



The Bachmann team in Rendsburg will aid in retrofits to extend turbine lifetimes. (Courtesy: Bachmann)

MAINTENANCE

Bachmann expands its retrofit capabilities with team acquisition

Bachmann electronic, an industry leader in wind automation solutions, recently strengthened its significant expertise by acquiring a team of 10 wind-energy experts.

With more than 20 years' experience in turbine control technology, the new team in Rendsburg/Büdeland, Germany, will concentrate on the global turbine retrofit market. Their target is to provide turbine Life Time Extension (LTE), optimized efficiency, and support wind farms in delivering affordable energy.

Bachmann retrofitted turbines are

now compliant with advancing technical requirements with increased cyber security and optimized operator safety. The Bachmann M1 automation system offers a wide variety of software components to older turbines. Components such as WTT (Wind Turbine Template), WPS (Wind Power SCADA), SPPC (Smart Power Plant Controller), Condition Monitoring Systems (CMS), and Structural Health Monitoring (SHM) update and standardize technology to meet international standards. Bachmann wind-energy customers increase their farm's efficiency, lower costs, and maximize performance.

"We are very excited to be joining Bachmann," said Martin von Mutius, head of the new retrofit team. "We want to grant independence to our customers, giving them the most

from their turbines. This means durable, long-lasting automation solutions ensuring continuous productivity throughout turbine lifetimes; exactly what Bachmann provides."

Bachmann electronic, a global automation company with headquarters based in Feldkirch, Austria, has been optimizing customer productivity and profit for 50 years. With more than 20 years' experience in the wind market and as the leader in wind-energy automation, Bachmann provides the highest quality, durability, and reliability to one in three turbines worldwide.

Open and flexible communication standards, integrated machine health monitoring and web-based visualization are just part of the total solution Bachmann offers its customers. Continuous innovation and accumulated engineering know-how safeguard suc-

cess and build trusted partnerships between Bachmann and its customers for generations to come.

MORE INFO www.bachmann.info/en/industries/wind-power

MAINTENANCE

Rope Partner gets new investors for turbine service demand

Rope Partner, Inc., an international leader in wind-turbine blade repair, maintenance, and performance-enhancing services, has been acquired by funds advised by Magnesium Capital LLP (Magnesium).

In the last decade, the global wind market has rapidly expanded, with the majority of operating capacity installed since 2009. Providing the required operations and maintenance (O&M) services for these existing turbines as they enter the second half of their design life creates an evolving need for high-quality wind technicians to efficiently and safely service this sector.

With the global wind industry forecast to more than double by 2027 (adding 65 GW annually), the global O&M market is projected to be a \$21 billion market by 2025. The offshore market alone is expected to grow by 17 percent annually, to more than \$12 billion by 2028. This investment will support Rope Partner's continued work to provide the expanding market with the high-quality services critical to supporting and accelerating the transition to a clean energy economy. This includes strategic growth plans in North America and abroad, with Europe and Latin America already identified as key growth markets.

"Since our beginnings in 2001, we have become the leader in the space and have a global reputation, with our services relied on by many of the world's largest wind-energy owners

and manufacturers," said Eric Stanfield, Rope Partner CEO. "This next phase of growth is a very exciting time for us. We see many opportunities in the North American market, both onshore and offshore, and also in Europe and Latin America, where our customers already have wind turbines operating."

Rope Partner, headquartered in Santa Cruz, California, is recognized internationally as the premier at height service provider of repair, maintenance, and performance-enhancing services for wind-turbine blades. With more than 100 highly qualified technicians, the company counts among its clients more than 40 blue chip wind-energy asset owners and OEMs in North America and abroad, and, over two decades, has developed an unparalleled quality and safety record. In the last 18 years, the company's technicians have completed several thousand

