



**Prescriptive Maintenance Software Helps
Saras Improve Business Performance and
Drive Operational Excellence**

“Improving reliability positively impacts a wide range of issues, from reducing current maintenance costs to planning for abnormal process conditions, avoiding emergency or unplanned shutdowns and successfully managing unpredictable feed and demands. Saras expects to achieve savings from this initiative, which is part of an important digitization project.”

- Alessandro Zucca, Digital Platform Manager,
Operations and Assets, Saras

Detection accuracy of
91%
with 30 days of lead time

CHALLENGE

- Reliable operation of a 300,000 BPD refinery and a 575-megawatt integrated gasification combined cycle (IGCC) power generation plant
- Strategic objective to improve uptime and decrease maintenance costs

SOLUTION

The initial project, conducted in just a couple of weeks, covered the work to build Aspen Mtell® agents to identify the failures for a subset of equipment. The data for these agents included condition data and process data.

BENEFITS

For a reciprocating compressor, the agent showed high accuracy (91%) with a lead time of 30 days

The pattern learned through this agent was also able to predict two valve events:

- Valve high outlet temperature failure event, with a lead time of 39 days
- Valve replacement due to an instrument failure, with a lead time of 25 days

Aspen Mtell was able to execute this project within weeks, impressing Saras with its speed of deployment, accurate early detection of asset failures, avoidance of false alarms and ability to scale the solution system-wide.

Overview

Saras is the owner of the most complex refinery in the Mediterranean, with 300,000 barrels per day of refining capacity. As part of their digitization program, they were evaluating ways to drive greater reliability in their capital- and asset-intensive refinery operations. They selected Aspen Mtell based on a competitive pilot project selection process which initially focused on critical refinery equipment, such as large compressors and pumps.

Aspen Mtell mines historical and real-time operational and maintenance data to discover the precise failure signatures that precede asset degradation and breakdowns, predict future failures and prescribe detailed actions to mitigate or solve problems.



Efficient Implementation

Aspen Mtell was able to execute this pilot project within weeks, impressing Saras with its speed of deployment, accurate early detection of asset failures, avoidance of false alarms and ability to scale the solution system-wide. Saras plans to use its sister engineering company, industrial automation specialist Sartec, to roll out Aspen Mtell refinery-wide.

The initial project focused on four pieces of equipment:

- **Feed pump** — pumps liquid charge from other plants towards the exchange train
- **Wash oil pump** — recycles wash oil coming from the separator toward the mixer
- **Makeup H₂ compressor** — streams makeup H₂ from the hydrogen supply toward the main exchange train
- **Recycle compressor** — recycles H₂ coming from the exchange train

The desired outcomes of the pilot project were:

- An accurate solution that detects precise patterns of normal behavior, failures and anomalies
- A solution that indicates early warning, with significant lead time from point of detection to actual failure
- The ability to capture a failure signature and use it to detect failures in unseen data on the same assets and/or similar assets

The data used for the Aspen Mtell agents consisted of 52 million sensor values, including condition data and process data. The team reviewed 163 quality issues (such as bad values and missing values) and cross-referenced the work order history for the four assets, including 340 prior work orders. The maintenance history spanned 17 problem classification codes.

Measurable Results

The project achieved all objectives, and the Aspen Mtell agents were able to predict failures with significant lead time.

- High valve temperature: **36 days**
- Oil seal replacement: **45 days**
- Pump seal replacement: **33 days**
- Gas seal replacement: **24 days**

The agents accurately identified the specific failure mode — and did so without false positives. These capabilities are expected to reduce unplanned shutdowns by up to 10 days, increase revenue by 1 to 3 percent, reduce refinery maintenance costs and cut operating expenses by 1 to 5 percent.



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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