



Case in Point

Lochinvar's KNIGHT XL Delivers Savings for Non-Profit YWCA Facility.



The YWCA facility of Walla Walla, Washington, has come a long way since its groundbreaking ceremony in 1950. However, the heating plant was one of the facility's few areas that had not been improved since its original installation more than 60 years ago, and it was on its last leg in 2012.

The YWCA's 3 million Btu/hr steam boiler, which occupied nearly a third of the floor space in the mechanical room, had started to leak in several areas. In response to these leaks, the facility manager, Tom Stanley, and YWCA Administrator, Anne-Marie Schwerin, sought out bids for replacement of the boiler because they understood that repairing it would not be worth the expense.

The first contractor proposed to remove all the asbestos in the mechanical room and cut the boiler into pieces for removal. Their plan was to replace the boiler with two 83 percent efficiency, 700,000 Btu/hr cast iron sectional boilers for backup



Existing Steam Boiler

and redundancy. The estimated cost of this first proposal was well over \$100,000.00, and far out of reach for this non-profit organization.

Standard Plumbing Heating Controls of Spokane, Washington, had a very different idea. The fact that the existing boiler was simply serving a shell and tube steam converter (steam to hot water heat exchanger) that supplied hot water to fan coils in the various areas of the facility (a women's shelter, aerobics and dance studio, ice skating rink seating area, offices and exercise gymnasium,



etc.) and no longer had any actual steam devices attached to it, Don Smet of Standard Plumbing thought that this project was a natural fit for Lochinvar's KNIGHT® XL Modulating/Condensing boilers. He calculated that at the normal operating pressure of 6 psi on the steam side, the heat exchanger was capable of dissipating 670,000 Btu/hr maximum. Two Lochinvar KNIGHT XL 399,000 Btu/hr units were chosen for backup and redundancy, as well as for the powerful

PROJECT:

YWCA FACILITY

eliminating racism
empowering women
ywca

LOCATION: WALLA WALLA,
WASHINGTON

LOCHINVAR PRODUCTS INSTALLED:

2 – KNIGHT XL COMMERCIAL
BOILERS (KBN399)

INSTALLER:

DON SMET OF STANDARD
PLUMBING HEATING CONTROLS OF
SPOKANE, WA

PAYBACK PERIOD:

PROJECTED AT 3 TO 5 YEARS

10:1 turndown ratio they can provide when run as an optimized cascade system with up to 96 percent thermal efficiency.

Because of the KNIGHT's small footprint, the decision was made to abandon the old asbestos insulated steam boiler in place and not remove it. This brought the project cost down to less than half of what the cost would have been, with the total project costing \$56,750.00.

In addition, the KNIGHT's SMART SYSTEM Control could take over the facility's domestic hot water load when paired with an indirect domestic water heater. The load was previously managed by two 50-gallon residential 40,000 Btu/hr gas fired water heaters. An 80-gallon indirect water heater was chosen, and it was piped in parallel with the existing 400-gallon storage tank as a standard heating zone rather than priority heating zone. This approach allows for one of the boilers to be taken offline should it require maintenance or repairs during the heating season, and the other boiler to temporarily maintain the building and the domestic water demand.

Standard Plumbing's lead installers, Jeff Jewell and Paul Taylor, piped in the new boilers and domestic water piping using Aquatherm (PP-R pressure piping for potable, heating and cooling and greywater applications). According to Jewell, "The low-friction loss, lower than copper expansion rate, and lower labor cost of installation for using a heating iron/fusion type piping system, made this a natural choice for us on this project. From raw material to installed end product, this piping system uses less energy to produce than any comparable piping system, so it is very environmentally friendly too."

The installation went smoothly with Taylor welding in 2.5-inch threadellets into the building loop's existing 3-inch piping, and Jewell running the fusion iron for the polypropylene piping. Together, they were able to complete the installation in five working days. The venting was accomplished using the existing masonry chimney with a single 4-inch PVC exhaust pipe for each boiler. The KNIGHTXL's Room Air Option came in extremely handy as there was more than adequate combustion air already supplying the original steam boiler, so combustion air piping was not necessary at all.

The final piece was integrating the new heating and domestic water plant into the building's existing Automated Logic BAS system. "We had several options, as the KNIGHT's SMART SYTEM Control has a Modbus integration option," stated Smet. The Standard Plumbing team chose to utilize the existing analog 2-10V signal that, prior to the installation, was



controlling the steam valve on the hot water converter. "We simply moved the wire into the lead boiler and programmed it to control the modulation rate of the cascade. I didn't even have to adjust the PID controller, and the system maintains reset setpoint to within plus or minus 2 degrees...smooth as silk," Smet continued.

The existing reset schedule was not set up very aggressively. When Jewell, Taylor and Smet were done reprogramming the BAS, the target temperature was 30 degrees lower and the boilers were running at 20-30 percent modulation.

The YWCA received 30 percent of the total project cost as an incentive from the local gas utility company, and expectations are that simple payback will be achieved in a 3 to 5 year period. "They are now running much lower water temperatures, at a much higher efficiency, and the domestic water load is being handled at the same efficiencies as the heating system - how can that be a bad thing?" Smet said with a smile.

For more information, visit www.Lochinvar.com.



ABOUT LOCHINVAR

Lochinvar, LLC is a leading manufacturer of high-efficiency water heaters, boilers, pool heaters and storage tanks. Based in Lebanon, TN, with facilities in Chicago, Detroit, Orlando, Tampa, Pompano Beach, Dallas and Phoenix, Lochinvar stocks all products in all locations.

