

*Giving Wind Direction*

# WIND SYSTEMS

**inFOCUS:**

## **O&M: Maintenance, Condition Monitoring**

» **Profile:  
Valley Forge & Bolt**



JUNE 2017

# Proven Quality.

## Pitch Control Slip Ring Advantages:

- High reliability
- Maintenance free
- Minimal wear debris generated
- No lubrication required
- Wide operating temperature range
- Reliable data transfer
- Lower life-cycle cost
- Proven fiber brush technology



Moog has developed direct replacement pitch control slip rings for today's wind turbines. The slip ring provides reliable transmission of power and data signals from the nacelle to the control system for the rotary blades. The slip ring operates maintenance free for over 100 million revolutions with field demonstrated performance.

Moog's proven fiber brush technology has become synonymous with high performance slip rings around the world. With over 50 years of experience and more than 10,000 slip ring designs, our engineers work together with your design team to find a solution that is right for you.

**Moog solutions for wind power also include: alternators, generators and control systems.**



+1-540-552-3011

800-336-2112 (USA)

mccg@moog.com

[www.moog.com/components](http://www.moog.com/components)

**MOOG**  
COMPONENTS GROUP

www.abaris.com

# Take our course and become a fan



**R-5 Advanced Composite Windblade Repair: 5 Days, \$2,295**

**Jul 31-Aug 4 or Dec 4-8**

+1 (775) 827-6568 • [training@abaris.com](mailto:training@abaris.com)

**ABARIS**  
TRAINING



14

## Approaching Zero Downtime

*ServiceMax uses the Internet of Things in the field to help companies save money, resources, and improve customer satisfaction.*

## ALSO IN inFOCUS

- 18** Maintaining the Green-Energy Progress
- 26** Company Profile: Valley Forge & Bolt
- 30** Conversation with Doug Herr with AeroTorque

**ONSITE BOLTING SERVICES DONE RIGHT.  
ANYTIME. ANY WHERE...  
even when day looks like night.**

## **WIND ENERGY SOLUTIONS**

- ACCELERATED TORQUE AND TENSION SERVICES
- TURNKEY BOLTING SERVICES
- COMPLETE OEM TORQUE AND TENSION SYSTEMS
- BOLTING CONSULTATION SERVICES
- ISO 17025 ACCREDITED CALIBRATION SERVICES
- REPAIR SERVICES FOR MOST TOOL MODELS
- ERAD DIGITAL TORQUE CONTROL SYSTEMS
- ELECTRIC GEAR TURNING SYSTEMS
- WTG SPECIFIC BOLT TENSIONING SYSTEMS
- HYDRAULIC WRENCH SYSTEMS
- WTG SPECIFIC SELF LOAD INDICATING FASTENERS

*extreme bolt working solutions*

# SECTIONS

Volume 09 Issue 06



## DIRECTION

Building Energy's First Wind Farm Begins Operations

8



## INNOVATION

Sentient Science Partners with Sandia National Laboratories and NREL

32



## MANUFACTURING

GE Completes Acquisition of LM Wind Power

36



## CONSTRUCTION

Seacat Services Launches Two Vessels Under New Code

40



## CROSSWINDS

WoWE becomes WRISE as it expands its focus to all renewables and broadens its core philosophy

45



*Wind Systems* (ISSN 2327-2422) is published monthly by Media Solutions, Inc., 266D Yeager Parkway Pelham, AL 35124. Phone (205) 380-1573 Fax (205) 380-1580 International subscription rates: \$72.00 per year. Periodicals Postage Paid at Pelham AL and at additional mailing offices. Printed in the USA. POSTMASTER: Send address changes to *Wind Systems* magazine, P.O. Box 1210 Pelham AL 35124. Publications mail agreement No. 41395015 return undeliverable Canadian addresses to P.O. Box 503 RPO West Beaver Creek Richmond Hill, ON L4B4R6. Copyright 2006 by Media Solutions, Inc. All rights reserved.



**EXPERIMENTS  
BELONG IN A LAB**

**NOT  
IN YOUR TURBINE.**

The right oil shouldn't be a guessing game.  
Maximize your ROI with AMSOIL PTN 320,  
one oil, no guessing.

- Specifically formulated to meet the needs of wind turbines, addressing the areas where others failed.
- OEM approved, customer verified for over 8 years with an industry leading warranty.



**DEVOTED TO PROTECTION™**

**NO ADDITIONAL  
TOP TREATS NEEDED**

FIND OUT MORE AT [AMSOILWIND.COM](http://AMSOILWIND.COM)

# EDITOR'S DESK

JUNE 2017

## Wind Developments Keep Coming

There's been a lot going on in the wind industry over the last few months.

Maryland recently became an offshore wind contender when its PSC awarded offshore renewable energy credits to US Wind and Skipjack Offshore Energy, LLC to build 368 MW of wind projects. Those projects will create almost 10,000 new jobs. Looks like Block Island Wind won't be alone for long.

Another interesting development has been the rebranding of Women of Wind Energy (WoWE). The nonprofit organization has expanded its core philosophy and become Women of Renewable Industries and Sustainable Energy (WRISE). Its goals with wind are still there, but it's adding other aspects of renewable energy to its outreach to get and keep women in renewables beyond wind.

In this month's Crosswinds, you can read more about WoWE's evolution to WRISE as well as how the organization began 12 years ago.

In the June issue of *Wind Systems*, we're also focusing on maintenance and condition monitoring, and with that, we're bringing some fascinating information dealing with maintenance and how to keep those O&M costs down.

Our company profile is on Valley Forge & Bolt. That company has had a hand in many industries over the course of its 40-year history, and now, it's wanting to break into the wind industry with some of its patented fasteners designed to lower O&M costs.

An expert with ServiceMax discusses how his company is modernizing field service with wireless technology.

Maintenance is sometimes literally the nuts and bolts of the wind industry, so it's important that once those assets are spinning, that they keep spinning as efficiently, and as long, as possible.

That's just a sample of what you'll discover in this issue that illustrates the ways companies are trying to modernize and advance wind maintenance. I hope you enjoy it.

And, as always, thanks for reading!



**Kenneth Carter, managing editor**  
*Wind Systems* magazine  
editor@windsystemsmag.com  
(800) 366-2185, ext. 204



## AWEA Reports Strong Industry Statistics

Courtesy of AWEA

- The U.S. wind industry added jobs nine times faster than the overall U.S. economy in 2016.
- Each new modern wind turbine supports 44 years of full-time employment over its life span.
- More new wind energy was installed during the first quarter of 2017 than any first quarter since 2009.
- Earlier this year, North Carolina became the 41st state with a utility-scale wind farm.
- The U.S. now has enough installed wind capacity to power 25 million homes.

The American Wind Energy Association (AWEA) is the premier national trade association that represents the

interests of America's wind energy industry. For more information, go to [www.awea.org](http://www.awea.org)



Giving Wind Direction

# WIND SYSTEMS

## SEEKING OPPORTUNITY?



Scan **Wind Systems** website to enjoy a host of features, including:

- Our new jobs listing, for employers and jobs seekers alike
- Events calendar to keep you informed
- A searchable articles archive, downloadable individually
- View the digital magazine, or download entire issues
- Vendor listings, along with our annual Buyer's Guide
- Company profiles and Q&As
- Connect to the wind industry through social media
- Wind industry news from around the world

Visit [windsystemsmag.com](http://windsystemsmag.com) today and get connected!

## Building Energy's First Wind Farm Begins Operations



Building Energy's Iowa wind facility consists of 10 3.0 MW geared onshore wind turbines. (Courtesy: Building Energy)

Building Energy SpA, a multinational company operating as a global integrated IPP in the Renewable Energy Industry, through its subsidiary Building Energy Wind Iowa LLC, recently announced the inauguration of its first wind farm in Iowa, which adds up to 30 MW of wind-generation distribution capacity. The project, north of Des Moines, will generate approximately 110 GWh per year.

The beginning of operations was celebrated on the Wind of Life event in Ames, Iowa, attended by Andrea Braccialarghe, MD America of Building Energy; Alessandro Bragantini, chief operating officer of Building Energy; Giuseppe Finocchiaro, Italian consul general; and George Revock, managing director and head of alternative energy and project finance at Capital One Bank.

The overall investment in the construction of the Iowa distribution generation wind farms amounted to \$58 million, and it sells its energy and related renewable credits under a bundled, long-term power purchase agreement with a local utility. Capital One Bank is committed to a tax equity contribution of approximately \$33 million to the project.

The wind facility, developed, financed, owned, and operated by Building Energy, consists of 10 3.0 MW geared onshore wind turbines, each with a rotor diameter of 125 meters mounted on an 87.5-meter steel tower.

The energy generated will power 11,000 U.S. households every year while avoiding the emission of about 70,000 tons of CO<sub>2</sub> emissions according to U.S. Environmental Protection Agency methodology, which is equivalent to taking 15,000 cars off the road each year.

Besides the environmental benefits, the wind farm also has advantages for the local communities, providing it with clean energy and creating jobs for local Iowans. The project involved more than a hundred of local skilled workers during the construction phase. Some of those jobs will be permanent as necessary

# CASTROL® OPTIGEAR® SYNTHETIC CT 320

Castrol's ashless option introduced over 10 years ago and protecting 25,000 megawatts globally...and growing every day.

- Lowest water ppm in the market – 7 year field average 76 ppm
- Higher viscosity index and long-term viscosity stability to provide increased protection over a wider temperature range
- Superior micro pitting protection and foam control that outperforms other competitive oils
- Ease of changeover from other competitive oils. Can cut labor and downtime costs up to 50% on conversion

**Contact our expert engineers to discuss how Castrol can extend oil change out intervals and reduce O&M costs.**

**Learn more at [Castrol.com/windenergy](http://Castrol.com/windenergy) or 1-877-641-1600.**



for the operation and maintenance activities as well as for additional services such as delivery, transportation, spare parts management, landscape mitigation, and further environmental monitoring studies. The developmental stage of the wind farm required a vast number of studies, including environmental surveys, title surveys, engineering studies, and wind-resource studies, that were carried out by local engineering firms, law firms, and various advisers such as a local university.

The company has been present in many states since 2013 with more than 500 MW of projects under development, spread across different renewable energy technologies.

“We are extremely proud to begin operations of our first wind farm in Iowa and to celebrate with the whole Iowa community through this inauguration ceremony,” Braccialarghe said. “Taking advantage of the strong wind resources in the state of Iowa, the project has been bringing benefits to the local economy with new job positions since the projects’ developmental stage and will continue to do so throughout the life of the plants. The wind farm will span six different towns, Huxley, Kelley, East Ames, East Nevada, Grinnell, and Alden, in order to provide renewable energy to as many local communities as possible respecting the environment without impacting residential areas or conflicting with agricultural or livestock activities, while at the same time keeping electricity rates stable and affordable.”

*Source: Building Energy*

For more information, go to [www.buildingenergy.it](http://www.buildingenergy.it)



Broadview Wind has the capacity to generate 324 MW of energy. (Courtesy: Pattern Energy Group)

## Pattern Energy Acquires Broadview Wind

Pattern Energy Group Inc. has acquired interests in the two wind projects that comprise the 324 MW Broadview Wind power facilities and associated independent 35-mile 345 kV Western Interconnect transmission line from Pattern Energy Group LP for \$269 million, consisting of cash consideration of \$215 million and an assumed project loan of \$54 million. Broadview, located 30 miles north of Clovis, New Mexico, commenced commercial operations in late March.

“This extraordinary project brings inexpensive renewable power from eastern New Mexico, one of the highest wind areas in the West, using dedicated transmission capacity from several transmission systems into California,” said Mike Garland, president and CEO of Pattern Energy. “Broadview’s production complements production from California’s domestic renewable resources helping California transition to a carbon-free, low-cost, renewable grid. We are especially

excited to bring this project on line because Pattern Development is actively developing several significant opportunities in New Mexico and the southwest U.S. as part of the region’s increasing demand for low-cost, renewable energy. These new opportunities will be subject to our ROFO as part of our relationship with Pattern Development.”

Pattern Energy has acquired from Pattern Development 1.0 an 84 percent initial cash flow interest in Broadview and a 99 percent ownership interest in Western Interconnect. Institutional equity investors have acquired from Pattern Development 1.0 a 16 percent initial cash flow interest in, and a 99 percent initial taxable income allocation from, Broadview. Following the acquisition, based on its initial cash flow share, Pattern Energy retains an owned interest of 272 MW in Broadview. Pattern Energy’s commitment to own and operate the facility was a core component of securing high-quality

institutional equity investors for the project financing.

Pattern Energy acquired Broadview and Western Interconnect for \$269 million, including cash consideration of \$215 million and an assumed project loan of \$54 million secured by Western Interconnect. The cash consideration was funded from available corporate liquidity. The Western Interconnect loan commitment was originally secured at the time of the agreement to acquire Broadview in June 2016. The interest on the debt is 90 percent swapped over the 19-year amortization term. The debt has a maturity of 10 years.

Broadview will begin receiving both pay-as-you-go (“PAYGO”) contributions from Broadview’s tax equity investors and certain New Mexico production tax credits starting in 2018. Based on the expected timing of these cash flows and assuming normal wind conditions, Pattern Energy expects the CAFD contribution, after deduction of Western Interconnect financing costs, to be \$18 million in 2018 and to increase approximately \$2.5 million a year thereafter through 2022. This results in a five-year average CAFD of \$23 million per year and a 9.3x CAFD multiple, based on the cash consideration of \$215 million paid to acquire Broadview and Western Interconnect.

Broadview consists of 141 Siemens 2.3 MW wind turbines and has the capacity to generate 324 MW of energy, the power equivalent to the annual energy usage of approximately 180,000 California homes. Broadview is limited to 297 MW of injection capacity at Broadview’s transmission interconnection point.

Broadview has entered into two 20-year power purchase agreements (“PPAs”) with Southern California Edison (“SCE”), which has a BBB+/A2 credit rating, for sale of 100 percent of the output, up to a total of 297 MW, which has been factored into Broadview’s economics.

Broadview interconnects to the Western Interconnect transmission project, a 345 kV transmission line, approximately 35 miles in length. To wheel the output from Broadview to the California Independent System Operator system where it is delivered to SCE, Broadview has entered into long-term, firm, point-to-point transmission service agreements to move the output through the Western Interconnect, Public Service of New Mexico and Arizona Public Service transmission systems. ↴

*Source: Pattern Energy Group*

For more information,  
go to [patternenergy.com](http://patternenergy.com)



The Vormark wind farm in Brandenburg, Germany.  
(Courtesy: CEE Group)

## CEE Group Acquires 27.6 MW Wind Farm in Brandenburg

CEE, the Hamburg-based private equity group, continues to expand its wind power portfolio in Germany with eight wind turbines in the Vormark wind farm in Brandenburg. The seller is a consortium consisting of the Danish company European Energy A/S and the Berlin-based Green Wind Energy GmbH.

