

## **Progressive Thinking Leads to Dramatic Energy Efficiency for Suffolk County**

If a government can be both progressive and conservative, the leaders of Suffolk County, New York certainly qualify. It's progressive in that it passed Resolution #126-2006 requiring any county building project exceeding \$1 million to incorporate green design principles. When that progressive thinking was put in practice during a renovation of the county's marine police bureau, the result of significantly improved energy efficiency can't be considered anything but conservative. In fact, the energy savings have been so great since the installation of an AERCO Benchmark 2.0 (BMK2.0) boiler that the local utility called the county Department of Public Works (DPW), which supervises all of Suffolk County's engineering, to see if the facility's meter had been turned off.

Located on the south shore of Long Island where winters can be bitter, the Marine Police Bureau is a 15,000-square-foot facility that houses the equipment and law enforcement professionals who keep the 1,000 miles of coastline safe for 1.4 million county residents. In order for vehicles to enter the facility for maintenance, a large bay door must be opened, thus allowing outside air to sweep through the main part of the bureau's first floor. Since most of the maintenance work is done during the winter, heating the facility was a challenge the existing system could no longer meet.

The 30-year old, oil-fired, hydronic modular boilers that fed unit heaters throughout the bureau were at the end of their useful lives. The six oil-fired units, which had a combined capacity of 1.2 million Btus/hr, now required frequent maintenance and repairs, further increasing operating costs and significantly impeding their ability to support the building's heating needs. For the County's Facility Engineering Division staff at the DPW, modest renovations to the Great River facility presented an opportunity to improve working conditions, as well as spend taxpayers' dollars more wisely.

Chief Engineer, Thomas LaGuardia, P.E., said, "This was the first major heating plant renovation to the facility in 30 years. I wanted to take the opportunity to upgrade the bureau with technology that would have long-term benefits, both environmentally and financially."

The County's other successful high-efficiency projects at other facilities served as a good reference, according to Principal Mechanical Engineer, Michael Monaghan, P.E. "We asked our Energy Engineer, Javed Ashraf, P.E., C.E.M., to consider a number of alternatives that might help to reduce operating costs significantly by just upgrading one component of the existing hydronic system – the boilers."

Ashraf contacted David Shepard, P.E., President of G.A. Fleet Associates, an AERCO manufacturer's rep, to learn more about the operating advantages of condensing boilers with very high turndown. At Ashraf's request, Shepard provided a list of local facilities designed with AERCO units. Among them was the Sachem School District, one of the largest school systems in New York State. Sachem had purchased 12 AERCO units from G.A. Fleet to accommodate several diverse load requirements, including space heating, domestic hot water and pool water heating, at its new high school.

"I conferred with Mike after a site visit to the school and several conversations with the school district's engineers and maintenance people. We knew that the AERCO technology was best for our needs, and Tom agreed," said Ashraf. "Then, it became a matter of which unit to select."

LaGuardia notes, "We chose the AERCO Benchmark because we felt the 2 million Btu/hr heating capacity, coupled with its wide range in operating capability, would best fit the special needs of the Marine Bureau staff and building. The design challenges posed by the garage doors, the building's immediate proximity to the Great South Bay, and the operating profile of the Marine Unit's maintenance staff were all considered."

The BMK2.0 is designed to be operated in condensing mode for increased efficiency and delivers 20:1 turndown for a wide range of non-cycling operations. The unit matches any load between 100,000 BTU/hr. and its full two million BTU/hr. capacity without shutting down, minimizing cycling losses. Another benefit is that the boiler's efficiency – up to 99% – increases as the firing rate drops to meet the part load conditions which characterize the spring and autumn temperatures that greatly extend the heating season.

Suffolk County's additional challenge was to install the system in time to benefit from a utility incentive. Monaghan recalled the AERCO installation required a switch from fuel oil to natural gas and KeySpan Energy had offered the County an incentive if the conversion was completed by December 31, 2005. Here is where Ashraf's previous experience working for a utility helped, as did the hard work of Thermo Tech Combustion, Inc., the contractor hired for the project. Even though the project didn't begin until late November, it was completed before the deadline.

More than a year after installation, LaGuardia has proof that his decision to choose AERCO was a smart one. The county saved \$11,780 in fuel costs in just the first year. Imagine his surprise when he received a phone call from the local utility. "Our savings were so great that KeySpan actually called to ask if we turned off the meter," he recalled.

For the Facilities Engineering Division staff at the Suffolk County Department of Public Works, the call affirmed their efforts and diligence – and was proof that government can be both progressive and conservative.