



Norton Healthcare

Louisville, Kentucky

October 2017

"We upgraded aging infrastructure with more efficient equipment to achieve energy savings, cost avoidance, reduced maintenance, and most importantly enhanced system reliability and indoor air quality to maximize comfort." -- Anthony Mathis, Norton Healthcare, dir. of energy.

Challenge

With aging equipment, and rising energy and maintenance costs, Norton Healthcare sought to increase energy savings, reduce its carbon footprint and operational costs, and enhance indoor air quality and patient comfort. "We operate 24/7/365, the lights are always on, energy is always being used, and equipment ages at an accelerated rate," said David Boome, system director for design and construction, and facility planner, Norton Healthcare. "Maintaining the proper environment for our patients is our goal, and we want to do that as efficiently and cost effectively as possible."

Solution

Working with its long-time equipment, controls and services provider, Trane, the healthcare system set out to address infrastructure issues, beginning with an energy assessment to define the project scope. The team spent hours walking the facilities, talking with maintenance crews, compiling a list of efficiency improvement opportunities, and developing a comprehensive energy saving plan. With a shared commitment to the community and a goal to achieve sustainable energy cost reductions, Norton Healthcare and Trane moved forward with a four-year, multiphase energy initiative covering nine system facilities with approximately 2.8 million sq ft of space. Varying in size and complexity, upgrades include chiller plant integration and modernizations; air handler, variable air volume unit and lighting replacements; building automation system upgrades; and building envelope improvements.

Shifting demand load to off-peak hours

A new combined cycle central plant was integrated with the existing plant at Norton Audubon Hospital. The system combines thermal storage with gas chillers to provide reliable,



Not-for-profit Norton Healthcare has more than 250 locations, including 5 hospitals, 7 outpatient centers and 13 immediate care centers, all with more than 14,000 employees committed to providing quality healthcare.

cost-effective cooling and heating. The ice storage system provides 4,500 ton-hours of cooling capacity for the building. It includes two Trane air-cooled Stealth™ Helical Rotary Chillers and eighteen CALMAC® IceBank® energy storage tanks. The chillers generate ice at night when loads are lowest, taking advantage of lower-cost, off-peak electricity rates. During the day, the chillers are turned off and the stored ice is used for cooling, significantly reducing energy use and demand costs. Two 400-ton natural gas fired chillers provide chilled water for the facility, offsetting electricity demand and consumption with a lower cost fuel source. The gas chillers' heat recovery option also produces hot water for the facility 24/7.

"There are more efficient ways to produce heating and cooling," said Boome. "We have been working with Trane on alternative ideas to reduce our demand load. Trane engineering knowledge and expertise, coupled with their familiarity of our systems, are helping to make it happen."

Matching chillers to application needs

The Trane® Stealth™ air-cooled chillers at Norton Audubon Hospital deliver the highest combination of part-load and full-load efficiencies. With the lowest published sound levels, the Stealth chillers provide optimal performance without disrupting sensitive areas, such as the ICU and critical operating rooms. At another facility in the healthcare system, Norton Women's and Children's Hospital, a more conventional chiller plant with cooling towers and three 1000-ton, high-efficiency Trane® CenTraVac™ centrifugal chillers proved to be the best option for the high demand levels. That facility's aging air handlers were also upgraded with modular units.

Optimizing system performance

A Trane Tracer® Ensemble™ building management system provides an enterprise view of the entire Norton Healthcare system to help increase productivity, and enable equipment monitoring and troubleshooting. The system's Web-enabled user interface allows facility managers to conveniently and remotely access HVAC, lighting and other systems using a tablet or smart phone. Operators use Tracer Ensemble to establish set points, perform scheduling, optimize operations, respond to trouble calls and manage alarms that could affect surgeries or other procedures.

Driving down energy consumption and cost

Trane® Intelligent Services provides real time energy use data, system performance analysis, and consultative services to help increase energy efficiency, operating income and sustainability. With visibility to what is happening in their buildings, facility managers can fine tune operations to drive down energy use and cost. In addition, Norton Healthcare uses dataPoint™, a utility bill management software, to easily manage its more than 1,000 utility accounts, ensuring invoice accuracy and on-time bill payment to avoid late fees.



Two Trane Stealth air-cooled chillers provide efficient, quiet operation to generate ice at night for the Norton Audubon thermal storage system, shifting demand load to lower-cost, off-peak hours.

Results

Trane Connected Building Solutions, including intelligent systems, building automation and energy management, are working to help Norton Healthcare achieve its comfort and energy savings potential. "We are just entering the implementation phase of the initiative, but the energy saving potential is staggering," said Boome. "It's going to be exciting to see how it all plays out."

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