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BHGE-ENOC system drills into the details

BHGE, ENOC create new lube monitoring system that takes 'fingerprint'

VitalyX measures multiple parameters for better picture of machine health. By **DJ Slater**

Baker Hughes, a GE Company (BHGE) and Emirates National Oil Co. (ENOC) are looking to take the guesswork and the wait times out of lubrication health and analysis.

The two companies have jointly developed VitalyX, a monitoring system designed to measure and detect lubricant properties in real-time while also providing operators with comprehensive data, analytics and recommended actions.

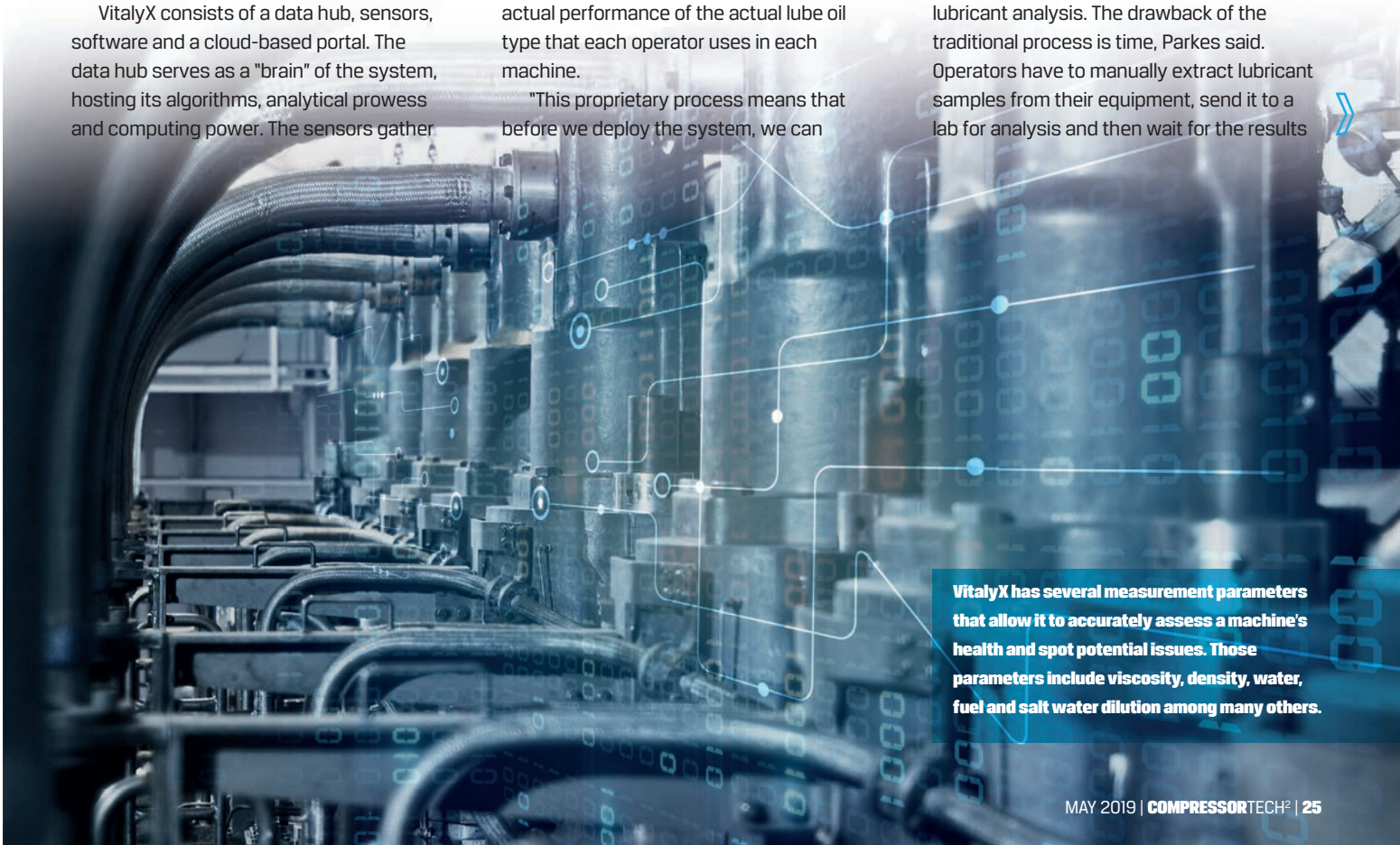
VitalyX consists of a data hub, sensors, software and a cloud-based portal. The data hub serves as a "brain" of the system, hosting its algorithms, analytical prowess and computing power. The sensors gather data and relay it back to the data hub, which uses its software to process and analyze the data before providing insights. Those insights and actions are accessible through the cloud-based portal, known as UX (User EXperience).

