

CHALLENGE

Eliminated **\$16.1M/yr** in losses from transient calcium phosphate deposition in ethylene compressor intercoolers

A petrochemical complex faced repeated cleanings and threat of plant shutdown from sudden bulk deposition that neither the incumbent supplier nor the operating team could resolve. A focused root-cause investigation corrected the program — recovering firm annual savings and cost avoidance across lost production, cleanings, and thermal losses.

LOST PRODUCTION
RECOVERED**\$15.8M**

CLEANING COST AVOIDED

\$132K

THERMAL LOSSES RECOVERED

\$121K

TOTAL ANNUAL VALUE

\$16.1M

CHALLENGE

What was happening

Recurring calcium phosphate deposition was driving:

- Lost production from throughput cuts and unplanned unit shutdowns
- Repeated online and shutdown cleanings
- Chronic thermal/energy losses from fouled intercoolers
- A standing risk of a full plant trip

The incumbent supplier and operator had run the program for years without finding the trigger.

INTERVENTION

What we did

Aligned disparate data sources — service-company records, customer process and water-quality data, onsite-collected data, and laboratory results — into a single unified model. Applied heat-exchanger and competing-ion saturation modeling with time-series prediction of failure events, plus an onsite review with the operating team. Delivered an engineering report with root cause, corrected control bands, and an online monitoring plan.

ROOT CAUSE

Corrosion inhibitor was incrementally increased to hold ultra-low corrosion rates and phosphate targets — but the **polymer dispersant was never increased to match**. Each phosphate step-up pushed the system past its dispersant headroom, triggering a transient bulk deposition event in the intercoolers.

RESULTS DELIVERED

Eliminated transient deposition events
Restored design throughput & reliability
Removed opportunistic shutdowns & cleanings
Installed online monitoring to prevent recurrence

Small changes drive large failures — and large dollars — in petrochemical plants. A first-principles, data-driven review finds and corrects the root cause, and the savings follow. Your critical system deserves an independent review.