The wind farm consists of eight turbines (type Vestas V126, 3.45 MW). The hub height is 137 meters with a rotor diameter of 126 meters. The overall capacity of the wind farm 27.6 MW. The turbines, commissioned in February and March, will supply environmentally friendly power to about 21,000 households. CEE Operations, which manages the CEE Group’s power plant portfolio, is responsible for the commercial operations. Green Wind Operations GmbH, a sister company of Green Wind Energy GmbH, will assume responsibility for technical operations.

“We are pleased to have grown further in our core German market by acquiring the Vormark wind farm,” said Detlef Schreiber, CEE Group’s CEO. “After the acquisition of the Gollenberg wind farm a few months ago, this renewed expansion of our overall portfolio underlines the CEE Group’s strong position in a competitive market.”

“To acquire a wind project of this size in the current market environment is a very positive start to 2017 for our investors and for us,” said Jens Schnoor, the responsible investment director of CEE Management. “We hope that this first transaction with European Energy A/S and Green Wind Energy marks the beginning of a longer period of collaboration.”

“We are focusing increasingly on the repowering of old turbines, and in Gross Pankow we have doubled the megawatt capacity by deploying new, highly efficient turbines,” said Martin Kühn, managing director of Green Wind Energy GmbH and project developer of the wind farm. “Green Wind, together with European Energy, has found a strong partner in the CEE Group, which pursues a sustainable energy policy. In our view, repowering will also play a significant role in this connection even after the introduction of the new Renewable Energies Act (EEG).”

“With the successful implementation of the project in Vormark, we were once again able to demonstrate our expertise in the German market as one of our core markets,” said Knud Erik Andersen, managing director and main shareholder of European Energy A/S. “In addition, the project testifies to our expertise in the field of repowering. We are pleased to collaborate with experienced partners such as the CEE Group and Green Wind Energy and also see new opportunities for cooperation in the future.”

Following the acquisition of the Vormark wind farm, the CEE Group’s renewables portfolio has grown to about 585 MW. In 2017, CEE’s energy parks will probably generate around 920,000 MWh of electricity from renewable sources. ↴

Source: CEE Group

For more information, go to [www.ceegroup.net](http://www.ceegroup.net)



The Buffalo Bill Center of the West’s exhibition showcases a broad range of efforts underway to ensure the golden eagle remains a vital component of western ecosystems and our natural heritage. (Courtesy: Moosejaw Photography)

## Eagle Exhibition Gets Duke Energy Grant

The Buffalo Bill Center of the West received a \$50,000 grant from Duke Energy Foundation in support of Monarch of the Skies, an exhibition about golden eagles and their habitats. The project presents the natural and cultural history of the golden eagle and its conservation in Greater Yellowstone and western United States.

The exhibition is slated to open in spring 2018.

Charles R. Preston, wildlife scientist and the center’s Willis McDonald IV senior curator of the Draper Natural History Museum, leads the design effort.

“This exhibition provides a wonderful opportunity to share the adventure, results, and application of scientific research by our own team and by others across the western United States,” Preston said. “And we are delighted to receive this support from Duke Energy, an important stakeholder and contributor to golden eagle conservation for the future.”

“Golden eagles thrive in some of the windiest places in the country, which include the open plains of Wyoming,” said Tim Hayes, Duke Energy Renewables environmental director. “This same abundant wind resource can be tapped to make clean and increasingly affordable electricity, but this overlap sometimes creates a conflict between golden eagle habitat and wind farms. Our primary focus for several years has been figuring out a way for wind turbines and eagles to coexist.”

Based on a decade of extensive field research conducted by the Center’s Draper Natural History Museum, the eagle exhibition immerses visitors in the power, beauty, and cultural and ecological significance of North America’s most powerful raptor. The exhibition integrates interpretive text, graphic panels, and audiovisual components with interactive features. In addition, the project’s plan includes stunning photographs, a

“ We are delighted to receive this support from Duke Energy, an important stakeholder and contributor to golden eagle conservation. ”

reproduced sandstone cliff nest site, three-dimensional models, mounted specimens, and Plains Indian ethnographic objects.

Golden eagle strongholds in sagebrush grasslands are undergoing rapid changes, and scientists are concerned about the impacts on eagles and associated wildlife. The “Challenges and Opportunities” section of the exhibition is designed to focus on the human-caused threats to golden eagles and associated wildlife, and the efforts of multiple stakeholders to reduce and mitigate negative impacts. One challenge golden eagles face in today’s West is increased mortality

due to collisions with the growing numbers of wind turbines.

“At Duke Energy Renewables’ wind sites, we are continually refining ways to reduce the risk of golden eagles and other soaring raptors from colliding with wind turbines,” Hayes said. “Our Top of the World wind site near Glenrock, Wyoming, has tested radar, visual and sound deterrents and is currently using a camera detection system called IdentiFlight as well as human observers to curtail turbines when eagles are present, thereby reducing collisions.”

The exhibition showcases these and a broad range of other efforts underway to ensure that the golden eagle remains

a vital component of western ecosystems and America’s natural heritage.

“These magnificent raptors are a true apex predator and have never had to worry about something harming them while they are flying,” Hayes said. “We have more work to do, but through partnerships with scientists like Dr. Preston, technology developers like IdentiFlight, and organizations like the American Wind Wildlife Institute, I’m confident we will find viable solutions.”

Source: Duke Energy Renewables  
For more information, go to [www.duke-energy.com/renewables](http://www.duke-energy.com/renewables)

## Fort Hood Facilities Enter Commercial Operations

The U.S. Army’s largest single renewable energy project began officially generating clean electricity in April. Apex Clean Energy developed, managed construction of, and operates the groundbreaking hybrid wind and solar complex, which will provide more than 50 percent of the annual load at U.S. Army Garrison Fort Hood in Killeen, Texas.

Apex and Northleaf Capital Partners own the renewable energy portfolio of which the complex is a part: the 50.4 MW Cotton Plains Wind and 151.2 MW Old Settler Wind facilities in Floyd County, Texas; and the 15.4 MWac Phantom Solar onsite at Fort Hood.

The Defense Logistics Agency-Energy, on behalf of the Army, is purchasing the power from Cotton Plains Wind and Phantom Solar to supply energy to Fort Hood. The two facilities will save the Army — and taxpayers — an estimated \$168 million in direct

energy costs over the life of the project. Old Settler Wind, meanwhile, is generating enough clean electricity to power 51,000 average U.S. homes. Apex is providing asset management services for all three facilities.

“With our deep corporate ties to the military, Apex is honored to partner with the Army on its goals to increase our country’s energy independence and protect our national security,” said Mark Goodwin, president and CEO of Apex. “We are all proud to help Fort Hood.”

“We are pleased to partner with Apex, given the company’s reputation as a leading renewable energy company,” said Jared Waldron, a director at Northleaf. “Direct investments in fully contracted wind and solar assets are consistent with Northleaf’s investment strategy.”

Source: Apex Clean Energy  
For more information, go to [www.apexcleanenergy.com](http://www.apexcleanenergy.com)

Stahlwille Tools is the ONLY tool company with dimensionally accurate hand tools!

**STAHLWILLE**

**TORQUE WRENCHES**

- Super accurate scale designed for industrial applications
- Can be used as a breaker bar with no damage
- Designed to ISO 12 month calibration cycle
- Does not need to be “zero’d” after use
- Interchangeable insert heads

**MOBILE TORQUE TESTERS**

STAHLWILLE TOOLS NA, SARASOTA FL, 800-695-2714  
[WWW.STAHLWILLETOOLS.COM](http://WWW.STAHLWILLETOOLS.COM)

Dealer Inquiries Invited

**STAHLWILLE**

Professional Tools made in Germany  
800-695-2714

# inFOCUS

## Approaching Zero Downtime

*ServiceMax uses the Internet of Things in the field to help companies save money, resources, and improve customer satisfaction.*

By Kenneth Carter

**I**f it ain't broke, don't fix it.

That cliché can take an ominous turn when it comes to big complex systems like the ones that make up wind-farm turbines.

In that world, when something does finally break down, it has the potential to cause a lot of damage to an unprepared company's bottom line.

But now, with the help of the Internet of Things and the cloud, ServiceMax can give industries such as wind a leg up in detecting problems before they happen.

The Internet of Things and the cloud have come a long way in a short time to connect technology to the world. That connectivity has made it possible for industries to move from a reactive maintenance paradigm to a predictive maintenance one.

Athani Krishnaprasad, co-founder and chief strategy officer with ServiceMax, came to the table with 15 years of experience working with companies to make their service operations more efficient. ServiceMax officially began life in 2007.

"We were doing that using predictive technology, and we were obviously very passionate about it," he said. "It was tough during that time because the cloud was very new, and the mobile devices were still old generation. So we couldn't solve all of their problems, so we started to think how could we change the game."

That game changer was the begin-

nings of how ServiceMax reimagined better field service software using the cloud.

### REACTIVE VS. PREDICTIVE

By looking at the haphazard methods of reactive maintenance, it's easy to see why ServiceMax searched for a better and more efficient way of approaching maintenance. And that reactive maintenance paradigm had been the traditional service model for all types of industry for decades.

Reactive maintenance would kick in when an asset developed a problem, which would spur the customer to call and report that problem. That phone conversation would start with troubleshooting and more than likely lead to a technician being dispatched to address the problem and repair it, according to Krishnaprasad.

"And that's been the paradigm, and it's totally a reactive paradigm," he said. "So, what we've been advocating is for customers to move into a proactive predictive paradigm. Because now, with the Internet of Things, technology is becoming mainstream, and it's becoming cheaper to connect the products into the internet and start collecting data from them so you can actually, as a manufacturer or a servicer, have a window into what's happening with the machine without needing to do guesswork and essentially predict that something is going wrong."



With predictive maintenance, error messages or other anomalies serve as a prognosticator of possible failure and a heads up to the operators.

The result is sending a repair team out proactively or developing a software patch before a more extensive repair becomes necessary.

"That movement toward predicting failures and preventing failures from happening before they occur is the direction in which the processes and



A field-service worker fulfills a work order and maintains a PREVAC Plus pressurization system using ServiceMax on his portable device. (Courtesy: ServiceMax)

service thinking can move because it is possible now,” Krishnaprasad said.

The predictive service paradigm not only provides benefits in terms of predicting failure and preventing downtime that would affect customers, but it also has benefits for the providers as well, according to Krishnaprasad.

“In a predictive regimen, it’s much

easier to organize your services more efficiently into the future, so you can organize yourself much more efficiently in terms of who goes where and how do you organize parts so they’re available to the tech when he shows up,” he said. “That prevents multiple times the tech might have to visit if he doesn’t bring the right part.”

## ALSO IN THIS SECTION

- 18** Maintaining the Green-Energy Progress
- 26** Profile: Valley Forge & Bolt
- 30** Conversation: Doug Herr with AeroTorque



ServiceMax is able to capture the data from the technician's repair and feed that back into the system. (Courtesy: ServiceMax)

## WIND ADVANTAGE

Krishnaprasad added that the wind industry is particularly suited for this predictive maintenance.

“Wind is a great example, solar is a fantastic example as well,” Krishnaprasad said. “These are the industries that were born in the internet age. So from the get-go, any provider that is managing a wind farm or managing a solar farm connects the panels and these wind turbines into the internet from the beginning. They don’t have the legacy of having to design and produce the machines 10, 20, 30 years ago that didn’t have the internet connection available at that time.”

But he said all industries will have to eventually move to a predictive service model.

“Everyone is going to ultimately, at some point in the future, look and feel like a wind or a solar operator from the perspective that they will have the visibility from the data; they will move toward a proactive maintenance regimen,” Krishnaprasad said.

## EXPANDING THE DATA

ServiceMax takes data coming in from wind farms and expands on it, according to Krishnaprasad.

“A lot of these wind operators and solar operators

have gotten good at monitoring the assets in the field producing energy,” he said. “So they can pick up slow downs in performance, and they can pick up glitches, and they know that there is something wrong that requires intervention.”

ServiceMax can take that signal coming from a command center and translate it into an operational flow.

For example, ServiceMax picks up and interprets signals coming from a command center that’s monitoring a wind farm, and then automatically kicks out a work order for a technician to go out, according to Krishnaprasad.

The ServiceMax software interfaces with a monitoring system that has data coming in from assets and looks at several parameters: failure patterns, alert patterns, error-message patterns. A root engine in the command center looks at these patterns, and depending on how many times a pattern is perceived within a 24-hour period, the system determines if an asset will require some kind of intervention.

If action is necessary, the work order produced can contain vital information including assigning the right technician, creating a snapshot of the sensor data that led to the failure, and actually bringing a live feed of the failure to a tech in the field, according to Krishnaprasad.

“And that actually provides insights for the tech to be a lot more effective,” he said. “It takes the guesswork out of the job. And we make it all available on a mobile device, which works online and offline.”

ServiceMax is able to automate the process of sending someone out, and once a technician is dispatched, ServiceMax is able to capture the data from the technician’s repair and feed that back into the system, which will serve in better predicting failures and interventions in the future, Krishnaprasad said.

“We help customers close that loop,” he said.

## TARGETING RENEWABLES

ServiceMax has been targeting renewables for about half a decade. It started a relationship with GE in 2010. The company recently was acquired by GE Digital for nearly \$1 billion.

Before the acquisition, ServiceMax had more than five years’ experience working with GE to enable its service deliverable processes in the renewables business. And now ServiceMax includes companies such as Siemens in its wind-division processes.

Krishnaprasad said there are similarities to how it approaches the wind industry as compared to others.

“Wind is sort of ahead of the curve compared to other segments,” he said. “They are demanding service processes that can actually slice up data. So they are much further ahead in terms of that curve that everybody else is trying to get onto. That makes it particularly interesting to work with the wind customers.”

Another element in wind that comes up more often than with other industries is safety considerations, according to Krishnaprasad.

“Specifically with wind, the assets are hard to access,” he said. “So safety concerns bring unique requirements for us in terms of being able to potentially predict issues. For example, if the mobile device the technician is carrying falls, we can detect that through an accelerometer and predict some potential safety issues. The tech has to climb 500 steps on a ladder to get up to the asset, which makes it very hard for them to go back-and-forth from the truck to the top of the wind turbine. That means it’s very important for us to enable this tech to know every piece of information he or she needs to be effective up there and make sure we send up all the parts that will be required.”

Wind creates unique factors simply due to the settings where wind technicians have to work, according to Krishnaprasad.

