AI story

Augury and Baker Hughes: Powering Machine Health with Advanced AI

Augury AI Exceeds Traditional Threshold Monitoring To Achieve 99.9%+ Machine-Fault Accuracy, Almost 0 False Alarms, And Delivers Fully Prescriptive Diagnostics

2%
False alarm rate

vs. 40% for advanced threshold approaches

3X-10X
Average ROI

often within months

99.9%+
Accuracy detection

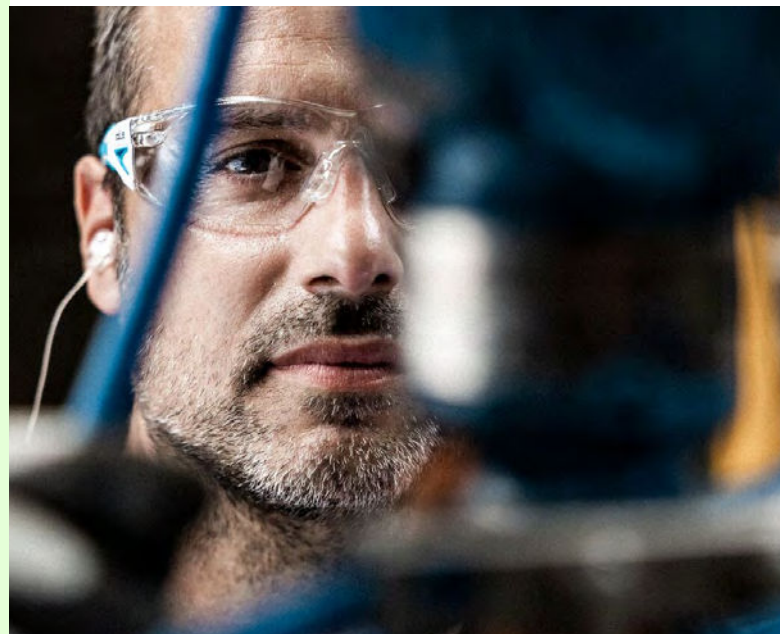vs. 80% for advanced threshold approaches

90%
Response & engagement rate

"

This solution is like having a big brother... somebody tapping you on the shoulder to let you know, 'Hey, you need to go fix this.'

Paul Bonorden, Corporate Rotating Equipment Capability Manager, INVISTA

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As digital transformation became increasingly more critical, we knew that artificial intelligence (AI) would be a key component to deliver the next wave of outcomes. You could say our experts know as much about machines as doctors know about the human body. We're combining that deep knowledge with Augury's strength in the AI tech space for machine health. We're connecting AI and our historical knowledge to bring this solution to heavy industries.

Sequoia Murray, Global Customer Success Leader for Bently Nevada

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Partnership Unlocks Reliability And Productivity Through AI

Augury and Bently Nevada, a Baker Hughes company, formed an alliance with the goal of **delivering an expanded set of asset performance capabilities, providing connected data, analytics, and insights into energy and industrial assets.** By combining Augury's purpose-built AI and IoT technologies with Baker Hughes' asset management solutions, the two companies are driving advances in machine health and prescriptive diagnostics for heavy industrial operations.

After a decade of continuous monitoring and data labeling by trained domain experts, the partnership's Machine Health dataset now includes more than **100 million hours of machine recordings from over 80 thousand unique machines.** As the recording volume exponentially increases, so does the accuracy, relevancy, and timeliness of fault insights the algorithms deliver to users.

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The Exponential Benefits Of Adding AI Data Analysis To AI Monitoring

