

CASE STUDY

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Little League Baseball World Series® Opts for Tankless to Keep Players' Uniforms Clean and its Energy Consumption Lean

Little League® International must clean more than 200 baseball uniforms daily during its annual Baseball World Series. But its hot-water needs are far below that peak the rest of the year. A new, 9-unit, tankless system manages both extremes with ease.

BY SCOTT ISAKSEN

SOUTH WILLIAMSPORT, PA — The numbers themselves are a bit mind-boggling: more than 200 youth players and their adult coaches on 16 teams, hailing from nine different countries, including eight squads from every corner of the United States, playing 32 baseball games in 11 days. All of which is why there are few sporting events in this country or anywhere else on the planet that can match the pageantry, the excitement and the sheer inspiration of the annual Little League Baseball® World Series. (The 2013 undefeated winner was from Tokyo, having bested teams from the Tijuana, Baja California, Mexico, and Chula Vista, Calif., on its way to capturing the crown.)

But that many 11- and 12-year-old boys rolling in the outfield, diving into bases, and sliding into home over that many days also results in whole bunches of really, really dirty uniforms and assorted baseball gear. The monumental chore of keeping all that fabric bright and white, so that the teams will show well for the folks in the stands – plus those watching back home on ESPN – falls heavily on the diminutive structure known as the “laundry facility,” situated on the property of Little League International® (LLI) in South Williamsport, Pa.



The Little League Baseball® World Series: Lots of exciting action and lots of dirty uniforms that need washing — and therefore plenty of hot water — each and every day of the tournament.

LLI assistant director of facilities John Swisher estimates that the 900-square-foot operation will restore roughly 150 uniforms to their former pristine brilliance each day during the annual tournament. During this period of absolutely frantic activity, all seven washing machines (six of them commercial-grade) and two sets of four-bowl stainless sinks for pre-soaking the uniforms are doing a full-tilt boogie, gulping roughly 32 gallons of 140° to 180°F water per minute. As Swisher notes, in an understatement as big as the task itself: “The need for hot water is urgent. We simply cannot afford a breakdown, not even a little one.”

The problem: Of course, that doesn’t mean the laundry operation hasn’t suffered its share of stoppages. Until January 2012, the washing equipment was fed hot water from a pair of 86-gallon storage-type water heaters. Most of the malfunctions, according to Swisher, were the result of “stuck gas valves” that would somehow oxidize, evidently because of the chemicals used in the washing process.



LLI assistant director of facilities John Swisher, a licensed plumber, performed the installation. “We decided tankless was the best remedy because of the large volumes of hot water we needed during our peak periods during the summer, as well as the much smaller volumes required the rest of the year.”

“Usually, only one of the tank units would cease functioning in these situations. But our facility personnel were so busy, they wouldn’t notice until the second unit, operating all by itself, ran out of hot water.” Of course, to obtain the desired results — perfectly clean baseball uniforms — maintaining a consistently high water temperature is critical.

Water hammer, due to sediment in the system, was another chronic headache. Although it didn’t impact the availability of hot water, the problem drove the staff to distraction at times: “The noise got so bad,” says Swisher, “it sounded like someone was slamming a hammer on the pipes with all their might. We were worried that our two-inch copper water main might actually burst.”

Swisher is a licensed plumber, having worked nine years for a local plumbing contractor before joining LLI in 2010. His skills and expertise helped persuade LLI management that it was worth investing in a substantial upgrade in their hot-water system — by going tankless.

Easy choice: The system that Swisher eventually brought to his superiors — after extensive consultation with Noritz regional manager Jeff Kornhaas — consisted of nine Noritz NC250-DV-ASME gas-fired units, with an input range of 11,000 Btu per hour to 250,000 Btu/h and a maximum flow rate of 11.1 gallons per minute (gpm).

The three men “carefully discussed a number of possible options” to the gas valve and water hammer problems. But the choice of tankless was a relatively easy one, according to Swisher, whose previous experience working with the technology was mainly in residential applications.

“We decided tankless was the best remedy because of the large volumes of hot water we needed during our peak periods during the summer, as well as the much smaller volumes required the rest of the year,” Swisher says. “The opportunity to cut gas consumption and fuel costs was the main motivator. If we are operating at only 30 percent of peak demand eight or nine months of the year, why run the system all-out, 24/7, as we were doing with the two tank units?”

What about the up-front expense of tankless versus tank? Swisher acknowledges a “like-for-like” replacement strategy would have cost considerably less. But the ongoing operational savings, plus the labor savings achieved by keeping the installation in-house convinced LLI Senior Vice President of Staff Administration & Chief Financial Officer Dave Houseknecht and Director of Maintenance and Field Facilities Gary Mitcheltree that tankless water heating would be the more economical option, long-term.

“We didn’t calculate a payback, because it’s difficult for us to isolate the gas consumption in the laundry facility from other usages,” says Swisher. “But not having two water heaters firing to the max around the clock was bound to save a lot of fuel – and cost – in a relatively short time.”

The redundancy of multiple tankless units would also allow Swisher to service one or two of them, while the others continued to meet ongoing demand. With all these advantages in mind, says Swisher, “Dave and Gary really had no misgivings in the end.”

