Combined Cycle Power Plant

Case Study

IMI Insyt

Identifying the root cause of plant issues

Location: Texas, USA

The problem

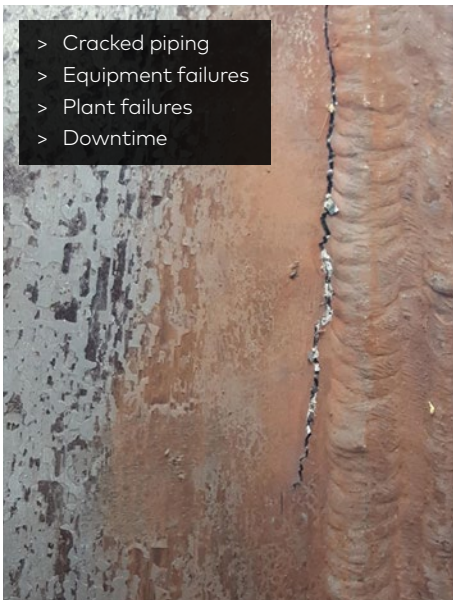
A 540MW Combined Cycle Power Plant outside of Austin, TX, was experiencing equipment failures across the plant. The facility was noticing cracked piping and repeated equipment issues within the Hot Reheat Bypass to Condenser application. This led to significant plant failures, requiring expensive equipment replacements and unplanned downtime.

The Hot Reheat Bypass to Condenser protects the plant in the event of a steam turbine trip or failure. It is also used during each start-up of the plant. If a complete failure occurs, the plant is unable to start. An idle plant leads to hundreds of thousands of dollars of profit loss each day.

In the past, the plant would perform visual inspections of piping and equipment, but never performed a formal review of data and operational procedures. While the visual inspections helped find the problems after they occurred, there was no evaluation of root causes or recommended operational fixes.

The facility also had a large amount of operational data collected from their Distributed Control System (DCS), but they did not have the personnel or experience to analyze the data.

The plant wanted to find out why they were having problems, how to avoid significant failures in the future, and receive recommendations to improve their operational processes.



IMI Critical Engineering

Breakthrough Engineering

The solution

The plant was an existing IMI Critical Engineering customer with IMI CCI valves already installed. They reached out to our team of expert engineers for help. After assessing the plant's needs, the IMI team recommended implementing the IMI Insyt end-to-end prescriptive engineering service. This would find the root causes and prevent problems before they happen, protecting the plant's process.

With a system-wide, physics-based analysis carried out by highly experienced IMI engineering experts, Insyt can identify needed improvements for desuperheating performance and system control, including steam flow, spraywater profiling, and thermal cycling.

The analysis work by IMI Insyt was time-sensitive, as it had to be completed before an upcoming planned outage of the plant. Working hard to identify the operating modes that were leading to failure, the Insyt team captured and analyzed data to quickly identify the major issues requiring immediate attention in the plant.

The IMI Insyt team, alongside plant personnel, were able to implement control algorithm changes that immediately improved plant operations and start-up. This was all done virtually. The IMI Insyt team was able to review live data and trends from California, while the plant team was making control modifications in real time in Texas. The virtual concept expedited the project and minimized costs.

As a result of IMI Insyt and their analysis, the plant has benefitted from longer life of equipment, increased maintenance intervals, better understanding of processes and equipment, and improved personnel safety. IMI Insyt has shown the plant team how to prevent cracked equipment, now and in the future.

Catherine
Plant and Maintenance Manager

"The IMI Insyt team helps make sense of the wealth of data that we have. Now we have better operational processes and increased plant safety, while greatly minimizing any future failures."

> IMI Insyt digitally analyzed data from the plant's Distributed Control System (DCS)