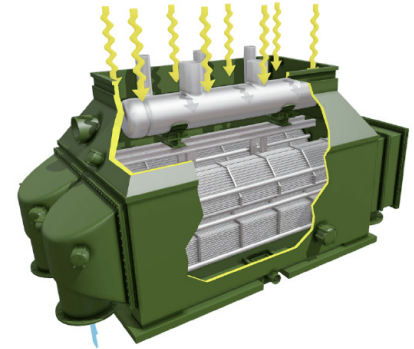


UptimeAI Saves \$300,000 Annually by Resolving Fouling Issues in Condenser

Background: The Challenge

In this case, the condenser unit experienced several abnormal behaviors, including increased condenser back pressure, discharge pressure of cooling water (CW) pumps, and vacuum pump current, along with a decrease in CW pump current.

In complex connected systems such as Condensers any identified changes in sensor data can be attributed to multiple anomalies hence, detecting the correct operational issues at inception is also quite difficult. Also, if left ignored this would have led to higher auxiliary power consumption and a reduced turbine heat rate, affecting the equipment efficiency leading to revenue loss of \$300,000 annually.



Technical Overview of Condenser

Solution with UptimeAI Expert:

- » In this case, UptimeAI Expert analyzed 48 critical tags across the condenser system, leveraged historical data and operational fingerprints to compare current behavior with baseline performance and highlighted 4 key issues.
- » **Increased condenser back pressure** indicated reduced heat transfer efficiency.
- » **Rising discharge pressure of cooling water pumps** pointed to flow resistance likely caused by fouling.
- » **Decreased cooling water pump** current suggested restricted flow within the condenser.
- » **Increased vacuum pump current (by 3-5 Amps)** highlighted the condenser's inability to maintain vacuum effectively.
- » Based on the mapped deviations, UptimeAI Expert was able to rule out other potential causes like upstream equipment issues or control failures and confirming that fouling was the most probable cause.
- » This early and accurate diagnosis enabled the customer to take swift action, conducting a condenser backwash that restored key operational parameters and prevented further efficiency losses.

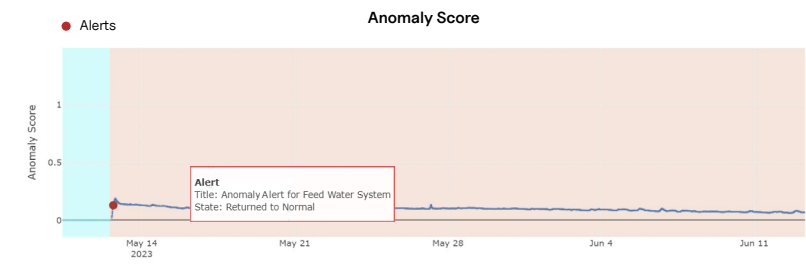
Summary

Estimated Savings
\$300,000 / year

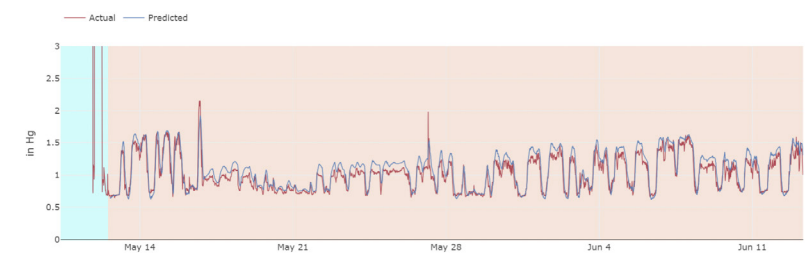
Systems Models
1

Deployment Time
2 Hours

Number of Tags
48



CONDENSER BACK PRESSURE [Asset: CONDENSER]



Condenser Fouling(0.0017)

Approved
Relearn

Reason: Monitor Condenser Backpressure and Circulating Water Supply for concerns.

Recommendations

☐ Measure ejector/vacuum pump air flow and confirm that there is an air ingress

☐ If vacuum pump air flow is high then identify the location of air ingress through mechanical methods like: Acoustic leak detector or through helium leak test

☐ Detect the air ingress location and patch/seal the ingress location

☐ Start standby vacuum pump in order to maintain condenser vacuum

☐ Confirm that vacuum pump/ejector system is working properly and is on holding mode

☐ Carry out condenser water fill test, identify the leakages and attend the leakages

Add Recommendation
Add

About UptimeAI:

UptimeAI uniquely combines Artificial Intelligence with Subject Matter Knowledge from 200+ years of cumulative experience to explain interrelations across upstream/downstream equipment, adapt to changes, identify problems, and give prescriptive diagnosis like a human expert would.

The UptimeAI Expert OEx Platform serves as a trusted Subject Matter Expert, empowering plant engineers to achieve operational excellence with minimal dependency.