SCHNEIDER SELECTS VAISALA AS GLOBAL WIND FORECASTING PARTNER

Schneider Electric, a global specialist in energy management and automation, has signed a long-term international wind energy forecasting agreement with Vaisala, a global leader in environmental and industrial measurement and an expert in wind measurement, project assessment, and energy forecasting.

The agreement was signed following a competitive two-month live trial where Vaisala demonstrated superior performance in several key accuracy metrics across multiple forecast horizon times at several independent wind farm sites located throughout North America and Europe. This means that developers and operators can now benefit from best-of-breed wind power and weather forecasting information and an industry-leading software platform along with all of the other management tools Schneider Electric offers within its online decision-support application.

Schneider Electric's application, known as WeatherSentry Wind Energy Edition, uses next-generation mapping to provide detailed weather forecasting for wind farms around the world. This includes patented alerting technology to signal wind farm personnel about approaching lightning or other severe weather. It also includes dynamic location support through mobile device apps. The application helps wind operators enhance situational awareness and efficiently schedule operations by assessing their risk with respect to multiple weather parameters so that proactive and reactive wind project site activity can be better managed, monitored, and planned.

The wind power forecasts will also be available as part of the Schneider Electric Renewable Control Center solution, an automation tool for renewable power plant performance monitoring, management, and optimization.

This combination of services delivers an improved user experience, particularly for individuals working on operational projects who may not be directly experienced with meteorology and weather markets.

Vaisala

Schneider Electric interface

"Irrespective of where in the world wind farm owners and investors are operating projects, it's imperative to have access to high-quality weather forecasting information to plan for operations and maintenance, maximize production, and safeguard the facility," said Jon Reifschneider, vice president and general manager of weather at Schneider Electric. "In light of this, and having spent considerable time developing a product that's tailored to the specific needs of our global wind customer base, it was crucial that we develop a strong commercial partnership with a trusted renewable energy

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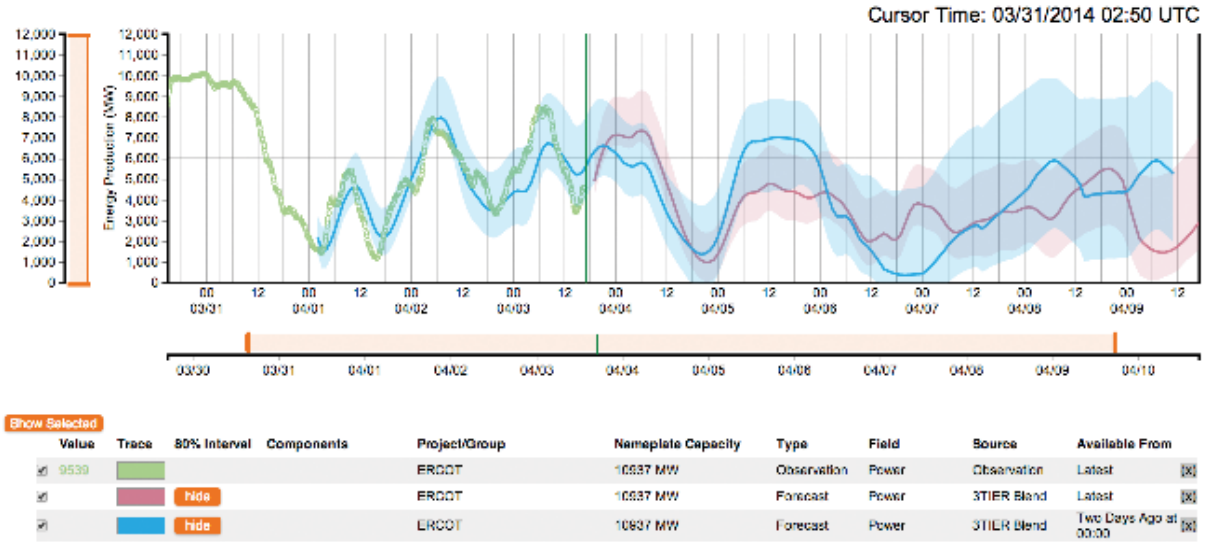

Vaisala's forecast dashboard (*The information looks slightly different when presented through the Schneider Electric's application.*)

Vaisala

forecast provider. Vaisala consistently demonstrated forecast accuracy and an unrivalled understanding of the market. Through its first-class forecasting technology, Vaisala provides us a strong source of data that can be delivered globally to enable further development and growth."

