

CUSTOMER CASE STUDY

Alcoa transforms its approach to maintenance

Senseye - www.senseye.io
Industry - Metals

Challenge

- No way to analyze or compare historical data in the AVEVA™ PI System™ with maintenance data in Oracle eAM

Solution

- Asset framework, a capability of AVEVA PI System, creates context to connect data to Senseye's analytical tools

Result

- 20% decrease in unplanned downtime, lowered maintenance costs, and a 10% decrease in maintenance man-hours

Alcoa is a global industry leader in the production of bauxite, alumina, and aluminum, with 2019 revenue of \$10.4 billion and operational assets across six continents. Since developing the aluminum industry more than 130 years ago, the company has built a legacy of breakthrough innovations and best practices.

Alcoa was already using AVEVA PI System to collect and store its data. Then Alcoa hired Senseye, the leading automated predictive maintenance product, to take the sensor data from its machines in its aluminum smelters and use that information to predict maintenance needs before failures occurred, avoiding expensive downtime.

“We believe that predictive maintenance is a key part of our strategy to evolve and become a more stable, more profitable organization.”

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Árni Páll Einarsson
Reliability Implementation Manager, Alcoa

Asset framework creates context

With maintenance data stored in Oracle eAM, and sensor data feeding into AVEVA PI System, Alcoa had no useful way to compile and use this information to predict equipment failures. Senseye's technology isn't designed to store data or connect to sensors. To access and analyze the data, Senseye relied on Alcoa's use of asset framework, the contextualization layer of AVEVA™ PI Server. The asset framework duplicates tangible assets digitally, making it easy to sort, understand and use any kind of sensor data. Within the asset framework, event frames can structure and measure specific events within sensor data, from a few seconds long to many hours.

With a built-in template function, the asset framework and event frames capabilities are quick and easy to build out and replicate for any new asset. "If you have identical equipment you can actually build an element template with the event frames built-in, which is very handy," said Einarsson.

Senseye also decided to use the PI Web API to access Alcoa's historical data easily and leverage Alcoa's previous data investments.

"We felt it was easiest to start running with that and get some immediate results."

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Alexander Hill

Chief Global Strategist and Co-Founder, Senseye

Putting AVEVA PI System to the test

Alcoa decided to implement its new strategy at the Fjardaal aluminum smelter as a test case before rolling it out to the company's other assets and smelters.

Alcoa had its first few use-case successes on the rod mill. One part of the rod mill is the saw motor, which cuts the wire into different sizes. The sensor on this part of the machinery measures the current change as the saw contacts the wire. Using event frames to delineate the idle and cutting currents, Senseye's technology detected a fault in the system.

This was Alcoa's first use-case, so "getting the people on the floor to believe us that there was something wrong with a machine that was running perfectly [was difficult] but data does not lie to us," said Einarsson.

During the next shutdown, Alcoa convinced the maintenance crews to take a look and discovered that the belt guard had come loose and was damaging the machine. The machine had yet to fail, so by resolving this minor issue in a regular maintenance cycle before it became a major one, Alcoa saved 12 hours of unplanned downtime.

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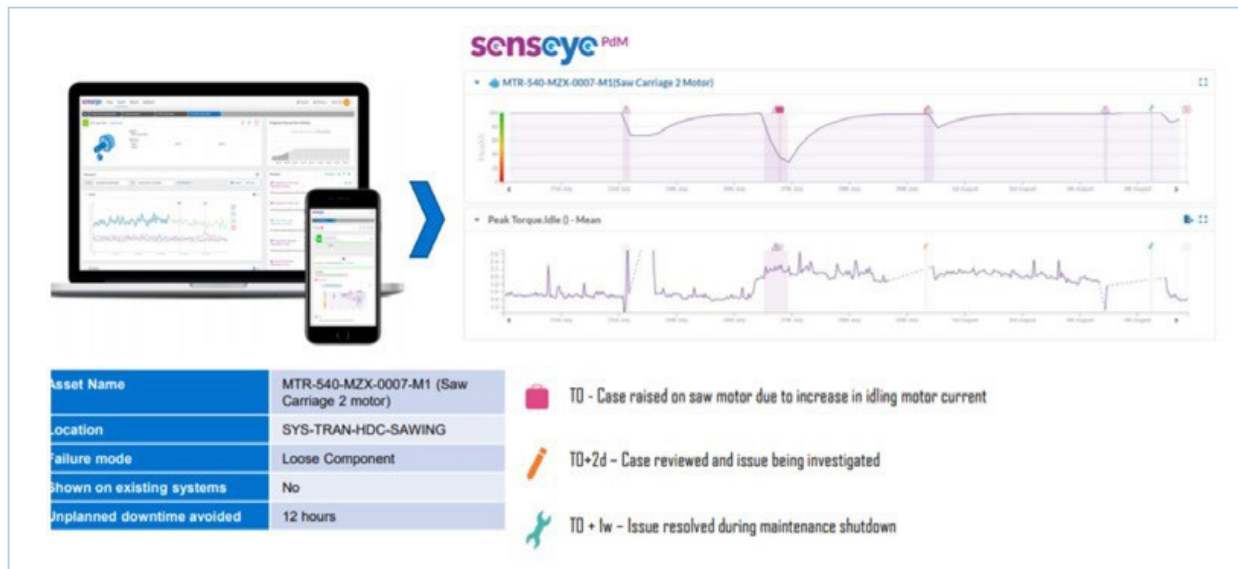
Alexander Hill

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With event frames in AVEVA PI Server, Alcoa was able to track down anomalies during the runtime of the saw that were previously undetectable by the maintenance team and avoid twelve hours of unplanned downtime.

Another use case was with the coiler rod cropping shear motor. The system detected an increase in motor torque while the machine was running. The maintenance team, who now trusted the data coming from AVEVA PI System and Senseye, went to investigate and discovered a loose sensor was the cause of the problem.

The team was able to resolve the issue while the machine was still running, not only avoiding three hours of unplanned downtime but avoiding maintenance downtime completely on this machine element. "These were just two of many examples we had," said Einarsson. "We can actually start to predict the remaining useful life of that machine," said Hill, "by matching up current data that's coming from the AVEVA PI System and maintenance data from Oracle eAM. So that can tell you not only what's going wrong and why, but how long that asset has to live."



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Return on investment

Within six months, Alcoa received a full return on investment for its predictive maintenance project thanks to Senseye and AVEVA PI System. With maintenance costs down across the board, a 10% reduction in maintenance person-hours, and a 20% reduction in unplanned downtime, Alcoa is preparing to roll its predictive maintenance solution out to the rest of its locations and assets.

“This year we will be expanding from these 50-70 assets, and our goal is 1000 assets this year just in Iceland,” said Einarsson. The templated structure of the asset framework in AVEVA PI Server will make this expansion easier than ever.

For more information about AVEVA PI System [click here](#).