table 2_ Minor Findings

Finding	Figure	Observation	Requirement
Rolling element bearing failure due to water or moisture	4A/4B	Internal Rust	1 2 - 1

Major findings on Bradleys As-Found report.

via the app. Management and staff employ available tools to respond and take corrective action vis-à-vis recurrence proofing.

To effectively manage and improve processes, Bradleys follows the mantra "if you can't track it, you can't control it." It includes data collection, analysis, algorithm development, and metric creation to measure performance. Through ongoing monitoring and analysis, Bradleys can improve its services by identifying areas for enhancement and taking proactive measures.

INTERNAL AND EXTERNAL RESOURCES

A service industry such as Bradleys is challenged with numerous issues that need to be addressed. First, it is essential to maintain the service floor hardware and ensure the timely addition of new inspection and processing devices. Second, having a trained and skilled team that receives continuous training and documentation of knowledge is crucial. Third, adhering to service standards, including transparency, time commitment, traceability, and post-service coordination, is imperative for maintaining guality. This also encompasses Bradleys' internal standards and guidelines.

External resources, or suppliers, are also vital to Bradleys, especially when critical parts and services from suppliers are employed. Ensuring supplier quality assurance is crucial when discussing Total Quality Management (TQM). ISO 9001-2015 acknowledges TQM as one of the backbones of quality and is given Bradleys' full attention.

DATA DRIVEN DECISION-MAKING AND TRACEABILITY SYSTEM

In the modern digital era, data is abundant, but organizing and analyzing it intelligently can create significant value. Bradleys recognizes the importance of impartial information on service history for clients, investing in applications that collect, organize,

have always been critical factors for success. Bradleys' road to continuous improvement is always under construction.

and manipulate data for scientific conclusions. This saves time and effort for both parties, building trust in Bradleys' services. Comprehensive reports such As-Found reports are shared with clients, offering valuable insights that can reduce liability and improve long-term reliability. The focus on details makes Bradleys' services dependable and valuable to customers and their motors.

Bradleys is at the forefront of adopting new technologies every

day and implementing a new quality model across the organization. Their skilled craftsmen and experienced professionals are driving these initiatives, utilizing the best available standards to enhance service quality. The American Society of Quality (ASQ) recognizes this as the Industry 4.0 era, requiring a new paradigm and innovative concepts to meet and exceed customers' everchanging expectations. Traceability, on-time delivery, and zero-defect As an ISO 9001:2015 Certified Company with a Continuous Improvement mindset, Bradleys recognizes that agility and a sense of humor are necessary. No matter how well-thought-out its written procedures may be, there is always room for improvement, whether it's mitigating risks, providing training, or enhancing communication. Bradleys' continuous improvement journey started with significant effort, time, and investment. For more information, visit **www.bradleysmotors.com**.

high-head applications.

THE NEW ROTO-JET® 2300 PUMP

trilliumflow.com/roto-jet

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Maturity Model created by Bradleys Engineering Dept.

SEALING SOLVITIONS

HIGH PERFORMANCE SOUTH OF THE BORDER

The rise of Hilube bearings in the Mexican pump industry

BY DEBORAH SPICER, VESCONITE

ver the past six years, Vesconite Bearings has witnessed a significant uptick in its supply of bearings to Mexico—a testament to the growing recognition of Vesconite Hilube's superiority over bronze.

LEAVING THE BRONZE AGE BEHIND

For decades, bronze had been the go-to material for manufacturing plain pump bearings in Mexico. Numerous local bronze foundries had historically been the backbone of the pump industry, supplying the industry with the various components that it needed.

However, as demands are growing more stringent, especially in sectors such as mining, where acidic water poses challenges to corroded traditional material components, the

KEY FEATURES OF HILUBE

Vesconite Hilube is our flagship bearing material, designed for particularly difficult operating environments.

- No water swell
- Extended wear life
- Low friction
- High load-bearing strength
- Dimensional stability
- Shaft friendly
- Chemical resistance

Vesconite Bearings has witnessed a significant uptick in its supply of bearings to Mexico, says Monique Potgieter, an application engineer with Vesconite Bearings.

limitations of bronze as a bearing material have become apparent.

