UptimeAI

CASE STUDY

CUSTOMER PROFILE

Industry
Oil & Gas

Crude Oil Processing Capacity
15.5 MTPA

Deployment Scope
18 Unit Models, 100+ Critical Assets

Annual Cost Savings
$9M

NATIONAL PETROLEUM GIANT AVOIDS >$1M FEED PUMP FAILURE LINKED TO POLYMERIZATION IN REBOILER

Early fault detection, reduced downtime, and improved maintenance planning deliver measurable results

The Refining Industry's Complexity Starts at the Source

As the backbone for the many products that define modern life, the petroleum refining industry isn't slowing down, it's ramping up. In a market importing 90% of total crude supplies, growing demand means refiners must accept a more variable feed slate, and all the operational implications that come with it. The variable composition, quality, and contaminants present in crudes often manifest in refineries as:

- Throughput limitations bumping up against quality and heat transfer constraints
- Increased wear and tear and frequent repair of rotating machinery
- Alert fatigue from false alarms caused by shifting operating windows

Complex Problems Aren't Solved in Silos

Increased power draw requirements correlated to feed changes. Ambient temperature swings preceded throughput constraints. In the refinery, analyzing equipment data alone rarely solved their pump or compressor problems.

In the past, the path to a root cause and a remedy involved putting all the refinery domain experts into a room together. Together, the team had the communal expertise necessary to get a full picture of the problem. But with experts retiring faster than their replacements can be hired, assembling this collection of plant experts became unsustainable. There is an opportunity for technology to deliver holistic, plant-wide optimization insights, without relying on human-driven analysis.

How a Leading Petroleum Refiner Cracked the Code

Recognizing that their traditional approach of assembling domain experts had become unsustainable, this leading national petroleum refiner partnered with UptimeAI to develop a solution that could think like their expert team while operating continuously across all units.

CASE STUDY

The Breakthrough: $1.3M Feed Pump Failure Detected Over a Week Early

UptimeAI connected the dots between the refinery's unit operations and functional silos, uncovering a process issue that was causing a reliability headache.

A $1.3M feed pump failure was avoided thanks to an accurate, timely anomaly alert on the crude separator reboiler. The alert triggered over a week before the effects of polymerization caused by fouling in the reboiler would manifest as high amps on the pump. UptimeAI's model generated this alert by looking at the feed pump in the context of the upstream and downstream process units, taking a system-level rather than equipment-level approach.

UptimeAI's software was thinking about problems like their team of experts always had reasoning between process indicators like heat transfer and polymerization and machinery indicators like required electrical load to get to the resolution. The continuously learning model captured the failure mode and associated action, codifying it into domain intelligence linked to the company's data, reducing their reliance on a single individual.

Rapid Expansion: Success Built to Scale

The avoided feed pump failure helped accelerate the transition from the initial feed pump pilot to full production roll-out. They set an ambitious target, working with the UptimeAI team to expand from a single unit model to 18 unit models covering over 100 critical equipment assets in just 6 months.

$9M Annual Savings And Operational Transformation

Quantifiable Gains

- $1.3M feed pump failure prevented through early anomaly detection
- Over $9M in annual savings from early fault detection, reduced downtime, and improved maintenance planning
- 18 unit models deployed covering 100+ critical equipment assets
- 6-month expansion from pilot to full production roll-out

Transformational Results

- System-level approach connecting upstream and downstream process units
- Continuously learning models that codify domain expertise
- Reduced reliance on individual experts through AI-preserved institutional knowledge
- Proactive maintenance planning replacing reactive problem-solving

What's Next?

With over $9M in annual savings from early fault detection, reduced downtime, and improved maintenance planning, this refiner is now shifting their experts' attention toward the future horizon. Having seen how AI can help them do what they've always done better, they are beginning to explore challenges they once considered unsolvable.

About UptimeAI

UptimeAI provides AI reasoning agents that help industrial operations teams make goal-oriented, real-time optimal decisions. Our solutions achieve 90%+ pilot-to-production success rates and are trusted by leading companies in cement, oil & gas, power generation, chemicals, and metals industries. Backed by industry leaders including ABB, Yokogawa, and Mitsubishi.

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