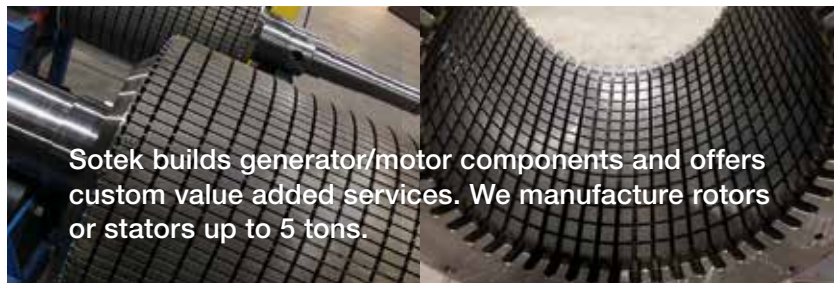
projects for every major manufacturer and a majority of the wind-farm owners in North America.

"The industry has evolved significantly over the last several years," Stanfield said. "As the wind farms mature along with the market, customers are placing additional focus on the condition of their blades. As such, it is important for us to keep innovating to safely deliver value to our customers. In Magnesium, we have found a partner with a deep understanding of our core market, an established network in Europe, and the financial backing to respond to our customers' requests. With this infusion of capital, we can develop new services and expand internationally, including through potential acquisitions to consolidate what today remains a fragmented sector."

"Eric and his team have developed a great company over the years with a strong culture of safety, quality, and



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environmental sustainability that is committed to maximizing uptime and ROI for its customers,” said Magnesium’s managing partner Ian Jones, who joins the board of Rope Partner. “The focus on optimizing wind-turbine performance will help accelerate the energy transition by supporting the decarbonization of the electricity system. We look forward to working with Eric and his team through its next

phase of growth.”

“We are delighted to partner with Magnesium and Rope Partner to support the team’s continued growth plans,” said Andrew Carnwath, director of Private Equity at BMO Global Asset Management. “The company has established an unrivaled reputation within the industry, and it is now well placed to benefit from growth in the wind sector and increasing focus on

blade maintenance. We are therefore confident that our investment will provide our investors with a market leading return and have a wider positive impact through growth in sustainable and affordable renewable energy and high skilled job creation.”

MORE INFO www.ropepartner.com

▀ MAINTENANCE

Pure Safety Group introduces stronghold quick-switch system

Pure Safety Group (PSG) recently launched the Stronghold® Quick-Switch® Tool Tether System for the prevention of dropped objects during work at height. The system is based on the proprietary Quick-Switch design, the only technology that allows workers to switch tools from one connection point to another in a single motion to provide a level of dropped objects safety unmatched in the industry.

The Quick-Switch system keeps tools connected at all times, including when they are transferred or handed off. With Quick-Switch, tools can be carried, managed, and used at height while protecting people and property below. The Quick-Switch system gives workers the flexibility to use multiple tools at their work areas and switch tools, all while keeping them connected through a patented combination of keys, links, and anchors. Keys allow the use and manipulation of the tools. Links are the mechanism that allows the switching of locations of tools. Anchors are the points that support the tool in the event of a drop.

The Quick-Switch system components include:

- ▀ Quick-Switch Starter Pack that includes everything needed to get started with the Quick-Switch system: four Quick-Switch Links, one Quick-Switch Bungee Tether, and one Quick-Switch Wrist Cuff.

- ▀ Quick-Switch Link and Dock: Links are paired with tools and are the



Rope Partner is recognized internationally as the premier at height service provider of repair, maintenance, and performance-enhancing services for wind-turbine blades. (Courtesy: Rope Partner)



The Quick-Switch system keeps tools connected at all times, including when they are transferred or handed off. (Courtesy: PSG)

mechanism that makes Quick-Switch the only tethering system in the world that allows movement of tools from one place to another without ever having to be untied. Each link comes with its own dock.

- ✔ Quick-Switch Wrist Cuff.
- ✔ Quick-Switch Bungee Tether, for tethering tools to a belt or fixed structure.
- ✔ Quick-Switch Retracting Tether for retractable applications.
- ✔ Quick-Switch Apron for use over handrails and railings.
- ✔ Quick-Switch Rotating Dock: the anchor point for the Quick-Switch system that can be used on pouches and tool pockets.
- ✔ Quick-Switch Tethered Tool Bucket and Bolt Bag and Tool Holder to contain anchors.

