



The Dominican Center in Spokane had a roundabout and wasteful way of getting heat to their residents before an energy-saving renovation. Photo courtesy of Lochinvar.

## A convent receives a heating system makeover

By Wendy Levine

gested a new boiler be installed next to the old one to be near existing gas and steam lines.

Don Smet had a different idea. Smet, a commercial designer and service manager with Standard Plumbing Heating Controls Corporation in Spokane, agreed with Ressa that a boiler should be installed in the main part of the building. He got to work and designed a system in a few weeks.

Smet knew he wanted a modulating condensing boiler for its high efficiency and flexibility.

“The negative pressure gas cells that come in a mod/con boiler are so sensitive and adjustable that you can literally dial in less than 50 ppm of carbon dioxide low NOx,” Smet said, adding the rated efficiency of a modulating/condensing type of boiler is between 15- and 20 percent higher than that of a copper fin or a cast iron boiler.

After some time at the old drawing board, Smet decided two boilers would do the job and chose a pair of Lochinvar Knights, which can pump out a total of 500,000 BTU each.

Though all mod/cons feature built-in digital controls, Smet liked the Smart System programming options on the Knight.

“Not all mod/cons have built-in sequencers or outdoor reset,” he said. “And none of them except Lochinvar have built-in night setback right in the boiler.”

Because the Center has a sizable commercial kitchen with high demand for hot water, the plan also called for a dedicated mod/con water heater. Not one to change horses in midstream, Smet decided on a 399,000 BTU Lochinvar Armor water heater and paired it up with an ASME 100-gallon insulated storage tank to take care of domestic hot water delivery for the entire building. It was also determined that the new system would eliminate the need for steam, which was not required for kitchen or laundry use.

# BLESSED EVENT

Since 1969, steam heat had been taking the scenic route through the Dominican Center in Spokane, Wash. Updating the system, which featured all sorts of twists and turns and a nightmare of piping, certainly seemed a worthy cause. The 22,000 square foot building houses retired and active Dominican Sisters who work with hospitals along with charitable and religious organizations in an effort to help women around the world.

With the annual heating bill running about \$1,000 per square foot, it was finally time for a change.

Facilities manager Dave Ressa identified the problem: “We had this big, 3 million BTU boiler in the boiler house 150 feet away from the main building,” Ressa said. “So we were piping steam at 212 degrees underground,

through the boiler building and shop portion of that building, down to the center—so there’s at least 150- to 200 feet right there—and underneath the dormitory part of the building and down a real long hallway which is about another 100 feet.”

The steam boiler was later estimated to be running at 60 percent efficiency, losing much of its heat outdoors.

“The grass would never die in the winter, and the snow was always melted on that part of the ground,” Ressa said. “I had this idea: Why wouldn’t we put a boiler down in the main part of the building? That would eliminate this long run of steam line and would certainly be more economical.”

Following administrative policy, Ressa consulted with three different contractors but none of them shared his vision. Each sug-

## blessed event



The installation replaced the Center's 3 million BTU fire tube boiler. Photo courtesy of Dominican Center.



Designer Don Smet installed two Lochinvar Knight 500,000 BTU mod/con boilers and a Lochinvar Armor mod/con water heater with 399,000 BTU together in the main building. Photo courtesy of Lochinvar.

Preliminary work began in March 2007. The team from Standard welded in a pair of closely spaced, 2.5-inch tees and valves behind the boilers in order to reach the existing 4-inch water heating loop, which was set up in a primary/secondary configuration. The boilers were then piped in using their own recirculating pumps.

Direct venting to the atmosphere was accomplished by running PVC piping up through the building and then out through the roof. The building's main electrical panel was a scant 20 feet away from the new boilers in the same room so there weren't any challenges of note on that front. The new boilers were wired up in a cascading sequence using a two-wire pair to set up the controls and burners.

The old equipment was kept up and running during the installation of the new hardware, with the exception of a few days in May during which everything had to be shut down for several hours at a time. "We waited for a good time to do it," Ressa said. "It was a flawless change-over. It went great."

Estimates are the new system will save the Sisters at least 35 percent on fuel costs, paying for the system in somewhere between three and four years. Another benefit for the Sisters was that the local power company—Avista Utilities—provided them with a 30 percent reimbursement incentive for the installation.

The proof is in the bank. It's too early for real heating needs, but when the gas bill cometh for June, it confirmed the wisdom of the

## Empire Dairy Milks Mod/Cons for Warmer Water

Besides their multi-tasking abilities, modulating condensing boilers can also be used to make hot water hotter. David Collier, western-states training and technical manager for Weil-McLain in Michigan City, Ind., handled such a case as a contractor. The Empire Dairy in Wiggins, Colo., was milking 4,620 cows, 100 at a time, three times a day.

"They had a 199,000 BTU, 100-gallon water heater that they were heating of bulk water for their washing equipment and cleaning their milk lines and wash tanks. And the problem was that they were going through these units about one every three years," said Collier. Owner Norm Dinis was looking for something that would produce more hot water than what they currently had and be hot enough to sanitize equipment, to about 180 degrees.

"They go through approximately 150 gallons of water at a time," said Collier. "There's numerous steps to the washing of the pipeline and they need water for all of the steps that they go through." Collier installed two Weil-McLain Ultra 230 mod/con boilers. "For me, I didn't think there was another way to go. And now he has all the hot water he needs."

Collier listed a number of "pros" to the mod/con. "It calculates the number of BTUs needed to heat the water to desired temperature. So if you need a lot of water, it uses a lot of energy or uses the capacity of the boiler, and when it doesn't need as much, it will save energy and only use the energy that it needs to produce enough heat to raise the water to the temperature it needs to be." The benefits go beyond energy savings, Collier said. "It's very quiet. It's about as loud as a refrigerator."

**Editor's note—The staff of Reeves Journal magazine was saddened to learn of the sudden and untimely passing of Weil-McLain western-states training and technical manager Dave Collier shortly after this interview was completed. The Dave Collier Memorial Fund has been set up to help pay for his children's education. Contributions can be made in care of Heer Mortuary, 225 E. Platte Ave, Fort Morgan, CO 80701.**

design. While everyone expected a big savings from the year before, the difference was staggering. Measuring approximately the same demand as the same month the year before, the cost had dropped from \$2,309 in 2006 to \$1,152 for June 2007.

Smet admitted the savings are due to the "horrible inefficiency" of the old system but he's very proud of the project.

"They were actually firing a steam boiler and running it through a steam-to-hot water heat exchanger and then storing 550 gallons of it, and then pumping it 150 feet to the building they were going in," he said. "So that was huge. And we ended up putting in that Armor water heater and a hundred-gallon tank and turning the water temperature down to 140 degrees where it belongs, right in the same building where they were using it."

Dave Ressa is pleased with the way the project turned out, too. He said the money not being spent on fuel because of the new hot water system will now be available for other worthwhile things.

"It's a big help to the Sisters' cause, to what their mission is all about," he said. "I'm kind of proud of being able to make that happen for them."

Ressa said several of the residents who are retired haven't noticed anything different, and that's a good thing. "It stays plenty warm for them and they're ones to scrutinize things like that." ■