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In (or out) of hot water

At Marriott KC Airport, it's digital mixing to the rescue

Gregg Brinkerhoff, KC Airport Marriott Airport director of engineering, tests water temperature at a guest room sink fixture within the Kansas City Airport Marriott hotel.

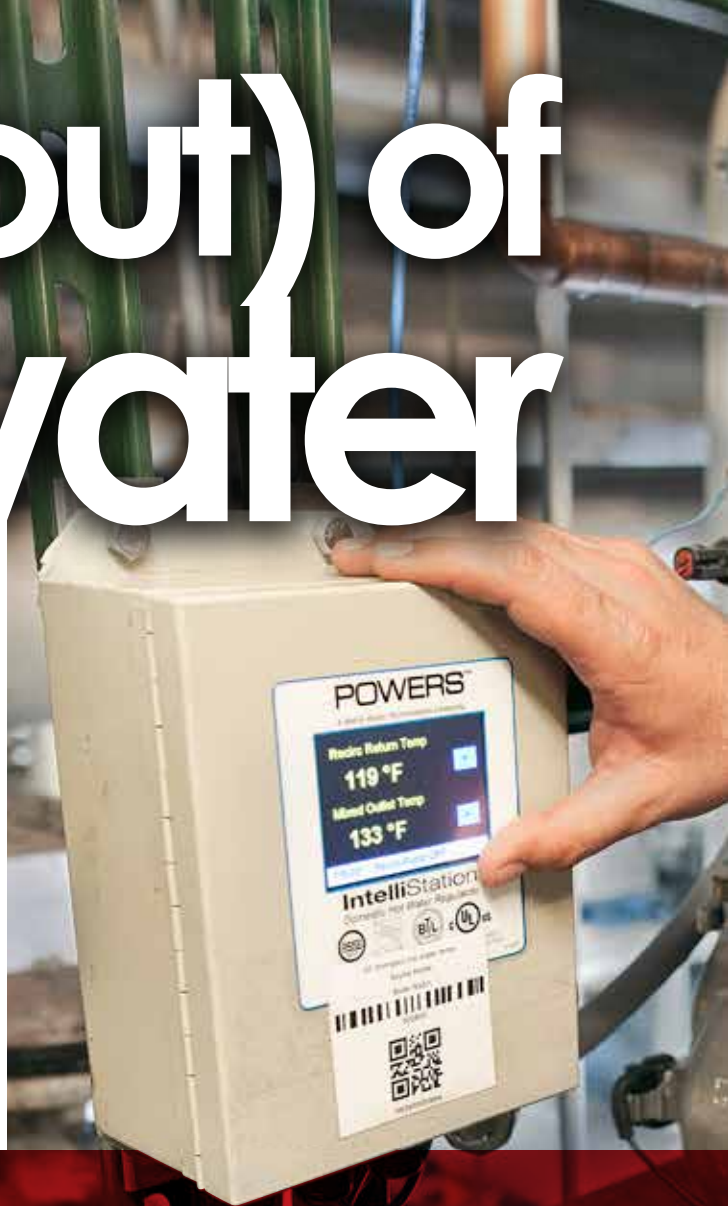
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In (or out) of hot water



At Marriott KC Airport, it's digital mixing to the rescue

By John Vastyan

Most hotel managers have learned through experience that their toughest, crankiest customer is an unhappy guest midnight or 5 a.m. They've either just woken up and have to move out post-haste or, after a long day of travel, they need to turn in immediately.

But the "hatchet's in hand" if there's insufficient pressure — or hot water — for a shower.

Angry hotel guests, at the oddest hours, are known to make quite a ruckus if a hotel's worst-case scenario coincides with a stressed-out business traveler. "It's a situation we work very hard to avoid," says Greg Brinkerhoff, director of engineering at the Marriott Kansas City Airport hotel.

Brinkerhoff says late arrivers and early risers can push the limits of a hotel's water heaters and plumbing systems. At his 384-room hotel, adjacent to a busy airport,

there's a steady flow of guests at all hours. "The highest demand for hot water comes between 5 a.m. and 6 a.m., and again between 10 p.m. and midnight. It wasn't uncommon for hotel managers to get several calls a week from guests, displeased about the lack of hot water."


Unfortunately, the best Brinkerhoff could tell them at the time was that hot water "was on its way."

Hot water woes

For more than two years, the hotel battled domestic hot water issues. As it turns out, a large hydronic valve was used for the original system. The misapplied valve had a 120-second response time and couldn't actuate quickly to keep up with the changing water pressures present within the hotel.

Because of the valve's sluggish response time, every time something would go wrong with the pumps, heat exchangers or storage tanks, the entire domestic hot water system would require a time-consuming recalibration.

"Maintenance was required routinely — a constant source of disruption for the engineering staff," Brinkerhoff says. "More or less, when maintaining the domestic water system, we had to isolate the entire piped network, shutting it down completely. Whenever the hot water mixing valve opened or modulated, the entire system would flood with cold water."



Ian Walters, project manager, Lexington Plumbing (left), and Jamie Shibel, outside sales for the manufacturer's rep firm, Mack McClain and Associates, make adjustments to the mixing valve's setpoint.

Instead of being able to run the hot water storage tanks at 150-degrees F, facility engineers had to turn the tanks down to produce storage temperatures of only 125-degree F. Also, the capacity of hot water storage plummeted.

Enough is enough

Last winter, facility managers and engineers came together and decided to replace the entire hot water system.

Brinkerhoff was appointed to act as liaison between hotel ownership and the installing contractor. Having worked with him in the past, Brinkerhoff called on Ian Walters, project manager for Kansas City-based Lexington Plumbing, a mechanical contracting firm specializing in commercial and industrial work.

