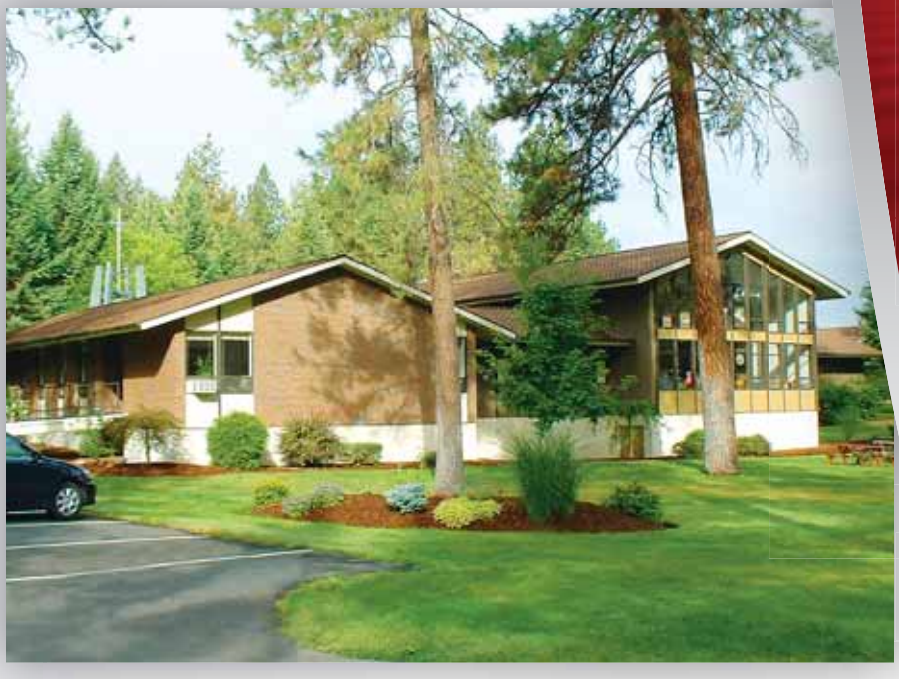
Case in Point



Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

Lochinvar KNIGHT® and ARMOR™ Installation Shields Residence Center from High Energy Costs

In 1969, the Dominican Center in Spokane, Washington, was constructed to house the Dominican Sisters, who work with charity organizations worldwide to help troubled women, victims of abuse and addiction, as well as single mothers.

Originally designed with a separate boiler room located 150 feet away from the main building, the heating plant housed a three million Btu fire tube boiler. The steam was piped underground from the boiler room across the entire length of the building to a steam-to-water converter located 350 feet away, where water was heated at 120° to 180°F to heat the building.

While the equipment had been well maintained throughout the years and the piping was in good condition, the condensate pumps, controls, boiler tubes, tanks and other parts would soon need to be repaired or replaced. This assessment, along with rising natural gas prices, prompted an evaluation of the system.

As a result, two Lochinvar KNIGHT modulating/condensing heating boilers and an ARMOR water heating system were specified for the redesign of the Center's heating and domestic hot water system.

MORE›

PROJECT:
DOMINICAN CENTER

LOCATION:
SPOKANE, WA

LOCHINVAR PRODUCTS INSTALLED:
2 - KNIGHT BOILERS (KBN500)

1 - ARMOR WATER HEATER (AWN399)

DESIGNER/CONTRACTOR:
SPHControls
STANDARD PLUMBING HEATING CONTROLS

STANDARD PLUMBING HEATING CONTROLS CORP.
10419 E. TRENT AVE.
SPOKANE, WA 99206-4515
WWW.SPHCONTROLS.COM

A Cause for Change

Upon assessment of the Dominican Center's heating system, it was discovered that a significant amount of heat was being lost in many unwanted areas. Since the main steam line was buried underground along with the domestic hot and cold water piping, heat was being transferred to the earth and the domestic water pipes. As a result, the cold water was actually lukewarm whenever the steam boiler was running, and the Center's crawl spaces and storage areas had become unbearably hot.

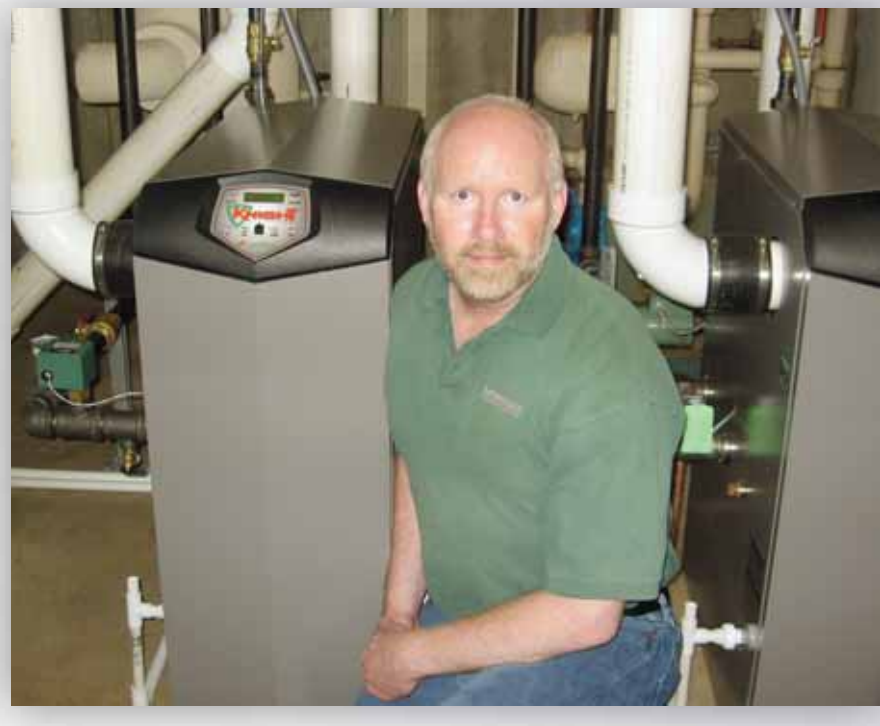
The building that housed the boiler room also produced domestic hot water for the Center, which was stored and maintained at 150 degrees Fahrenheit in a 546-gallon tank before being piped 150 feet to the main building.

