

IDENTIFYING HIDDEN PUMP DEGRADATION

IN A HIGH-PRESSURE BOILER FEEDWATER SYSTEM, A FIELD-VALIDATED MODEL CONFIRMED EXISTING CAPACITY—ELIMINATING THE NEED FOR A NEW PUMP.

MAINTAINING BOILER FEEDWATER RELIABILITY WITHOUT NEW EQUIPMENT

A Gulf Coast refinery's high-pressure boiler feedwater system relies on four centrifugal pumps running in parallel, each rated for roughly 885 gpm at 757 psid differential, to serve multiple high-pressure boilers across the facility. With boiler feedwater reliability non-negotiable, the site needed to know whether anticipated future demand growth would require additional pump capacity.

CHALLENGE

The refinery lacked field-validated performance data on its feedwater pumps. Before committing to new capacity, the site needed to understand how each pump was actually performing against its design curve — not just its nameplate rating.

SOLUTION

Hydrus Works conducted a one-week field measurement campaign, capturing flow rate at each pump discharge with clamp-on ultrasonic meters and suction/discharge pressure with calibrated field gauges.

Operating points were plotted against manufacturer design performance curves, and valve positions, instrumentation status, and equipment condition were reviewed across the system. The data isolated one pump behaving far outside its expected performance band.

RESULTS

The measurement campaign turned an assumed capacity question into a confirmed answer, and without adding equipment.

- Identified one pump (of four) operating at 90.4% performance degradation, contributing zero flow to the system
- Confirmed the remaining three pumps meet both current and anticipated future demand
- Verified N+1 redundancy remains intact even without the degraded pump
- Eliminated the need for new pump capacity

Field-validated performance testing identified a severely degraded pump contributing zero flow and confirmed the site's existing pumps meet current and future demand — avoiding an unnecessary capital purchase.