Once dependent on threshold-based machine monitoring and analysis, manufacturing maintenance and reliability teams have access to extraordinary technology today. Artificial Intelligence (AI) tools go far beyond the capabilities of traditional methods, and are redefining what's possible for understanding machine health, improving mean time between failure (MTBF), and keeping production lines running.
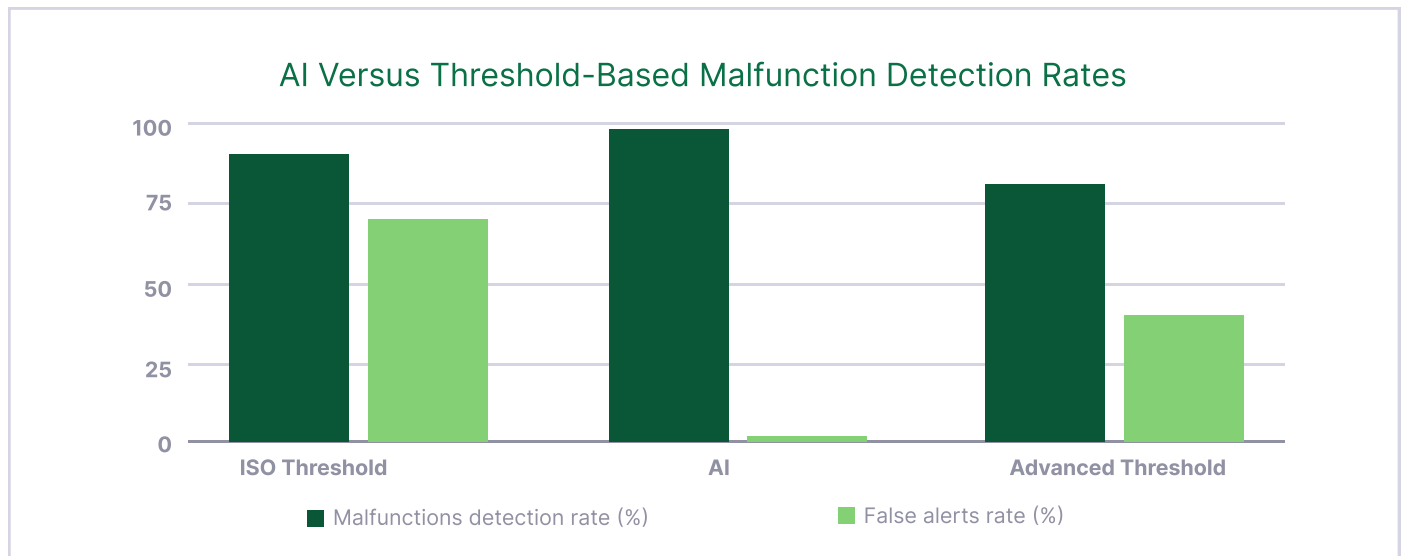
There are two types of threshold-based standards: those set by the International Organization for Standardization (ISO), and custom or advanced thresholds, which are set by manufacturers themselves based on their own experience. Many businesses choose to follow these advanced standards to give themselves more flexibility and control over their machines and maintenance routines. These ISO thresholds are based on industry standards, and are created with the goal of protecting the machinery. This standard often doesn't allow much time for analysis, forcing maintenance teams to shut down assets with little warning. They also can trigger alarms unnecessarily.

Advanced-threshold-based analysis issues alerts when a machine's overall vibration level reaches a certain level. This offers a more predictive approach compared to ISO thresholds, and gives operations teams time to plan and prepare for maintenance shutdowns. When levels do reach the established threshold, a vibration expert analyzes the data to determine the source of the alert and the problem. But in a threshold-based analysis, there is one crucial decision: Where to set the alert threshold? The higher the threshold is, the more likely it is that a critical production machine will fail unexpectedly. On the other hand, the lower the threshold is, the more false alerts will be received.

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Augury's AI, on the other hand, continuously analyzes a machine's vibration waveform with and without regard to the overall vibration levels. Based on that history, and a vast collection of data from similar machines at other plants, Augury's AI can optimize alarm levels and alarm delays.

A recent experiment in machine vibration levels conducted by Augury revealed the stark differences in outcomes between following standard threshold alerts and Augury's AI. The study was performed on over 29,000 event detections on more than 90,000 critical machines monitored by Augury globally over a period of six months.

AI Versus Threshold-Based Malfunction Detection Rates

Legend: ■ Malfunctions detection rate (%)　　■ False alerts rate (%)

Categories: ISO Threshold, AI, Advanced Threshold

Out of 29,000 events, 5,096 were AI-detected malfunctions. Of those 5,096 malfunctions, 426 were missed by the ISO threshold system. In addition, ISO triggered alerts for an additional 3,561 cases, which were all false detections.

This means that a maintenance team using ISO thresholds would have spent a large chunk of their time chasing malfunctions that do not exist. In the real world, this would not only waste enormous amounts of time, but also cause plant employees to lose confidence in the system and eventually ignore alerts, some of which would be real, leading to more and possibly catastrophic machine failures.

Augury AI outperformed thresholds by a wide, wide margin, detecting 99% of vibration faults paired with less than 2% false alarms. The benefits translate to improved business outcomes on multiple levels.

Manufacturers who adopt AI-driven solutions are extending the life of critical and supporting equipment, drastically reducing downtime, improving product quality, cutting waste, running safer plants, providing maintenance teams with new skills and new opportunities, and boosting bottom lines.

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Augury's AI: Superior Fault Accuracy Plus Prescriptive Diagnostics

While monitoring equipment with AI technology has been around for some time–though adoption still lags in the industry–recent advances in AI generally and Augury-specific capabilities allow for AI to not just collect data, but find trends and issues amid mountains of information–a task that humans could never accomplish.