“Those are some of the interesting nuances we’ve learned to address in our product, and we have built features

around those because of the interaction with the wind industry,” he said.

## “HIDDEN GOLD MINE”

Because of the potential savings that can be a product of predictive maintenance, Krishnaprasad said ServiceMax approaches customers with that economic advantage in mind.

“We talk about service operations management as a hidden gold mine in these companies in terms of the value we can extract from it,” he said. “Both from a productivity and efficiency cost savings point of view, but also in terms of moving the needle on the top line growth.”

Along with certain metrics that ServiceMax measures, it also produces an annual survey that shows its customers have seen about an 18 percent increase on average in productivity, a 12 percent increase in terms of efficiency, and a 12-15 percent increase in revenue, according to Krishnaprasad.

“These are the same parameters that actually are applicable to the wind industry,” he said. “They’re looking for efficiencies; they’re looking for effectiveness when the tech goes up that ladder as well as overall workforce productivity.”

Wind farms employ dozens of techs, so ServiceMax is able to know how to optimally dispatch technicians so they’re not wasting time driving from place to place. It can also ensure those techs have the skills needed to solve a particular problem, Krishnaprasad said.

“All of these things matter,” he said. “But in addition to that, I think the conversation we have with the wind industry specifically is the safety considerations.”

## BROADER PLATFORM

And becoming a part of GE Digital has given ServiceMax a much broader platform to be involved globally about its predictive maintenance platform, according to Krishnaprasad.

“Especially in energy,” he said. “All the power generated on the planet Earth, GE technology is used in half of that. That spans across fossil fuels, hydro, and renewables, both solar and wind. So we have both now the ability to ride the GE relationship into these big industries across the globe and bring value and have meaningful conversations.”

And with GE Digital also being a pioneer of the industrial Internet of Things, it has been able to gear the platform toward industrial segments that speak to the depth of security, volume, and cloud performance to be able to predict failures fast, Krishnaprasad said.

“We can truly sort of move the needle on what it means to service modern assets through modern technologies like ServiceMax,” he said. ↵

# Maintaining the Green-Energy Progress

*Polymeric solutions aid turbine maintenance, keeping renewable energy's future bright.*



Historic milestones in 2016 show a bright future for renewable energy. (Courtesy: Belzona)

By Thomas Belli

The renewable energy market is continuing to go from strength to strength, with 2016 marking a series of impressive milestones versus conventional, fossil-fueled energy. Certainly, one of the most remarkable was global investment in new renewable energy infrastructure surpassing that spent on new fossil infrastructure<sup>1</sup>. This statistic reinforces how climate change policies and low-carbon initiatives have improved cost-competitiveness of renewable technologies, making them a much more affordable and accessible form of energy.

Significantly, as funding and support for renewable energy projects begins to outweigh traditional energy sources, it is necessary to ensure a continued return on this investment. This can be achieved through effective maintenance of renewable assets and management of the issues affecting them.

Whether through immersion in corrosive seawater, contact with high geothermal temperatures, or aggressive abrasion imposed by gale-force winds, the methods of harnessing greener energy are not without complications. By its very nature, cap-

turing renewable energy involves exposure to the elements, some of which can wreak havoc on the machinery, equipment, and structures used throughout the industry. This is true for geothermal, solar, tidal, and wind power, all of which suffer from a variety of different damage mechanisms. The expansion of the renewable energy sector is certainly positive for the planet; however, maintaining the existing green assets across the globe is a challenge that confronts many energy companies.

Like the maintenance of any other industrial assets, owners

and operators require cost-effective solutions that can be carried out quickly and easily yet ensure long-term results. Belzona has established itself as a worldwide provider of polymeric solutions for a variety of maintenance issues in most power generation markets, combating corrosion, erosion, and chemical attack. As a result, the transition to repair and protect renewable-energy equipment and facilities has been successful. The most progress has been made in the wind-power industry, where polymeric materials have been able to solve maintenance problems present from the base of the turbine to the tip of the blades.

## EDGING AHEAD

From the vast investment in new renewable infrastructure, perhaps the biggest beneficiaries were offshore wind farms, which have boomed in the past 12 months. In total, capital spending commitments for this form of green energy reached a record \$30 billion in 2016<sup>2</sup>.

Further to these pledges, there are offshore wind-farm projects under construction in European waters that equate to 27 GW. This adds significantly to the global wind-power capacity of 433 GW logged in 2015<sup>7</sup>.

Despite being one of the leading forms of renewable energy, the design of wind turbines and the environments where they operate pose a variety of problems from a maintenance perspective.

Corrosion of components and foundation damage are among some of these maintenance issues; however, the single largest problem for the wind-power industry is leading edge damage. Blade tips can revolve at up to 190 mph (300 kph) in widely fluctuating temperatures, humidity levels, and rates of UV exposure. Coupled with the damage from a variety of impact and abrasion fac-



Polymeric solutions can be applied to a variety of different areas on wind turbines. (Courtesy: Belzona)

tors, including rain, dust, ice, insects, birds, and lightning, this can cause substantial erosion of the substrate.

Evidence suggests damage to the leading edge can lower the annual energy production (AEP) of a wind turbine, with energy losses estimated between 4 percent and 20 percent if the erosion damage is severe<sup>3</sup>. This generates a reduction in aerodynamic efficiency, affecting the energy output as well as exacerbating the damage to other turbine components. Imbalance between the blades can cause wear and damage in the shaft and gearbox, in addition to putting further stresses on the tower and base. Overall, this reduces the tower's operational life expectancy.

Alternative solutions for this problem include fillers, binders, and tapes, yet none of these will provide extensive, long-term repair and protection. In these scenarios, repairing the damaged substrate can be achieved with Belzona's range of reconstructive composites and protective coatings. Following sanding of the damaged area and adequate surface preparation, Belzona 1121

(Super XL-Metal) can rebuild the eroded blade to original specifications, adhering extremely well to FRP substrates. As a protective layer, the molded surface can be overcoated with Belzona's range of erosion and corrosion resistant, epoxy systems. Brush- and spray-applied, they offer a high level of durability and flexibility versus the threats of abrasion and impact.

Rather than simply a reactive option, these solutions can be applied proactively at the OEM stage, protecting the most threatened areas before entering service. A Japanese industry-leading engineering company recently took this approach. It specified Belzona 1341 (Supermetalgilde) as a protective coating for the leading edges of turbine blades during manufacture<sup>4</sup>. Over an estimated 10 years since their original installation across sites throughout the U.S., these blades have withstood the effects of erosion beyond their anticipated life expectancy.

It is not just leading-edge damage that can be rectified to improve the output and operation of wind

turbines. Some of the other major issues that befall these structures involve the components in the nacelle. Protecting brake drums, sealing cables, as well as the repair of worn and damaged shafts, can be achieved with Belzona's polymeric solutions.

Meanwhile, the integrity of the nacelle, tower, and platform can all be upheld by using seamless, weatherproof, and waterproof protective coatings, maintaining wind turbines despite the often-adverse weather conditions in their operational environments. In addition, ensuring the stable foundations of these structures is essential. Trends show blades are getting bigger as rotor diameters have steadily increased over the last 20 years in line with higher output capacities. Offshore blades in particular are estimated to reach a staggering 190 meters (623 feet) in diameter by 2030<sup>5</sup>, nearly double the size of today's blades, making firm foundations integral to keeping turbines upright. Therefore, the repair and rebuild of concrete around the base can be achieved with Belzona concrete repair systems and the surface protected with Belzona coatings.

### OTHER RENEWABLES

Although there is an array of maintenance solutions in place for wind turbines, this does not mean that other renewable energies are neglected in terms of their repair and protection. The stresses placed upon the likes of tidal, wave, and geothermal energy are displayed in many of the industrial environments that Belzona operates. Therefore, the solutions adept at resisting corrosion, erosion, and chemical attack will translate well into these new application scenarios.

For example, the characteristics of geothermal fluid can vary significantly, including temperature, chemistry, and non-condensable gas content (NCG), all of which can have an extremely



Severely damaged turbine blades can result in energy losses of up to 20 percent. (Courtesy: Belzona)

corrosive effect on power-plant components. The negative impact on the efficiency and function of the geothermal power plant can manifest in pipes, turbine casings, heat exchangers, and tanks, all machinery and equipment which Belzona has experience at safeguarding. According to reported statistics on the state of geothermal technology, the use of corrosion resistant

materials, such as protective coatings, can reduce generation costs by an estimated 0.25 cents per kWh<sup>6</sup>. When extrapolated to the global electricity generation of geothermal resources in 2015 (71 TWh)<sup>7</sup>, savings through corrosion mitigation can exceed well over \$100 million, while also helping to improve the efficiency of deteriorated equipment.

Moreover, the repair and protection of turbine blades is not isolated to wind power, as this type of application has a similar role to play in the tidal-power industry. At sea level, water is 784 times denser than air, so tidal turbine rotors can be much smaller but still generate equivalent amounts of electricity. Cavitation, when there's a pressure difference in a fluid, is prominent in this situation and can threaten the integrity of the blades, much like erosion on wind turbines. By employing a cavitation and erosion resistant solution, the in-service life of tidal turbines can be extended, protecting them against deterioration emanating from turbulent flow.

## GREEN INTENTIONS

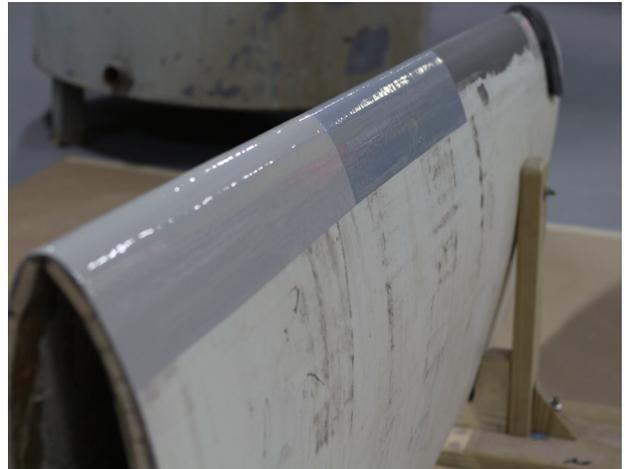
With the rapidly growing presence of renewable energies in countries such as Brazil and Kenya, it is clear the world's emerging economies are showing similar interest in the low-carbon transformation of global-energy sourcing. In fact, they are matching many of their better-equipped counterparts. This highlights the wave of support for green energy is truly growing and capturing the world's attention.

As this sector expands, there will continue to be investments of increasing magnitude; however, it is essential these assets are maintained and remain operational, providing an effective return on investment. Polymeric repair and protective solutions already have had proven success in the power industry and have made notable impressions in the renewable energy market to date. Extensive testing and long-term involvement with industry-leading companies certainly demonstrates these systems can effectively manage the frequent issues associated with erosion, corrosion, and abrasion.

Renewable energies represent the future landscape of energy resourcing, something that Belzona aims to maintain through the development of new repair and protection systems for global renewable assets. ↵

## ACKNOWLEDGMENTS

1. Pettit, D. (2017) 2016: An historic year for renewable energy, [Online] Available at: [tumblr.ridgenews.com/2016-an-historic-year-for-renewable-energy/](http://tumblr.ridgenews.com/2016-an-historic-year-for-renewable-energy/). [Accessed: 1st February 2017].



Rebuilding and protecting the leading edge against erosion damage. (Courtesy: Belzona)

2. Thomas, C. (2017) Record \$30 billion year for offshore wind but overall investment down. Bloomberg New Energy Finance, [Online]. Available at: [about.bnef.com/blog/record-30bn-year-offshore-wind-overall-investment/](http://about.bnef.com/blog/record-30bn-year-offshore-wind-overall-investment/). [Accessed February 1, 2017].
3. Sareen, A, Sapre, C, & Selig, M. (2014) Effects of leading edge erosion on wind-turbine blade performance. Wind Energy, [Online]. 17;1531-1542. Available at: [m-selig.ae.illinois.edu/pubs/SareenSapreSelig-2014-WindEnergy-Erosion.pdf](http://m-selig.ae.illinois.edu/pubs/SareenSapreSelig-2014-WindEnergy-Erosion.pdf). [Accessed: February 10, 2017].
4. Kawano, M; Hayashi, N; Kuroiwa, T; & Nakamura, N. (2014) Wear control apparatus and wind-turbine blade monitoring system including wind-turbine blade. Mitsubishi Heavy Industries Ltd. [Patent] US 8739612 B2. Available at: [bit.ly/2kph3i1](http://bit.ly/2kph3i1) [Accessed: January 4, 2017].
5. Metcalfe, J. (2016) The Future of Wind Turbines is Enormous. City Lab, [Online]. Available at: [www.citylab.com/tech/2016/12/how-large-can-wind-turbines-get/509678/](http://www.citylab.com/tech/2016/12/how-large-can-wind-turbines-get/509678/). [Accessed: February 15, 2017].
6. Kagel, A. (2008). The State of Geothermal Technology Part II: Surface Technology. Geothermal Energy Association, [Online]. 2, 6. Available at: [bit.ly/2kwQiDw](http://bit.ly/2kwQiDw) [Accessed: January 4, 2017].
7. REN21 (2016). Renewables 2016 Global Status Report, [Online]. Available at: [www.ren21.net/wp-content/uploads/2016/10/REN21\\_GSR2016\\_FullReport\\_en\\_11.pdf](http://www.ren21.net/wp-content/uploads/2016/10/REN21_GSR2016_FullReport_en_11.pdf). [Accessed: December 11, 2016].



**Thomas Belli** is a marketing assistant with Belzona. He has been with Belzona since September 2015.



The SeaHub system can be installed aboard a vessel, platform, or even on a remote land-based location. (Courtesy: SeaRoc Group)

## Sea-Fire Protects Offshore Communications Hub

SeaRoc Group has launched a monitoring and voice-and-data communication solution that links land-based operations to distant offshore petroleum platforms and wind farms via satellite, fiber, and other data services. An engineered fire detection and suppression system from Sea-Fire Europe was chosen to protect the sensitive and valuable electronics inside these unmanned SeaHubs.

The SeaHub system is mobile, so it can be installed aboard a vessel, platform, or even on a remote land-based location. It allows drill rigs and wind farms to be installed farther offshore than was possible in the past.

Inside are VHF A and M radios, TETRA, AIS, ADS-B, MOB and other high-tech communication

equipment. Everything is housed in a temperature-controlled, standard 8-foot or 10-foot DNV-certified shipping container. All systems, including fire detection and suppression, are monitored and remotely managed by SeaRoc's proprietary SeaPlanner™ modular software suite to ensure component protection, service continuity, and worker safety when present.

