

CASE STUDY

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Tankless Water Heaters Ensure Unfailing Hot Water Supply for Florida Jail

After replacing faulty boilers with Noritz NCC1991 tankless water heaters, Indian River County Jail in Florida guaranteed its 400 inmates constant, on-demand hot water and saved nearly \$50,000 over tank-types.

BY JASON FLEMING

VERO BEACH, FLORIDA —An uninterrupted flow of hot water is a modern necessity, especially when it comes to certain commercial applications. Without it, places like restaurants and hospitals would literally shut their doors—the inability to cook and clean properly would put peoples’ health at grave risk.



Jails too, have a constant need for hot water; be it for cooking, dish washing, laundry or hygiene. Indian River County Jail in Vero Beach realized this firsthand when a boiler and 300-gallon storage tank in its E-building complex began to malfunction.

“The last thing you want is a riot because the inmates do not have hot water in their showers,” warns Administrative Lieutenant Adam Bailey, who oversees facility maintenance at the jail. This need for hot water prompted Bailey to replace the boiler with multiple tankless water heaters, providing continuous hot water on-demand without the hassle of storage. Furthermore, when combined in a multi-unit system, if one tankless unit malfunctions, the others will automatically work to meet demand until the problem can be fixed.

By choosing tankless, the jail assured that hot water would always be delivered on demand. On the financial front, \$50,000 in installation costs were saved, and the tankless system’s energy efficiency continues to provide savings in energy and operating costs.

Tankless Goes to Jail

Indian River County Jail houses the county's pre-trial detainees as well as inmates with sentences lasting up to one year. Although it currently houses around 400, the 200,000-square-foot complex has a maximum capacity of 611 inmates.

E-building's malfunctioning boiler proved extremely problematic. In total, the building contains four units with 64 beds in each and over 100 showerheads and sinks, meaning a potential of 256 inmates could be impacted by insufficient hot water.

Bailey explains that E-building was constructed in 2007, but was temporarily shut down due to a low inmate population. It was during this period that the jail decided to replace the original propane-fired boiler and storage tank. "That boiler had always had problems, even when the facility was still housing inmates," explains Bailey. "It turned out that the boiler had been set to Canadian air standards, obviously very different from those in Florida."

The question of whether to replace the old boiler with another boiler or install an alternative water heating system was yet to be answered.

The Vero Beach branch of plumbing wholesaler Winnelson Company offered Noritz tankless water heaters as one option to replace the defunct boiler. "There was some initial hesitation on the jail's part to choose the tankless option because it is still relatively new technology," says Ralph Litton, president of the supply company.

"I was worried about there being enough hot water to effectively serve the long piping distance from the heater to the last fixture," admits Bailey.

PROJECT PROFILE: INDIAN RIVER COUNTY JAIL

Location: Vero Beach, Florida

Application: Commercial hot water systems for the county jail. Usages: showers, faucets, clothes washers.

Construction Time Frame: June 2013 – February 2015

Water Heater Installer: Southern Plumbing

Problem: Replacing two malfunctioning boilers to provide sufficient amounts of hot water at the right temperature for a jail serving roughly 400 inmates.

Solution: 14 Noritz NCC1991-DV Condensing propane-fired tankless water heaters were installed in two separate buildings (eight in one; six in the other). The set of eight in E-building can deliver a combined maximum of 1,599,200 BTU/hour and was common vented using a Tjernland exhaust fan. The set of six in C-Building can deliver a combined maximum of 1,199,400 BTU/hour and was individually vented. To ensure that the jail's laundry hot water needs would be met, the second set was installed with a 119-gallon storage tank.

Payoff: The jail saved roughly \$50,000 in equipment costs by choosing to install the tankless water heaters over storage tank heaters and continues to save significant amounts in energy, though this number could not be disclosed. Furthermore, the tankless units' compact size allows for easier maintenance than what would be the case with larger boilers or storage tank heaters.

The Quote: "The tankless water heaters are very good products that eliminate the need for bulky storage tanks, simplify maintenance, and significantly reduce operating costs," says Administrative Lieutenant Adam Bailey.

Still, Bailey was extremely open to the technology, having successfully installed a residential tankless unit in the past. “I began doing a ton of research on tankless to ascertain whether it would be a prudent installation,” says Bailey.

Unlike traditional storage water heaters, tankless water heaters use a powerful burner to quickly heat incoming water to the set point temperature. They activate only when a fixture is turned on and cease heating once it is off. This ensures energy efficiency because the heater is not constantly heating stored water.

