



Condensate Recovery

Customer: Fushun Petrochemical Division of PetroChina
Refinery No. 1 Plant

Location: Fushun, China

Scope of Work: Armstrong International designed, engineered, installed and financed a condensate recovery and re-use project for Refinery No. 1 Plant at Fushun Petrochemical Division of PetroChina.



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

In Refinery No. 1, the existing condensate return pipeline is relatively well developed and most of the condensate from each unit is recovered. The wax removal unit for ketone benzene uses a separate condensate return, however, other units share one return line.

Due to the inevitable leaking in various indirect steam heating equipment in the process units, condensate is contaminated with oil, iron, and other foreign matters, making it unqualified as MP boiler feed water.

The recovered condensate, after passing through the heat exchangers, is routed to the industrial water supply system in the plant and can't be fully utilized.

Upgrade Projects:

- Install on-line monitoring system in condensate return lines for real-time monitoring on the condensate quality
- Install active carbon filter to remove the minimal oil in the condensate
- Install 50 ton/hr condensate treatment system IEF to remove the ion out of the condensate via filtering and ion exchange
- Install intermediate water tank and water pumps to match the newly added equipment with the existing system in power workshop

Contract: The total value of the agreement is \$411,000.

Terms: The projects were completed in July 2001.

Benefits:

- The annual condensate recovery: 228,000 tons
- Annual net energy savings: \$190,000
- Payback period: 2.4 years