According to Pascal Storck, global manager of energy services at Vaisala, "Vaisala and Schneider have enjoyed a longstanding global working relationship, and this latest agreement underlines the strength of this commercial partnership."

"Working closely with the team and having added considerable forecasting integrity to the platform, the focus over the course of the next 12 to 18 months now lies in continuing to attract new end users to the platform, while at the same time expanding and developing the existing service and reach," Storck said. "This is likely to include regional wind forecasts in key energy markets."

— Source: Vaisala

For more information,
go to www.vaisala.com/energy.

ROMAX WINS IWEF TECHNICAL CONSULTANT OF THE YEAR

Romax Technology was recently acknowledged as Technical Consultant of the Year through an award at the Indian Wind Energy Forum held in New Delhi in November 2015.

The event focused on the future of operations and maintenance (O&M) and asset management of wind farms, where Romax's InSight division gave a presentation on using technology for performance and reliability improvement. Romax has a proven track record working on the predictive maintenance and condition monitoring of wind farms across Asia, particularly in India, Korea, and China. In India, this has involved establishing key partnerships that successfully include providing turbine health assessments and condition monitoring services for India's largest independent power producer, Mytrah Energy, and working with India-based wind turbine manufacturer Inox Wind, which not long ago placed its 500th order for the Romax-designed 2-MW wind turbine gearbox.

Romax is widely regarded as a market leader in wind turbine drivetrain design and wind turbine generator (WTG) technical operation and maintenance services. Its condition monitoring software tools and predictive maintenance services provide wind farm owners and operators with diagnostic and prognostic intelligence to facilitate cost- and time-saving predictive maintenance regimes.

This latest award is a great accreditation for the company, whose focus has been to invest in some of the industry's brightest minds, including strategic thinkers, technology innovators, experienced engineers, and world-leading software specialists to be in a position to develop and supply innovative simulation tools and services for drivetrains and gearboxes across the globe.

— Source: Romax Technology

For more information,
go to www.romaxtech.com.

RECOVER LOST ENERGY OUTPUT WITH BLADE CLEANING

By Jack Wallace

Wind farm owners spend a great deal of time figuring out how to produce more power, make more money, lower their expenses, and achieve the most part gain out of their spinning assets. For a wind turbine to generate power, and thus more money, either the wind has to blow more or you have to get paid more for your power. We don't have control of how much wind is blowing within the swept area of the turbines, and we usually don't have control over the rate of pay that we are compensated for when we supply power. The best option is to make the turbines as available as possible (as safely as possible). In doing so, there may be a way to improve your revenue.

There is a maintenance task that is for the most part ignored, but it can affect the turbines' energy production — blade washing. Those who know me understand that I don't waste my time or limited budgets on performing unnecessary services to keep our turbines running. Some may believe that turbines with dirty blades that have variable pitch and variable speed don't need washing. However, I have not found this to be true. I have found that blade washing can improve your turbines' production output during certain times of the year. In fact, you may find that your power output will benefit from a blade-washing program.

Blade washing has been one of the wind turbine services that Frontier Pro Services has provided over the last 30 years. Thousands of wind turbine blades have been getting washed in California since the 1980s. Each spring, during the hatching season for winged insects, we begin our blade-washing program, and we continue it throughout the summer as the blades get dirty from bug build-up and the turbines' energy production declines. We have found that the build-up of smashed insects creates enough of a change to the blade airfoil and a drag on the blade that the turbines' production outputs drop. My yearly indicator to know when it's time to start our blade-washing program is when bugs start to build up on my truck windshield. If I need to clean the windshield of my truck, then it is time to start washing blades.

