



New Boiler



Old Feedwater Tank

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SDSM&T Boiler Replacement Project & Feedwater Tank Replacement Project

This boiler replacement project involved the removal of one 750 hp firetube scotch marine 2-pass boiler and the installation of one 500 hp firetube scotch marine low pressure steam 4-pass boiler. The new boiler is a "wetback" configuration that helps minimize refractory maintenance.

The project design also included the use of an Autoflame burner control system which allows precision control of the burner and provides an optimum air to fuel ratio at all times.

The feedwater tank replacement project involved the replacement of a failing boiler feedwater tank located in the SDSM&T Physical Plant. An additional small feedwater tank was added to allow continuous operation of the boiler plant during primary feedwater tank replacement and future service. Minor modifications to the condensate return system, soft water make up piping and feedwater pump piping were also necessary.

Project Data

Owner

South Dakota School of Mines and Technology

Location

Rapid City, South Dakota

Building Type

Physical Plant

Building Area

3,375 square feet

Mechanical Systems / Features

Low pressure steam firetube Boiler
"Autoflame" burner control system

Electrical Systems / Features

Connection to new equipment and associated controls

Construction Cost

Boiler: \$375,000
Feedwater Tank: \$150,000

Completion Date

Boiler: December 2006
Feedwater Tank: 2014

Mechanical Engineering

Low Pressure Steam generated in the boiler plant is distributed around the campus through a tunnel system serving each major building. This project replaced an older lower efficiency boiler with a new four pass model to gain several points of efficiency. The boiler is a dual fuel model utilizing both natural gas and fuel oil for combustion.

An initial study of various replacement options compared fire tube to water tube boilers. It was determined through this study that the fire tube boiler was the best selection for the available budget.

The oxygen trim package was integrated in to the existing Johnson Control building automation system.

This boiler has been operating year-round to provide a reliable source of steam to the campus.

The feedwater system was studied and it was determined that the existing tank should be replaced. Additional redundancy was added to the feedwater system to improve reliability and ease maintenance.