

UptimeAI Expert Enhances Operational Efficiency of Generator Unit to Avoid 45 Days of Unit Shutdown

Customer Profile

| | |
|---------------------|-------------------------------|
| Industry | Number of Tags Linked |
| Power Industry | 67 |
| Power Plant Output | Primary Issue Identified |
| 663 MW | Uneven heating in Stator Core |
| Overview of Plant | Estimated Savings |
| 5 Units of 120 MW , | 5 days of Downtime avoided |
| 1 Unit of 63 MW | |

Overview of the Issue

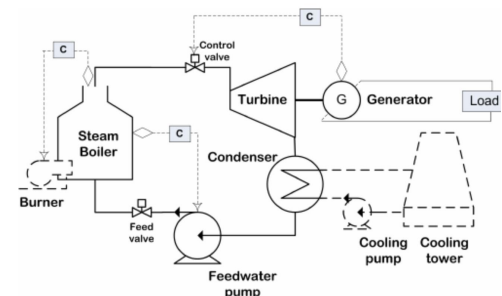
The Generator section of the 63MW unit encountered a critical alert which if left unresolved could have impacted power generation of the entire unit

- › The Generator core experienced an increase in temperature around 20 C for its median operating temperature.
- › The Plant Operations team observed the increasing deviation of Max_Min temperature in generator core which could have risked the entire unit's output.
- › Based on the validation of temperature data in DCS and in AIExpert OEx platform, the plant operations team affirmed it's a major process anomaly.

Solution with 'UptimeAI Expert'

The OEx platform leveraged its advanced System Model approach to analyze the data from 47 connected tags for this unit. Based on Historical Time Series Data, it showcased deviations in Generator operating conditions for performance anomalies. The OEx platform also identified 6 sensor alerts due to missing data, out of range, and flatline data, ensuring mitigation of future false alarms.

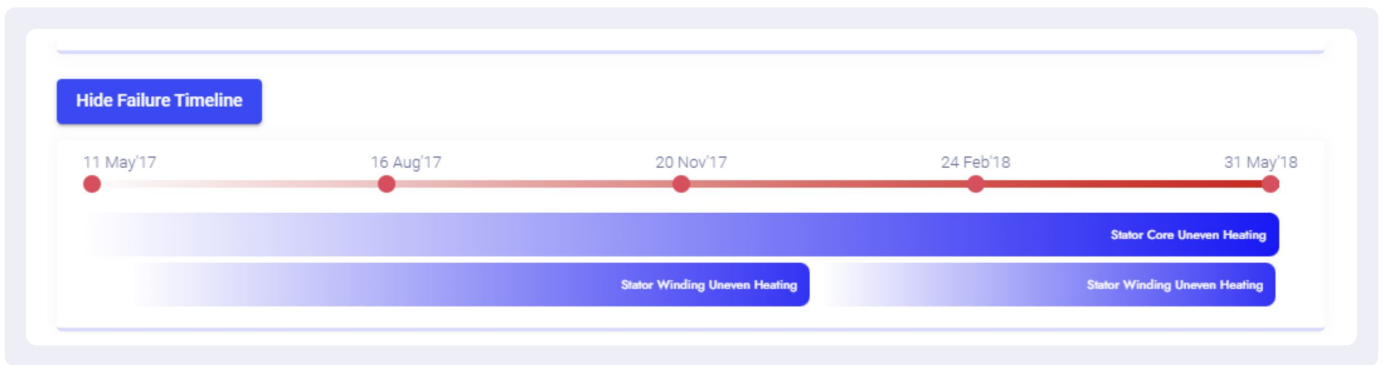
Data quality is at the heart of the OEx platform, ensuring system models are trained on quality datasets. This limits the number of false alarms and reduces the time to understand the issue.



Schematic Diagram of Generator Unit

How did UptimeAI Expert identify and resolve the major process anomaly?

- There was a minor uptick in the generator core temperature in the beginning of May, which gradually increased from the set median operating conditions.
- As showcased in the time series data, the Max-Min graph also displayed the increasing trend of deviation.
- With the rise in anomaly score a critical alert for “Stator Core Uneven Heating” was triggered on May 13, alerting the plant operations team.
- The UptimeAI Expert solution also showcased the Failure Timeline view and the progression of the failure mode for this critical alert.



- After inspecting the generator unit, Process Engineers confirmed the core temperature increased by 10°C which if not fixed immediately, would have led to equipment breakdown.
- Based on SME recommendations by our System Model approach, operations team also reviewed the MVA capacity of the generator was not exceeding its design limits.
- The process engineers quickly connected the dots, and the necessary MVA capacity was altered. Then the temperature returned to normal.

Max_UNIT4_GEN_TEMP [Asset: Generator]

Max_Min_UNIT4_GEN_CORE_TEMP [Asset: Generator]

Generator

Failure Modes 👤

1. Stator Core Uneven Heating (0.887) ⋮

Approved Relearn

Reason: Yes, I see that core temperature has increased by 10deg. Needs checking. 📝

May 11, 2017, 8:15 PM - May 21, 2018, 8:45 PM

Recommendations ⋮

- Confirm that MVA capacity of generator is not exceeding design limits
- Check stator CW flow is normal and hydrogen pressure is maintained
- Confirm generator stator CW temperature controller is on auto control
- Confirm hydrogen cooling water controller is on auto mode
- Consider testing the insulation resistance and PI
- test

Add Recommendation Add