

INNOVATION

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SENTIENT SCIENCE TAKES \$17 MILLION IN VENTURE FUNDING

Sentient Science, a leading provider of materials science-based life prediction and extension technology, recently announced a significant working capital infusion to add new products to its wind turbine operator fleet. Toba Capital selected Sentient Science as its first investment in materials science-based prediction software. Sentient has initially focused the DigitalClone technology on roller bearing-centric, rotating equipment delivering computational testing and asset management.

This investment will support accelerated growth through added sales, marketing, and product investments, along with international expansion. The financing supplements \$25 million in small business innovation research (SBIR) funding that had previously been competitively won from the Departments of Defense and Energy, the New York State Energy Research and Development Authority (NYSERDA), Defense Advanced Research Projects Agency (DARPA), and the National Science Foundation (NSF).

Sentient Science, which recently received the Tibbetts Award at the



Sentient Science

White House — the nation’s highest technology honor — will also add supplier and logistics services to its rapidly growing fleet of rotating equipment assets. DigitalClone models reduced the cost of energy by 1 cent per kilowatt per hour by providing three levels of asset and budget visibility, which is currently set at six to 36 months and 20 years. DigitalClone is a fundamental innovation in the market with its physical accuracy, high visibility, and low cost that

enables efficient life extension operations and vendor comparisons for mechanical power and drivetrains, including bearings, gears, and lubrication additives.

“Sentient Science’s DigitalClone software has eliminated the costs and the lengthy process associated with the physical testing of materials, components, systems, and fleets,” said Ward Thomas, chairman and CEO of Sentient Science. “How would your business be transformed if all of your decisions

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were tested in real time and virtually for free? Our brilliant team of material scientists, developers, and market experts give operators and suppliers simulations of millions of scenarios tested 24 hours a day, seven-days a week, 365 days per year on every component of their rotating assets. Now, trillions of dollars in bearing-centric spending decisions can be made based on our lifing predictions, lowering the cost of sales and purchasing for our clients and improving outcomes equal to 13 percent of revenues.”

Sentient Science currently has more than 14,700 gearboxes under contract, and according to Thomas, this financing accelerates that momentum.

“Sentient Science pushes the envelope of software simulation far into what has been an expensive and wasteful hardware monopoly: testing by physically breaking,” said Vinny Smith, founder of Toba Capital. “Its material simulations replace hardware with no loss in accuracy. When they can do the same job, bits beat atoms every time — software is always more scalable and cost-effective than a machined alternative. We at Toba are thrilled to back Ward Thomas, the team of pioneering scientists lead by Dr. Nathan Bolander, and seasoned technology executives including Elias Tavaréz and Ed Wagner. We expect to lend signifi-

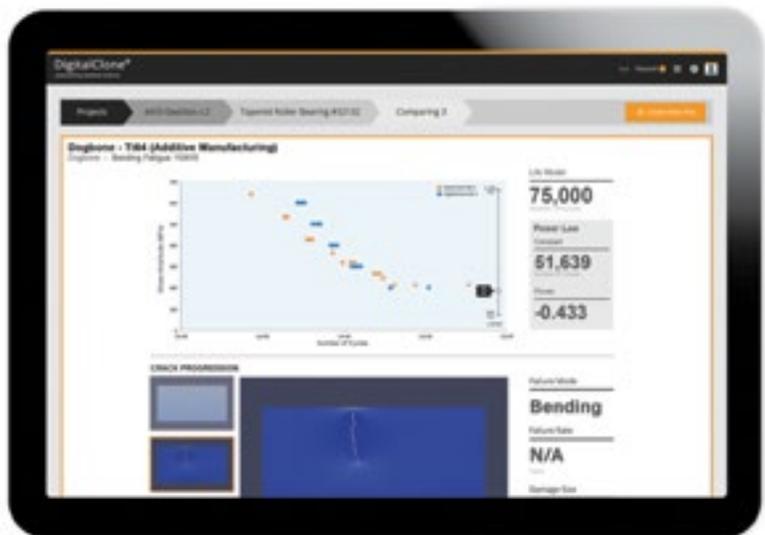
cant operational support and investment as Sentient Science becomes a dominant player in the industrial Internet.”

Sentient Science initially deployed and validated its computational testing solutions with the Department of Defense — the world’s largest equipment operator — predicting the future behavior of the most complex machines (bearings, jet engines, and gearboxes) on the Air Force F-35, the U.S. Army’s Apache and Black Hawk rotorcraft, and the Marine Corps’ Osprey programs with the world’s largest OEMs, including GE, Boeing, United Technologies, Textron, and Exxon. Based on the success of those flight certification

tests, the Department of Energy requested the use of Sentient Science’s computational testing solution for problematic wind turbine gearboxes that were failing prematurely in deployment. Sentient Science turned its attention to the renewables market in late 2014, and in just 15 months, it has captured contracts covering over 14,700 gearboxes in the U.S., Mexico, and Europe. With Toba’s investment, Sentient Science will expand its operations into more countries in Europe and China. ↘

— Source: Sentient Science

For more information, go to sentientscience.com.



