

**Case Studies (FIS-280)**

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## **CDHDS Reboiler Heater (H-60) Efficiency Improvement Project**

Furnace Improvements Services (FIS) was employed to develop an efficiency improvement scheme for CDHDS reboiler heater (H-60).

The CDHDS reboiler heater is a vertical cylindrical natural draft heater built in 2002. The CDHDS reboiler heater (H-60) was designed for a process duty of 72 MMBtu/hr, with a design efficiency of 81%. The heater was operating at an efficiency of 79%, with a flue gas stack temperature of 780°F.

FIS reviewed the design and proposed the following changes to improve the efficiency:

- Adding six rows of steam generation coil in the convection section
- New stack transition cone
- 25 ft of stack extension

In this scheme, 71,000 lb/hr of 450 # steam condensate is flashed to 150 # 2 phase, vapor-liquid stream. Flashing is completed before it enters the convection section.

The total heat duty of the heater was increased to 82 MMBtu/hr. The extra 10 MMBtu/hr is absorbed in the steam generation coil. Flue gas temperature leaving the stack was reduced at 400°F.

**The efficiency of the heater was increased to 90%, which brought energy cost savings of approximately \$590,550 per year. The payback period is 1 year 3 months.**

This project was successfully commissioned in October 2007.

