Optimizing Smelting and Refining Equipment Reliability with Prescriptive Analytics

aspentech | Case Study

Cost avoidance of $2.1M USD

in 2016 and greater savings in 2017

CHALLENGE

One operations group's reliability team needed a technology to track, detect and prevent equipment failures.

SOLUTION

They utilized Aspen Mtell® machine learning to track and predict equipment failure as well as determine the precise process signature leading to a failure.

BENEFITS

- Provides insights into what might lead to a future failure or impact production
- Triggers a warning when similar detrimental operation scenarios arise, predicting number of days to failure
- Improves safety and environmental performance by highlighting potential risks before they become dangerous

Overview

One of the world's largest fully integrated zinc and lead smelting and refining complexes wanted to improve their metallurgical operations. As a producer of refined zinc and lead, a variety of precious and specialty metals, chemicals and fertilizer products, their team's success is based on improving best practices, optimizing efficient processes, reducing failures and increasing the bottom line.

The team recognized they had an opportunity to improve preventative maintenance by using information from their process signal historian. In addition, they wanted a solution that could help as the company developed a comprehensive approach to strengthen environmental, employee and community safeguards.

Mtell has the ability to read process signals and calculate how much runtime a piece of equipment has left, and even automatically file a work order.

Detecting problems early to prevent unplanned downtime

This customer made extensive use of Mtell autonomous agents for early warning of degradation in their metals refining processes and equipment. At the site, a change in maintenance and culture occurred with this new solution. The agent within Mtell provided guidance of a time-to-failure of roughly 40 days on a process crucial pump. The maintenance and reliability team acted and performed a detailed SWOT analysis to determine the best course of action based not only on the tool's guidance, but on the site's production forecast as well.

Agents successfully predicted imminent failures and issued actionable prescriptive advice allowing staff to make more informed decisions about equipment servicing and operation. Making process changes immediately prevents catastrophic damage and allows staff to intelligently schedule service/repair before failures cause major production losses or worse, employee injuries. At the site, hundreds of Mtell agents monitor scores of asset classes in real time, including process equipment and piping, which tend to get foul and plug.

Using AspenTech's Mtell, the refinery applied machine learning to their existing data to track and predict equipment performance and impending failures. Mtell accurately identified the process variable signature that leads to a failure. The solution takes a snapshot of process signal data to learn what's normal and stores this information. While monitoring equipment in real-time, Mtell provides insights into what might lead to a future failure and triggers a warning when similar scenarios arise. With this method and the ability to mark specific warnings as acceptable, Mtell provides fewer false positives than similar solutions.

Controlling costs and improving safety

The customer's site benefitted from approximately $2.1M USD in cost avoidance in 2016 and even greater financial savings in 2017. Safety and environmental performance improved as well since staff get alerted to potential risks long before they become severe problems. The solution is currently used in numerous oil and gas and petrochemical facilities, providing insight for a wide range of additional types of equipment and sites. From conveyor belts and pumps to shovels and haul trucks, AspenTech's Mtell is the machine learning standard in process driven industries.

aspentech | Technology That Loves Complexity

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 faster, safer, longer and greener.

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