

Calloway

QUARTERLY

Low Return Water Temps Make Aerco A Perfect Fit At North Springs High School

When thermal shock had rendered the boilers at North Springs High School inefficient and ineffective, Joseph Clements, coordinator of Utilities Services for Fulton County Schools, knew it was time for a change. The existing gas fired boilers were badly damaged from thermal shock, particularly around the fire housings. Low temperature water entering the boilers had caused sooting up in the combustion chamber and serious cracks in the refractories.

“The original boilers had been poorly applied,” said Clements, referring to the fact that these boilers were not designed for low temp operation. Technically, says Clements, there should have been a 3-way valve redirecting the cooler water to prevent thermal shock on the boilers. However, by the time the school sought help, the boilers were beyond repair.

Water Source Heat Pumps—Why Condensing Boilers Work

Low return water temperature was a product of the existing water source heat pumps, which provide cooling in the summer and heat in the winter. The boilers were connected to the water source heat pump loop and water was drawn from the main building loop through the boiler using recirculation pumps. Since heat pumps extract so much heat from the

loop water, return water temps were very low, causing thermal shock and condensing in the existing *non*-condensing boilers.

In designing a boiler retrofit, Clements’ goals were simple: To eliminate unreliable operation of the boilers due to low return water temperature while improving operating efficiency. These goals led him directly to Aerco Benchmark full modulation boilers.

Designed for condensing, the Benchmark can withstand low return water temperatures. In fact, the lower the return water temperature, the higher the efficiency. In addition, the Benchmark operates at its highest efficiency under part load conditions—which encompasses most of the heating season.

Two 2-million BTUH boilers were selected for the North Springs installation to operate in parallel with each other, most typically at low fire for better efficiency. However, should one boiler fail, the other would be able to maintain the typical heating load.

No re-piping was necessary, so the existing boilers were simply removed and the Benchmarks put in their place.

Gas Usage Slashed

Despite the fact that load has increased at North Springs over the



Aerco Benchmark Boilers at North Springs High School

past few years, gas usage has gone down since the Aerco installation. In fact, when comparing 1998 with 2002 consumption (after the boilers were installed) usage was almost cut in half during the major heating months.

“The Benchmarks have allowed us to provide the correct amount of heat in the loop without overshooting the heat level,” said Clements. “That’s been one of the best things for us.” In addition, Clements said that control requirements were simplified since the Benchmarks can operate at a low return water temperature and did not require any 3-way valves to pipe or operate.