



• POWER STATIONS

Inland Power Plant Cooling System Case Study China

2 *HydroFLOW*® Multihead 72" were installed on a steam condenser system using river water, with the objective of reducing chemical use and improving steam condensation efficiency.

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Chemical Dosing

1.5°C

Transit Temperature Drop

1 kPa

Vacuum Pressure Increase

No

Hard Scale

⇒ BEFORE & AFTER

● BEFORE

- ✗ Anti scaling and biocide were dosed
- ✗ Transit temperature was 5°C to 6°C
- ✗ Hard scale was a system concern

● AFTER

- ✓ Chemical dosing was stopped
- ✓ Transit temperature held at 4°C to 5°C
- ✓ Only soft scale was observed, can be washed easy.

OVERVIEW

An inland power plant in China using river water in a circulating cooling system (two 600 MW units). Water quality from the Yuen River varied by season and turbidity was high during the summer rainy period. The site had been using anti scaling and biocide chemicals, with refill water running at 700 tonnes per hour. The project objective was to reduce chemical use and improve steam condensation efficiency.

CHALLENGE

Seasonal river water quality and scaling risk and seasonal water variation required ongoing chemical treatment and steam condenser efficiency.

- River water quality varied from season to season
- Water turbidity was high during the rainy season
- The system relied on anti scaling and biocide chemicals
- The site wanted better steam condensation efficiency



SOLUTION

Two *HydroFLOW*® Multihead 72" units were installed on the complete steam condenser system on 1800 mm outer diameter pipes. A clear plastic cover was used to provide shielding for the units.

UNIT INSTALLED

2x *HydroFLOW*® Multihead 72"

PIPE SIZE

1800 mm O/D

WATER SOURCE

Yuen River

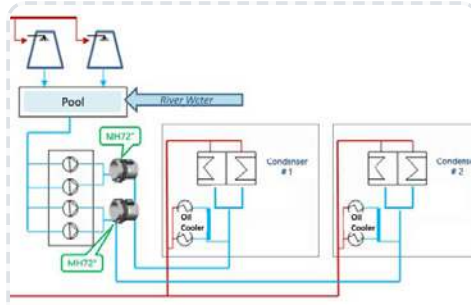
INSTALL DATE

7 November 2016



INSTALLATION

On main pipe



SITE

Cooling flow diagram



RESULTS

Chemical dosing stopped

Chemical dosing was stopped one week after *HydroFLOW*® installation.

Lower transit temperature

Steam condenser transit temperature held at 4°C to 5°C instead of 5°C to 6°C.

Improved condensation

Vacuum pressure within the steam condenser increased by 1 kPa.

No hard scale found

Inspection found no hard scale inside the steam condenser after three months.

Soft scale only

Only soft powder scale was observed and it could be washed down by water jets.

Water reused on site

Cooling tower discharge water was used for gardening and other applications.

KEY TAKEAWAY

Summary

At an inland power plant in China, two *HydroFLOW*® Multihead 72" units were installed on the circulating cooling system using river water. Within three months, chemical dosing had been stopped, steam condenser transit temperature was maintained at 4°C to 5°C instead of 5°C to 6°C, and condenser vacuum pressure increased by 1 kPa. Site inspection also found no hard scale inside the steam condenser, with only soft scale that could be washed away by water jets.

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CHEMICAL DOSING

1.5°C

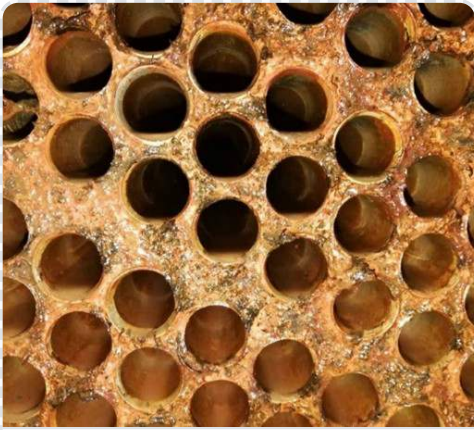
TEMPERATURE DROP

1 kPa

VACUUM INCREASE

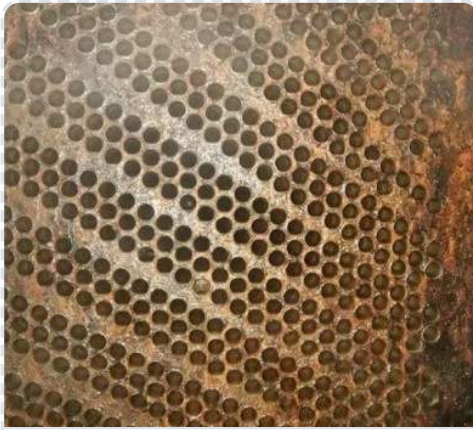


ADDITIONAL PHOTO EVIDENCE



AFTER

Condenser tube plate after three months of operation



AFTER

Cooling tower fill surface during inspection



AFTER

Steam condenser surface during site inspection



RESULTS

Soft powder scale collected during inspection



RESULTS

Cooling system pipework showing soft scale condition



RESULTS

Cooling tower component showing soft scale only

HYDROPATH

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