L&T Technology Services

500,000 Data Points. Every 15 Minutes.

AI-led Asset Health That Sees Failure Before It Happens.



CASE STUDY

EXECUTIVE SUMMARY

A leading global petrochemical major - operating across 50+ countries with a 30,000+ workforce, and recognized for its ESG leadership - needed to move from reactive, legacy asset monitoring to predictive, AI-led asset health across its plants.

LTTS deployed its proprietary Asset Health Monitoring solution across 22 plants in KSA, US, and Europe - processing **~500,000 data points every 15 minutes across 1400+ assets** - cutting unplanned incidents by **>80%** and saving the client **~$10 Mn in the first year.**

CLIENT CHALLENGE

Petrochemical manufacturing runs on complex, interdependent process and equipment units - where a single unplanned failure can stall an entire plant. The client's existing plants relied on conventional, legacy methods for asset performance and reliability that could not proactively flag asset breakdowns or plant shutdowns with enough lead time to prepare or mitigate. The gaps were structural: no effective monitoring of critical Key Performance Indicators (KPIs) - driving operational inefficiencies, material losses, and process leakages - and no reliable way to identify the right KPIs to track per asset or schedule periodic maintenance against them. What the client needed was a predictive, AI-led layer that could see failure coming across a diverse, geographically spread asset base.

ENGINEERING COMPLEXITY

Predicting failure at this scale meant solving four very different problems in parallel — on plants that could never be paused, spread across KSA, the US, and Europe.

01 **Data at industrial scale and velocity.** ~1400+ assets, 100 parameters each at 15-minute frequency, against 5 years of historical data - ~500,000 data points to ingest, clean, and score every 15 minutes without falling behind real time.

02 **Diverse, hard-to-model asset physics.** Extruders, steam turbines, centrifugal and reciprocating compressors, centrifugal pumps, and heat exchangers - each with distinct failure signatures that no single generic model could capture.

03 **No clean baseline for what "normal" looks like.** Legacy KPI monitoring meant the right variables per asset had to be discovered from the data itself - not inherited from an existing, trusted setup.

04 **Predict early enough to act, across geographies**
Detection had to arrive with enough lead time to prevent a shutdown - and reach the right owner across KSA, US, and Europe operations, not just surface on a dashboard.

OUR SOLUTION

A proprietary Asset Health Framework, deployed as five interlocking capabilities — each closing a specific risk from the section above.

Capability	What it delivered
AI advisory decision support system	A Machine Learning (ML) engine that turns live plant data into ranked, actionable maintenance guidance for operators.
Anomaly detection & failure prediction	Sensor-driven classifiers flag anomalies and predict failures before they cascade into unplanned shutdowns.
Custom models per critical asset	1500 individualized data models - tuned per asset type: extruders, turbines, compressors, pumps, heat exchangers.
Customizable data pipeline	~500,000 data points ingested every 15 minutes across 1400+ assets, on 5 years of historical baseline.
Workflow & alert notification mechanism	Automated workflow and email alerts route each anomaly to the right owner - closing the detection-to-action loop.



BUSINESS OUTCOMES

>80% drop in unplanned incidents within a year. A step-change in plant safety and reliability that earned significant client recognition.

~$10 Mn saved in year one. 104 critical events across 12 plants were identified and pre-empted - events that had previously gone entirely overlooked.

Up to 20% less equipment downtime. Optimal, prediction-led maintenance scheduling replaced reactive firefighting.

Up to 20% higher productivity, up to 30% lower maintenance cost. Deeper real-time analytics improved throughput while cutting maintenance spend and lifting Return on Investment (ROI).

From POC to 22-plant scale - and a 4+ year partnership. A 2 plant pilot project expanded into deployment across 22 plants, and is now being scaled to 50 plants across the globe. This is the undeniable litmus test that the LTTS model works.

The EI Edge

A pure data-science vendor could have built the models. An automation contractor could have wired the sensors. Neither, alone, could have engineered predictive asset health for **1400+ assets across six equipment classes and three geographies** - and turned ~500,000 data points every 15 minutes into failures caught before they happened.

The difference came from fusing deep process-industry domain expertise with AI, anomaly detection, and a proprietary Asset Health Framework - working as one connected layer from sensor to decision.

The client didn't just get a monitoring tool. They got a **predictive reliability partner** - one they are scaling from 22 plants toward 50+ across their global operations.

This collateral includes AI-enhanced imagery

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