

Bradford White training facility raises the bar

BY DAN VASTYAN



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Hi-tech training facilities have become an industry standard for manufacturers and large rep firms. At Bradford White's manufacturing location in Middleville, Mich., a cutting edge facility has been in the works since mid-2010.

Bradford White's intent for the LEED Gold- certified International Technical Excellence Center (ITEC) wasn't to simply raise the bar as a measure of excellence for training facilities. They set out to create a facility that would exceed their current needs, forwardly calibrate future generations of installers, and service technicians system designers, engineers and specifiers.

In December 2012, they cut the ribbon, heralding what Bradford White's president and CEO Nick Giuffre called, "A new and exciting future with a training facility that provides a level of service and exploration on equal footing with our latest technology." He added, "We've been waiting for this moment a long time. We now invite our customers to experience it with us."

The new ITEC facility includes a live-fire training lab that offers a total capacity of 5 million BTUs, stadium seating in the main classroom for up to 64, and HD video cameras for close-up live viewing and recording. But learning doesn't end in the lab. The facility's 4,000-square-foot mechanical room showcases VFDs, boilers, pumps, heat exchangers, geothermal equipment and DHW tanks. All hydronic piping

is color-coordinated to aid in visualization.

"Each and every operating mechanical component of the building's mechanical system serves as a training tool. There's no substitute for seeing

these components in operation and seeing how they interconnect; it's hands-on training in the best sense," said Dustin Bowerman, director of technical services at Bradford White. He along with Mike Gordon, senior VP of engineering at Bradford White, designed much of the system.

Building layout and design was the result of customer feedback and the goal of creating a comfortable, ultra-efficient learning center. The working laboratory is intended to serve for generations, allowing easy introduction of emerging technology.

Products in motion

There are two interwoven mechanical systems in the building. The first is the actual system to heat and cool the structure, and second is the live-fire lab. Heat sources include five dedicated Laars NeoTherm boilers with an input of



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1.7 million BTUs located in the mechanical room. The live-fire lab has 10 working hands-on stations, each with a variety of equipment chosen to match course curriculum. The heating capacity of the lab is up to 5 million BTUs.

The live-fire lab and heating system are connected via Taco-HVAC plate/frame heat exchangers. When water heaters and/or boilers used for training in the lab raise the lab loop water temperature to a point where it becomes viable to harvest those BTUs, the boiler heating loop receives BTUs through the plate/frame heat exchangers. When the heating loop is up to temperature, the lab loop then heats a glycol system that's piped to dry coolers for heat rejection. Each of the five dry coolers is rated at 1 million BTUs.

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Color-coded pipe insulation allows visitors to follow system flow and operation. Each color has different meanings, specific to the loop it's part of. Red is specific to the heating loop, while dark blue identifies chilled water. ITEC's mechanical system includes six different colors.

Because all the equipment in the training center can be actively fired, Bradford White took care to make the system as visually appealing as possible. The spacious mechanical room has ample space for observation with all of the equipment installed on a 24-inch mechanical pad, bringing the equipment to eye level.

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The Honeywell building management system is housed in control panels with glass doors to show the numerous connection points branching throughout the facility. Danfoss VFDs are installed next to the Taco pumps they control. Where VFDs are not used, Taco ECM-driven, variable speed Viridian pumps are employed.

Training

"Our goal for 2013 is 'training, training and more training,'" Bowerman said. "The industry is changing at a remarkable pace, and we recognize the need to keep pace with it and to create a better understanding of today's technology. If November and December of last year are any indication, we'll routinely see between 50 and 75 attendees each month."

Bowerman added, "We provide training sessions for both installing and service contractors, reps,

wholesalers and even engineers. The wide scope of the ITEC mechanical system has a lot to offer all key audiences."

Class content depends on customer requests. ITEC's flexibility allows for training on almost any topic related to hot water generation and distribution. Coverage includes a broad range of gas-fired residential, commercial water heaters and boilers (natural gas and propane) along with electric water heaters rated up to 480 volts. Bradford White's goal at ITEC is to easily replicate real-world service situations while emphasizing sequence of operation and procedures to identify the component failure.

The facility also includes a comfortable, Wi-Fi enabled business center, conference room and dining/kitchen area.

Sustainability in re-use

The ITEC building, now with expansions, was purchased in 2006. It had existing office space that was soon occupied by Bradford White's 24/7 Technical Services Team.

"We added the mechanical room, and used the mezzanine for the four ERV/AHUs," Bowerman said. The ITEC geothermal system employs 14 300-foot-deep bores that carry a combined load of 25 tons. The system is dedicated to the four ERV/AHUs for cooling, each serving a different part of the building.

Each ERV/AHU has an energy wheel (air-to-air heat exchanger) in addition to heating and chilled water coils. Air exchanges are done

at neutral temperatures, meaning that air into the building is the same temperature as the exhaust air. The VFD-driven ERV/AHU system also handles building air balance, while monitoring carbon monoxide/dioxide levels.

When in the heating mode, waste heat from the live-fire training boilers all work in tandem to provide optimal air temperatures. As the primary heat source, in-floor radiant was used throughout the newly constructed portions of the building, while hydronic baseboard is installed in the remodeled area.

"We chose portions of the parking area where we would not include snow-melt," Bowerman explained.

"In total we have approximately 9,000 lineal feet of 5/8-inch PEX tubing under the sidewalks and main parking areas, served with a BTU load just over 700,000."

Through much of the heating season, this load can be handled by waste heat from the live-fire lab.

Domestic hot water is provided via a solar thermal array that is installed at ground level to allow those not familiar with solar technology to see how it works, up close and personal without having to climb on a roof. The solar thermal indirect tank is in series with a second indirect tank that is connected to the live fire lab loop. If the lab isn't firing, the NeoTherm boilers can also provide hot water to the indirect fired tank.

Other LEED point features include a 4 kW photovoltaic array, which has the framework to grow to 20 kW, and a rain water harvest system. Rainwater is collected and holds 30,000 gallons underground to supply all irrigation water for the landscaping and all gray water for toilets and urinal flushing. All light fixtures use energy-savvy LED bulbs.

"We wanted to give contractors, reps and wholesalers the opportunity touch, feel, fix and observe new mechanical equipment in use for more than just making shower water," Bowerman noted. "After seeing how well courses go here, I'd say we hit this one out of the park." ●

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