

| CASE STUDY |

Historic Hotel Wins Rave Reviews – for Hot Water

The 276-room Embassy Suites in Portland, Oregon meets demand for hot water with digital mixing technology.

BY BRUCE FATHERS



The Embassy Suites in Portland, Oregon, is in what was the Multnomah Hotel built in 1912.

Before staying at a hotel, a friend of mine always checks the online guest reviews. They tend to be frank. I can imagine that some hotel managers rejoice (or cringe) at the honesty.

So, before visiting the Embassy Suites in Portland, Oregon, for the first time, I decided to do some online sleuth work of my own. The hotel received 4.5 stars out of five. That's a good sign. I was then surprised to find thousands of hotel reviews giving an enthusiastic thumbs-up for the 276-room architectural masterpiece built in 1912.

As I scrolled through the reviews, page after page of them, one caught my eye. A husband and wife stayed there for at least one night. In the review, he wrote that he had two pet peeves: an uncomfortable bed and the lack of hot water.

Keep in mind that those choice comments were for other hotels. The bed at Embassy Suites passed with flying colors. As for the hotel's hot water, the reviewer said a hotel operation once told him

that "technical problems" made it impossible for him to take a warm shower, but if he were to wait a couple of hours, the hot water would be back in operation. He went on to add, however, that the Embassy Suites provided hot water fast and plentifully. He rated it five out of five stars.

But my interest was more than mere curiosity. I would soon visit the hotel, and I was especially intrigued to see that the guest indicated the hot water that he gave a rave review was connected to my reason for visiting the hotel.

A year ago, hotel managers decided to install a digital mixing station for the hotel's domestic water system. I was going there to see the installation, and to find out if hotel managers were pleased with its performance. Of course, I already knew that at least one guest rated it at five stars.

Water temp: What's the big deal?

The issue of hot water clearly was important to the guest who posted

his pet peeves for all to see. And it was important to me because my visit to the hotel was to experience the marvel of near-instantaneous hot water so that I could write this article.

For many years, according to Phil Cox, the hotel's chief engineer, domestic water was heated in three, 1,500-gallon tanks through copper tube bundles that exchanged BTUs from two steam boilers. No thermostatic mixing was involved.

"Heat was moved directly over from the boilers, on priority, into the big steam bundles to meet hot water demand by room guests," Cox explains. "This was the way guest room, kitchen, laundry, janitorial water was heated for 20-some years."

Cox adds, however, that the setup did not always provide steady hot water on demand.

"We weren't comfortable with that inconsistency, even though we were fairly successful at maintaining 120- to 125-degree water temps leaving the tanks," he says.

But hotel management was worried about something else, too.

"There was also the potential of microbial growth in the tanks if storage temps went too low," Cox says. "And if we stored water at higher temps to eliminate the risk of microbes in the big storage tanks, we created the risk of too-high water temperatures at points of use – sinks and showerheads."

After conducting some research on digital mixing technology, Cox knew this would be well suited for a hotel retrofit.

"Considering the routine maintenance and ongoing challenge of constantly fine-tuning our efforts to keep guests comfortable – and it was no small challenge, given the lack of precise control of storage temperatures – we made a proactive decision to eliminate all problems with one solution – digital mixing," he adds.

Fortunately, Cox had a manufacturers rep who was eager to help.

Sales engineer Luke Erickson with rep firm, Stone-Drew/Ashe & Jones, based in Seattle, along with Dan Checric, business development manager with POWERS, a Watts brand company, initially met with Cox and others at the hotel early in January 2017. Three weeks later, all installation preparations had been made.

While visiting the hotel, Erickson also discovered another facet of the challenge at the hotel – not uncommon to commercial properties in Portland (and in many U.S. cities): the challenge of pressure differential.

"The expected or anticipated delivery pressure from the municipal water supply was 80 psi," Erickson says. "But the reality was that, several times a day, the delivery pressure dropped to 38 or 40 psi. That's chiefly during peak use and also city-wide, but at times when hotel managers most wanted to maintain proper pressure and temperature settings."

