



CHEMICAL

CASE STUDY

Optimize utilities with zero impact on production.

Challenge

A major chemical facility depended on a complex steam distribution network to supply more than 20 process units. Disturbances from downstream operations was creating significant steam header variability, making boiler control difficult, reducing efficiency and affecting profitability.

The plant needed a safe, predictable way to optimize header performance without impacting production.



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Solution

A rigorous 1st-principles-based simulation of the utilities system, including boilers, commercial cogen, and steam headers, enabled the client to accurately replicate real-time system dynamics. Using an offline simulated environment, engineers designed and safely tested improvements. The team implemented 30 feed-forward control loops to reject disturbances caused by load changes. Although the simulator was not introduced in the design phase of the plant, it still serves multiple purposes. The accuracy of the dynamic models makes the simulator useful for operator training on critical but less frequent procedures such as startup and shutdown.

Results

- ⬡ **>\$500K annual savings** achieved from improved steam header stability
- ⬡ **Identified underperforming field devices** and verified replacements were working correctly.
- ⬡ **Reduced variability** and increased overall plant reliability
- ⬡ **Multi-Purpose Dynamic Simulator (MPDS)** provides ongoing benefits for engineering and operator training



Onyx 360 Connects Technology, People, and Processes. We design solutions for the Chemical industry that enable:

- ⬡ Reaction kinetics, heat transfer and energy usage optimization
- ⬡ Batch-to-continuous process evaluation
- ⬡ Raw material variability impact assessment
- ⬡ Safety-critical procedure training (startup, shutdown, emergency)
- ⬡ Plant layout changes and new equipment validation
- ⬡ Scale-up, tech transfer, and formulation changes
- ⬡ Continuous process monitoring

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