

PROFILE

POLARIS LABORATORIES®

EXTENDING THE LIFE OF A TURBINE

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POLARIS Laboratories® is headquartered in Indianapolis, Indiana but services more than 90 countries worldwide. (Courtesy: POLARIS Laboratories)

By testing lubricants, grease, and coolants used in wind turbines, POLARIS Laboratories® works to ensure a turbine can continue producing energy as efficiently as possible while lowering maintenance costs.

By KENNETH CARTER ▶ Wind Systems editor

Lubricants are important in many industries where friction ranges from being inconvenient to financially disastrous.

Making sure parts run smoothly is paramount when it comes to the smooth operation of a wind farm, and POLARIS Laboratories®, with locations around the globe, works to ensure friction and its related forces don't impede the production of energy.

"In the wind industry, we really have three different types of products and tests," said Bryan Debshaw, CEO of POLARIS Laboratories. "One certainly is the oil and testing the lubricants. We also get involved in testing grease. Some of the towers have cooling systems on them as well, and we can test the coolant."

All of these testing procedures are performed to help extend the life of a wind turbine and prevent catastrophic failure, while ultimately lowering maintenance costs, according to Debshaw.

"By pulling a sample, we can monitor the condition and let owner-operators know when the optimal time to change the fluid is," he said. "And based on the contaminants in the fluid, we certainly can get indications of excessive wear or other damage that could be happening internally so that they can take a small corrective action versus having to do a major repair."

THE IMPORTANCE OF MONITORING

Debshaw points out that wind-turbine maintenance can be costly, given the environment, and being able to monitor them is critically important.

"Even the fluids that they use are very expensive; they are high quality fluids," he said. "It's a very demanding application when you look at the temperature extremes that these towers or turbines will operate in and you look at the load factors and so forth."

Think about going from low speed to high speed under extreme temperatures and conditions, not to mention just the sheer amount of work and costs involved on doing what should be a simple task like changing the lubricant. There aren't simple tasks when dealing with wind, for sure."

DATA ANALYSIS

In addition to its lubricant testing capabilities, POLARIS Laboratories® also offers data analysis and management with its HORIZON® platform, according to Debshaw.

"We have excellent tools for the customers to manage their data, their history, their trends," he said. "Our service is very much a trending service. And we have the ability to connect directly to their data monitoring systems and pass

information to them so that they have the ability to access our information in their information management systems."

HORIZON can help with a wind farm's overall condition monitoring and predictive maintenance, according to Debshaw.

"I think with the wind industry in particular, there is the challenge of pulling a sample, and there's certainly a lot of interest around sensors and technology and how do we move to predictive maintenance," he said. "If we look across that spectrum of maintenance, it's run to fail and then it's we'll do preventative maintenance, and then we'll condition monitor."

Now, in today's world with data and the tools that are available to us, how do we help the customer get out into that predictive maintenance area? And it's really by bringing the data together and being able to utilize the data together and build the appropriate data science models that help. They can predict where we'll be in the future based on the current information and trends."

HELPING CUSTOMERS SAVE THEIR EQUIPMENT

POLARIS Laboratories' bottom line is it wants to help its customers with their bottom line, according to Debshaw. "When we look at what we want to do for our customers, we want to help them save their equipment," he said. "We're very much focused on how we can help them optimize their intervals, extent, optimize their life of the equipment, and



POLARIS Laboratories' fluid testing and analysis capabilities include oil, coolant, diesel fuel, and grease. (Courtesy: POLARIS Laboratories)

make sure that they are very much a reliable producer of power at a low cost."

Debshaw said POLARIS Laboratories starts that process by working with its customers to define what the overall objective is and lay out the appropriate testing.

"In many cases, the testing regime is going to be set up based on what the OEM requirements are," he said. "From there, if they're experiencing a particular failure, we may do additional testing like analytical ferrography where we can actually view particles in the samples under a microscope and look at the type of wear that we're seeing, the types of metals that are coming off, and give them some indication of how and when we think it's happening."

POLARIS Laboratories' process is aimed at understanding customers' objectives while providing the best information possible so they can make good decisions on their equipment, according to Debshaw.

"We work to help our customers save millions of dollars of equipment," he said. "Oil analysis is about helping reduce that maintenance cost, but at the same time, it's very much about safety because if we can help the customers by providing good information so they can schedule maintenance and take small actions, it helps reduce the exposure and risk to personnel. When we look at most accidents in maintenance, they're going to happen during unscheduled downtime, and by helping give them the information, it's making it safer

for the industry as well."

BROADENING ITS TESTING

In that vein, Debshaw points out how POLARIS Laboratories has been expanding its testing capabilities as the wind industry continues to evolve.

"This year, we added pretty extensive grease testing capability," he said. "Many companies will say they do grease testing, but they're testing new greases. What the industry needed was appropriate testing for used grease and to give it some indication of the asset health or the health of the equipment that it's coming from."

So one way we've evolved is certainly by adding used-grease testing capability. The other way would be in the data side and the connectivity of being able to connect directly with the customers. Once again, I think that's an area where the wind industry has really evolved; everything's a connected device, and they're working to monitor everything they can. It's truly a business that is driven off of large amounts of data."

SEVEN LOCATIONS WORLDWIDE

In order to assist an industry that is worldwide, POLARIS Laboratories has expanded its global footprint since it began 20 years ago in Indianapolis, Indiana.

In addition to its Indianapolis laboratory, POLARIS Laboratories now has locations in Houston, Texas; Salt Lake City, Utah; Edmonton, Alberta, Canada; Poznan, Poland; Guatemala City, Guatemala; and now in Bogota, Colombia, according to Debshaw. The wind industry is only part of POLARIS Laboratories' oil-conditioning monitoring.

"Our primary business is lubricants, and we have many branded private label customers, so many oil lubricant companies, as well as OEMs, will use our service to help their customers improve their equipment reliability," Debshaw said. Part of that involves POLARIS Laboratories' powerful statistical tools used to analyze data generated from the laboratory testing, he said.

"We really want to be able to open it up and analyze other sources of data that are being monitored today on the equipment in real time," Debshaw said.

"So, to be able to pull that information and combine it with the laboratory information is really where we see the opportunity to move to a much more of a predictive model."

And the wind industry seems certainly perfect for that when you consider the capital investments and the costs of doing maintenance. It just seems to be an ideal industry to develop those predictive technologies."

As wind energy moves offshore in the U.S., Debshaw thinks the process of monitoring an asset's lubricants won't change.

"Whether it's onshore, offshore, probably to us it probably doesn't change much of what we do," he said. "It certainly increases the challenge of getting a sample from the customer. Potentially, there could be different contaminants. But I think largely we'd be seeing the same things." ↗

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