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INNOVATIVE HYDRONICS SAVES HEATING ENERGY AT HOUSTON DOUBLETREE

ENEREF INSTITUTE EXAMINES HOW THE HILTON DOUBLETREE HOTEL, INSPIRED BY GUESTS, INSTALLED AN INNOVATIVE HEATING SYSTEM .

Because of its close proximity to the heart of the Texas oil and gas industry, the Houston DoubleTree Hotel books numerous corporate guests working within the global energy industry, as well as booking tourists visiting the Houston Galleria.

Hilton Worldwide, the 100-year-old global giant that operates the American DoubleTree hotel franchises, developed sustainability goals in 2009 to reduce energy consumption, carbon and waste output by 20 percent within four years. As one of the DoubleTree chain's top

THE NEW HVAC SYSTEM USES 40% LESS ENERGY AS COMPARED TO THE PREVIOUS SYSTEM.

The key to the efficiency was the combined functional benefits of dual boilers, which itself was only possible because of the uniquely designed hydronics system.

financial producers the Houston hotel is naturally one of the chain's largest energy users as well. But that distinction is changing as increasingly the number of energy-savvy guests from outside the US insist on a hotel with a smaller carbon footprint.

The DoubleTree is listening. According to Jim Mullins, whose responsibilities with DoubleTree includes negotiating room rates with large corporate clients, "More and more of our oil and gas clients' Request For Proposals ask what types of sustainability programs we have in place."

To develop a more sustainable property, in 2012 the hotel began looking into energy-saving options and found a pearl of an opportunity in hydronics—the system that transfers heat for everything from heating showers to warming guest rooms in the winter. While their newly retrofitted hydronics technology is more evolutionary than revolutionary, it may offer a model on how to

affordably reduce heating and cooling costs within large hospitality facilities.

SUSTAINABILITY IS THE NEW FOCUS

Environmental responsibility is a new priority for the Houston hotel, says Mullins, because, customers are "now very concerned about how much water and energy we use." In fact, in 80% of every sales request Mullins negotiates, he is asked what type of sustainability plan they have in place.

What inspired the hotel to grow more aggressive in reducing energy was the large number of hotel guests who arrive from outside of the US, especially from countries where social and environmental responsibility is more the norm. As an international hotel, the Houston DoubleTree has had guests from as many

as thirty different countries at one time, often with multiple,

month-long stays. Mullins says the young technology graduates from Brazil, Venezuela, and Argentina are especially cognizant of their environs.

"South Americans see us as very wasteful and care very much. "South Americans see us as very wasteful and care very much about how we dispose of their garbage," says Mullins. "And they are surprised to find out we have air-conditioning."

European guests are no less concerned. Recently a large group of young energy graduates from the Netherlands used the final evening of their 120-day stay to pepper the hotel staff with questions about how the City of Houston is managing sustainability.

MAJOR CLIENT INSPIRES CHANGE

Corporate visitors have different stay patterns than vacationers, whose longer stays— sometimes three months at a time— make them more like residents. Over four-fifths of Houston DoubleTree guests are corporate.

And the DoubleTree's most environmental responsible corporate client is also their largest customer, says Mullins: Schlumberger, the world's leading technology solutions supplier to the oil and gas industry.

Schlumberger's North America-



HEATING SPACES WITH HYDRONICS

To comfortably heat rooms throughout the morning, the hotel's boilers needed to maintain a consistent operating temperature .

based training center is just minutes from the hotel and brings a brigade of recent college recruits to their campus who, Mullins says, are more concerned than most guests about energy efficiency and product recycling within the city. Schlumberger (slb.com) employs over 120,000 people from over 140 nationalities and operates in more than 85 countries.

This newfound interest in sustainable development from the hotel's customers— especially Schlumberger, says Mullins— is fueling change in how the hotel sees itself as a user of natural resources.

“I don't think it was as much of a hot button in 2013,” says Mullins. “The world is changing and we have to keep up with that change, as we do business with these Fortune 50 companies.”

PUTTING THEORY INTO PRACTICE

Houston DoubleTree has been successful in putting theory into practice and has been taking advantage of newly introduced hydronics technology.

Hydronics is the common method of using water to transfer heat within a building. But innovative companies have developed

new hydronics technology well beyond traditional space heating systems that deliver steam to radiators.

In the Southern US, during the spring and autumn months, commercial buildings like the DoubleTree need space heating in the morning hours, but as the temperature rises in the afternoon, the building's HVAC system may need to switch from heating to air-conditioning. Conventional HVAC systems, such as non-condensing boilers, are not well suited for intermittent, on-off operations because of the amount of energy required to fully heat a

INSPIRED BY GUESTS TO REDUCE ENERGY USE, THEIR HYDRONICS SYSTEM WAS THE LOW-HANGING FRUIT

Although the most vocal, Schlumberger was just one of several important corporate guests that want to see hotels invest in energy efficiency.

high-volume boiler. Unused heat only dissipates and is wasted energy when the system switches from heating to air-conditioning.

Goes Heating, a Houston-based company, approached the Double-Tree with a solution: an HVAC system that took advantage of newly available technology to “substantially reduce the heating energy requirements for the hotel,” explained Jason Geagan, a system’s designer for Goes Heating.

To comfortably heat all the hotel rooms throughout the morning (70-72°F), the hotel’s boilers needed to maintain a consistent operating temperature. To do that, the boilers relied on a sufficiently high temperature of water returning to the system. Too low of a return temperature would reduce the boiler’s capabilities to provide sufficient heat to the emitters, such as the fan coils in each hotel room. In the afternoon, when the cooling (AC) system is engaged, the boiler shuts down. But most of the heat—expensive thermal energy—stored in the system was left to dissipate, essentially left to cool off, and was therefore wasted.

To eliminate this loss of unused, dissipated heat, Goes Heating designed an efficient modu-

lating near-condensing boiler system. The new boiler permits a lower temperature return water, and runs with greater efficiency because it can modulate instead of running all the time at full tilt. The new systems saves over 40% in energy compared to the previous system. The same boilers also provide domestic hot water to the entire hotel, for everything from showers to laundry.

ECONOMICALLY SOUND TECHNOLOGY DECISION

At the heart of the energy saving is the innovative hydronics technology, a Caleffi HydroCal™ hydraulic separator. A hydro-separator partitions the flow of heat on the source side, or supply side, (such as the boilers) from the load, or heat distribution side. The goal of a hydro-separator is to ensure that whatever happens on one side doesn’t effect the other. The energy-savings solution was only possible because of the multifunctional HydroCal technology, according to Goes. The same hydro-separator also protects the system from both dirt and unwanted air, thereby reducing installation costs and maintenance expenses down the road.

HYDRONICS AS A GREEN SOLUTION

As a heat transfer medium, water is very efficient, affordable and safe, making hydronics one of the greenest options available when looking for HVAC energy reduction opportunities.

The global energy demands will not be found in any one solution, but rather in individual solutions that make up a string of pearls. The goal is to implement smart, financially responsible systems available now. And as Double-Tree’s Jim Mullins explains, energy savings is also positive on the revenue side.

“We’re certainly being questioned more about what we are doing for sustainability,” says Mullins, who went on to expressed how fortunate he was to have the guidance of one of the world’s leading energy companies encouraging his energy reduction efforts.

Efficient hydronic systems may be one more pearl that facility-owners need to consider.

Research and reporting compiled and provided by Eneref Institute. (www.eneref.org)