

UptimeAI Expert enhances Operational Efficiency of an Oil Refinery to avoid off-spec Diesel production and mitigate \$0.7M in production losses

Customer Profile

Industry
Oil & Gas

Operational Savings
\$0.7M

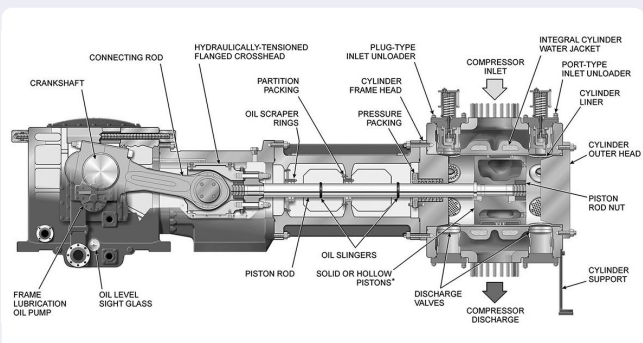
Crude Oil Processing Capacity
15.5 MMTA

Process Anomalies Identified
Performance Deterioration
of Reciprocating
Compressor

Solution with UptimeAI Expert

The DHDS (Diesel Hydrotreating and Dewaxing) unit is crucial for refining diesel into a low-sulfur product that meets environmental standards and fuel quality. The compressor plays a key role in maintaining the pressure and flow needed for this process. Hence, any issue with the reciprocating compressor could lead to a complete halt in production or cause the refinery to produce out-of-spec diesel, which would severely impact revenues and operational efficiency, leading to refinery shutdown.

In this case, UptimeAI Expert was deployed on the DHDS unit. With ~60 tags on the reciprocating compressor model monitoring the performance, an alert was triggered on the rising discharge temperature (up to 140 °C) along with the packing temperatures in one cylinder. Finding this 24 weeks in advance allowed plant operations to schedule and fix this issue during a planned shutdown.



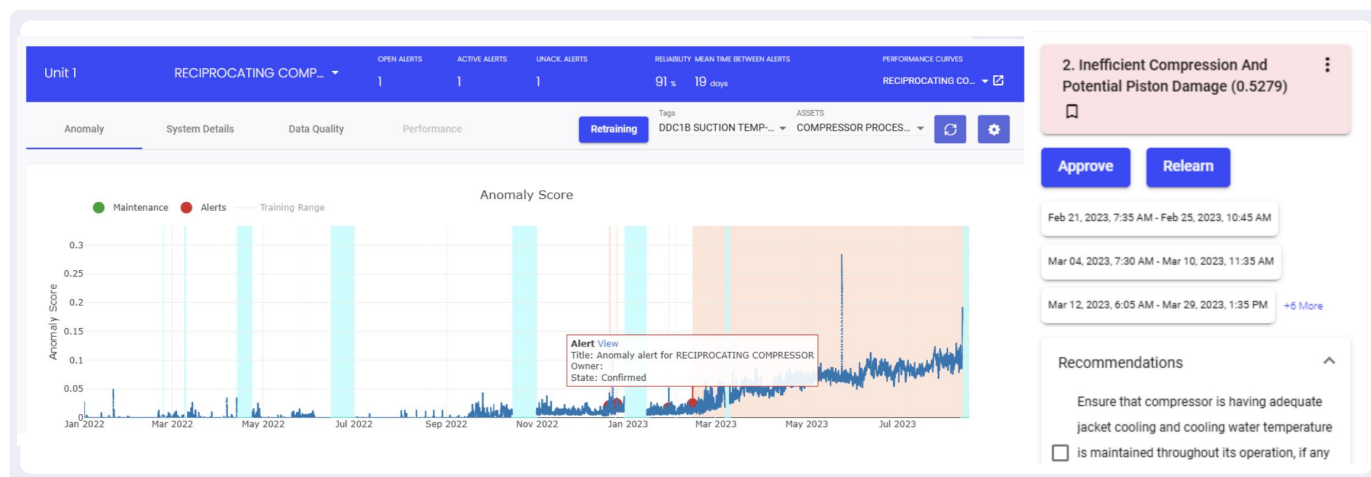
Challenges with Unit Shutdowns for Oil and Gas Industry

As per McKinsey, Fortune Global 500 (FG500) manufacturing and industrial firms lose approximately 3.3 million hours of production time to machine failures, and almost \$1 trillion through unplanned downtime.

- This amounts to an economic impact of \$864 billion or 8% of their annual revenues.
- Hence, identifying process disruptions which might lead to plant shutdowns are critical to avoid production losses.

How did UptimeAI Expert OEx platform help resolve this process anomaly?

- The initial alert was triggered in March, highlighting a considerable deviation from normal operating parameters on a Reciprocating Compressor.



- Notably, the N₂ cylinder parameters remain within normal limits, while the Cylinder 1 exhibited rising discharge temperatures (up to 140°C) and motor current. At the same time UptimeAI detected a decrease in rod drop position and the discharge pressure, pinpointing the issue with Cylinder 1.
- Also, the UptimeAI Expert solution highlighted a loss in compression performance and Potential Piston Damage as one failure mode, alerting the plant operations team to do a further inspection for damages during the planned shutdown.



UptimeAI Expert was able to mimic what an expert would do and identified a failure mode 24 weeks in advance triggered by compression inefficiencies and allowing the plant operations team to do a root cause analysis in a simplified timeline in under 1 hour as opposed to taking days. Recommendations were provided to inspect the valve conditions along with the integrity of the piston rings during a planned shutdown. The customer will save \$0.7M in operational savings and production losses.