Sea-Fire Europe engineered a solution that meets IMO and SOLAS requirements. The system includes smoke and heat detectors, an extinguishing release panel, and cylinders containing state-of-the-art 3M Novec 1230 fire suppression fluid.

Novec 1230 is electrically non-conductive and non-corro-

sive, so electronics aren't damaged during discharge. It's environmentally safe with a global warming potential equal to CO<sub>2</sub>, so it won't deplete the ozone and has low toxicity for worker safety.

"If personnel are working inside a SeaHub at the time of a fire event, we know that Novec 1230 is not harmful or fatal to human life," said Sarah Simmons, SeaRoc Group marketing manager. "This and safeguarding the equipment were key deciding factors in ensuring the highest fire protection solution, as well as the important environmental consideration." ↵

Source: SeaRoc Group

For more information, go to [www.searoc.com](http://www.searoc.com)

## Timken Acquires the Assets of PT Tech

AeroTorque Corp., a U.S. manufacturing and engineering firm for torque damping products and torque monitoring for wind turbines, has joined the Timken team. Timken recently acquired PT Tech, Inc. The acquisition adds PT Tech and AeroTorque brands to Timken's growing portfolio of mechanical power transmission products.

"Acquiring the AeroTorque business expands our offering in existing and comparable end markets," said

Hans Landin, vice president — mechanical power transmission for the Timken Company.

"We are pleased to add industrial clutches and brakes to Timken's growing portfolio of mechanical power transmission products," said Richard G. Kyle, Timken president and chief executive officer. "This acquisition allows us to better serve our customers by offering a broader, more diverse package of products and services. The addition of PT Tech will

also provide ample growth opportunities, as we leverage our portfolio to drive growth across complementary markets around the world."

Timken engineers, manufactures, and markets bearings, gear drive systems, chain, belts, couplings, lubrication delivery systems and a variety of related services. ✎

Source: AeroTorque

For more information, go to [www.aerotorque.com](http://www.aerotorque.com)

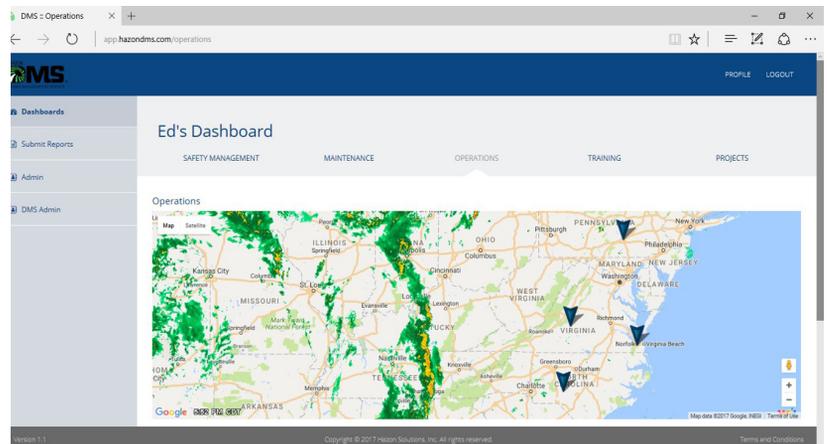
## Hazon Solutions Announces Cloud-Based Drone Management Software

Hazon Solutions, the national leader in drone-inspection services, recently announced the launch of the Hazon Drone Management System (Hazon DMS). Hazon DMS is a secure, web-based management tool providing all drone operators, whether hobbyists with a single drone or a large corporation with hundreds of drones, a way to safely and efficiently track and manage their drone fleet, pilots, and workflow.

"Hazon DMS is the first software designed by professional drone pilots, for professional drone pilots," said Ed Hine, Hazon director of drone capability development. "We designed it to be a robust, yet simple to use, management tool that can handle all of our safety, maintenance, operational, and pilot management requirements with one efficient application."

Some of the Hazon DMS features include remote pilot (RP) logbooks, RP qualifications tracking, asset tracking, client management, proactive safety and maintenance tracking and reporting, and workflow management. Hazon DMS is offered as software as a service through the freemium model for individual users.

"At Hazon, we believe it is important to actively promote the safe and responsible use of drones



Hazon DMS is a secure, web-based management tool providing drone operators a way to safely and efficiently track and manage their drone fleet, pilots, and workflow. (Courtesy: Hazon Solutions)

throughout the entire drone industry, so we offer a free subscription to everyone," said Hazon COO and Co-Founder Sean Cushing. "Startup drone businesses now have the ability to utilize this very powerful tool early in their life cycle. This will allow them to focus on operating drones safely and with professional processes in place from Day 1."

Hazon DMS is a cloud-based service offered at three levels. The "Remote Pilot" level is free to individual users with up to two drones. The "Drone Team" level is for multi-person, multi-drone opera-

tions available on a per-user, per-month fee schedule. The "Enterprise Systems" level is designed for larger organizations, municipalities, or universities with organic drone operations that require features such as customized branding, alternative licensing and hosting options, dedicated 24/7 customer support, optional custom analytics, and multi-tiered administrators.

"Even though it is already the most capable management software for the drone industry, we are quickly working to deploy the next set of advanced features,"

Hine said. “One of the things that makes Hazon DMS so unique and powerful is that in order to support our customers’ needs and adapt to the rapid changes in our industry, we will update the tool

with speed and purpose.”

Hazon DMS has recently completed beta testing with a wide range of drone operations including Hazon Solutions, the York County Fire Department, Aerial Works,

and Liberty University. It is available at [www.HazonDMS.com](http://www.HazonDMS.com). ↘

Source: Hazon Solutions

For more information, go to [www.Hazonsolutions.com](http://www.Hazonsolutions.com).

## Lifetime Lubrication Ensures Smooth Operating for Zero-Max Drives

Lifetime lubrication in Zero-Max “Crown” gear drives assures motion system designers of a smooth operating, quiet right-angle gear drive that needs no maintenance. These drives are designed for economical transfer of speed or power.

Lubricated for life with Beacon 325 premium grade grease, Zero-Max Crown drives feature heat-treated AGMA Class 10 spiral bevel gears. This combination of bearing design and lubrication formulation ensures long-term, maintenance-free operation for demanding industrial applications. The drives feature precision hardened and ground ball bearings with non-magnetic steel shafts for handling speeds up to 2,000 rpm in most operating environments. The internal gears are permanently mounted to the shafts with locking pins. This provides a resilient and durable connection for use in heavy load applications while requiring no maintenance.

Sealed-for-life systems using motors, generators, and similar equipment in industrial applications require an equally robust gear drive. Crown drives provide that and more. Lubrication with Beacon 325 grease ensures optimum performance in temperature ranges from minus-50 degrees C to 120 degrees C without evaporation.



Lifetime lubrication ensures long-term, maintenance-free operation for Zero-Max Right Angle Gear Drives, left. (Courtesy: Zero-Max)

Zero-Max ensures its drives are predictably smooth operating, and similar model sizes have identical performance characteristics when designed into multiple drive setups. To accomplish this, Zero-Max drives are precision assembled for perfect bearing and gear alignment. The drives are pre-lubricated during assembly, then completely enclosed in a heavy-duty anodized aluminum housing. The housing is designed for maximum strength and heat dissipation. This design ensures internal gears stay permanently aligned, lubricated, and free of contamination

from outside debris.

Zero-Max Crown drives are used throughout dozens of industries in hundreds of applications. Available in many sizes and models, Crown drives are ideal for a wide range of horsepower, torque, and shaft speed requirements. Standard two- and three-way models are available with 1:1 and 2:1 speed ratios in shaft diameter combinations of 3/8, 1/2, 5/8, and 3/4 inch. ↘

Source: Zero-Max

For more information, go to [www.zero-max.com](http://www.zero-max.com)

“ Zero-Max Crown drives are used throughout dozens of industries in hundreds of applications. ”

## Abaris and KVE Partner to Train European Customers

Abaris Training Resources Inc. in Reno, Nevada, and KVE Composites Group in Maastricht, The Netherlands, recently announced their exclusive collaboration for composite training for the European market. To better support European customers, Abaris and KVE have joined forces and together will provide the Abaris Training curriculum.

KVE will hold training classes in advanced composite repairs at its facility at Maastricht Aachen Airport. KVE will use Abaris Training course curriculum in both active classroom and workshop environments. Together, the industry-experienced instructors will provide European companies with cutting-edge composite training for their engineers, technicians, and inspectors working with advanced composites.

“This collaboration is a great opportunity for both parties to create more growth and to bring the Abaris Training standard to a worldwide audience,” said Abaris CEO Michael Hoke.

The first European class, “Fabrication and Damage Repair — Phase I” was June 12-16 at KVE’s Maas-



An Abaris technician repairs a composite panel. (Courtesy: Abaris Training)

tricht facility. Future European classes will be posted on the Abaris and KVE websites soon. ✎

Source: Abaris Training

For more information, go to [www.abaris.com](http://www.abaris.com)

# WIND TURBINE TECHNICIAN ACADEMY

Competency-based, hands-on training  
Industry-guided skill assessments  
Industry tools and equipment  
ENSA GWO Certified Safety Training

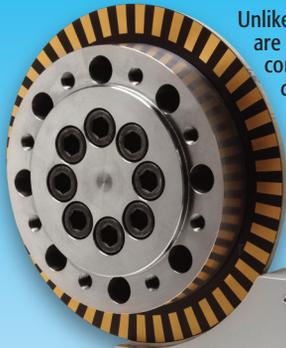
Change your life and your world.

Kalamazoo**VALLEY**<sup>™</sup>  
community college  
269.353.1253  
[www.kvcc.edu/wind](http://www.kvcc.edu/wind)






## How accurate is your torque measurement?



Unlike competitors whose specifications are only proven in the lab under controlled conditions, our products deliver accuracy in the field. Our new MCRT<sup>®</sup> Bearingless Digital Torquemeters offer the highest accuracy, overrange and overload of any similar products on the market. Plus, they're simple to install and very tolerant of rotor-to-stator misalignments.

**Ask us to prove our performance difference.**

S. Himmelstein and Company calibration laboratory is ISO 17025 accredited by NVLAP (Lab Code 200487-0)

Register with: [calibratenow.com](http://calibratenow.com) to access your calibration data online.



**S. HIMMELSTEIN AND COMPANY**  
[www.himmelstein.com](http://www.himmelstein.com) 800-632-7873

# PROFILE

## Valley Forge & Bolt

*Valley Forge & Bolt's load indicating fastener could help the wind industry lower its O&M costs.*

By *Kenneth Carter*  
Managing Editor | Wind Systems

Since 1974, Valley Forge & Bolt has supplied bolts and fasteners for a variety of industries that include mining, oil and gas, cranes, scrap metal, and cement processing.

With a recent addition to its line of products, Valley Forge & Bolt is making inroads into wind.

"We have a product which is perfect for the wind industry," said CEO Michele Clarke.

That product is called a load indicating fastener, and its installation in wind turbines could greatly reduce maintenance, according to Clarke.

"Usually, when you have a fastener, you have a specification to torque it. Load has been translated into torque but it is uncertain what load is actually on the fastener," she said. "A load indicating fastener will show you direct load on the fastener regardless of how much torque you apply. You're actually seeing the design load on the fastener."

### LOAD INDICATING FASTENER SPECIFICATIONS

Valley Forge & Bolt follows the ASTM F-2482 specification when it comes to load indicating fasteners. That specification allows the company to be within plus-or-minus 5 percent accuracy on a fastener's designed load, per the ASTM



The use of load indicating fasteners in wind turbines could greatly reduce maintenance costs. (Photos courtesy: Valley Forge & Bolts)

### Valley Forge & Bolt

**Founded:**  
1974

**Headquarters:**  
Phoenix, Arizona

**Website:**  
[www.vfbolts.com](http://www.vfbolts.com)

standard. Fasteners using torque have been found to have a direct load accuracy tolerance of plus-or-minus 30 percent; some refer to the torque-to-tension relationship.

With this technology, an end user can quickly see if a fastener is losing load. This becomes important in critical applications.

In a recent application for the oil and gas industry, Valley Forge was able to replace standard conventional studs of a 20-year-old heat exchanger with its load indicating fasteners. The exchanger was infamous for being a notorious leaker. By replacing the studs, the company was able to save about \$213,000 over the course of five years.

Translating the load indicating fastener into the wind industry also could reap economic benefits, according to Clarke.

“That’s how we’ve excelled in this industry,” Clarke said. “We’ve been providing an added feature of seeing load on your fastener.”

## COLLECTING DATA

With more and more wind farms seeking out ways to translate the constant flow of data coming from wind assets into useful information that can prevent maintenance and save on the bottom line, Valley Forge & Bolts has developed a new type of fastener that will help collect that data, according to Clarke.

“What we have for wind is a wireless transmission probe that, using Wi-Fi, will send your load information to your tower data collection points,” she said.

Being able to pull data from the fasteners can prevent or delay costly maintenance visits, according to Clarke.

“Instead of a man having to go up the tower with torque wrenches on his back, you can just poll the tower, and you can say, OK, bolt number 22 is a little bit low, but we can wait until we next go up for maintenance,” she said.

## PREVENTING MAINTENANCE

But Clarke said if load indicating fasteners are installed at the beginning of an asset’s installation, then bolt maintenance issues are reduced.

Problems arise from the use of unnecessary torque, and when the fasteners are unevenly loaded, that’s how they can end up breaking.

“Some fasteners are carrying more load than the other fasteners,” Clarke said. “And those fasteners get too much load, and then they crack, and you have all these problems.”

So the advantages for the wind industry are twofold.

“I think for the wind industry, if we could get in there and get



With technology used in load indicating fasteners, an end user can quickly see if a fastener is losing load.

perfect installation, then they’d just recheck,” she said. “With our system, the fastener can send data once a day or it can send data once a week. And then you’ll just have a router that collects the data and downloads it, and nobody has to climb up that tower and tighten fasteners unless it is warranted.”

A large part of the advantage of Valley Forge’s Wi-Fi fasteners will be their ability to keep maintenance costs down as well as keeping wind technicians from potentially hazardous conditions when possible, according to Clarke.

Clarke also sees Valley Forge’s fastener technology being extremely helpful in offshore wind.

“On those projects, they put a

man down by helicopter to tighten the fasteners,” she said. “I can imagine this would save a fortune if you don’t have to put somebody out there unless the bolts are really coming loose or having issues.”