The example below (Image 1) shows vibration spikes for a pump. In the field, a pump such as this one would not be operating in a vacuum; other production line components or settings could also have an impact on vibration, such as valve configuration. With a traditional threshold system, each of the spikes would have generated an alarm. For each alarm, an operator would need to respond and probably trigger an action by the maintenance team. In this case, maintenance would have responded to the alert but wouldn't have found any problem, classifying it correctly as a false alert. In most circumstances this would have happened repeatedly until eventually the team would lose confidence in the alerts. Augury AI, with the added benefit of auto setpoint and auto setpoint latching, shows the machine to be in good condition, eliminating the number of false alerts and the amount of work for maintenance and condition monitoring teams.
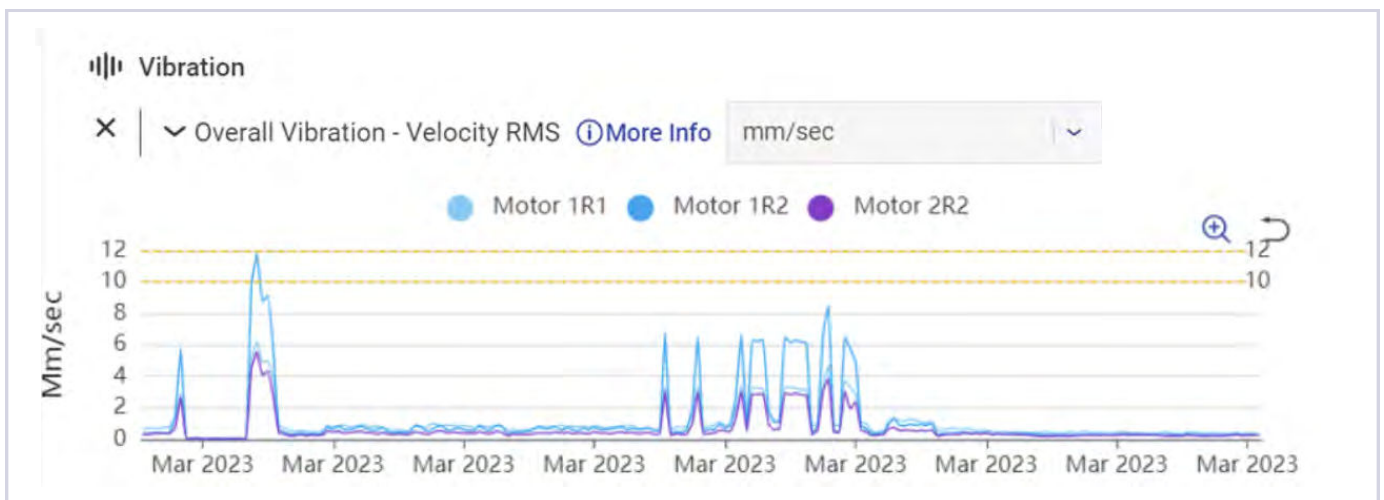

Image 1: Vibration spikes

Thanks to Augury's partnership with Baker Hughes, the two companies now have visibility into an enormous number and wide variety of use cases. An interesting example raised by Sergey Kornichuk, Application and Solution Architect at Bently Nevada, a Baker Hughes company, is an alarm triggered by high frequency methods like peak demodulation or shock pulse method (Image 2).

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Like the previous example, Augury AI uses additional auto setpoint latching, which is vital when dealing with peak demodulation or shock pulse because those methods can mask significant issues, or misidentify a bearing overload defect.

