



DoubleTree By Hilton Hotel- Market Center

41%

Reduced energy
consumption

\$45K+

Hotel rebate from the
service provider

\$192K+

Federal tax deduction
under IRS section 179d

Challenges

As a result of aging, unreliable chillers, comfort complaints were on the rise at the DoubleTree by Hilton® Hotel Dallas–Market Center. Inefficient chiller operation was also resulting in high energy and repair costs, having a detrimental effect on customer satisfaction and the establishment’s bottom line.

Solutions

DoubleTree contacted CVAL Innovations LLC, an established energy conservation and project management firm, to help them address their equipment, and high energy and repair cost challenges. As the hotel’s energy services company (ESCO), CVAL Innovations did a comprehensive evaluation of the building to identify equipment and operational inefficiencies.

Conducting energy audit

The CVAL Innovations team conducted a detailed ASHRAE® Level 2 audit for the building and detailed load modeling using Trane® Trace® 700. As a result of this exercise, building load requirements were calculated, and various energy conservation measures (ECMs) were identified, including a variety of lighting and HVAC improvement options. The decision was made to execute the project in two phases: a lighting retrofit followed by chiller and controls upgrade.

Evaluating chiller plant options

After considering multiple manufacturers, CVAL Innovations selected Trane, a trusted HVAC partner, to evaluate the existing plant and suggest chiller options to meet energy efficient design specs. Using the myPLV™ chiller performance evaluation tool, specific criteria, including the building’s location and purpose, were input and used to accurately predict efficiencies of the various configurations. Payback periods, energy rebates, first cost, and 20-year life cycle comparisons were also calculated for each option. For further evaluation, the project team visited multiple job sites to view centrifugal and screw water-cooled chiller solutions in operation, assessing performance and fit for physical dimensions. The team recommended a multiple screw-chiller solution with variable frequency drives that also offered a heat recovery option.

“The HVAC equipment, building controls, lighting, water pumps. All of the building systems work together; one isn’t effective without the others.”

Jinen Adenwala
President, CVAL Innovations.

Designing for comfort and reliability

CVAL Innovations moved forward with the chiller plant redesign. Based on efficiency, reliability and budget considerations, two 175-ton Trane® Optimus™ Helical Rotary Water-Cooled Chillers (model RTHD) were selected. The Trane helical rotary technology is well suited for the hot, humid Dallas climate. The semi-hermetic design, with excellent compressor lift and continuous unloading helps ensure efficient comfort for the high-occupancy hotel. The unique two-chiller plant design, with evaporators in series and the condensers in parallel, allows for a wider Delta T, resulting in better humidity control. In heat-recovery applications, the Trane Optimus chillers can generate condenser water temperatures as high as 114°F (45.6°C) to support energy-saving initiatives by repurposing compressor-generated heat that normally would be rejected into the atmosphere.

Increasing efficiency

Trane Adaptive Frequency™ drives work with the chiller motors to continuously match compressor speed to required levels, improving chiller efficiency at reduced loads. Using a building automation system (BAS), the hotel is able to maximize energy savings by optimizing the sequence of operations to the building utilization and weather conditions. Right-sizing the chilled water and condenser water pumps also helped with energy savings and reduced the leaks from chilled water pipes.

Reducing installation and maintenance costs

Smaller in size, the Trane Optimus chillers fit through the outside double doors of the building, eliminating the need to tear down exterior walls for installation, saving time, materials and labor costs. The direct drive compressor design of the chillers reduces failure risk for improved reliability and lowers maintenance requirements. In addition, downsized chilled water pumps used in the new chiller plant have eliminated leaking, also helping to lower operating costs.

“We took a holistic approach to the building design, looking at the entire facility, and the resulting interactive effect helped multiply and maximize the energy savings.”

Jinen Adenwala
President, CVAL Innovations.