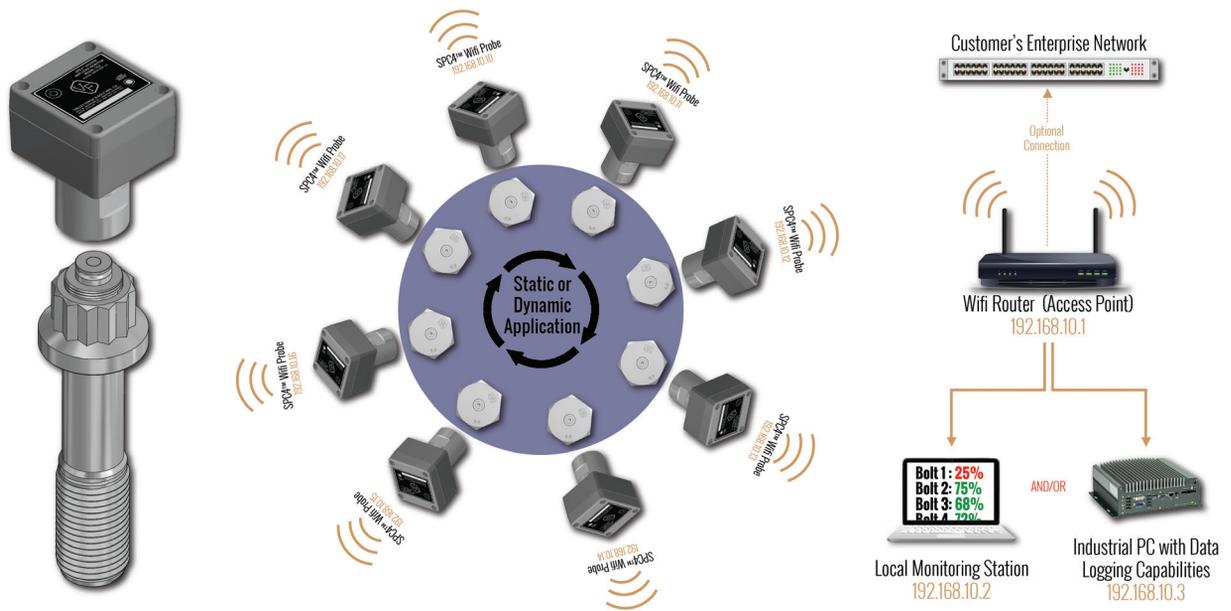
The fasteners’ ability to transmit data on their status makes it a perfect application when it comes to tech safety, according to Clarke.

## COLORADO PROJECT

Clarke said Valley Forge is involved with a wind project in Colorado with a German company.

“It’s a project that we’ve supplied some load indicating fasteners, not the wireless,” she said.

The project has been moved back over the past few months mainly



Valley Forge & Bolts has developed a new type of fastener that will help collect data via Wi-Fi.

because of wind complications, but Clarke said the project should be ready to install by June.

“This one will be our first big installation for a big OEM,” she said.

Clarke said Valley Forge also manufactures a washer for the foundation bolts that could be helpful when building turbines.

“The foundations on these towers are critical, and we’re testing that one out,” she said. “That’s another product we would offer up to the wind industry.”

In the meantime, Clarke said Valley Forge plans to focus on what it does well. About 40 percent of the company’s business is with the mining industry, and it’s there where the wireless fasteners are going to be rigorously tested.

“We have three mining installations in South America running with wireless, and we’re going to have one in Australia in July,” she said. “That’s going to be a big installation. They’re basically doing a large quantity of wireless probes on a rotating ore-crushing mill.”

### STARTED WITH MINES

Clarke’s father, Ron Clarke, started Valley Forge 43 years ago.

“He had experience in making and designing and setting up these large forging machines all over the world,” Clarke said. “He started making bolts for mines here in Arizona. Slowly, we’ve developed what I think makes us unique, a large volume of patented



Valley Forge & Bolt CEO Michele Clarke says if load indicating fasteners are used at the beginning of an asset’s installation, then bolt maintenance issues are reduced.

products that we’ve developed.”

By being involved in so many industries, Clarke said it has given Valley Forge the ability to adapt and offer products and services that best serve its customer’s needs.

“Basically, we’ve spent these years developing solutions that solve customers’ problems by going to their sites and seeing what’s working and what’s not working in their bolting applications, then we come up with ideas that have made their maintenance and safety issues easier to handle which saves them downtime,” she said. “Saving downtime always translates directly into saving money.”

# EXPERT KNOWLEDGE.

SUSTAINABLE FOCUS.

Staying on the forefront of the new energy economy requires cutting-edge information from authoritative voices. Each month, *Wind Systems* keeps its readers attuned to the latest innovations in the wind-energy industry. Let us be your partner in driving sustainability — and your business — to new heights.

*Giving Wind Direction*

# WIND SYSTEMS

For your FREE subscription to *Wind Systems*,  
log on to [windsystemsmag.com](http://windsystemsmag.com).

# CONVERSATION

## Doug Herr

Director of Marketing, Technical Sales  
AeroTorque

+1 330-590-8105

[www.aerotorque.com](http://www.aerotorque.com)

[/AeroTorqueEBO](https://www.facebook.com/AeroTorqueEBO)



### Tell us about AeroTorque and its core philosophy.

AeroTorque's core philosophy is that you must control transient loads to control your equipment's life span. For almost 40 years, we have optimized drivetrains in extreme machines by minimizing damage from unexpected loading.

### What are your duties with AeroTorque?

My focus is on communicating our message to the market and building our fleet sales. Early on in my wind career, I was focused more on our field work, with up-tower wind-turbine torque data capture. I've really done a wide variety of duties as we have built our business.

### What are some of the services and products AeroTorque specializes in?

AeroTorque has two main market offerings: The WindTC is a mechani-

cal, retrofit torque control that has been proven to significantly reduce the impact of severe transient loads in wind-turbine drivetrains. Imagine the impact of reducing peak transient loads by 50 to 70 percent. The focus again is to remove the damaging loads before they can affect the equipment.

Our Wind<sup>TM</sup> torque monitor is a service offering that gives owners high-resolution measurement of the real-world loading of their wind turbines.

### What has been the evolution of WindTC?

When we started in wind in 2010, our initial installs were in sub-MW class turbines. We quickly moved into the MW class turbines, where we have seen even greater benefits. The WindTC has moved up from the 750 kW machines of the first installations. Our highest volume today is in the 1.5 to 2.3 MW range.

One thing our fieldwork has proven conclusively: Transient loads are occurring due to many factors and more often than expected. It is not specific to any turbine model or manufacturer; it not the fault of any component; it is core to the unique nature of wind and wind turbines.

### What areas has AeroTorque pioneered to increase turbine maintenance efficiency?

The WindTC is proactive, prevent-

ing damage before it can occur. It stands on its own but when combined with other improvements, such as up-graded bearings or lubrication, it can be a game-changer in the useful life of the drivetrain.

### You were recently acquired by Timken. How does that affect AeroTorque moving forward?

We see a great fit for us in Timken. They are an industry leader in bearings and other products. We share a focus on in-depth engineering and quality products. We, with our sister brand PT Tech — a world leader in torque limiters and brakes, are a bolt-on addition to Timken's mechanical power offerings. We really look forward to growing with them.

### Where do you see the wind industry headed in 2017 and beyond?

Wind is here to stay! With the movement away from a PTC-driven market, the wind industry is proving that we can stand on our own. Power prices have shown that wind is economical and even the lowest cost solution in some areas. Near term, repowering and the new install boom will run its course over the next three to four years and then settle into a steady growth rate. The growth will continue to be driven by private industry and consumers, who are demanding clean and economical power. ↘



# 2017 SUMMER & FALL EVENTS

## **REGIONAL WIND ENERGY CONFERENCE - NORTHWEST**

July 25 - 26 | Renton, Washington, USA

## **WIND RESOURCE & PROJECT ENERGY ASSESSMENT CONFERENCE**

September 27 - 29 | Snowbird, Utah, USA

## **OFFSHORE WINDPOWER CONFERENCE & EXHIBITION**

October 24 - 25 | New York, New York, USA

## **WIND ENERGY FINANCE & INVESTMENT CONFERENCE**

October 25 - 26 | New York, New York, USA

## **WIND ENERGY FALL SYMPOSIUM CONFERENCE**

November 7 - 9 | Albuquerque, New Mexico, USA

[www.awea.org](http://www.awea.org)

# INNOVATION

*Research & Development • Design & Engineering • Forecasting & Analysis  
Consultancy • Certification & Standards • Efficiency • Emerging Technologies*

## Sentient Science Partners with Sandia National Laboratories and NREL



Researchers will subject a Sandia-designed DOE National Rotor Testbed 13-meter turbine blade to continual fatigue testing and use optics to identify the wear of the blade over time. (Courtesy: Sentient Science)

Sandia National Laboratories and the National Renewable Energy Laboratory (NREL) have been awarded Department of Energy funding to work with Sentient Science Corporation on the development of a prognostic solution to predict and extend wind-turbine blade life.

Sentient Science, which developed its DigitalClone® Live software using four technical pillars — materials science, data science, tribology, multi-body dynamic system modeling to predict the life and provide life extension actions for rotating mechanical equipment — has been enhancing its DigitalClone technology to include wind-turbine blade early failure predictions.

The collaboration with Sandia and NREL will give Sentient access to intellectual and technical resources at both laboratories to accelerate blade-modeling capabilities within DigitalClone Live.

“A single defective wind-turbine blade could cost wind operators up to \$300,000 if it’s not caught early enough for repair,” said Elon Terrell Ph.D., computational tribologist at Sentient Science. “We’re developing a predictive health monitoring solution to detect contact bending fa-

tigue and wear rates of wind-turbine blades. The partnership and access to the lab resources and brilliant minds at Sandia and NREL will help us accelerate this program.”

The U.S. Department of Energy’s program encourages collaboration between national lab researchers and American small businesses. The Small Business Vouchers program facilitates access to DOE national laboratories for competitively selected small businesses, enabling them to tap into the intellectual and technical validation resources needed to validate critical technology enhancements in an effort to advance energy products, lower the cost of energy, and gain a global competitive advantage.

As part of the project, researchers will subject a Sandia-designed DOE National Rotor Testbed 13-meter turbine blade to continual fatigue testing and use optics to identify the wear of the blade over time. The physical test data will be used during the development of the computational model and then validate the accuracy of the digital approach.

“We look forward to the opportunity to partner with Sentient Science in leveraging Sandia’s decades of work

in sensors, prognostic structural health monitoring, and damage modeling,” said Jon White Ph.D., principal member of the technical staff at Sandia.

“Partnering with Sentient Science provides a unique opportunity to advance predictive turbine-blade monitoring solutions,” said NREL mechanical engineer Scott Hughes. “NREL’s structural verification research helps validate tools that can extend the life of wind-turbine blades.”

Once the DigitalClone blade model is completed, the software capabilities will be built into Sentient’s DigitalClone Live Software as a Service, which is used by wind-turbine operators to lower their cost of energy through prognostics and life-extension recommendations.

“Our DigitalClone Live prognostic technology is being used by wind operators and OEMs around the world to achieve life extension on their wind turbines,” said Ward Thomas, CEO and president of Sentient Science. “We see what sensors can’t see and predict early failure initiation months and years before a sensor or a CBM (condition-based monitoring) system detects a field failure. Users understand which turbines to climb and which components need attention with enough advanced notice to optimize their supply chain, lower inventory, reduce lead times, and coordinate maintenance plans to reduce cost and downtime. We expect to reduce the user’s cost of energy by an additional \$1/MWh with the integration of blade life extension through the software’s watch list and asset action recommendations.”

Source: Sentient Science

For more information, go to [www.sentientscience.com](http://www.sentientscience.com)



Breeze and Bright apps collect data from wind farms and solar sites. (Courtesy: Greenbyte)

## New Breeze and Bright Apps Allows Users to Monitor Assets from a Mobile Device

The Breeze and Bright apps bring the most popular features from Greenbyte’s renewable energy management systems to a mobile phone.

The apps collect data from wind farms and solar sites and present it in an intuitive interface. Access key figures from an entire portfolio and drill down to monitor the status of each site and device on the go.

These updates bring custom alarms to dashboards, app notifications from stops, warnings and alarms, an updated user interface for Android, and more.

- Use the comprehensive overview dashboards to monitor and analyze a portfolio of wind farms and solar sites in real-time.
- Receive notifications from stops, warnings and custom alarms on a mobile device.
- Filter on range of wind turbines, status codes, and time span across various dashboards.
- Use the map to see a geographical overview of wind turbines in relation to your own position.
- Monitor custom Breeze and Bright alarms together with other status events in dashboards.
- Quick switch between Breeze and Bright apps for organizations with both wind and solar assets.
- Get started quickly with the new dedicated help section.

The Breeze and Bright Apps are available for download on the App Store and Google play.

Source: Greenbyte

For more information, go to [www.greenbyte.in](http://www.greenbyte.in)

## Dual-Action PAC Keeps Workers Comfortable in Extreme Environments

Working in extreme environments can take a toll on workers, but dual action personal air conditioners (PACs) from Vortec keep workers comfortable and productive in either hot or cold working conditions. PACs minimize heat stress and fatigue in elevated temperatures, or with simple adjustment, they raise vest and body temperatures to ward off the cold. A dual action PAC generates cold or hot air to provide airflow to the worker, along with a cooling/heating vest that diffuses the airflows around the worker's torso.

Durable, plasticized vests are available in three sizes and provide continuous cooled or warmed air through its perforated lining. They do not restrict movement, do not absorb sweat or other contaminants, and can be worn under other protective clothing. Vortec PACs are ideal for any work environment where temperature extremes pose a problem, including foundries, steel mills, boiler rooms, mines, smelters, glass manufacturing, cold storage, powder painting lines, and more.

Cold-only PACs feature an integral temperature adjustment knob that allows workers to easily "dial in" the desired temperature. When wearing PACs, workers require fewer and shorter cooling and warming work breaks, increasing overall productivity.

Vortex Tubes convert compressed air to a low-pressure cold- or warm-air source.

A compressed air stream enters the vortex tube



Vortec's dual-action PACs keep workers comfortable and productive in hot and cold working conditions. (Courtesy: Vortec)

where it spins rapidly, splitting into hot and cold air streams. ↴

Source: Vortec

For more information, go to [www.vortec.com](http://www.vortec.com)

## SecuraTrac Introduces Tiny, Powerful MobileDefender Model S

SecuraTrac®, a leading provider of mobile health and safety solutions focused on senior safety, employee well-being, and the healthcare industry, recently announced its next generation mPERS mobile emergency pendant, the MobileDefender™ Model S (MD-S). The model S (MD-S) is developed on the same platform as the MobileDefender™ and introduces new capabilities to help ensure the safety of those who use the MD-S and the SecuraTrac platform.

