Baylor Scott & White Medical Center

CASE STUDY

Design paradigm shift results in 80 percent reduction in natural gas use; helps meet doctor expectations; improves patient experience.

Challenge

As Baylor Scott & White began planning its new medical center in College Station, energy efficiency, doctor retention, patient comfort and safety were priorities. The health care system sought an alternative to boiler heating, common in medical facilities, in order to combat high natural gas and tower makeup water prices. For their operating rooms, Baylor Scott & White was looking for an energy efficient means to achieve the surgeon's need for cooler and drier air, which often leads to improved patient outcomes and still satisfies temperature and humidity health code requirements. The hospital also wanted to incorporate new technologies to control the circulation of contaminants to reduce airborne disease transmission.

Solution

Based on successful working relationships that spanned many years, Baylor Scott & White assembled its project team for the new facility, relying on the expertise of Jacobs Engineering -- and the creative strategic insights of Trane -- to design a truly high performance hospital. While hospitals typically use 180 degree hot water from boilers for comfort heating, Trane presented a unique HVAC system design that would use 115 degree water from Trane heat recovery chillers in the upstream position of a series chiller configuration. Although skeptical at first, the hospital and Jacobs Engineering soon became convinced of the significant efficiency benefits achievable with the design paradigm shift.

Improving efficiency with heat recovery

The unique system uses four Trane® CenTraVac™ heat recovery chillers to preheat outside air and for reheat variable-airvolume (VAV) boxes. The heat recovery chillers make 115°F water with NG (natural gas) boilers in a side stream to trim the leaving heat recovery temperature when necessary. While the facility's heating load is 4.7 MMBH, the chillers can reject up to 11.4 MMBH. Relying on the system to salvage waste heat that would have been discarded to the cooling tower allows the boilers to be turned off 80 percent of the time. Using the boilers only for sterilization and laundry that requires hotter temperatures significantly reduces natural gas consumption.

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College Station, TX

PROJECT HIGHLIGHTS

Established in 1897, Scott & White Healthcare, now a part of Baylor Scott & White Health, is a leading health care system, encompassing one of the nation's largest multi-specialty group practices that provides personalized, comprehensive health care enhanced by medical education and research. Located on a 98-acre campus, the system's 119-bed hospital in College Station, Texas, specializes in treating patients experiencing chest pain and heart attacks.

Energy efficiency, patient comfort, doctor retention, and safety were key objectives for the Baylor Scott & White Medical Center in College Station.

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CASE STUDY

Controlling critical humidity levels

To control humidity levels in the surgical suites, Trane® Performance Climate Changer™ air handlers with Cool Dry Quiet (CDQ™) desiccant dehumidification wheels were installed. The CDQ desiccant wheel adsorbs water vapor from the process air downstream of the cooling coil, enabling the system to deliver drier supply air at a dew point that is 5°F to 10°F lower than traditional systems. When the wheel rotates, it releases the adsorbed water vapor to the air upstream of the coil, which removes the transferred water vapor via condensation. These air units allow the operating rooms to be cooler and drier as preferred by surgeons.

Reducing transmission of airborne disease

The air handling units include the Trane Catalytic Air Cleaning System (TCACS) air purification. TCACS combines three technologies—MERV 13 high-efficiency filtration, UV-C lights and photo-catalytic oxidation (PCO)—to help control a broad range of biological and chemical airborne contaminants and provide comprehensive air cleaning. A titanium dioxide (TiO2) mesh catalyst is irradiated by UV-C lights, which creates hydroxyl radicals that reduce organic compounds (viruses, mold, bacteria, VOCs) passing through the air handler.

Simplifying facility management

Facility managers use a Trane Tracer™ ES to obtain an enterprise-wide view of the medical complex. The web-based system provides system access via a PC or mobile device to perform daily operations and measure, monitor, analyze and report on environmental conditions.

About Baylor Scott & White Medical Center

Trane® CenTraVac™ heat recovery chillers salvage waste heat, allowing the medical center boilers to be turned off 80 percent of the time.

Results

Embracing a paradigm shift, Baylor Scott & White, Jacobs Engineering and Trane implemented a unique, energy efficient mechanical design for the medical center in College Station, TX. Using 115 degree water from Trane heat recovery chillers in the upstream position of a series chiller configuration, rather than 180 degree hot water from boilers, for comfort heating has reduced natural gas usage by 80 percent, and lowered electrical and water consumption by the cooling towers. Trane Performance Climate Changer air handling units with CDQ and TCAC technologies help to provide a healthy, cool and dry environment in the operating rooms to help meet doctor expectations, enhance the patient experience and reduce infection rates. Pleased with the facility's efficiency and indoor air quality, Baylor Scott & White is making the unique design the standard for its new facilities.

TRANE

Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments through a broad portfolio of heating, ventilating and air conditioning systems and controls, services, parts and supply. For more information, please visit *trane.com* or *tranetechnologies.com*.

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