



• STEAM SYSTEMS

600 & 700 HP Steam Boilers Case Study Wapato, Washington, USA

Three *HydroFLOW*® i60 units removed scale from two diesel steam boilers, cutting daily fuel use from 400 to 275 gallons and delivering reported annual savings of roughly \$150,000.

400→275

Gallons of Fuel per Day

250°F

Stack Temperature
Reduction

\$150k

Reported Annual Savings

2–3 mos

Reported Payback

⇒ BEFORE & AFTER

• BEFORE

- Scale threatened a week-long boiler shutdown
- Acid cleaning typically cost over \$15,000
- Possible boiler replacement at ~\$350k each

• AFTER

- ✓ Scale debris discharged within days
- ✓ Fuel use fell from 400 to 275 gal/day
- ✓ Boiler replacement was postponed



OVERVIEW

A chemical plant in Wapato, Washington operated 600 and 700 HP low-pressure diesel steam boilers on well water at approximately 200 ppm hardness. A softener reduced hardness to about 80 ppm, yet excessive scale persisted. Acid cleaning required an estimated one-week shutdown and cost more than \$15,000, while replacement of either boiler could cost about \$350,000.



CHALLENGE

Despite water softening, persistent limescale caused frequent cleaning, downtime and costly boiler replacement.

- Make-up water remained ~80 ppm after softening
- Acid cleaning required ~1 week offline
- Cleaning cost over \$15,000



SOLUTION

HydroFLOW® i60 units were installed: one after the softener on the make-up line to the deaerator tank and one on the incoming water line to each boiler.

UNITS INSTALLED

3× *HydroFLOW*® i60

BOILERS TREATED

600 and 700 HP diesel steam boilers



INSTALLATION

HydroFLOW® i60 on water line from softener



INSTALLATION

HydroFLOW® i60 on pipe feeding the steam boiler



INSTALLATION

HydroFLOW® i60 on pipe feeding the steam boiler



RESULTS

Scale Purging Began Within Days

Soft grey and red putty-like scale began leaving through boiler blowdown within days.

Stack Temperature Cut by 250°F

Within 2.5 months, stack temperature on each boiler fell from about 650°F to 400°F.

Fuel Use Cut by 125 Gallons Daily

Combined daily diesel use fell from about 400 to 275 gallons within 2.5 months.

\$ About \$150,000 Saved Annually

The case study reports roughly \$150,000 in annual fuel savings.

Two-to-Three-Month Payback

Return on investment was 2–3 months.

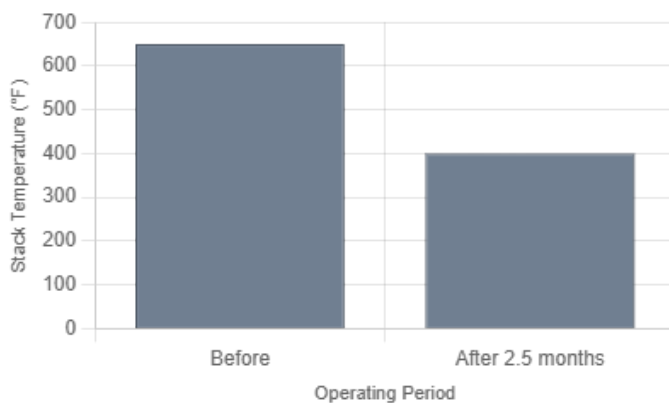
Boiler Replacement Postponed

The customer delayed possible replacement of two boilers valued at about \$350,000 each.



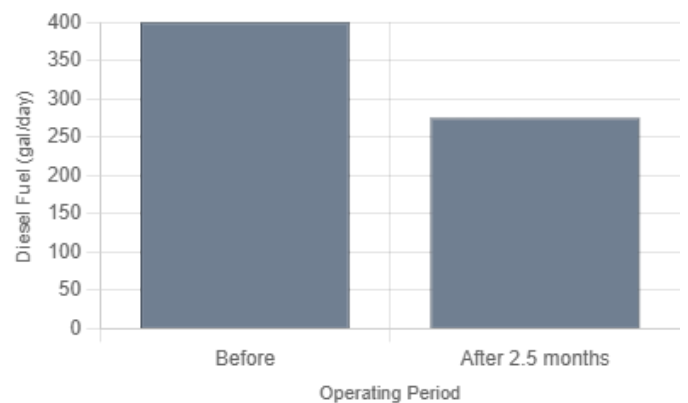
GRAPHS

Boiler Stack Temperature



Stack temperature on each boiler fell from approximately 650°F to 400°F within 2.5 months.

Daily Diesel Fuel Consumption



Combined daily diesel consumption fell from approximately 400 to 275 gallons within 2.5 months.



TESTIMONIAL

"I'm very pleased with HydroFLOW's results. Instead of dreading it, I'm actually looking forward to the next state inspection!"

— Maintenance Supervisor, chemical plant

KEY TAKEAWAY

Summary

Three *HydroFLOW*® i60i units treated the deaerator make-up line and two diesel steam boilers. Scale began leaving through blowdown within days. Within 2.5 months, stack temperature fell from approximately 650°F to 400°F and daily fuel consumption dropped from 400 to 275 gallons. The case study reports roughly \$150,000 in annual savings, a 2–3 month payback and postponement of possible boiler replacement.

250°F

STACK TEMPERATURE REDUCTION

125 gal

DAILY FUEL REDUCTION

\$150k

REPORTED ANNUAL SAVINGS



ADDITIONAL PHOTO EVIDENCE



SYSTEM

DA Tank



SYSTEM

600 HP Steam Boiler



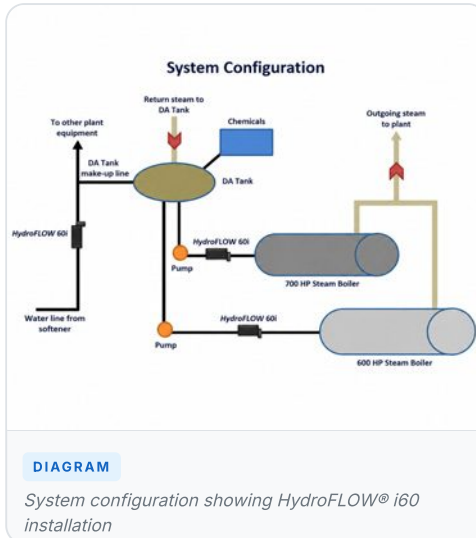
SYSTEM

700 HP Steam Boiler



INSPECTION

Lime scale from steam boiler blow-down

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