“According to the National Safety Council, every 10 minutes someone is injured because of a dropped tool,” said Matt Moreau, product manager, dropped objects and foreign material exclusion (FME). “Until now, there was no way to transfer tools, hands-free, and maintain 100 percent tie-off.”

Moreau notes that the Quick-Switch products meet the latest OSHA and ANSI standards for drops prevention.

The new Quick-Switch system is the first product launch for PSG’s newly

branded Stronghold family of dropped objects prevention line. Stronghold is the brand that evolved from Ty-Flot, which was the company PSG acquired

in 2018. Stronghold is one of three PSG brands that also includes Guardian® Fall Protection and Checkmate®, both fall protection product brands. Products from all three brands are increasingly available throughout the world, as part of PSG’s recent global expansion.

MORE INFO www.puresafetygroup.com

CONSTRUCTION

Northstar, IntelStor partner to quicken segmented tower tech

Northstar Endeavors LLC of Omaha, Nebraska, recently signed an agreement with IntelStor LLC to provide services related to the commercial adoption of Northstar’s segmented wind-turbine tower technology.

The wind turbine tower market has


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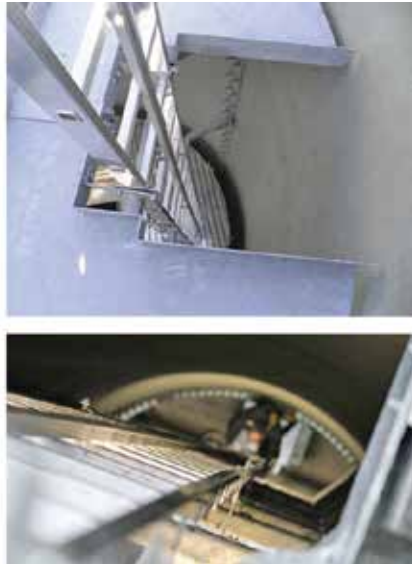
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The Northstar design can be factory pre-assembled in segments and shipped to a project site on standard flatbed trucks instead of extra-long, heavy hauler trucks typically required for a conventional wind turbine tower. (Courtesy: Northstar Endeavors)

long been dominated by conventional conical steel tube towers. As the industry seeks to exploit lower speed wind regimes with an emerging generation of larger wind turbines, new solutions for an economical wind turbine tower that is both tall and transportable will be required.

The benefit of the Northstar design is that it can be factory pre-assembled in segments and shipped to a project site on standard flatbed trucks instead of extra-long, heavy hauler trucks typically required for a conventional wind turbine tower.

This eliminates the need for special permits and eliminates the need for height restrictions for bridges and tunnels during tower transport. That opens up the economic viability of more wind-turbine project sites globally by reducing total installed cost.

Recent independent research indicates that the total transportation and installed cost of a segmented tower can actually be significantly less costly than other commercial solutions due largely to these lower transportation costs.

For truck transport, the logistics cost on a segmented tower can actually be between 50 and 80 percent cheaper than a conical steel tube tower of the same hub height due to the

avoidance of heavy haulers in favor of standard flatbed trucks that require no special permits.

The savings on the transportation costs are further augmented by the reduction in installed costs, which can add up to an additional 14 to 23 percent depending on project site logistics and tower height. In spite of some need for on-site tower assembly, the pre-fabricated tower segments are simple to manipulate and do not require construction personnel to be suspended at height to complete any fittings.

Additionally, due to the segmentation of the tower, the tower base diameter can be allowed to expand between 6 to 8 meters depending on hub height. This wider base allows for better loads distribution and less material usage, which can lead to a cost savings which is upwards of 12 to 18 percent versus a conventional conical steel tube tower of the same height.

This can result in a total cost reduction of between 31 and 48 percent for a reference tower with hub heights of 120 to 160 meters using Northstar technology versus a steel tube tower or concrete / steel tube hybrid tower of the same hub height.