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DNV GL ISSUES TYPE CERTIFICATE FOR SIEMENS NEW 7-MW OFFSHORE WIND TURBINE



DNV GL, the world’s largest resource of independent energy experts and certification body, recently awarded Siemens Wind Power with final type certification for its new 7-MW offshore wind turbine SWT-7.0-154, confirming full IEC-61400-22 compliance ahead of schedule.

The new award-winning Siemens model delivers nearly 10 percent more energy production than its predecessor under offshore wind conditions while retaining the same proven reliability. The new 7-MW offshore wind turbine has been developed by Siemens as an evolution of the company’s flagship offshore wind turbine — the SWT-6.0-154, which has already set new industry standards in terms of gearless turbine design.

As demand for offshore turbines to deliver higher power outputs to reduce the levelized cost of energy continues to increase, timelines to develop optimized types become increasingly tight. To meet industry and customer expectations, it was crucial for Siemens Wind Power that the newly developed SWT-7.0-154 is IEC type certified and that it reached the market on time. DNV GL’s optimized project management provided the type certification ahead of schedule, giving Siemens

(From left to right) Andreas Kamleitner, global head of department loads (DNV GL); Jonas Stenzel, head of global product and technology type certification (SWP); Axel Dombrowski, global head of mechanical engineering (DNV GL); Morten Rasmussen, head of technology (SWP); Esti Utami Povlsen, SWT-7.0-154 certification project manager (SWP); Kent Gerner Christensen, senior project manager D7 platform (SWP); Vicente Garcia Munoz, portfolio manager for offshore certification (SWP); and Mersudin Bajric, principal project manager type certification (DNV GL)

Wind Power a strong basis for the further development of the large direct drive turbines.

To confirm ultimate operational safety and reliability of the most innovative wind turbine on the market today, DNV GL’s expert understanding of the turbine’s advanced technical specifications was crucial. Building on experiences from the previous certification process of the 6-MW offshore wind turbine SWT-6.0-154 and the recent SWT-7.0-154 prototype certification, both sides have continued to work closely together on this project.

“Conscious of the current state of the industry it was vital we deliver this project on schedule,” said Stefan Haupt, global head of business development and sales for renewables certification at DNV GL. “We understand our customers’ time pressures and the demand to continuously bring the latest turbine innovations to the market. This is why optimized project management combined with in-depth technical expertise was vital for our work with Siemens, al-

lowing the company to confidently demonstrate the safety and reliability of their ground-breaking new 7-MW turbine.”

Vicente Garcia, portfolio manager for offshore certification at Siemens Wind Power, added, “We felt it was critical to rely on our long-lasting partnership with DNV GL as certification body in this upgrade of our D7 platform, as we were confident in their ability to help us reduce the final time to market. What’s more, the extensive collaboration during the initial scoping phase was a key factor for the final outcome of delivering the project to a successful result by obtaining type certificate ahead of schedule and provides a strong basis for further development of the large direct drive turbines.”

Moving forward, DNV GL has also been contracted to work with Siemens on the upgrade of the 7-MW turbine, including the power boost feature to increase the power output. ↘

— Source: DNV GL

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

RENEWABLE ENERGY RECORD ACHIEVED AT LONDON ARRAY

London Array, the world's largest operational offshore wind farm, has set a new record for the amount of clean electricity produced by an offshore wind farm in a single calendar month.

In December 2015, London Array saw its 175 turbines generate 369,000 MWh of electricity — considerably above target and well above the previous best of 317,000 MWh set in November 2014. The capacity factor for the month, which saw average wind speeds of 11.9 m/s (27 mph), was 78.9 percent.

The two successive months of production brought net overall output for the year to some 2,500,000 MWh, enough to meet the needs of more than 600,000 U.K. households based on an average household consumption of 4,115 kWh per year.

“Both the monthly and annual figures are excellent results for London Array and show the contribution we are making to the country’s energy supply as well as the U.K.’s renewable energy targets,” said Jonathan Duffy, general manager of London Array. “Above average winds this winter have helped push production higher but that is only part of the story. We have a great team of people who support the operation and maintenance of the wind farm, and we have pushed hard over the past year to build on our earlier successes and develop our approach to turbine maintenance and repair. Together with key contractors DONG Energy and Siemens, we have focused on operational efficiency and expanding the amount of time our technicians are able to work offshore. This has helped ensure we extracted the maximum power from the wind and kept turbine availability above 98 percent over the winter. Our performance is also good news for the environment as it will have prevented the release



of some 1,075,000 tons of carbon dioxide in 2015, which is the main gas linked to climate change.”

— Source: London Array
For more information, go to www.londonarray.com.

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

10th Regulatory Environment

US v MAEDC Average Wage

US: \$22

MAEDC: \$14

Broadband + 4G

Thousands of Skilled Laborers

State and Local Incentives

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

7th BEST economic competitiveness

Missouri is ranked 7th by the American Legislative Exchange Council

Our region is a beautiful historic area.