Companies that dispatch employees into unknown environments and situations can rely on the MD-S to relay information about employee locations while providing them with an instant connection to help if an emergen-

cy occurs. From real-estate agents and home healthcare workers meeting with clients to construction workers and engineers alone in the field, the MD-S has a variety of useful applications.

In addition to state-of-the-art location technologies, the MD-S also offers a built-in fall advisory capability. The MD-S can detect horizontal and vertical movement, so if employees fall on the job or are knocked over, they do not have to initiate a call for help. The MD-S will trigger one automatically. Leveraging existing SecuraTrac cloud-based location technology, the new MD-S adds the ability for central stations to respond to potential accidents.



The MobileDefender Model S. (Courtesy: SecuraTrac)

To improve battery lifespan, the MD-S was designed with a new Wake-on SOS feature. Wake-on SOS gives this small, mobile PERS device the ability to last more than 30 days on a single charge because the device is off until the SOS button is activated. This preserves the battery while enabling the device to turn-on, locate, transmit its location, and make the emergency phone call after the SOS is activated.

“There is no other product in the mPERS space capable of preserving battery life with a sleep mode like the MD-S,” said SecuraTrac CEO Chris Holbert. “This, plus all of the other great features in one, small package, is a game changer. Not only can companies rest assured that they know where their human assets are at in the field at all times, companies and employees can feel empowered about safety. Even if an accident occurs, the MD-S can be relied on to create an alert that help may be needed without any action taken by the employee; it could be life-saving.”

Source: SecuraTrac

For more information, go to [www.securatrac.com](http://www.securatrac.com)

## DNV GL Launches Web-Based Forecasting

DNV GL, the world’s largest resource of independent energy experts and certification body, and a digital forecasting provider for more than 15 years, has launched Forecaster Now, the industry’s first forecast on-demand web portal with e-commerce enabled transactions. Forecaster Now is part of a suite of DNV GL subscription-based short-term forecasting services, which also includes: Forecaster Live, Forecaster Plus, and Forecaster Solutions.

“Power grids and markets will continue their rapid transformation to a low carbon system,” said Craig Collier, head of forecasting for the Americas at DNV GL.

Forecaster Now provides users with on-demand forecasts of select power markets with hourly resolution to seven days. Easily accessible

on the web, Forecaster Now aims to provide energy traders, plant operators, and other stakeholders with immediate estimates of future wind and solar plant energy production. These instant forecasts help energy traders validate trading instincts and inform O&M managers, which assists them with maintenance scheduling as well as offering a critical “second opinion” energy forecast.

Forecaster Now also provides insight into the potential impacts of wind and solar generation on power supply and pricing, delivering energy traders the data needed to help validate timely trading decisions in the ERCOT market.

Source: DNV GL

For more information, go to [www.dnvgl.com/short-term-forecasting](http://www.dnvgl.com/short-term-forecasting)

**MAEDC AREA**

Moberly-edc.com      moberly area::edc      660.263.8811

**Amazing Transportation Access**

- Air: Local Airports
- Truck: Interstate 70
- Port: Via Missouri River
- Rail: Multi Rail Access

**10<sup>th</sup> Regulatory Environment**

US v MAEDC Average Wage

US: \$22

MAEDC: \$14

Broadband + 4G

**7<sup>th</sup> BEST economic competitiveness**

Our region is located near the center of the population of the US called the population mean. Making distribution centralized.

Missouri is ranked 7th by the American Legislative Exchange Council

Thousands of Skilled Laborers

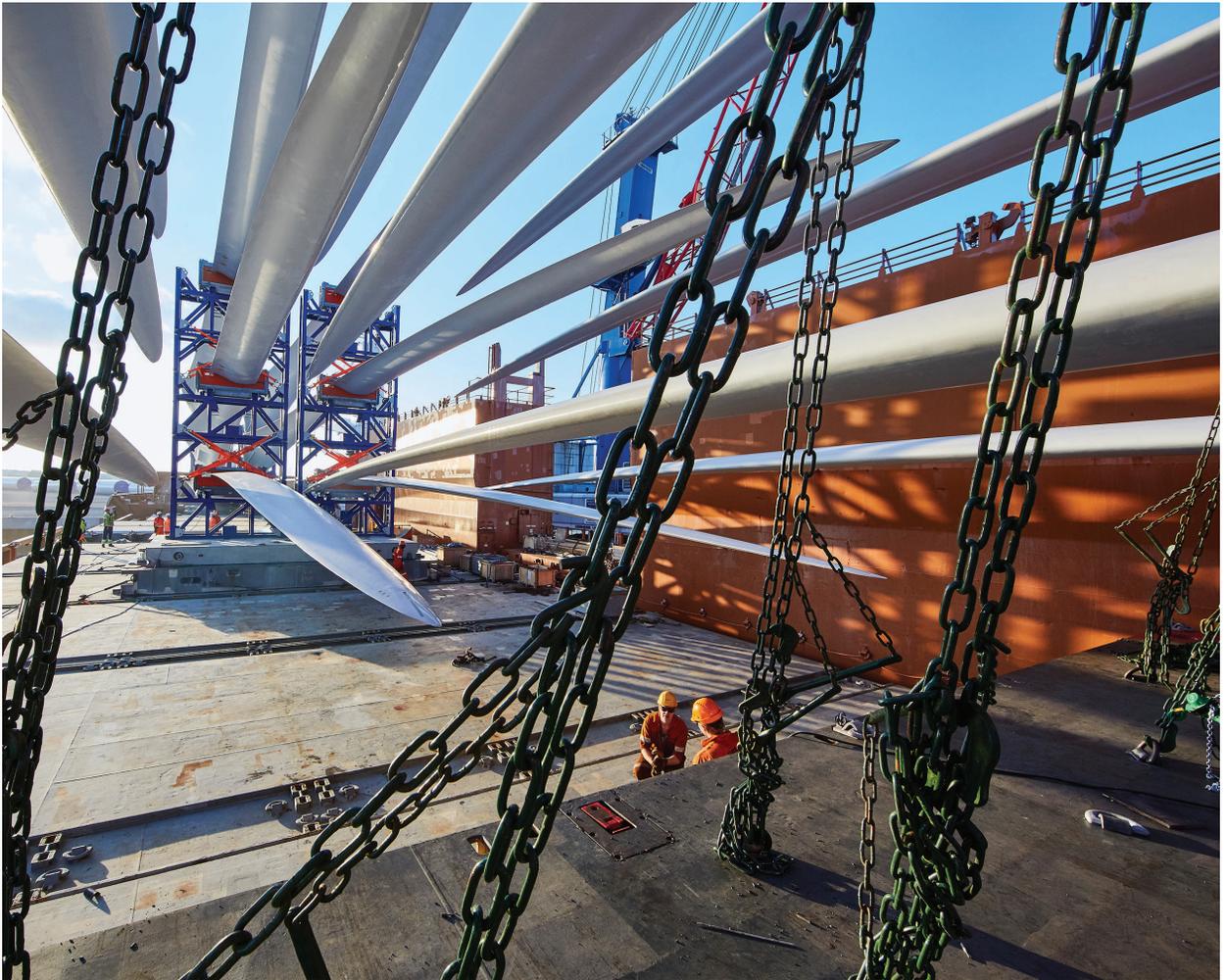
State and Local Incentives

Our region is a beautiful historic area.

# MANUFACTURING

Production • Fabrication • Components • Supply Chain • Materials • Tooling • Machinery

## GE Completes Acquisition of LM Wind Power



LM Wind Power has had a long-standing partnership with GE that has included the installation of the first offshore wind farm in the U.S. (Courtesy: GE)

GE, the world's leading digital industrial company, recently announced it completed the acquisition of LM Wind Power, a Denmark-based technology developer and manufacturer of rotor blades to the wind industry. The completion of the transaction follows regulatory approval in the European Union, the United States, China, and Brazil.

GE reached an agreement with the London-based private equity firm Doughty Hanson in October 2016 to purchase the company for \$1.65 billion. The transaction in-sources wind-turbine blade design and manufacturing for GE's renewable energy business, improving its abili-

ty to increase energy output and create value for onshore and offshore wind customers. The deal will be accretive to GE earnings in 2018.

"The completion of the LM Wind Power acquisition provides us with the operational efficiencies necessary to support the growth of our wind-turbine business, which is the fastest growing segment of power generation," said Jérôme Péresse, president and CEO of GE Renewable Energy. "With LM's technology and blade engineering, we are now able to improve the overall performance of our wind turbines, lowering the cost of electricity, and

increasing the value for our customers. Together, we are set to capitalize on the expansion of renewable energy and be a growth engine for GE.”

“LM Wind Power has had a long-standing partnership with GE that has yielded many innovations and commercial successes, including the installation of the first-ever offshore wind farm in the United States,” said Marc de Jong, CEO of LM Wind Power. “We see many digital and advanced manufacturing technology capabilities that will help accelerate our technology development and increase our customer reach.”

LM Wind Power will be run as an individual operating unit within GE Renewable Energy, providing blades for both GE’s onshore and offshore wind-business units. LM Wind Power also will continue to supply blades to the rest of the wind industry, having established protocols and safeguards to protect customers’ confidential data.

With this deal, GE continues to deepen its capabilities and ambitions in renewable energy. In the past year, GE has delivered the first offshore wind farm in the U.S., won its first offshore project in China, launched its onshore digital wind farm and digital hydro plant, and developed hybrid projects in wind-solar and hydro-wind.

GE’s goal is to deliver renewable energy projects locally that maximize electricity output while reducing the cost of electricity, bringing affordable, sustainable energy to the world and more value for its customers. ↘

Source: GE

For more information, go to [www.gerenewableenergy.com](http://www.gerenewableenergy.com)



Senvion 6.2M152 turbines like these will be manufactured for the TWBII offshore wind farm. (Courtesy: Senvion)

## Senvion to Proceed with 203 MW Trianel Borkum II

Senvion, a leading global manufacturer of wind turbines, has announced the contract for the Trianel Windpark Borkum II has been concluded and is now effective.

The notice to proceed was confirmed at the end of April with Trianel Windkraftwerk Borkum II GmbH & Co KG (TWBII).

The conditional contract for the turbine delivery and service for the TWBII offshore project was signed in September 2016. With the contract completion achieved, the project now can enter the next phase of development.

The TWBII offshore wind farm will consist of 32 Senvion 6.2M152 turbines with a power upgrade, and will be installed in a water depth of 25 to 35 meters. The wind farm will produce about 800 million kWh of electricity every year, enough to supply about 210,000 households annually.

The wind farm is planned to be installed 45 kilometers north of the island of Borkum in the German North Sea. It will be close to the alpha ventus wind farm, which started operations in 2009 and is equipped with six 5M 126 Senvion offshore turbines. The installa-

tion of the turbine components is planned for spring 2019.

“We are very pleased with the completion of this contract and the confidence the Trianel project-consortium has shown in our turbines,” said Jürgen Geissing, CEO of Senvion. “We look forward to a successful partnership together. It is particularly significant that Senvion has been awarded one of the last offshore projects under the current German feed-in tariff regime. This confirms our solid position in the offshore market and proves that our product developments and innovations continue to set standards in the cost-effective generation of offshore wind energy.”

“A half year after contract signing, I am very pleased that we could successfully start the realization phase together with Senvion,” said Klaus Horstick, commercial director of TWB II. “From spring 2018 onwards, the Trianel Windpark Borkum II will be installed in the North Sea and will expand the municipal offshore engagement.” ↘

Source: Senvion

For more information, go to [www.senvion.com](http://www.senvion.com)

## WEG to Manufacture Wind Turbines in India

WEG S.A. plans to manufacture wind turbines at its Hosur plant in India, marking the company's entry into the Indian wind market. The company intends to upgrade its large electric motors and generator factory in Tamil Nadu, near Bangalore, to also manufacture 2.1 MW wind turbines.

WEG India's factory has 35,000 square meters of built area and about 490 employees.

"The modular design of our manufacturing complex allows us to expand the company with reasonably low investments, in this case limited to certain devices and tools specifically used in the manufacture of wind turbines," said Swapnil Kaushik, managing director of WEG India.

With capacity to absorb production of up to 250 MW per year, as well as to produce the nacelles, generators, and hubs, the Indian unit will be able to supply the first turbines in 2018. Meanwhile, the company will begin the commercial activities to capture supply contracts and also development of local suppliers.

According to João Paulo Gualberto da Silva, WEG's global wind turbine managing director, India presents attractive conditions for the Company.

"In addition to being the world's fourth largest wind-power generation market, the country offers an excellent supply chain for wind turbines and very competitive production costs," he said.

WEG's entry into the Indian wind market was announced at Windergy, a national wind energy fair in New Delhi. ↴

Source: WEG

For more information, go to [www.weg.net](http://www.weg.net)



WEG India will supply the first turbines in 2018. (Courtesy: WEG)



Prysmian is the largest manufacturer of cable and accessories in the U.K. (Courtesy: Prysmian)

## Prysmian To Add Offshore Cable Capabilities to U.K. Factory

Prysmian Group, a world leader in the energy and telecom cable systems industry, will manufacture 33 kV and 66 kV submarine cable cores used for the inter-array cable connections in offshore wind farms at its U.K. production facility in Wrexham.

The new product line will enable the linking and collecting of power produced by offshore wind turbines before onward transmission to the onshore grid.

Prysmian is the largest manufacturer of cable and accessories in the U.K. Recently celebrating 100 years of history, it operates multiple factories and provides extensive cable installation and test services to the highest voltage levels across England, Scotland, Wales, Northern Ireland, and beyond. Its high voltage facility in Wrexham is the only factory in the U.K. capable of manufacturing these submarine cable cores.

"Our Wrexham factory has been manufacturing the highest quality cables for decades, and we are delighted to be directing this depth of experience and know-how to products that will further grow the business, sustain and create local jobs, and provide U.K. manufactured cables for the next generation of U.K. and European offshore wind farms," said Llyr Roberts, CEO of Prysmian U.K.

In the U.K., Prysmian already has an established and strong presence serving the offshore wind-energy sector. Alongside a dedicated submarine operations and engineering office in Chelmsford, Prysmian operates an offshore logistics and services base in Middlesbrough, which serves as a center of excellence offering maintenance, repair, and cable storage services for all offshore cabling.

It is also in Middlesbrough where the Prysmian cable laying vessel, Cable Enterprise, is based. The site is home to an extensive range of cable burial and protection equipment, underpinning the EPCI capability of Prysmian to execute submarine cable projects. ↴

Source: Prysmian Group

For more information, go to [www.prysmiangroup.com](http://www.prysmiangroup.com)

## Stratix 2500 Lightly Managed Switch Addresses Evolving Networking Needs

Manufacturers that use unmanaged network switches but struggle with downtime or security concerns now have an alternative to using managed switches. The Allen-Bradley Stratix 2500 lightly managed switch from Rockwell Automation provides the security, resiliency, segmentation, and bandwidth-optimization benefits of a managed switch without the need for extensive configuration.