Substantial pressure fluctuations wreak havoc with any type of domestic water system – especially at hotels where many points of use may be active simultaneously.

Enter digital mixing

"We were very fortunate in many ways," Cox says. "Though we experienced challenges related to temperature consistency, and also had the pressure issues for municipal water delivery, guests rarely complained."

Maybe that's because guests expected that while staying in a

grand ol' hotel.

"But that didn't deter us from wanting to solve a problem before it grew," Cox adds. "Our own internal audit confirmed that this was something we needed to do. After all, maintaining the temperature across the entire water system was a maintenance challenge. We also learned that we could handle it with the use of new technology, and with relative ease – regardless of how complex we thought the challenge might be."

Erickson introduced Cox to the Watts IntelliStation, assuring him that the system was capable not only in managing consistent temperatures throughout the hotel's entire water system but, by design, responds to municipal pressure fluctuations based on its impact to water temperature change.

"It's one of the key functions of contemporary digital mixing controls," Cox says. "They're equipped with technology that continually monitors temperature, flow and pressure. The digital controls make constant adjustments, sampling 10 times per second, based on the differential between mixed outlet temperature and pre-programmed outlet set point."

Simple thermostatic mixing valves can't do that. Large pressure and temperature swings are difficult to manage, requiring that they be reset routinely, and that systems be rebalanced.

After a careful examination of the capabilities of the Powers IntelliStation digital mixing control, and assessing its fit for the hotel's water system, Cox called Erickson to say that he'd made his decision to go ahead with the install.

Portland-based Lovett Services won the installation contract. As one of the area's leading commercial/industrial plumbing firms, and with 25 technicians, their pros are familiar with the challenge of decommissioning and draining-down an entire, hotel-sized plumbing system.

To avoid downtime to the greatest extent possible, they did as much prefabrication of piping to and from the digital mixing station as possible.

They worked closely with Cox and hotel managers to complete the installation, beginning with a lengthy drain-down, in the middle of the night.

Dave Benson, Lovett's commercial division manager, and a technician, were able to install the IntelliStation within about four hours' time.

"This was our first experience with this product, though we've had plenty of experience with Powers technology previously," Benson says. "The IntelliStation went right to work. Shortly after we completed the supply and return connections, the system did an awesome job of controlling water temperature to all points of use in the hotel."

Now, storage temperatures are set at 150 degrees, and supply temps are consistently delivered at 125 degrees, plus or minus 2 degrees.

"Having that level of consistency within a big, old hotel is a real accomplishment," Benson adds.

The Powers IntelliStation touchscreen control operates a simple three-way valve through a high-speed actuator to precisely

Risks Associated with Large Domestic Water Systems

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, 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 temps are delivered to ASSE-listed thermostatic point-of-use devices (shower or sink valves) to minimize this risk.

Digital mixing is the smarter, safer way to deliver mixed water throughout a commercial and institutional facility. Digital mixing and recirculation solutions can be integrated into a building automation system to allow facility managers complete control of their domestic hot water delivery.



The 125-degree mixed outlet water temperature being sent through the mixed water loop to guest rooms and public restrooms, etc. (The “2.8 V” is a monitoring correlation, indicating valve position to control signal).

maintain the selected outlet temperature. Temperature and pressure sensors are included at key points within the panel to enable an immediate response to changes in fixture demand and supply water conditions. A built-in pump provides recirculation of the tempered water loop. This reduces the wait time at point-of-use fixtures and conserves water.

According to Erickson, sizing and specifying a digital mixing station is 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 set point 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 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.

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 to allow facility managers to remotely monitor and control water temperatures.

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, Cox 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-degree water is sent to guest rooms in an instant, a second hot water loop now runs 150-degree 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.

Now, almost a year in with the new digital mixing system, Cox affirms that guests are happy.

“And when guests are happy, and especially if they’re offering online reviews with multiple stars, facility engineers, hotel managers and building owners are happy,” he adds. “We can’t ask for much more than that.” ●

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