After his research, Bailey sat down with supplier Litton and local Noritz representative Roger Davis (Integrity Sales & Marketing, Inc., Mulberry, Fla.), who further eased his apprehensions about installing the tankless product. The design they developed involved installing multiple tankless units; which would ensure that even if one failed, there would be enough hot water produced to meet the jail’s needs.

A further incentive involved the fuel consumption and installation savings that tankless would provide. The fact that tankless units do not operate constantly translates into lower fuel costs. Meanwhile, the per-unit costs for the tankless equipment were actually lower than those for the storage-tank alternative Bailey was considering. With all this in mind, he ultimately opted for tankless.

E-Building

Bailey decided to install eight 199,900 BTU per hour, propane-fired NCC1991 tankless water heaters in E-building. “Unit redundancy was very important to me because it offered the certainty that there would always be sufficient hot water.” The building also had an existing hot-water recirculation system to which the new water heaters were connected, further enhancing system performance.



Jared Taylor of Southern Plumbing was contracted to do the installation in June 2013. Part of the job involved choosing a venting system for the water heaters. The building was constructed with pre-stressed concrete and had one exhaust hole serving the boiler. To avoid the complicated and costly process of drilling individual vents through the wall, it was decided to common-vent the eight water heaters through the existing exhaust aperture. “We ended up installing an exhaust fan from **Tjernlund Products** to prevent emissions backflow into the room,” explains Taylor.

“The installation itself went smoothly and was completed in less than two weeks,” he continues. The only challenge presented itself long after the

original installation, when the building reopened. At that point, the tankless system began to display an error code. “There were some complications between the water heater controller and the exhaust fan that we had to straighten out,” recalls Taylor. After discussing the issue and solutions with Noritz, the error was resolved.

Although the exhaust fan added to the total installed cost, Bailey reports significant savings on the water heaters themselves over storage tank-type alternatives. “Having spent \$63,397 on the eight tankless water heaters, we saved around \$14,000 over tank water heaters,” reports Bailey. Indeed, the lower cost of tankless is what allowed the jail to install eight heaters. Bailey admits that had they installed tank-style heaters, they could have budgeted only for six.

C-Building

These savings made such an impression that when it came time in February 2015 to replace another boiler in C-building, which can house 120 inmates, Bailey had zero hesitation about choosing tankless.

Financial savings in equipment and propane costs were once again the main incentive to go tankless for Bailey. The other factor was that the small size of the room did not easily allow for bulky commercial tank heaters. For example, the previous boiler had to be stripped to pieces prior for removal because the room had actually been constructed around it. The tankless units’ compact size eliminated this problem.

The water heaters in C-building needed to serve the jail’s non-stop laundry operation, as well as 15 showers and 35 sinks. These extra hot-water needs required by the laundry led to the decision to install a 119-gallon storage tank, in addition to six NCC1991 water heaters. “It was advisable to install the storage tank, not only for the additional hot-water that the laundry would require, but also because it meant having to install fewer tankless units,” explains Taylor, who handled this second installation as well.

Unlike in E-building, the heaters in C-building did not require common venting. “In C-building, we were able to vent all of the units individually, three through one penetration and three through another, reducing the total cost,” says Taylor.

The installation, which spanned two days with a crew of three to four, had to be coordinated so as not to frustrate the jail’s laundry process; which continued to operate in its same space. Post-installation, Southern Plumbing remains involved by performing annual descaling and other maintenance check-ups on both tankless systems.

Equipment-cost savings in C-building were once again significant, totaling roughly \$36,000, and the ability to individually vent the system saved additional funds. As with the E-building installation, the ongoing savings in propane usage are substantial accord-

ing to Bailey though he was unable to provide specifics (since the county pays the bills). “The fuel savings are truly the driving incentive for many of my commercial customers who decide to go tankless,” states Taylor.

Both applications have been meeting hot-water demands since the installations. For his part, Lieutenant Bailey is extremely pleased for choosing tankless water heaters. “They are very good products that eliminate the need for bulky storage tanks, simplify maintenance, and significantly reduce operating costs,” he concludes.

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NORITZ AMERICA CORPORATION, a subsidiary of Noritz Japan, has corporate offices in Fountain Valley, Calif., and Atlanta, offering a full line of tankless water heaters to meet the hot water demands of residential and commercial applications. Noritz supports its products with a national network of skilled representatives and employees who are committed to providing the finest products and services to our communities by helping consumers live in a more comfortable, efficient and healthy lifestyle. For more information on Noritz America and the entire line of Noritz’s ENERGY STAR® tankless water heaters, please call (877) 986-6748 or visit our website at www.noritz.com.

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Hi-res versions of photographs to accompany this case study are available for immediate download in .tif format by using this link: <http://noritz.oreilly-depalma.com/2015/cs-indian-river-jail.shtml>.

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