“Unmanaged switches deliver the network connectivity required for less complex industrial applications, but they can’t provide diagnostics, manage traffic, or enhance security,” said Divya Venkataraman, global product manager for Rockwell Automation. “Manufacturers need a more robust switch when issues like packet storms are bringing down their network, or if they want to protect against growing security threats. This is where a lightly managed option like the Stratix 2500 switch delivers exceptional value.”

When installed out of the box, the Stratix 2500 industrial Ethernet switch can prioritize critical industrial network traffic. It also can be configured for application-specific needs. Manufacturers can use this flexibility to future-proof their operations by deploying the switch out of the box and scaling it up to a lightly managed switch as their needs evolve.

As a lightly managed switch, the Stratix 2500 switch far exceeds the capabilities of an unmanaged switch by monitoring and optimizing traffic flow and providing diagnostic information to help minimize downtime. It also can support up to 64 VLANs for logical segmentation, which helps reduce total cost of ownership. In addition, port security allows users to disable ports or control end-device connectivity based on the media access control address.

The Stratix 2500 lightly managed switch uses embedded Cisco technology

and is part of the Rockwell Automation Integrated Architecture system. This helps ease network configuration, management, and support while optimizing integration with the enterprise network.

“With embedded Cisco technology, the Stratix 2500 switch delivers the security and monitoring capabilities required by IT professionals

while exposing an easy-to-use web interface for operations professionals,” said Samuel Pasquier, director of product management, IoT Platforms, Cisco. ↵

*Source: Rockwell Automation*

For more information, go to [www.rockwellautomation.com](http://www.rockwellautomation.com)



**BUILDINGSTRONG**

**WANZEK**  
a MasTec company

wanzek.com

**Wanzek Construction Renewable Services**  
New Service Center Location: Amarillo, TX

# CONSTRUCTION

BOP/EPC • Project Status • Siting • Equipment • Project Due Diligence • Services

## Seacat Services Launches Two Vessels Under New Code



The 26-meter Seacat Courageous, was originally launched in February 2015. (Courtesy: Seacat Services)

Class-leading offshore energy support vessel (OESV) operator Seacat Services has completed its latest investment in its fleet, launching two vessels with the capacity for 24 industrial personnel — the newly-accepted Seacat Enterprise and the upgraded Seacat Courageous.

These boats are amongst the first wave of offshore energy support vessels to be certified under the new HS-OSC (High Speed — Offshore Service Craft) code, which now allows vessels under 500 metric tons to carry up to 60 industrial personnel. High Speed Utility Vessel (HSUV) Seacat Enterprise is the first vessel to be both built and registered in the U.K. under this new code.

Ahead of a busy offshore wind construction phase, this increase in personnel capacity offers a significant advantage from a logistical perspective and enhances the versatility of

the Seacat Services fleet. With the next raft of new construction sites in remote and deep waters — equating to significant time offshore — there is a growing market need for an increase in OESV size and technician complement.

Both Seacat Enterprise and Seacat Courageous are “dual-classified” under the recently introduced HS-OSC code and the existing workboat code, which means they can be licensed to carry 12 “passengers” under workboat code rules, and, as an HS-OSC craft, carry a further 12 “industrial personnel.”

In making this distinction between “passengers” and “industrial personnel,” HS-OSC recognizes the extensive safety training undertaken by offshore wind technicians and affords vessel operators greater versatility in meeting the demands of supporting large-scale construction projects.

It also has enabled the development of a new category of workboat for the offshore wind sector. Seacat Enterprise is the first U.K.-built HSUV, a highly capable 27-meter catamaran that is the most recent product of a long-term collaborative R&D program between Seacat Services, South Boats IoW, and Alicat Marine Design.

It features a substantially enhanced cargo and fuel carrying capacity that enables it to carry up to four 20-foot containers in addition to 24 personnel and ship's crew. This extra fuel capacity allows Seacat Enterprise to remain operational for significantly extended periods between port calls, enabling it to create operational efficiencies by supporting both larger vessels and other offshore assets.

Seacat Services' second HS-OSC-certified vessel, the 26-meter Seacat Courageous, was originally launched in February 2015 as a 12-seater, but thanks to a modular design, it now has been refitted and upgraded to become a 24-seater. It features a 26,000-liter fuel tank and a foredeck that can accommodate up to two 20-foot equipment containers.

"The introduction of the HS-OSC code is a welcome development for the U.K. offshore wind sector, enhancing the service provided by vessel operators like Seacat Services as we gear up for the upcoming construction phase," said Ian Baylis, managing director of Seacat Services. "The acceptance of Enterprise and upgrade of Courageous are part of our continuing investment in the fleet, and an ongoing program of significant scheduled refits to our vessels that will ensure that each and every one of our boats continues to meet the very highest standards. This investment in technology has been matched by expansions to our support facility and shore-based teams."

"In short, we're well-placed to continue supporting the fast moving offshore wind sector and the 'industrial personnel' driving construction and operations forward," he said.

Highly versatile HSUVs like Seacat Enterprise are the future of deep-water construction, operations, and maintenance support — fulfilling a number of hugely important roles and complementing the activities of other offshore wind vessels. ↵

Source: Seacat Services

For more information, go to [www.seacatservices.co.uk](http://www.seacatservices.co.uk)



## Fresh air.

Whatever clean technologies the future brings, lubricants will continue to play a key role. For innovative industrial lubricants that extend service life and enhance performance, look to lubricants formulated with NUFLUX™ technology from Evonik.

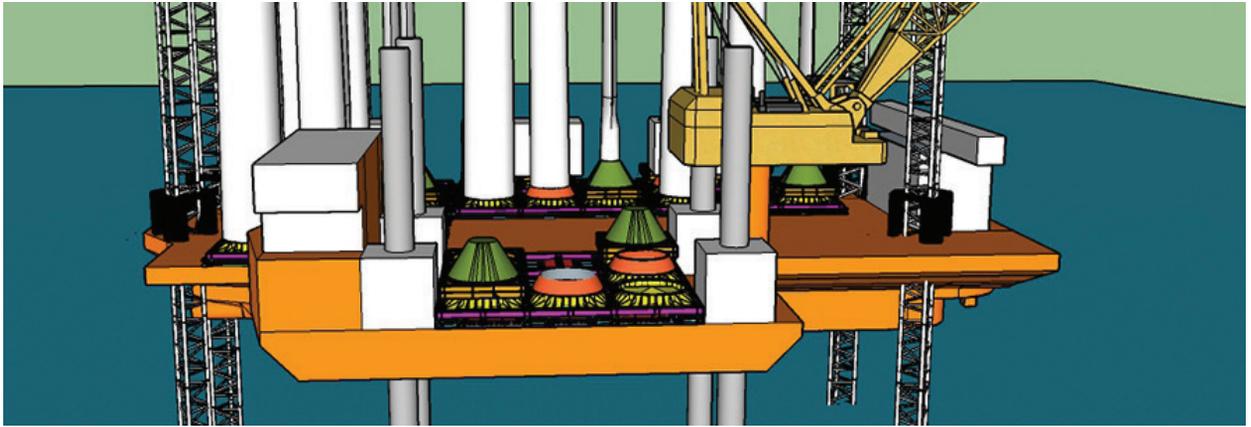
Aim high — **Let it flow.**

**NUFLUX™**

To learn more, scan the QR code or visit [evonik.com/oil-additives](http://evonik.com/oil-additives).



 **EVONIK**  
POWER TO CREATE



“Twisties” is a modular project-cargo transport frame system that is sea-fastened using container twist locks. (Courtesy: DNV GL)

## DNV GL’s “Twisties” to Improve Offshore Wind Logistics

DNV GL, the world’s largest resource of independent energy experts and certification body, has launched a revolutionary new joint industry project (JIP) to develop a Recommended Practice intended to de-risk the adoption of “twisties”

and demonstrate the unitization of wind project cargo. The innovative concept is called “twisties” — a modular project-cargo transport frame system that is sea-fastened using container twist locks — and which gives the frames their name.

The increasing size and quantities of wind turbines installed offshore means that a change in requirements is needed for shipping project cargo between manufacturing and marshaling port facilities, and feeding-wind turbine installation vessels offshore. Conventional feeder vessel operations have introduced many challenges, including operational limits on wave heights and wind speeds. DNV GL has identified that a fast feeder vessel using a RoRo (roll on, roll off) method of logistics transfer can avoid both wave-limits and the tight wind-speed limits often associated with lifting blades offshore. It is this constant requirement for handling project cargo of a repeatable form, with bolted flange connections, that has brought about an industry desire to optimize and standardize transport logistics and sea-fastening arrangements.

The wind industry has made attempts at unitization, such as grouping three blade sets into a “unit.” Modular twist-lock, stackable blade racks are now commonplace on the decks of installation vessels. DNV GL has taken this concept and proposed a method for unitization using modular transportation and sea fastening frames



# FIVE STAR FILTER

LARGEST STOCK & READY TO SHIP

We provide a wide selection of high-quality filters for many wind turbines and compressors

<p> <b>FILTER PADS</b></p> <p> <b>HIGH-PRESSURE HYDRAULIC CRANKCASE</b></p> <p> <b>OFF LINE LUBE FILTERS</b></p>	<p> <b>BREATHER AIR FILTERS</b></p> <p> <b>COMPRESSORS AND ENGINES</b></p> <p> <b>TOWER DOOR FILTERS</b></p>
---	---

Call us today to experience our Can-Do Guarantee!

Phone 713.290.1972
Email [service@5starfilter.com](mailto:service@5starfilter.com)
Website [5starfilter.com](http://5starfilter.com)

based upon standard 20-foot cargo container twist-lock centers.

Transporting turbines and other wind-farm components using “twisties” is shown to significantly lower construction-program durations to “single season” phases. It also allows for greater quantities of turbines to be installed using a defined number of wind-turbine installation vessels. The concept demonstrates cost savings in some cases of above 25 percent compared to conventional installation practice.

“Bringing industry stakeholders together within this JIP, with the intention of standardizing wind-project cargo now, can reduce installation costs and ensure that the industry is equipped to meet the aspirations of COP 21 and those outlined by other groups, such as IABR’s ‘2050-An Energy Odyssey’ vision where 25,000 installed turbines would form a European mega project in the North Sea and create thousands of jobs in the offshore industry,” said Prajeev Rasiah, regional manager for NW Europe, Middle East & Africa, DNV GL.

“Establishing a JIP will de-risk the implementation of this technology and promote the unitization of wind-project cargo,” said Chris Garrett, senior offshore wind farms engineer, DNV GL. “This continues our commitment to reduce the cost of offshore wind, as outlined in DNV GL’s Offshore Wind Cost Reduction Manifesto. Understanding the technicalities of current wind-industry transportation methods enables us to demonstrate the vast benefits that a standardized unit approach will bring to the entire industry.” ↵

*Source: DNV GL*

For more information,  
go to [www.dnvgl.com](http://www.dnvgl.com)

## IPS Service Center Creates More Jobs

Integrated Power Services (IPS), a North American leader in the service and repair of electric motors, generators, and mechanical power transmission components, recently announced a capital transformation project of its service center in Litchfield, Minnesota. The project, scheduled to be complete in June, greatly enhances the facility’s production capacity and will generate 25 new jobs.

The IPS Litchfield Service Center offers in-shop repair, field services (including up-tower wind turbine), distribution and storage of critical assets. All industrial applications are served, including wind turbines, power plants, mining, ethanol plants, refineries, pipelines, steel mills, paper mills, cement plants, food and beverage, and manufacturing facilities.

The initial phase of the transformation project involved moving distribution products and stored customer assets out of the Litchfield Service Center and into a new facility in Dassel, Minnesota. This move created 7,500 square feet of additional production space in Litchfield. The transformation also included rearrangement of the service center layout, improving flow of customer assets through the repair process and reducing repair motion from eight miles down to one and a half mile.

The additional space and improved layout, along with the installation of eight new jib cranes, an additional bake oven and Core loss tester, a new paint booth, wash bay, and ice blast booth will allow the IPS Litchfield Service Center to add 25 jobs to its second shift.

“The Litchfield Service Center transformation project will allow us to better serve the needs and expectations of current and new customers,” said Nick Willing, Litchfield Service Center area general manager. “The additional capacity, facility upgrades, and jobs generated will double our repair throughput capabilities. This is great news for customers, as well as Litchfield and surrounding communities.” ↵

*Source: Integrated Power Services*

For more information,  
go to [www.ips.us](http://www.ips.us)

## ALL Purchases Five Tower Cranes

To meet an increased demand for tower-crane rental, the ALL Family of Companies recently purchased a package of five new tower cranes. ALL’s diverse fleet of towers from Manitowoc/Potain and Terex now numbers about 100, with capacities ranging from 6 to 35 USt (about 5 to 32 mt).

The five-crane package includes:

- Two of the new Manitowoc/Potain CCS city tower cranes, model MDT 219 J10 (11 USt/10 mt), with a maximum hook reach of 213 feet (65 meters) and a maximum hook height of 231 feet (70 meters). Its innovative crane control system (CCS) provides fast, time-saving setup and outstanding lift performance. One MDT 219 is already in the ALL fleet and ready to work; the second is due to arrive in August.
- A Manitowoc/Potain Igo T 130 (8.8 USt/8 mt), the largest self-erecting tower crane from Potain, with a maximum hook reach of 164 feet (50 meters) and a maximum hook height of 200 feet (61 meters) when using an



The Manitowoc/Potain CCS city tower crane has a maximum hook reach of 213 feet. (Courtesy: ALL)

elevated jib. The new T 130 — the first one in the ALL tower fleet — has a greater capacity than others in its class, offering enormous flexibility with its multiple jib configurations, variable mast heights, and an offsettable jib. The T 130, available immediately, will be put into service by the Pittsburgh branch.

- Two Terex SK 415-20 hammerhead tower cranes (22 USt/20 mt) feature a maximum hook reach of 246 feet (75 meters) and a maximum hook height of 214 feet (65

meters). These workhorses are a popular staple in the ALL fleet, so the company chose to add two more that have the longer 263-foot (80 meter) jib versus 246 feet (75 meter). The SK 415s are due for delivery in July.

“Tower crane rental rates continue to trend upward,” said Clay Thoreson, general manager of ALL’s tower crane division and 45-year veteran of the tower-crane industry. “With the economic recovery in many markets, more buildings are going up on tight

city sites that require tower cranes. We’ve been adding to our fleet in categories where we see growth; last year in luffing-boomed models, the year before in larger hammerheads. Now in 2017 we are filling some of our customers’ niche needs.”

