

INNOVATION

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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



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

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

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

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

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Amazing Transportation Access

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

10th Regulatory Environment

US v MAEDC Average Wage

US: \$22

MAEDC: \$14

Broadband + 4G

7th 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.