Walters had a solution in mind shortly after speaking with Brinkerhoff about the hotel's DHW issues.

"Ian and I had this discussion about the hotel's domestic water system, and that there are just so many dynamic changes with the pumps and water pressures," Brinkerhoff says. "We knew what the hotel needed was a smarter, more responsive valve – especially considering that the guests in all 384 rooms had very different schedules."

Months earlier, Walters had learned about a digital mixing valve made by Powers, a Watts brand. "They make a smart delivery solution for mixing

domestic water in a hot water recirculation loop," he says. "It's called IntelliStation. Shortly after learning about them from our rep, we installed one at large hotel on the other side of town. There, we exceeded the expectations of facility managers – a strong confirmation that the technology worked well."

But Walters didn't want Brinkerhoff to just take his word for it. He wanted to show him first-hand. "I went with Ian to another Marriott hotel that had similar hot water issues," Brinkerhoff says. "They'd installed an IntelliStation digital mixing system there, and I was able to see it in operation and speak to facility managers who more than vouched for the system."

What he learned was that the hotel, which had experienced similar hot water issues, now had a fast-responding, safe and clean domestic hot water system that delivered hot water on demand.

"After hearing maintenance managers validate the technology – testifying that it only took seconds for hot water to get to taps – I was sold," Brinkerhoff says.

The right rep firm

Hotel guests at the KC Airport Marriott who get hot water fast today will likely never know that their comfort and convenience stems from a digital mixing valve presentation given just a few months earlier by Jamey Shibel, outside sales for manufacturer's rep firm, Mack McClain & Associates, Olathe, Kansas.

“We presented the IntelliStation’s capabilities at Lexington Plumbing,” Shibel says. “Very shortly after that, we were writing up an order for one to serve as the focal point for a domestic water retrofit at another Marriott hotel in Kansas City – the one that Ian Walters took Greg Brinkerhoff to before work began at the airport hotel. It was the success of that installation that led to the opportunity with Greg.”

Shibel says sizing and specifying a digital mixing station is relatively simple, with key parameters that include overall GPM, load of the building, pipe sizes, height of the structure, number of rooms, and fixtures, and size of utilities such as the laundry and kitchen facilities.

Digital mixing + recirculation

Designers of large plumbing systems are now discovering that a digital mixing system is the most effective way to deliver properly mixed water throughout a hot water recirculation loop.

Digital water mixing represents a significant leap in the technology used to control hot water delivery. The approach incorporates a programmable valve or system to quickly process temperature, flow, and pressure data, which is obtained from the hot and cold water inlets, mixed outlet, and sensors on the mixed-water return. High-speed, responsive electronic actuation modulates a simple valve that allows the setpoint to be electronically controlled and maintained.

Digital mixing allows engineers or facility managers to select a desired hot water temperature and to control and monitor the entire water distribution system. For even greater control, these systems can be installed as part of an ASSE-compliant water distribution



Ian Walters, project manager, Lexington Plumbing (left), and Jamie Shibel, outside sales for the manufacturer’s rep firm, Mack McClain and Associates, make adjustments to the mixing valve’s setpoint.

system, including point-of-use mixing valves at each fixture in the plumbing system.

This ensures that hot water storage temperatures can be kept at levels lethal to pathogens, then mixed to safer temperature levels both at points of distribution, and use.

Other key advantages to digital mixing include:

- Supports energy conservation through more efficient water temperature management – and in turn reduces energy costs
- Integrates with building automation systems to support integrated building management
- Supports consistent delivery of hot water on demand wherever and whenever it is needed, in accordance with building codes

Most systems are also field-configurable without the need for a laptop or special software. Digital water mixing and recirculation can easily be integrated into a building automation system (BAS) to allow facility managers to remotely monitor and control water temperatures.

No mixed emotions here

Since the installation of digital mixing technology at the hotel, facility managers have yet to receive a hot water complaint – with hot water arriving at taps and showers quickly and at a safe, consistent temperature.

Rather than experiencing the constant headache of boiler room problems and system troubleshooting, Brinkerhoff and his staff merely schedule routine maintenance checks on a six-month cycle.

Varying pressures and temperature fluctuations throughout the hotel’s hot water system no longer pose a threat; they’re managed with ease. While 125-degrees F water is sent to guest rooms in an instant, a second hot water loop now runs 150-degrees F water to the kitchen and laundry areas where higher temperatures are needed for cooking and cleaning. And, water is safely generated and stored at a germ-scorching 175-degrees F.

Four months in with the new digital mixing system, Brinkerhoff says guests are happy. “And when guests are happy, building owners are happy. There are no mixed emotions or opinion on this investment.” **FC**

Dan Vastyan is a regular contributor to *Commercial Construction & Renovation* magazine. Common Ground is a marketing communications brokerage that covers the commercial construction market.

Large domestic water systems risks

Legionella – According to the Centers for Disease Control, proper maintenance of water distribution systems is key to preventing illness from water-borne bacteria such as Legionella. CDC statistics show that 8,000 to 18,000 people are hospitalized with Legionnaires’ disease in the U.S. each year. Managers of commercial and institutional facilities know that selecting and controlling proper water temperature in their storage and delivery systems plays an important part in preventing germ growth.

Scalding – Uncontrolled and unmonitored water distribution systems can create high-temperature scalding hazards in bathtubs, sinks and showers. Digital mixing systems make it easy to select and set safe water temperatures for large domestic water systems.

Thermal Shock – The thermal shock of a rapid and uncomfortable change in shower water temperature can cause a fall or serious injury. With digital mixing, stable mixed water is delivered to ASSE-listed thermostatic point-of-use devices (shower or sink valves) to minimize this risk.