CASE STUDY

Heat Transfer Sales *of the Carolinas, Inc.*

Problem:

A new hydronic heating & domestic hot water boiler plant needed to provide energy-efficiency and a cost savings payback.

Solution:

Provide a boiler plant for both hydronic & domestic hot water heating while providing the owner with innovative & ultra-high efficient boiler technology.

Project:

North Charleston Elementary School

Location:

Charleston, SC

Products Utilized:

- AERCO KC 1000 Boilers
- RECO USA Domestic Hot Water Generator
- TACO Pumps, Air Control, & Hydronic Accessories

Reference Info:

- www.aerco.com
- www.taco-hvac.com
- www.usgbc.org/LEED

AERCO BOILERS CHOSEN FOR SOUTH CAROLINA'S 1ST EVER *LEED®-CERTIFIED* SCHOOL

In 2003, plans were being made to reconstruct historic North Charleston Elementary School. At an early stage, the decision was made that this school would become a model of excellence in design. This school was to be a LEED-Certified project. The LEED (Leadership in Energy and Environmental Design) certification system was established by the US Green Building Council. To achieve such a prestigious award, the building design had be environmentally friendly and utilize today's most energy efficient technologies.

One step towards this goal was to design a highly efficient HVAC system. That's when Epic Engineering called in Heat Transfer Sales of the Carolinas (HTS) for assistance. The mechanical engineer wanted the most efficient hydronic heating system available. That's when AERCO boilers were considered for the central heating plant.

First, the building heating load profile was calculated and then the seasonal efficiencies of the AERCO ultra-high efficiency condensing boilers vs. mid-efficiency non-condensing boilers were compared. Based on the natural gas rates and Charleston Bin data, a payback analysis was calculated. Using AERCO design technology would decrease the annual BTU input per year by 18.5%, which means a significant decrease in the number of therms of natural gas used each year.

A key factor that would help reduce natural gas consumption is the fact that modulating AERCO boilers have excellent turndown ratios. This way the boilers would only use the amount of gas that would be required for the heating load. The boiler efficiency also increased as the firing rate decreased. This is especially important considering the mild winter climate of Charleston would seldom require the boilers to be at a full firing rate.

Another item to be addressed was the domestic water heating load. The engineer decided to use part of the boiler plant capacity to indirectly heat the domestic hot water through a coil in a storage tank. During warmer months, one boiler at partial fire would handle the domestic water heating load. (Over)

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Since 1971, HTS has been setting the standard for hydronic HVAC and engineered plumbing suppliers. HTS offers the HVAC experience and professionalism of degreed sales associates. Engineering graduates staff every sales office helping you evaluate system requirements and select the best equipment for your job.

Need a condensing boiler?

HTS now offers a complete line of modulating, condensing boilers!
AERCO has expanded their product offering to include smaller units starting at 300 MBH input and also added a larger 3,000 MBH boiler with an amazing 28" x 64" footprint.
HTS has 17+ years experience with condensing boiler technology.
Our sales associates are ready to help you with your boiler plant design needs.

Heat Transfer Sales of the Carolinas, INC.

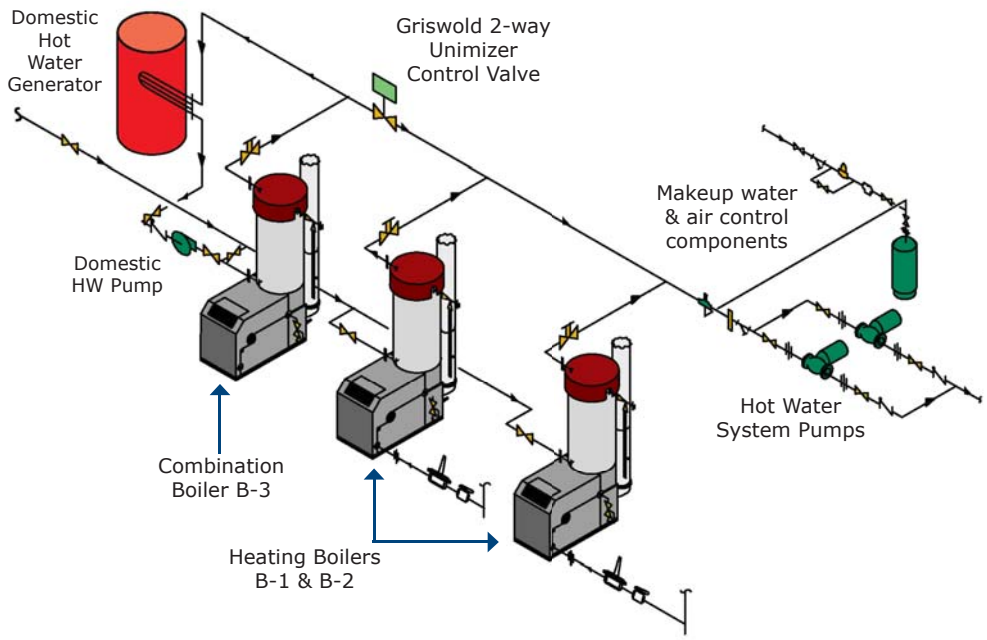
The driving force in forced circulation.

The boiler plant would be designed with (3) AERCO KC1000 boilers (1000 MBH input each). This was enough capacity to handle the building heat & domestic hot water heating loads and give some redundancy in case a boiler was taken offline for routine maintenance.

After crunching the numbers and realizing the energy savings, the decision to use AERCO boilers was the obvious choice. An added bonus that resulted from specifying and installing the AERCO boilers was the opportunity to generate LEED points within the "Energy & Atmosphere" category. Aaron Tempel of Epic Engineering stated, "The AERCO boilers and domestic water heating plant helped generate a LEED point for building energy reduction."

Once the project was completed, North Charleston Elementary School became the first ever LEED-Certified elementary school in South Carolina. This was the result of a combination of energy & water conservation, innovative design, and recycled building materials. HTS was proud to assist Epic Engineering with their design role to help achieve such a prestigious award & certification.

AERCO KC1000 boilers & water heaters now have a 20:1 turndown ratio for heating loads from 50 MBH up to 1000 MBH

TECH TOPIC: COMBINATION SPACE HEATING & DOMESTIC WATER HEATING PLANT

A combination space & domestic water heating plant is shown in the piping layout below. The combination boiler (B-3) can be isolated from the system by means of a normally closed two-way motorized valve. Boiler water is then pumped through an external hot water storage generator to produce domestic hot water through a closed loop coil.