One-man job: “In-house” installation ultimately translated into Swisher doing the work solo. “We had a lot of other important things going on at the time,” he says, so his five-man maintenance crew was busy elsewhere.

PROJECT PROFILE

Project: Little League International Laundry Facility, Williamsport, Pa.

Application: Hot water for (1) seven washing machines, six of them commercial-grade; and (2) two sets of four-bowl stainless sinks for pre-soaking. Peak hot-water load for all of these appliances and fixtures operating at once: 32 gallons per minute.

Problem: Previous system consisted of two, 86-gallon storage water heaters that were prone to breakdown and serious water hammer issues. Meeting peak demand during the annual World Series tournament in August was difficult. Demand during the remaining months dropped as low as 30 percent of the peak, yet the two-unit system fired at full-strength 24/7/365, wasting fuel.

Solution: Nine Noritz gas-fired, tankless water heaters work together in stages, firing in response to fluctuating demand. The primary tankless unit activates when a clothes washer or sink is in use. As other appliances activate, the flow rate through this first tankless unit increases in response. When the unit reaches 50 percent capacity, a second unit activates, and when the second unit reaches 50 percent capacity, a third unit activates, and so forth — until all nine are running at full capacity if necessary. A separate controller provides real-time diagnostics of all nine units simultaneously, and it will keep the entire system operational even if multiple units are down. Venting routed through the side wall with direct vent kits or four-inch stainless steel venting. A total of 95 feet of vent piping was installed, including 19, 90° elbows and 10, 45° elbows.

Models: Nine NC250-DV-ASME tankless water heaters and a SCU-201-12M system controller, all manufactured by Noritz.

Time Frame: January 2012

Installer: John Swisher, assistant director of facilities at Little League International, performed the work himself in January 2012.

Kornhaas vouches for the fact that Swisher was the lone installer and happily so. “We began shipping him components and supplies in mid-January 2012. By the time the tankless units were delivered later in the month, he had the system laid out, the plywood framing erected, and the piping pre-measured. The only assistance he needed was someone to help him lift each of the nine units into place.”

Swisher estimates that the full project took 80 hours of his time over a three-week period. Even so, the laundry facility was without hot water for just one day, which was not much of an inconvenience. “It was January, our slowest period, and I deliberately waited for a day in which the chief operator was on vacation,” he says. “While she was away, I fully installed a single tankless unit, so she would have enough hot water to do what she needed to do throughout the rest of the installation.”

As will often happen in replacement situations, the main hurdle of this multi-unit tankless system was how to configure the four-inch stainless steel venting in a mechanical room measuring only eight feet by 20 feet. These cramped quarters explain why Swisher took his supplier’s recommendation to use a direct-vent model that obtains all of its makeup combustion air directly from the outside.

But there was a further complication: Only two of the room’s four sides were exterior-facing, so all nine tankless units had to fit on only two walls. In addition, up the outside of the longer wall ran ductwork for the building’s space heating system, blocking any punch-outs for venting over roughly a third of the total 20-foot surface.

Swisher positioned three of the nine tankless units on the shorter (eight-foot) wall with direct vent kits, which are quick and easy to install on the top of each water heater. But on the longer wall, Swisher had to lay out the other six units and the controller box the utmost care. In the end, he used approximately 95 feet of stainless steel venting and a total of 28, 90° and 45° fittings.

“It was tricky, because you are limited by the pipe lengths and fitting sizes, but the adjustability of vent piping really helped. Just getting everything where it needed to be with the proper pitches and clearances, neat and clean to the eye, was the hardest part of the job.”

Fuel savings hard to measure: As noted earlier, Swisher cannot isolate the gas consumption of the laundry facility from that of the rest of the Little League complex, which encompasses approximately 20 separate buildings. But even if he lacks a precise measure how much less gas was used during the first year of operation, as compared with the previous year, he has no doubts over the new system’s superior fuel-efficiency.

“Instead of running two tank units around the clock and full-out, regardless of demand, I can meet our hot-water needs most days of the year with only one or two of the tankless units,” says Swisher, “so I know we are consuming less energy.”

The satisfactory outcome of the conversion to tankless in the laundry facility will eventually spur a similar switch-out in all four LLI dormitories, each of which is equipped with three 86-gallon tank heaters for hot water for showers and the like. The four tank trios will

soon be removed in favor of four tankless units, further helping to reduce gas consumption at LLI.

There have been other, less critical — but no less appreciated — benefits. For example, the nine, wall-hung tankless units actually command less physical space in the laundry facility than the two tank units, says Swisher. “Our chief operator has much more useable space in the mechanical room, both for storage and even for a small ironing area that wouldn’t have fit previously.”

But perhaps the primary benefit of the new tankless system relates to its flawless performance last summer, when those 16 baseball teams from around the globe converged on Williamsport to put the laundry facility through its paces.

“In the end,” says Swisher, “it was a headache-free World Series. The new system kept up with the full load each and every day with no problems. That, of course, is what we work to achieve every year.”

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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/2014/cs-little-league-intl.shtml>

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Photo Credit

Little League International®

Additional Products Used in the Installation

- NIBCO: Ball valves, copper fittings
- ANVIL/WARD: Black iron fittings (made in Pennsylvania)
- WHEATLAND: Black iron pipe