“We’re pleased to be partnered with IntelStor on this project, and this tech-

nology has been developed for more than a decade and proven through the installation of a prototype,” said Jeff Willis, president of Northstar Endeavors. “Our DNV GL certified design for a hub height of 80 meters allows us to serve as a bankable, verifiable option for the next decade of global wind energy growth.”

The Northstar tower technology is scalable for hub heights above 160 meters, which will become more common as project developers seek to repower projects or install new wind turbines that are 5-MW plus.

According to the agreement, IntelStor will be responsible for pursuing a technology license or asset acquisition agreement with a technology commercialization partner. Negotiations are already underway with interested parties, including tower vendors, wind turbine OEMs as well as EPC contractors in multiple countries.

MORE INFO www.intelstor.com/nda

INNOVATION

Aerox to market its leading-edge protection system

The company Aerox has just brought to market its leading-edge protection system for wind turbine blades; 20 months of work have been necessary to scale up the manufacturing and application processes of Aerox AHP LEP



The European Commission selected the project in 2018 to be funded under the SME Instrument scheme of the Horizon 2020 program. (Courtesy: Aerox)

System, the innovative solution of the company for the protection against erosion of the leading edge of wind turbine blades.

Aerox has accomplished the main objectives of the LEP4BLADES project, developing new manufacturing and application processes that have been validated by wind turbine OEMs and service companies.

“This project has been a success for the company, something that could not have been possible without the collaboration of renowned international institutions such as ORE Catapult, University of Limerick, and University CEU Cardenal Herrera of Valencia as well as the support of reference industrial partners in the sector,” said Raúl Cortés, Aerox CEO.

The results of the work carried out in collaboration with the Spanish service company GDES Wind were revealed at the Wind Turbine Blade Manufacture Conference in Dusseldorf last December. The conference, sponsored by Aerox in the 2019 edition, is the most important international industry event on design, materials, production and performance of wind-turbine blades.

MORE INFO www.aerox.es

▀ INNOVATION

Onyx Insight, Castrol partner to deliver oil sensor study

ONYX InSight, a leading provider of predictive maintenance to the wind industry, together with Castrol, one of the leading experts in industrial lubricants, has embarked on a multi-phase study designed to uncover the potential of combining oil and vibration data on the accuracy of wind turbine health monitoring.

With the objective to bring the most innovative and advanced predictive maintenance solution to the wind industry market, ONYX InSight and Castrol have completed laboratory



Combining oil data with vibration data may offer significant diagnostic advantages that improve maintenance planning across a turbine or fleet when deployed together with machine learning and engineering expertise. (Courtesy: ONYX InSight)

testing to measure the effectiveness of sensors to the changing conditions of oil in a simulated wind-turbine environment. The tests were carried out using a range of oil-sensor technologies, with each sensor type tested in multiple oils from three separate vendors to ensure comprehensive results.

The second phase is now in progress and has seen a rigorous program of oil-sensor installations in a commercial wind farm. Data from the field shows excellent correlation between oil sensor and vibration condition monitoring system (CMS) outputs relating to a developing gearbox bearing failure — giving operators even more confidence in the detection algorithm. The trials are helping ONYX InSight and Castrol refine new approaches for an advanced, integrated CMS by combining data from oil condition, vibration sensors and supervisory control and data acquisition (SCADA) systems.

The pioneering study comes in response to the industry’s need to increase efficiencies to help lower levelized cost of energy. The businesses believe that combining oil data with vibration data offers significant diagnostic advantages that improve maintenance planning across a turbine or fleet when deployed together with machine learning and engineering expertise.

“Current predictive maintenance solutions can already offer significant O&M cost-savings,” said Bruce Hall, CEO, ONYX InSight. “By adding an additional data stream through com-

binning oil and vibration data, accuracy increases. This allows our customers to generate even higher cost savings.”

“As wind farms find their profits increasingly squeezed in the post-subsidy market, it is vital to enable O&M teams to drive maximum operational efficiencies using the latest technology,” he said. “To continue to innovate and improve predictive maintenance best practice, we need to understand how oil and vibration data can be combined to provide the most accurate insights to enable us to best support our customers’ O&M teams.”