The way the blades are washed in California has been an evolving process. Sometime in the early 1980s, tower operators installed permanent blade washing pipes up the sides of the wind turbines near the top of the tower. The blade pipes have open ports along the pipe behind the rotor. While the turbine is running and the blades are passing by the pipes, water is pumped up-tower by a water truck that is connected to the bottom of the pipe. The water jets out of the ports along the pipe and sprays out into the path of the rotating blades. After a few minutes of the blades passing through the spray water, the blades are mostly clean of bugs, and the airfoil performs more efficiently.

Another method of blade cleaning is using a water truck or insulator

Image 1: Bug build-up on blade

Image 2: Blade surface after cleaning

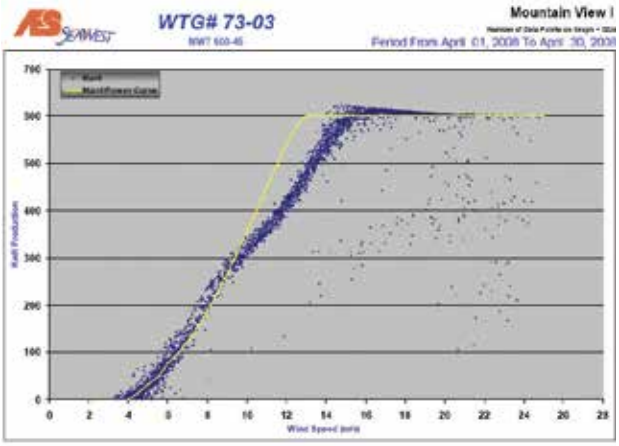

Figure 1: The dirty blades' power curve

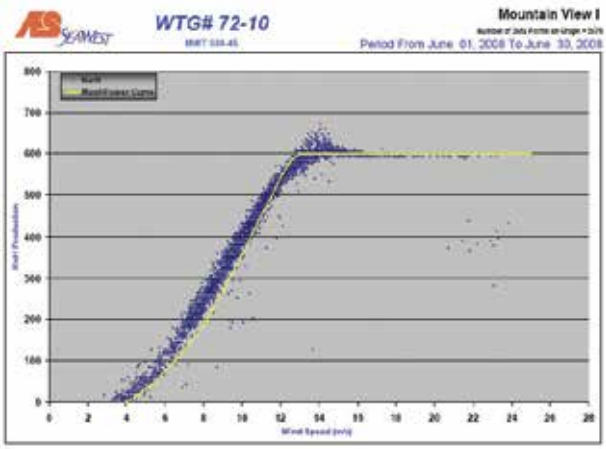

Figure 2: Normal power curve

cleaner truck with a similar spray bar attached to it. The boom with the spray bar is placed in front of the rotating rotor, and the water is sprayed out into the rotating rotor. Once again, the turbine production is back on track after a few minutes. This method is still used today, and it is completed as often as every two weeks during production months. There is even an automated smart spray bar system that uses the timing of the blades to spray the water as each blade passes the tower, thus conserving the amount of water used. There are a few other methods used for cleaning wind turbine blades, including a sponge-type apparatus attached to a boom truck. When the turbine is turned off, the sponge rubs the bugs off. This method cleans better, and the time between cleanings can be doubled to once a month. This has been done on turbines as large as 1 MW on 60-meter towers. Once again, with the blades cleaned, the turbines' production returns to its design's output. Sometimes, waxes or other coatings can be applied to make the bugs unable to land on or adhere to the blade's surface. Blades can be cleaned by rope-access teams, men in crane baskets, and virtually any way you can imagine.

Dirty-bladed variable pitch and/or variable speed turbines cannot produce energy as well as clean-bladed variable pitch and/or variable speed turbines. You just cannot make enough adjustments in less-than rated winds to bring the power curve back to the optimal design power curve.

