Digital Transformation with Predictive Maintenance Drives Cost Savings

aspentech | Success Story

“Aspen Mtell® is a rock star.”

Chief Digital Officer

Aspen Mtell provided

30% savings

over emergency maintenance costs

CHALLENGE

Three previous failures of a hydrogen compressor had resulted in millions in production losses and additional maintenance costs. With the early warnings Aspen Mtell provides, the company could have avoided much of this cost.

SOLUTION

Aspen Mtell predicted a compressor failure 35 days in advance, allowing the company to avoid an emergency shutdown and meet production goals.

BENEFITS

Having early failure predictions provided time to plan repairs and adjust scheduling and production. As a result, the organization:

- Reduced maintenance costs: planned maintenance has a savings potential of 30 percent over emergency maintenance
- Minimized production losses by planning the shutdown: $30M USD potential savings
- Improved health, safety and environmental performance by avoiding emergency shutdowns and unplanned asset failures

Overview

The customer is a diversified energy company with operations in refining, marketing, midstream, chemicals and specialties. They operate more than a dozen refineries in the U.S. and Europe with a total capacity of over 2 million barrels of crude oil per day.

The company had begun its own digital transformation initiative that uses big data, machine learning and artificial intelligence (AI) to drive cultural change in the organization. As part of the initiative, they were investigating predictive maintenance. The customer decided to organize a competitive bakeoff, trimming an initial list of ten predictive analytics vendors to a handful of finalists. Ultimately, AspenTech was chosen as the sole vendor to execute an online pilot project.

A hydrogen compressor in one of the refineries had multiple historical ring and piston failures costing over $250 million USD across just 3 events. Aspen Mtell was able to provide notification of pending failures over 35 days in advance. With that amount of warning, the plant could have scheduled the shutdown at a more opportune time within the 35-day window, reducing downtime by as much as 8 days. They would also have saved over 30 percent on the repair costs by planning work in advance. The combined production and maintenance savings from these three events alone would have been more than $75 million.

Seven anomaly agents and four failure agents were created for the compressor. These agents watched for a range of failure types, including piston and piston ring failures (38 days lead time), valve failures (24 days lead time) and lubricator failures (32 days lead time). This increased notification of problems provides ample time to mitigate impact, such as scheduling the time the asset is down for repairs when it minimizes production disruption.

Historical Failure	Potential Value	Description
$100M	**$30M**	**Save 8 days of shutdown by planning shutdown. Predicted 35 days in advance**
$150M	**$45M**	**30% maintenance cost by planning repairs 35 days in advance**
$250M	**$75M**	

Aspen Mtell capabilities are now seen as a catalyst for cultural change across the company, which is implementing big changes in workflows.

The customer recognized the importance of Aspen Mtell's ability to combine the mechanical view with the process view to find the earliest signs of failure. Aspen Mtell capabilities are now seen as a catalyst for cultural change. The team at the refinery is leveraging enterprise tools like SAP to communicate Aspen Mtell alerts to other organizations. The group changed the makeup of the team developing agents to ensure they evaluated both mechanical and process behaviors to identify failure patterns.

The interplay between downtime alerts and scheduling is a common topic in digital initiatives. The motivation to adopt is compelling: tens of millions of dollars in potential gains from better crude management enabled by far earlier warnings of asset failure. That is just one example of the kind of cross-functional collaboration our customers are seeking with digital transformation.

Based on these initial projects, the organization now plans to roll out Aspen Mtell to monitor more than 300 assets across 12 refineries and 6 pipelines.

aspentech | Technology That Loves Complexity

About Aspen Technology

Aspen Technology (AspenTech) is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets safer, greener, longer and faster.
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