Armstrong® Intelligent System Solutions®

CASE STUDY

Condensate Recovery

Customer: **Fushun Petrochemical Division of PetroChina Refinery No. 3 Plant**

Location: Fushun, China

Scope of Work: Armstrong International designed, engineered, installed, and financed a steam system and condensate return optimization projects for Refinery No. 3 Plant at Fushun Petrochemical Division of PetroChina.

This is one of the several sub-projects covered in a system optimization agreement implemented under the cooperation of Fushun Petrochemical and Armstrong.

In Refinery No. 3, condensate mainly comes from such units as arene, catalyser, sulfur, and hydrogen adding. Contamination of oil, iron, etc. and low pH levels force the condensate to be sent to the water sewer as industrial water.

Upgrade Projects:

- Reduce steam consumption by optimizing the liquid separation system in the re-boiler at the bottom of the steam lift tower in sulfur workshop.
- Rationalize the flow distribution by checking and optimizing the condensate return line and optimizing the line routing.
- Set up heat exchange network among condensate, demineralized water, and industrial water.
- Install active carbon filter to remove the minimal oil from the condensate.
- Install on-line monitoring system and active carbon filter mixing bed to monitor real time the oil content in the condensate. Once oil content exceeds the designed limit, condensate will be separated to ensure condensate quality and system reliability.
- Utilize HTRS software to simulate and optimize the heat exchange process among condensate, demineralized water, and industrial water; ensure complete condensate heat recovery when coolant is not widely available. Reduce project investment by fully utilizing components of the original system.
- After treatment, condensate fully conforms to the quality requirements for MP boiler feed water.

Contract: The total value of this agreement is $245,000.

Terms: The projects were completed in July 2001.

Benefits:

- The annual condensate recovery: 254,000 tons
- Annual steam savings: 1,200 tons
- Annual net energy savings: $131,000
- Payback period: 1.8 years

ENERGY STAR PARTNER