Figures 1 and 2 show data from older turbines with variable pitch that are greater that 500 kW, but less than 1,000 kW. Images 1 and 2 are of two blades, and Figures 1 and 2 are of the two power curves that they each produced — the clean blade with the normal power curve, and the dirty blade with the poor-performance power curve. Owners and managers of a wind power plant know that most of the energy production is produced during winds with less-than rated power. Turbines produce power for thousands of hours at less-than maximum output. If your blades are not clean, then you are losing production.

As always, work safe and prevent surprises.

CONDITION MONITORING FAILURE IS NOT AN OPTION

By Jeff Walkup

One question that stands out in the wind industry is if we can revisit time-tested fundamentals and practices already proven successful in other industries and apply them to wind. The wind industry has a target service life for the typical wind turbine gearbox of approximately 20 years. The U.S. wind industry not only represents a large market for wind power capacity installations, but also serves as a growing market overall for American manufacturing business and, subsequently, the jobs created as a result. Hundreds of manufacturing facilities all across the country make components for wind turbines, ranging from the towers and blades to the assembled nacelles. These jobs range from professional and engineering services to the skilled crafts and tradesmen that make, repair, and service the towers in all facets of their development, operation, and electrical production life cycle. As we strive to meet the evolving clean energy demands of the 21st century, the challenge will be to provide an environmentally clean and profitable solution for generations to come.

Taking into consideration wind farm history and case study documentation, it would suggest failures of wind turbine components are far too commonplace, with each failure requiring possible major component replacement or repair before designed end-of-life. Industry data indicates that in many cases, this occurs within the five- to seven-year range and possibly outside of a warranty period. This anomaly attributes to substantial loss in electrical production and associated cost that must be captured or passed on to the electrical consumer. Those who consider employing various forms or methodology of condition monitoring must validate from a business perspective the initial cost of condition monitoring versus run to failure (RTF) and energy cost. You must also factor in that the wind power industry is relatively young in comparison to other energy production sources and, thus, determining initial capital cost, maintenance, and operation scenarios is not an exact science. Wind turbines and wind farms in general can present various and complex challenges due to their remote locations, height above ground, adverse weather conditions, and the fact that as far as the power production demand goes, if a wind turbine should fail, its loss could be absorbed to some extent by other components within the infrastructure. Modern industry demands maintaining and monitoring bearings, gear systems, pumps, and hydraulic applications to any component that may require a vigilant proactive system and methodology to manage cost, reduce consumption, and reduce friction and wear. We must utilize the resulting data to monitor system health while reducing its impact to the environment. Machinery problems and failures are often not attributed to an engineering flaw and design, but rather to the lack of human intervention when indications warn us of an impending failure.

Developing plans and considering factors, such as the following, may prove to be beneficial regarding your condition monitoring program and goals going forward:

- Accept the risk as well as the reward by evaluating your current maintenance and monitoring program. Be willing to change things that are not working.
- Concentrate on factors that you can change and control. Enact good planning.
- Consider continual evaluation of lubrication usage and selection. Are you doing the correct things and getting the best result and return on your investment?
- Are you driven by circumstances, or are you in control?
- Consider benchmarking performance before and after the process. Are your efforts producing results?
- Establish organizational goals and objectives. Are all members of your team moving in the same direction?
- Ensure a program of sustainability in order to leave a legacy. Are you providing training for your team and preparing them to be in a better position than you were in?
- Prevent falling back into previous methods of business and maintain consistency.
- Grasp the power of momentum and seize opportunities. Early wins will motivate and propel you to new heights.
- Understand how to communicate change and its potential results. Be willing to take the time to establish accountability and credibility.

By building on these steps and adding to your existing program, you can be well on your way to achieving your goals. Failure does not have to be an option when you are in control. Use tools, systems, and experiences from lessons learned to work smarter, not harder.