STANDING UP TO HARSH CONDITIONS

Vesconite Hilube is a bearing material that is resistant to acidic environments and the chemicals typically found in copper and gold processing. Where water acidity can wreak havoc on traditional materials, Vesconite Hilube stands resilient, maintaining its integrity and performance even in the harshest conditions.

In addition, unlike bronze, Vesconite Hilube bearings excel in dry start conditions, eliminating the need for external feed lines to prime pumps before startup and reducing wear and failure during startup—a common challenge in pump operations.

SERVICE YOU CAN COUNT ON

Besides these operational advantages, Vesconite Bearings has been able to back up its products with exceptional service and lead times, ensuring that manufacturers receive what they need when they need it, thus becoming a trusted supplier to various Mexican original equipment manufacturers.

While the merits of Vesconite Hilube are undeniable, Vesconite Bearings' success in Mexico is also attributed to the company's proactive approach to customer engagement, says Monique Potgieter, an application engineer with Vesconite Bearings.

She has been instrumental in fostering relationships with Mexican

pump manufacturers and has undertaken five visits since 2021 to understand the unique needs and challenges of the market.

Potgieter says that Vesconite Bearings offers a comprehensive range of pump components to the Mexican market, including line shaft bearings, bowl bearings, suction inlet bearings, stuffing box bearings and casing wear rings.

FIT FOR YOUR APPLICATION

Vesconite Hilube is specifically recommended for moist and underwater applications. These include the pump and marine industry, where regular maintenance is not practically feasible or cost-effective. Displaying superior wear life, especially in poorly lubricated and dirty conditions, Vesconite Hilube has extended the life-cycle of components across myriad applications.

Vesconite Bearings is a worldleading manufacturer of low-friction, low-wear bearing materials for a wide range of industries. Selling to over 100 countries, these include the pump, agriculture, railways, mining, heavy transport, hydro, renewable-energy, earthmoving, marine, and construction industries. For more information, visit **www.vesconite.com**.

FEATURED PRODUCT

RUSSELECTRIC

ATS REMOTE ANNUNCIATOR

Russelectric, a Siemens business, introduces its new ATS Remote Annunciator (RTS-RA), a powerful accessory that brings together data from multiple automatic transfer switches into a single display.

The remote annunciator is designed to be configured by the customer. It allows monitoring of the position and status of up to eight Russelectric ATS types RTSCD and RPTCS, as well as viewing power data for each ATS and accessing current alarms and logged historical alarms. Users can initiate load tests and set timers remotely using the RS-422/485 Protocol to ATS. In addition, there is the ability to configure email alerts for alarms. An Ethernet connection is available for exchanging data via the OPC UA protocol to another SCADA or building management system.

ATSs manufactured by Russelectric are modern, high-speed switching devices designed to transfer electrical loads from a preferred power source to an alternate power source when voltage and/or frequency vary beyond preset limits. They also retransfer loads when the preferred source is restored.

For more information, visit WWW.RUSSELECTRIC.COM

GEFRAN

GQ AND GRSH SERIES SOLID STATE RELAYS

Gefran GQ and GRSH series solid state relays feature a wide range of contact ratings and input and output voltages. They are available in DIN rail or panel mounting styles and offer a variety of overload and thermal protection options. Gefran GQ series "hockey puck" style panel mount solid state relays, available in contact ratings from 15 to 90A, include thermal mounting pads, overload and thermal protection, and screw or push-in-spring terminal connection styles. Optional heatsinks are also available for high-power applications. For more information, visit **www.gefran.com**.

DANNAR

MOBILE POWER STATION

Part energy storage, part modular workhorse, the new platform option offers high power handling, bidirectional flow, enhanced efficiency and scalability ideal for large-scale industrial applications and integration into renewable energy sources like solar and wind. The Mobile Power Station is a versatile, modular off-road platform capable of powering a variety of work attachments, providing mobile microgrid energy, and supporting autonomous operations. It also functions as an unparalleled energy storage solution. For more information, visit **www.dannar.us.com**.