“As we work toward a more sustainable future, an important part of our strategy is to ensure that renewable energy sources, such as wind power, can achieve maximum efficiency and performance,” said Phil Booker, international application engineer, Castrol. “We have been at the forefront of supplying best-in-class carbon neutral lubricants to extend wind-turbine lifecycles. Now we are working with ONYX InSight to ensure that O&M teams have the knowledge they need to help propel growth in wind energy.”

The study comes as ONYX InSight prepares to launch the first in a series of digitalization reports that incorporates key findings from the combined oil sensor study along with additional research, to help companies rationalize the volume of data in the wind industry to help unlock the benefits of digitalization.

MORE INFO onyxinsight.com

▀ INNOVATION

OFS announces new vibration sensor fiber

OFS, a leading designer, manufacturer, and supplier of innovative fiber-optic products, recently introduced its AcoustiSens Wideband single-mode vibration sensor fiber. The fiber is designed to enhance distributed acoustic sensing (DAS) systems.



AcoustiSens Wideband single-mode vibration sensor fiber is based on the ITU-T G.657.A1 waveguide for enhanced bend insensitivity and includes an expanded operating band to ensure interoperability with all known DAS interrogators. (Courtesy: OFS)

Improving on recent AcoustiSens products, Wideband is based on the ITU-T G.657.A1 waveguide for enhanced bend insensitivity and includes an expanded operating band to ensure interoperability with all known DAS interrogators. AcoustiSens optical fiber, when coupled via sensing cables to commercially available DAS systems, enables significant improvements in acoustic signal-to-noise ratio (ASNR) through dramatic gains in the optical signal-to-noise ratio (OSNR) of the fiber. Splice-compatible with ITU-T G.657 and G.652.D telecom-standard fibers, AcoustiSens Wideband fibers simplify sensor fiber selection while improving system performance.

“Adding to the original AcoustiSens advantages of enhanced Rayleigh backscatter with low loss, we now include improved bend-insensitivity and a much wider operating band,” said Mike Hines, market manager for OFS. “AcoustiSens helps by meeting the challenge of greatly increasing Rayleigh backscatter while maintaining low attenuation, thereby improving OSNR within the fiber. This translates to dramatic improvements in DAS ASNR at the systems level.”

“The OFS specialty team is uniquely positioned to support development of next generation DAS systems with AcoustiSens as an enabling component,” said Adam Hokansson, OFS fiber value stream manager. “By adding im-

proved bend insensitivity, design and manufacturing of DAS sensing cables is simplified. Furthermore, by expanding to an operating band of 1,536-1,556 nm, AcoustiSens Wideband is now compatible with all known DAS interrogators.”

MORE INFO www.ofsoptics.com

INNOVATION

HARTING, Expleo Group cooperate on IoT solutions

The HARTING Technology Group and Expleo concluded a cooperation agreement at the SPS Trade Fair 2019 in Nuremberg. The agreement was signed by Philip Harting, chairman of the Board of the HARTING Technology Group, and Peter Seidenschwang, head of Industry at Expleo Germany GmbH.

It is a reaffirmation of the long-term cooperation by the two parties in the area of data-controlled services and IoT solutions for industrial customers. HARTING is offering the modular edge computing MICA®, which has been designed according to industrial standards for multiple industrial applications, and Expleo is contributing its know-how in connectivity and data-scientific competence.

The joint memorandum of understanding by the management of both



At the HARTING stand at the SPS 2019, Expleo's Industrie 4.0 Showcase demonstrated how production data can be compiled by the edge computing device MICA and evaluated in the SmartANIMO application. (Courtesy: HARTING)

companies is the culmination of many years of successful cooperation in MICA.network, the user organization supporting HARTING's edge computing system MICA®. Expleo has been involved in the network since 2016, working on the development of a solution for the process and operational optimization of machines and production systems. On the basis of compiled data, the SmartANIMO application from Expleo can independently learn the standard behavior of connected production lines and individual machines and use this know-how to identify deviations in the process without manual interventions.