ALL rents and sells a large variety of lifting equipment, including cranes, boom trucks, aerial lifts and material handlers. ↙

Source: ALL

For more information, go to [www.allcrane.com](http://www.allcrane.com)

## Women of Wind Energy Rebrands

*WoWE becomes WRISE as it expands its focus to all renewables and broadens its core philosophy.*

By **Kenneth Carter**  
Managing Editor | Wind Systems

After 12 years as Women of Wind Energy, the nonprofit organization is rebranding its image as its focus on renewables evolves.

Not only does that mean an expansion of its core philosophy, but also a new name and logo to go along with it.

As of May 16, Women of Wind Energy is now Women of Renewable Industries and Sustainable Energy (WRISE).

In addition to programs to help recruit and maintain women in the wind industry, it will now expand that role to other areas of renewable energy, according to Executive Director Kristen Graf.

“While our mission has been about renewable energy all along, this is a moment in time for us to kick the evolution of our work beyond just the wind-industry base,” she said. “There’s been a lot of demand from our membership and from our chapters to be working across some other technologies as well as from our corporate sponsors and from the industry.”

### **MORE DIVERSE INDUSTRY**

Graf said the industry is becoming more diverse with some wind companies working in solar and energy storage as well as law firms and finance organizations that work across the energy spectrum.

“There’s a lot more overlap between the work that’s going on across all the renewable energy space, and in the end, the issues around advancing and retaining women are pretty similar,” she said.



# WRISE

## Women of Renewable Industries and Sustainable Energy

Nuances exist depending on the size of the organizations or the maturity of the industry, but a lot of the work is similar, according to Graf.

“We really think it’s a great moment in time and opportunity to be supporting women across all those technologies,” she said. “Especially as women sort of move around in the technologies over their careers.”

WoWE has been around since 2005, and it has come a long way since its humble beginnings as a luncheon at a WINDPOWER show in Denver. But even that impromptu luncheon showed the demand to get women more involved in renewable energy.

After being founded by a small group of women who were frustrated at the lack of women in the industry, particularly at national conferences and as company executives, the group pooled its own money and, along with some money from friends and a few forward-thinking wind companies at the time, the group started the Rudd Mayer Fellowship, one of Women of Wind

Energy’s key pieces, according to Graf. Mayer’s work in the wind industry earned her national recognition where she promoted Colorado utilities’ wind-power programs.

The group brought some young women who were students and graduates to the annual wind conference.

### **BIG TURNOUT**

“We hosted our first-ever lunch,” Graf said. “It was a bit of a last-minute idea. So they got a room in a hotel near the conference center and were expecting maybe 20 or 30 folks to show up, and had a huge room full of people — about 120, almost all women. A lot of people were sort of blown away. And I think it was the beginning of recognition that there was a clear demand for that kind of work and activity.”

At the next luncheon in Pittsburgh, the women attending wanted to keep the momentum going in between conferences, according to Graf.

*Continued on page 48*

# Delivering Value with Wind Energy tooling

LARGE SCALE | HIGH QUALITY | PRICE COMPETITIVE | ON-TIME DELIVERY

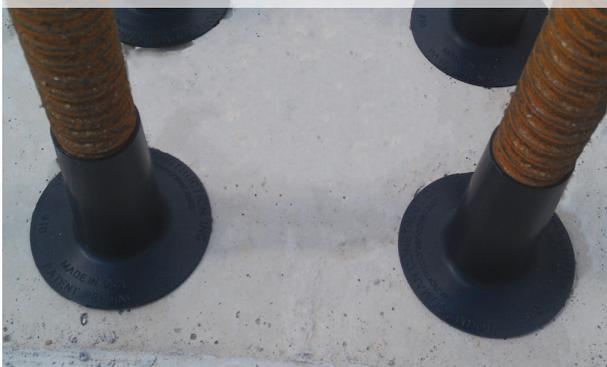


- ▶ Patterns, Molds, Plugs
- ▶ Precision 5-axis machining
- ▶ Composite Fabrication
- ▶ Engineering Services

[www.janicki.com](http://www.janicki.com)  
360.856.5143



## INTRODUCING IRONCLAD GROUT SLEEVES



- Grout Sleeves are More Effective in Protecting Bolts from Grout
- Saves Labor – Enhances Safety – No More Cutting Foam
- Displace Almost No Grout, Resulting in a Considerably Stronger Foundation



800.359.0372  
[JWBURCE@NTCWIND.COM](mailto:JWBURCE@NTCWIND.COM)  
[NTCWIND.COM](http://NTCWIND.COM)

Call to inquire about our special limited time pricing!

# WIND SYSTEMS

*Giving Wind Direction*

**David C. Cooper**  
Publisher  
[david@msimktg.com](mailto:david@msimktg.com)  
ext. 200

**Chad Morrison**  
Associate Publisher  
[chad@msimktg.com](mailto:chad@msimktg.com)  
ext. 202

## EDITORIAL DEPARTMENT

**Molly Rogers**  
Editor  
[molly@msimktg.com](mailto:molly@msimktg.com)  
ext. 205

**Kenneth Carter**  
Managing Editor  
[editor@windssystemsmag.com](mailto:editor@windssystemsmag.com)  
ext. 204

## SALES DEPARTMENT

**Mike Barker**  
Regional Sales Manager  
[mike@windssystemsmag.com](mailto:mike@windssystemsmag.com)  
ext. 203

**Tom McNulty**  
Regional Sales Manager  
[tom@windssystemsmag.com](mailto:tom@windssystemsmag.com)

## CIRCULATION DEPARTMENT

**Teresa Cooper**  
Manager  
[info@windssystemsmag.com](mailto:info@windssystemsmag.com)  
ext. 201

**Cole Morrison**  
Assistant  
ext. 209

**Jamie Willett**  
Assistant

## DESIGN DEPARTMENT

**Shane Bell**  
Creative Director  
[design@windssystemsmag.com](mailto:design@windssystemsmag.com)  
ext. 206

**Michele Hall**  
Graphic Designer  
[michele@windssystemsmag.com](mailto:michele@windssystemsmag.com)  
ext. 211

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage-and-retrieval system without permission in writing from the publisher. The views expressed by those not on the staff of *Wind Systems* magazine, or who are not specifically employed by Media Solutions, Inc., are purely their own. All "News" material has either been submitted by the subject company or pulled directly from their corporate web site, which is assumed to be cleared for release. Comments and submissions are welcome, and can be submitted to [editor@windssystemsmag.com](mailto:editor@windssystemsmag.com).



Published by Media Solutions, Inc.  
P. O. Box 1987 • Pelham, AL 35124  
(800) 366-2185 • (205) 380-1580 fax

**David C. Cooper**  
President  
[david@msimktg.com](mailto:david@msimktg.com)  
ext. 200

**Chad Morrison**  
Vice President  
[chad@msimktg.com](mailto:chad@msimktg.com)  
ext. 202

**Teresa Cooper**  
Operations Director  
[info@msimktg.com](mailto:info@msimktg.com)  
ext. 201

# AD INDEX

5 Star Filter .....	42
Abaris Training Resources .....	1
Amsoil .....	5
AWEA (American Wind Energy Assn) .....	31
Castrol Industries .....	9
City of Elk City Oklahoma EDC .....	47
Evonik Oil Additives USA Inc. ....	41
FGGS Field Services .....	47
Janicki Industries .....	46
Kalamazoo Valley Community College .....	25
Moberly Area Economic Development Corporation .....	35
MOOG Components Group .....	IFC
NTC Wind Energy .....	46
s. Himmelstein and Co. ....	25
Snap-On Tools .....	IBC
Stahlwille Tools NA. ....	13
TORKWORX LP .....	3
Wanzek Construction .....	39
Wind Systems .....	7,29
Winergy .....	BC

Factory Trained Service Provider for  
**Winergy Drive Systems**



**Field Service for Bearing and Gear Replacements up Tower.**

**OEM REPLACEMENT PARTS**

**Contact us today...**  
 115 Technology Drive  
 Suite A-201  
 Trumbull, CT 06611  
 P +1 (203) 268-5961 X-15  
 F +1 (203) 459-0301  
 info@fggscorp.com

**GWO, NR35 and NR10 Certifications**



**FGGS**  
 FIELD SERVICES

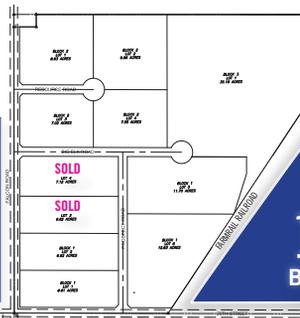
**Locations: US/Brazil**

[www.fggscorp.com](http://www.fggscorp.com)

Located in the **Heart** of The Wind Corridor



**ELK CITY, OKLAHOMA!**



**CITY OF ELK CITY**

Grow with us in our **3rd Industrial Park**

**130 Acre**  
 Big Elk Industrial Park



**On Interstate 40 and Historic Route 66**

Contact: Jim D. Mason, CEcd, EDFP  
 580.225.3230 [masonj@elkcity.com](mailto:masonj@elkcity.com) [www.elkcity.com](http://www.elkcity.com)

“And that’s really the organic way our chapters got going,” she said.

But coming up with a name came with a few surprises.

“They wanted to be Women of Wind, but realized conflicts with both Wind on the Wires as well as a large organization known as Women of the Wind that was focused on women who ride motorcycles,” Graf said. “So there was an early decision to shift to Women of Wind Energy.”

With an identity in place, the momentum continued to grow as the group’s steering committee decided to get serious in 2009 when it obtained some seed money, hired an executive director, and went through the incorporation process, she said.

“Now we have over 35 chapters around the U.S. and a few in Canada doing all the work as WoWE as an organization,” Graf said.

## RECRUITING AND RETAINING

Over its 12 years, WoWE would focus on recruiting more women to work in the renewable energy field while helping to retain and advance the women already working in it, according to Graf.

“We work with individual women on their career path and trajectory but also work with companies on some of their institutional policies and the things they can be doing to both hire more women and to keep the great women they have,” she said. “And we work with all the great women and men across our network to talk about renewable energy in different ways wherever they are.”

And WoWE had developed quite the arsenal of tools to meet those goals.

“We have a leadership forum that we host every year in the fall right before AWEA’s fall symposium,” Graf said. “We have webinars. We have a mentoring program that’s both one-on-one mentoring but also peer-group mentoring. We now have Woman of the Year Rising Star and a WoWE champion. And last year, for the first time, we worked with the Wind Energy Founda-

tion to add a new fellowship that’s specifically for women in wind-technician training programs called the Wind at our Backs Fellowship.”

## MAKING STRIDES

And with the rebranding, Graf said she expects the organization will continue to make strides in getting and keeping women in renewables beyond wind.

“I’m hopeful that in the long run, it will mean more chapters,” she said. “We still have some work to do in terms of visibility in the other technologies, but we’ve been working on that over the last couple of years. It’s an easy opportunity, right away, for the chapters that we already have in place. Some of them are already working across technologies.”

The mix in the beginning will tilt a little toward the wind side because the organization has so much experience with that part of the renewables industry, but Graf sees that changing.

“It’ll be a little bit heavier on wind just because that’s where we’ve had the strength and visibility and a lot of our sponsors,” she said. “But even that mix of who we’re already working with had begun transitioning on its own, in a way, with a lot of our individual members already working across more technologies. Some of that had already started to transition. Our goal is to provide value across all the technologies.”

Graf said a large component of the rebranding has been to think through their programming and see what changes will create value.

“There are some programs that probably won’t change that much,” she said. “Our webinars, for example, we can continue to evolve that, and maybe it means we just try to add a few more to the mix, so that we’re covering things well. But other things may change more dramatically.”

As an example, Graf said their leadership forum at the AWEA fall symposium might change after this year.

“That just feels too wind heavy, and it’s really such a strong event for us, we

want it to be as open as possible,” she said. “Having it connected (with wind only) feels more exclusive.”

## REBRANDING TALK

The idea of rebranding Women of Wind Energy had been bounced around the organization for years, but it wasn’t until November 2016 when talks became more focused.

“Upfront, there was a lot of scoping and making sure this was the right decision,” Graf said.

WoWE began working with Wilkinson and Associates, a Washington, D.C.-based branding agency, that helped with background work, membership surveys, and interviews that covered the breadth and depth of the organization as well as the stakeholders’ vested interest, according to Graf.

“When we had all of the results from that pulled together, we had some healthy conversations, and they came back with an initial round of names,” she said. “Definitely selecting the new name was a challenging, but great, part of the process. Everybody loved Women of Wind Energy, and our acronym WoWE (wow-ee) was really fun, so we had a lot of brand loyalty around that. So trying to find something that captured that same enthusiasm in energy, but also felt like it was inclusive of this broader spectrum and picture we were trying to encompass was a challenge.”

A similar process went into the new logo design and incorporating all the different facets of the organization’s new goals and philosophies.

“We gave them a pretty challenging piece,” Graf said. “I think in the end we came up with something really nice, but it is intended to show an evolution from the existing logo.”

The rebranding is meant to not only move the organization into the future, but to show how far the organization has come since its origins in 2005. And another positive for the organization’s rebranding: This time, WRISE didn’t have to compete with motorcycles. *✍*

# ENGINEERED DROP PREVENTION SOLUTIONS



Since inventing the socket and driver back in 1920, Snap-on has been driven by innovation. This GE 1.5 Hub Hatch Tool is an engineered solution that replaces the homemade version in many technician bags. It includes a floating, certified attachment point, ensuring functionality and drop prevention.

GE Hub Hatch Tool



Stainless Steel Safety Coil is designed to slide freely along the handle, so you can hold the wrench where you need to.

CUSTOM DESIGNED AND TESTED DROP PREVENTION TOOLKITS WITH INVENTORY MANAGEMENT SYSTEMS ARE ORDERED AS A SINGLE LINE ITEM.



Contact Power Generation Manager John Tremblay  
413-519-3380 or [john.r.tremblay@snapon.com](mailto:john.r.tremblay@snapon.com)  
[www.snapon.com/industrial](http://www.snapon.com/industrial)

**Snap-on**  
INDUSTRIAL

# What keeps the costs in line?

Superior service saves costs by delivering maximum availability of your turbine. Winergy performs OEM quality service and your wallet will thank you. Winergy offers Turbine-Ready Solutions™ with original parts and engineered upgrades at reasonable prices. Winergy is committed to support our key customers' management of Levelized Cost of Energy (LCOE) for Winergy or select other gearbox platforms.

Contact our **USA service office** at **+1 (847) 531-7400**