The steam boiler was estimated to be running at an efficiency of 60 percent, meaning that for each one million Btu of natural gas, the boiler used only 600,000 Btu to make steam. The other 400,000 Btu was lost to venting, piping or the air in the boiler room.

A Plan for Improvement

After learning that their old steam boiler was operating so inefficiently, the Center decided to install a new heating and domestic hot water system to improve efficiency and reduce energy costs. The local utility company, Avista Utilities, agreed to help pay for the project through incentives and gas credits that would be determined upon the completion of the installation.

Standard Plumbing Heating Controls Corporation of Spokane was selected for the project and worked cooperatively with the Center, Avista Utilities and the local building and code personnel to design a new heating and domestic hot water system in the basement of the Center. Standard recommended installing new highly efficient equipment in the Center's basement and eliminating the use of steam in order to significantly decrease the amount of natural gas required to heat the building and domestic hot water, as well as the electricity needed to move the condensed steam.



Don Smet, Designer
Standard Plumbing Heating Controls Corp., Spokane, WA

After determining the building's heat loss and domestic hot water requirements, designer Don Smet from Standard Plumbing Heating Controls chose two Lochinvar KNIGHT Boilers with 500,000 Btu and 95 percent thermal efficiency to heat the building; in addition, he selected a Lochinvar ARMOR Water Heater with 399,000 Btu and up to 98 percent efficiency and a new ASME 100-gallon insulated storage tank to supply domestic hot water for the entire building and kitchen.

Steps to Success

In March 2007, the installation project began. Work progressed smoothly through the spring and summer as demand for heating decreased and interruptions to the existing heating plant were minimized. The installation only required shutting down the steam system three times for less than six hours at a time, which ensured that discomfort would not be an issue to the residents of the Center.

The Standard team accessed the existing four-inch water heating loop by welding two closely spaced two-and-a-half-inch tees and valves behind the boilers using a primary/secondary configuration. The two boilers were then piped in cleanly and easily, utilizing their own circulating pumps.

The direct venting was accomplished by running the PVC piping up through the ceiling of the basement to the main floor, into the attic and then out above the architectural roof.

The existing electrical panel for the building was located 20 feet away from the new boilers in the same room, so the electrical installation for the boilers and pumps was simple. The Standard team took advantage of the KNIGHT's built-in cascading sequencer by simply wiring the two new boilers with a two-wire pair and then completing the quick and easy setup of the controls and burners. At that point, the steam boiler was shut down and the new heating plant was up and running smoothly and efficiently.

Don Smet states, "The Lochinvar SMART SYSTEM™ control is head and shoulders above anything else on the market. Straight out of the box, the KNIGHT can do anything I need it to do without any third- party controls. It is absolutely hands-down the best boiler on the market, and it saves my customers 30-50 percent in energy costs."

Piping for the new ARMOR domestic water heater and tank was simple and straightforward. The new piping was run to the existing hot and cold water pipes that were located in the building's basement. Since the water softener had been piped to the heating system in the old boiler room 150 feet away, it had to be relocated and piped in next to the ARMOR.

Dan Sem, Lead Installer
Standard Plumbing Heating Controls Corp., Spokane, WA

The cold water line coming into the building remained the same, but the hot water line had to be cut and isolated from the old boiler room. The lead installer for the project, Dan Sem, then converted the old hot water line, which had been cut in the tunnel leaving the Center, to a hot water recirculation line for the new system by coupling the newly cut end to a three-quarter-inch PEX line and running it all the way back to the ARMOR Water Heater with a mini pump.

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Case in Point

Once this isolation and recirculation line was complete, the ARMOR was fired up and the new domestic hot water system was running beautifully. The new SMART SYSTEM™ control on both the KNIGHT and ARMOR made the setup of the cascade, outdoor reset, night setback, and heating and domestic water setpoints and controls a quick and painless endeavor.

"No other water heaters on the market are as feature-packed or easy to configure as the ARMOR," says Smet.

Rewarding Results

For the first time since 1969, the Dominican Sisters have access to cold rather than lukewarm water, as well as nearly instantaneous hot water in all of their dorm rooms and the kitchen.

Without any modifications, the Dominican Center's new heating plant is ready for a future DDC building management system. The 100 gallons of stored domestic hot water is now maintained at 140 degrees, and the building's water heating setpoint is controlled solely on the cascade modulation of the boilers and the outdoor temperature.

The new system is dramatically more stable and efficient than the previous system. With an investment of $65,500, the Center can expect a minimum of 35 percent fuel savings, and after Avista Utilities' 30 percent reimbursement, a three to four year payback will easily be achieved.

The Sisters could not be more pleased and even joke that their "KNIGHTS and shining ARMOR have ridden in to save them money on their energy bills!"

Results at a Glance...

INVESTMENT:

$65,500 EQUIPMENT & LABOR

FUEL SAVINGS;

35% MINIMUM SAVINGS

PAYBACK:

3-4 YEARS

BENEFITS:

IMPROVED OPERATION, STABILITY

INCREASED EFFICIENCY, COST SAVINGS

INSTANTANEOUS, PLENTIFUL SUPPLIES OF COLD AND HOT WATER

DESIGNER/CONTRACTOR:

STANDARD PLUMBING
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About Lochinvar

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

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