With traditional thresholds, making the distinction between a real bearing issue and a false one is difficult, but Augury's AI ensures maintenance can tell the difference.
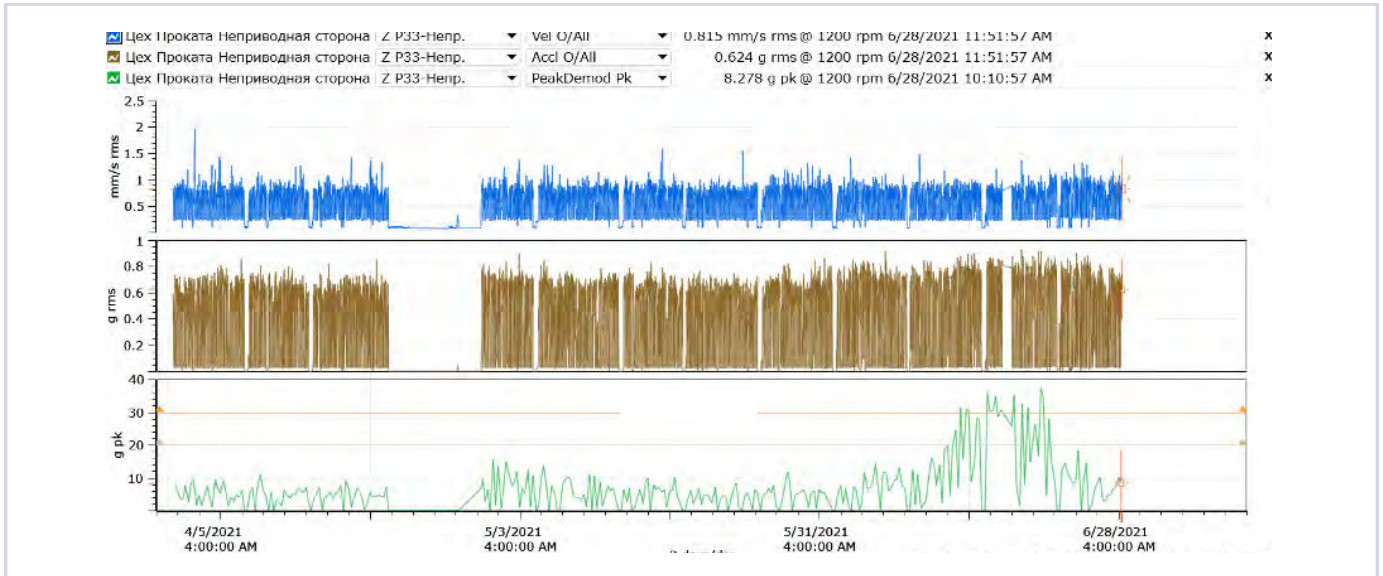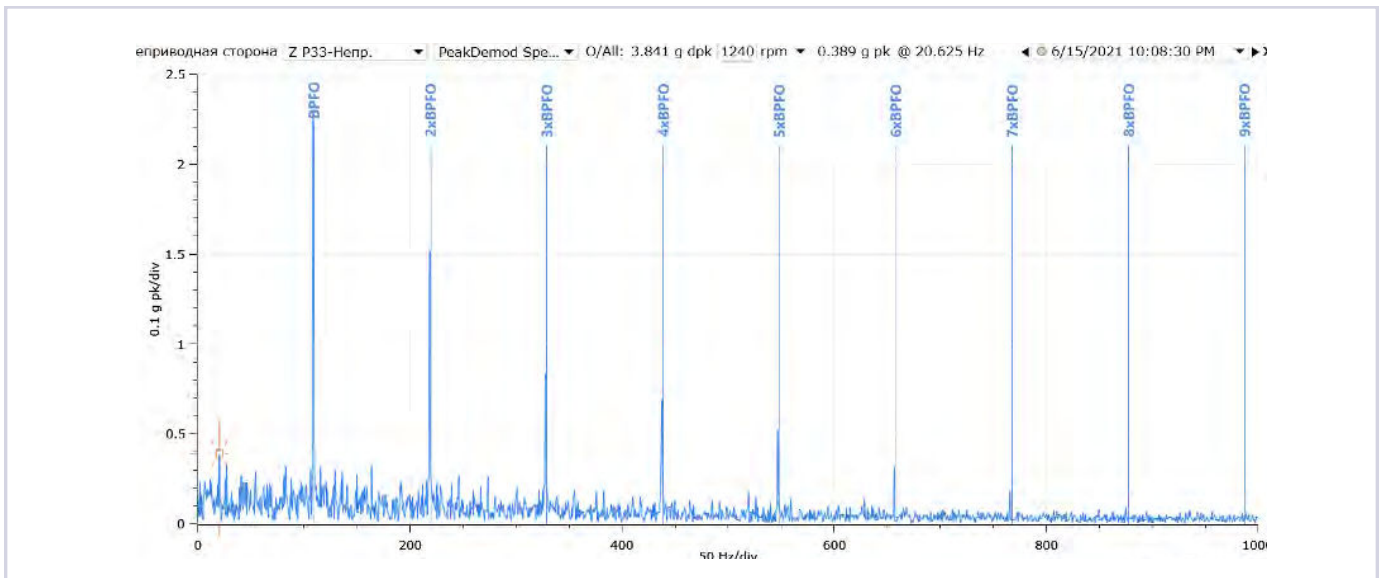

Image 2

Image 3

Every time AI can help maintenance engineers and reliability experts make critical decisions is more time, effort, and money saved. Augury AI analyzes monitoring data to provide prescriptive, root-cause insights to plant teams. And the benefits scale with every asset added to the Augury Machine Health program–more failures avoided, fewer false alarms stealing time from maintenance teams, more machine uptime, and higher ROI.

Augury and Baker Hughes

Baker Hughes, with its Bently Nevada product line, has been at the forefront of condition monitoring and protection for over 60 years. Augury provides manufacturers and other industrial sectors with insights into the health of machines, processes, and operations to transform how people work and what they can create.

Bently Nevada and Augury joined forces to combine the 60+ years of Bently Nevada's leadership in energy and heavy industry with Augury's leadership in AI-driven machine health in manufacturing. Together we deliver the world's most effective and scalable Machine Health coverage of your plant-wide assets.

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