Case Study

Modulex Boilers Help New England Apartment Complex Save Money and Reduce Fuel Consumption

Customer	**Georgetown Apartments**
Location	**Massachusetts**
Industry	**Multifamily Housing**
AERCO Product Installed	**Modulex 909**

What the Client Needed

Georgetown Apartments, located in Framingham, MA, is a large garden-style apartment complex consisting of nine, identical three-story buildings - each with 23 units. The complex was built in the early 1970s using concrete block construction with brick veneer and a gabled roof. When the existing boiler and water heating equipment, approximately 18-25 years old, had reached the end of its useful life, building owners opted to upgrade to high-efficiency equipment and a state-of-the art system design. The new mechanical infrastructure, which employs AERCO condensing and fully modulating boilers, Triangle Tube indirect water heaters, Wilo pumps and Taco zone control valves, is expected to reduce annual fuel consumption by 30%-35% and to save building owners more than $38,000 per year.

Original vs. New Design

The ground floor mechanical room in each building was originally equipped with two, atmospheric Hydrotherm Multi-temp boilers to support an 800,000 BTU/hr. space heating load. A freestanding, 72-gallon Bock water heater and separate storage tank were used to support building resident's DHW requirements. Andrew Turco, project estimator and high efficiency consultant at mechanical contractor Merrimack Valley Corporation, estimated that the original equipment was only 60%-65% efficient. Not only did this make for a cluttered and costly mechanical infrastructure, the use of pumps as circulators to each apartment proved to be difficult to manage for on-site service manager, Frank Daley.

Turco recommended replacing the existing low-efficiency boilers and freestanding water heaters with condensing, fully modulating AERCO Modulex boilers and Triangle Tube PhaseIII indirect water heaters with integral storage. The boilers would be applied in a system that utilized an outdoor reset schedule and was designed around a 40°ΔT between supply and return water temperatures.

Turco estimates that this approach will enable the boilers to operate in condensing mode for approximately 45 weeks of the year to maximize seasonal energy efficiency. Teamed with the 120-gallon, indirect hot water heaters, the boilers give priority to the DHW load.

A Wilo Stratos fully modulating pump, equipped with an ECM motor, was selected as the building's primary pump. It responds automatically to only circulate as much water as needed by the system to save additional energy. To simplify operations, Turco's proposal also called for the re-piping of the complex's 70 circulators to convert them to easy-to-operate Taco zone control valves.

AERCO's Solution

After evaluating several brands of condensing boilers, Turco selected AERCO Modulex MLX-909 units for the project. The MLX-909 features 20:1 turndown to match any load between 45,000 and 909,000 BTU/hr. without wasteful cycling or temperature overshoot. While the 98+% efficiency that can be derived from such unmatched turndown was an important consideration to the energy saving project, it was the unit's built-in redundancy that sold Turco on the AERCO equipment.

Unlike competitive boilers, the AERCO MLX-909 employs six independent, 151,500 BTU/hr. pre-assembled thermal modules housed in a common enclosure.

Each module is equipped with a dedicated controller with combustion safeguard, variable speed fan, modulating gas valve, electronic ignition with flame detector, modulating burner, flow and overtemp sensors and cast aluminum heat exchanger. If one module requires maintenance or repair, the remaining five modules continue to deliver the heat to the building. Each unit is also equipped with a Boiler Communications Module that supports remote control and, for enhanced reliability, also acts as a back up in the event of a master controller failure.

"Using another brand of equipment, we would have had to install twice as many units - 18 boilers compared to nine - not to mention the associated extra sets of pipes, pumps, etc. in order to ensure that the new mechanical system could provide mission critical redundancy to building residents," said Turco. "No other boiler could deliver the return on investment of the plan centered on the AERCO Modulex units."

The upgrade, completed in May 2008, went smoothly. Under the supervision of John Murray, Boston Regional Manager for the construction unit of Denver-based complex owner AIMCO, the chief goals of the retrofit was to limit disruptions to tenant services during the changeover.

It took the team approximately two days per building to complete the changeover. On the first day, the two existing boilers were removed and replaced with the single MLX-909. By the first evening, heat was restored to building tenants. On the second day, the freestanding water heater and storage tank were removed and replaced with the Triangle Tube 120 gallon heater with integral storage. DHW was restored to tenants in the evening.

Return on Investment

An upgrade to the apartment complex's boiler and hot water system proved to be a win-win for complex owner AIMCO and tenants. Incorporating AERCO boilers, Triangle Tube water heaters, Wilo pumps and Taco zone control valves, a more efficient system that saves money and provides reliable operation was achieved.

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