"The value of VitalyX is in the machine learning and algorithms," said Glen Parkes, executive product manager, BHGE. "The technology doesn't simply measure the characteristics of 'lube oil'; it measures the actual performance of the actual lube oil type that each operator uses in each machine.

"This proprietary process means that before we deploy the system, we can understand what brand and type of lube oil a customer uses," he said. "We understand the distinct fingerprint of that lube oil, so we gain a much more detailed view of its performance. With this level of detail, we can save operators a lot of time and money."

In real time

The real-time element of VitalyX gives operators monitoring speed and efficiency that isn't available through traditional lubricant analysis. The drawback of the traditional process is time, Parkes said. Operators have to manually extract lubricant samples from their equipment, send it to a lab for analysis and then wait for the results



VitalyX has several measurement parameters that allow it to accurately assess a machine's health and spot potential issues. Those parameters include viscosity, density, water, fuel and salt water dilution among many others.

ENOC and Baker Hughes, a GE company (BHGE), announced in late January the co-development of the VitalyX lubricant monitoring system. Ed Boufarah (left), vice president, Measurement & Controls in Middle East, Africa and India, BHGE and Burhan Al Hashemi (right), managing director, ENOC Marketing, shake hands during the announcement, which took place during BHGE's Annual Meeting in Florence, Italy.

to return, a process that can stretch on for weeks.

Long durations can be harmful to critical machinery, especially when downtime impacts a company's bottom line. BHGE has a customer that suffered an engine failure after a connecting rod crashed through the engine block. The culprit: salt water in the lubrication oil, which caused a seal to fail. A few days before this incident, the customer sent off its lubrication oil sample for lab testing.

"The current (manual) process has many downsides," he said.

Algorithms and machine learning parameters serve as two of VitalyX's primary assets. These two features together allow the system "learn" lubrication oil properties and behavior and use that knowledge to identify risks and potential issues before they cause catastrophic problems. Parkes provided an example involving a gearbox. The system can identify a trend from ferrous to non-ferrous particles in the lubrication oil. With this information, as well as context on the machine using the lubricant, VitalyX understands the composition of the gearbox's bearings, allowing it to alert the operator about bearing wear before it fails. The system can also prevent false alarms.

"For example, a spike in glycol in lube oil might set off a false alert, but with the ingestion of engine data into the solution, VitalyX can understand when a machine starts up," Parkes said. "There could be a natural spike in glycol (during startup), so an alert is not necessary."

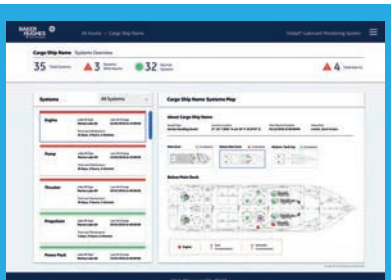
Several measurement parameters

VitalyX has several measurement parameters that allow it to accurately assess a machine's health and spot potential issues. While operators can purchase generic viscosity or density sensor for their lubrication oil monitoring needs, VitalyX goes beyond these measurements. Viscosity and density are covered by VitalyX, as is water, fuel and salt water dilution. The other measurement parameters include soot, glycol, TBN, TAN, temperature, metallic particles and dielectric sensing.

Combined, these parameters give operators a complete picture of an asset's health. Multiple measurements, for example, are designed to better estimate a lubricants lifecycle, preventing operators for changing oil too soon or leaving it in too long, Parkes said.

VitalyX users have access to customizable dashboards and charts to keep track of their monitored assets. The charts contain live data streams, along with historical information for trend analysis and context, while the dashboards allow the user to set alarms and alert threshold levels.

"By continuously monitoring, customers not only get results in real time but can also see trends and build context around those results to properly identify risks in the future," Parkes said.



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Collaborative process

BHGE and ENOC began discussing the concept of VitalyX in 2016. Customer feedback drove the two companies to collaborate on a new product. Those discussions also made it to the ears of other BHGE and ENOC partners across different industries, which made the pair realize VitalyX could be applicable to several industries.

The pair officially debuted the technology on Jan. 30 at BHGE's Annual Meeting Florence, Italy. While VitalyX's first order is for a marine application, executives from BHGE and ENOC emphasized the system can be applied to any machinery that uses lubrication.

That aspect, coupled with VitalyX's capabilities, give BHGE and ENOC a product they anticipate will gain notoriety in the coming months and well into the future, Parkes said.

"The future of monitoring critical machinery lies not within sensors, but in data that delivers real answers," he said, adding that VitalyX has the flexibility to complement existing platforms, such as Bently Nevada's System 1 software. "This is the true potential of VitalyX." CT2