Detecting any upcoming problems at an early stage means that the overall efficiency of the system can be improved with a focus on predictive quality or predictive maintenance. The robustness and flexibility of MICA® also enables Expleo to implement the solution in industrial environments and to retrofit existing production systems non-invasively.

MORE INFO HARTING-usa.com

MANUFACTURING

Vestas secures 155 MW order from Stena Renewables AB

Vestas recently secured a 155 MW order from Stena Renewables AB for the Åby-Alebo wind energy project. Located in Mönsterås Municipality, the project will be the largest wind energy project in the southern part of Sweden.

To maximize the project's power production, Vestas has developed a customized wind energy solution that features 36 V150-4.2 MW turbines in 4.3 MW power optimized mode.

The order underlines the strong relationship between Vestas and Stena Renewables AB as well as Vestas' leading position in the Swedish wind energy market where the company today has installed more than 4.2 GW of wind turbines.

“Stena and Vestas have a strong and long relationship that goes back 15 years,” said Peter Zachrisson, CEO Stena Renewable AB. “Vestas has proven to deliver high availability in our operating assets, which is the result of high-quality products and strong performance in the daily operations. We believe that the optimized V150 is a very good fit for the Åby-Alebo project, and we look forward to develop our strong relationship in this specific project.”

“We are delighted to continue our strong collaboration with our valued business partner Stena Renewables AB,” said Nils de Baar, president of Northern & Central Europe. “This order further strengthens our market-leading position in the Nordics and also emphasizes our ability to deliver energy solutions that offer the lowest cost of energy to the Swedish energy consumers.”

The project will feature a VestasOnline® Business SCADA solution, lowering turbine downtime and thus optimizing the energy output. The contract also includes supply, installation, and commissioning of the wind turbines, as well as a 30-year Active Output Management 5000 (AOM 5000) service agreement.

Turbine deliveries are expected to begin in the second quarter of 2021, while commissioning is planned for the third and fourth quarter of 2021.

MORE INFO www.vestas.com

MANUFACTURING

Luxcara, Vestas agree to close turbine supply for 160 MW in Finland

Luxcara, an independent asset manager in the global renewable energy market, and Vestas have closed turbine supply agreements and long-term service agreements for the three wind projects Vålikangas, Pihtipudas, and Sievi. Vestas has developed a customized wind energy solution that features 38 V150-4.2 MW turbines with

site specific towers, capable of optimizing annual energy production and offering competitive levelized cost of energy.

“We are very much looking forward to working together with Vestas on our Finnish portfolio,” said Dr. Philip Sander, managing partner of Luxcara. “We are convinced that the projects will benefit from Vestas’ expertise in the Nordics and that the selected turbines will ensure the best possible use of the very good wind conditions to produce clean and sustainable energy.”

“I would like to thank our customer, Luxcara, for the confidence they have shown in the capabilities of our 4-MW platform and our services,” said Christer Baden Hansen, vice president, sales North & West, Vestas Northern & Central Europe. “We believe that the three projects will benefit from the V150-4.2 MW turbine’s extremely competitive levelized cost of energy and its perfect fit with the site’s wind conditions. The order affirms the competitiveness of

Vestas’ wind power solutions and that wind power provides an attractive long-term energy investment, capable of delivering beyond its climate and sustainability benefits.”

The wind projects are in the Northern Ostrobothnia region and benefit from favorable wind conditions near the shore.

Together they will provide more than 140,000 households with clean energy. The wind projects have been acquired for a portfolio for institutional investors advised by Luxcara.

The contract includes supply, installation, and commissioning of the wind turbines, as well as a 25-year Active Output Management 5000 (AOM 5000) service agreement. The project will feature a VestasOnline® Business SCADA solution to lower turbine downtime and optimize the energy output. Turbine delivery is scheduled for the second quarter of 2021. ↵

MORE INFO www.vestas.com

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