SURVITEC

GAUNTLET ENERGY CONTAINMENT SAFETY DEVICE

Severe injury or death can be caused by the explosive forces released if a highpressure spring-loaded actuator device fails, along with significant damage to equipment and facilities. However, there is often a lack of regular inspection and maintenance, and the risks have attracted little attention in terms of technology or regulation. Compatible with all valve actuator types, the Survitec Gauntlet is a protective sleeve constructed from lightweight "bullet-proof" para-aramid armoring, ten times as strong as steel, and designed to contain the unpredictable forces of failure. For more information, visit **www.survitecgroup.com**.

WATSON-MARLOW FLUID TECHNOLOGY SOLUTIONS

MASOSINE CERTA PUMPS

Watson-Marlow cased drive peristaltic pumps offer superior flow stability, providing accurate and repeatable process control for nutrient feed fermentor applications. The end product of both plant-based and cultivated processes can be extremely difficult to pump due to its sticky and viscous nature. MasoSine Certa pumps from WMFTS can handle these products with ease due to the sinusoidal rotor that delivers a lower shear, gentle pumping action for the transfer of high viscosity end product, even when viscosity changes frequently. For more information, visit **www.wmfts.com**.

EFFICIENCY POINT

CREATING THE FUTURE OF ENERGY

At Evolve 2024, Enverus and its customers discuss AI's impact

ast month in Austin, Texas, Enverus, a leading generative AI and energy-dedicated SaaS company, hosted its Evolve 2024 conference, releasing free access to its new Instant Analyst technology to customers in attendance, adding 750 users that will be able to find concise answers quickly across tens of thousands of documents with the push of a button. Below, Manuj Nikhanj, president of Enverus, and the company's chief innovation officer, Colin Westmoreland, are joined by Mary Frances Deibert of Ironwood Midstream Energy Partners and Tenaris's Thomas Greene, both Enverus customers, to discuss the growing possibilities of AI in the energy sector.

MPT: How can AI become a tool for oil and gas or energy transition research?

MANUJ NIKHANJ: The total demand for energy is only increasing through time and a strong network of connections and support is needed to maintain a resilient and reliable energy systems. If one piece of that network fails, it's not just a ripple effect; it can be felt like a tsunami. That's why we engage in dialogue with our customers to meet their needs before their challenges arrive.

MARY FRANCES DEIBERT: Enverus provides valuable tools, especially for our business development group. Enverus does a great job of pulling together information about producers, and producers are our customer base. We gain a competitive edge when our team can access data and parse it in a way that makes sense for our company. The data is the data, but the way Enverus provides access lets us pull data together so that fits into our business like a little puzzle piece. We employ the data to create opportunities, adding real value to our business.

MPT: What differentiates Instant Analyst from other AI platforms available?

COLIN WESTMORELAND: High quality data and intelligence is core to our DNA, but we need to move beyond "just" better, faster decisions. Searching, sourcing, and citing the research behind an answer is now available to these users in a matter of seconds.

THOMAS GREENE: I think AI is going to be revolutionary. As an early user, I think Instant Analyst is set apart from other generative AI because of the source material that is behind it. With Enverus, you've got thirty-plus years of market intelligence that you're pulling from, which is not something you're going to be getting when you're referencing ChatGPT or Copilot.

MPT: How are events like your Evolve conference paving the way for greater adoption of AI in the energy sector?

COLIN WESTMORELAND: Learning and development training courses were also offered during Evolve. The L&D program is aimed at helping energy professionals enhance their skillsets around data-focused job functions that improve career growth opportunities.

MANUJ NIKHANJ: As an industry, we all have an inspiring mission to power the global quality of life for the eight billion people on our planet. Energy—an already complex connected ecosystem—is only getting more challenging to navigate. Together with them, we are creating the future of energy together.

A summary and highlights of the Enverus Evolve 2024 conference as well as a demonstration of the Enverus Instant Analyst AI system can be found at **www.enverus.com**.

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