CASE STUDY

HILTON BAYFRONT HOTEL
SAN DIEGO, CA

Energy Efficiency Plan

Summary

Working closely together, the Hilton San Diego Bayfront Hotel and Willdan developed an implementation plan that substantially reduced the baseline consumption, with no negative impacts to guests. Even with increased guest occupancy, meal service, laundry processing, and ballroom and meeting space utilization, **these measures collectively have produced over 15% energy reduction in nine months**. After completion of required measurement and verification (M&V), the hotel received significant cash energy incentives of over $271,000. On May 13, 2014, San Diego Gas & Electric honored the San Diego Hilton Bayfront Hotel with its 2014 Energy Champion Award for outstanding conservation efforts in the hospitality segment—establishing the hotel as a recognized leader in the implementation of energy efficiency projects in the San Diego region.

Goals and Challenges

In the 2010 calendar year, the hotel consumed 15.5 million kWh of electricity and 790,000 therms of natural gas, at a cost of over $2.5 million. The hotel engaged Willdan in 2011 to identify and implement energy- and water-saving opportunities to reduce their utility spend while capturing available utility incentives to offset costs.

Willdan conducted a detailed ASHRAE Level II audit and identified significant energy and water-saving measures throughout the facility. These measures included capital-intensive "ROI projects," as well as many simple upgrades and modifications with speedy paybacks.

Solutions and Results

Solutions/Outcome: 2014-15 comprehensive LED lighting projects saved over 1 million kWh with just over a 1-year payback.

The Hilton San Diego Bayfront Hotel has been truly exemplary in demonstrating its commitment to all facets of reducing its energy footprint. Willdan worked with the hotel management and facility staff to implement a comprehensive upgrade to the building management system (BMS) and central plant operation.

Estimated Annual Utility Cost Savings:
$544,066

Total Utility Incentive Rebate:
$419,425

Energy Savings:
3,227,759 kWh

Project Implementation Costs:
$1,699,610

Project Simple Payback:
2.35 years

Highlighted Result: Hotel has received multiple energy-related awards:

- 2014 SDG&E Energy Star Champion in Hospitality
- 2014 Association of Energy Engineers (AEE) International Energy Project of the Year

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This project included implementation of chiller sequencing and optimization of the three 845-ton centrifugal chillers serving the building, two of which are equipped with a variable-frequency drive (VFD) on their compressor and one without. The BMS sequence was revised to operate the optimum combination of the chillers with VFDs, and eliminate the operation of the less efficient constant-speed chiller.

Additional upgrades to the BMS included implementation of a chilled water supply temperature reset (based on outdoor temperature), elimination of throttling valves in the central plant chilled water distribution system, and utilizing the circulation pump VFDs for flow modulation and control. In addition to the comprehensive Central Plant and BMS project, the hotel implemented significant other measures including:

- Automated occupancy-based thermostats in the guestrooms to control the HVAC. Willdan conducted a detailed study of the property to evaluate two different solutions as well as conduct tests for any guest satisfaction issues. After a successful 6-week pilot, an advanced INNCOM system was installed so that when guests leave their rooms, the set point on the thermostat is automatically changed to minimize heating and cooling, and automatically resets to the temperature set by the guest the moment they return.
- Implementation of a laundry water-recycle system that reduces fresh water usage and conserves energy by reducing hot water discharges at various cycle stages. This project reuses 20% of the heated water — saving 900,000 gallons of water and 3,500 therms of natural gas monthly.
- Extensive lighting retrofits throughout the property including comprehensive upgrades from halogen and incandescent lamps to LEDs throughout the ballrooms, meeting rooms, lobby, corridors and common areas as well as changing 32W linear fluorescents to 25Ws.
- Installation of carbon dioxide (CO_2) sensors in the ballrooms and meeting rooms to allow for demand-control ventilation.
- Implementation of a supply demand-controlled ventilating air temperature reset strategy at the air handlers, based on the VAV box zone demands.
- Kitchen hood exhaust fan control, which utilizes heat, motion, and infrared sensors to control VFDs on the exhaust fan motors. The control varies the exhaust airflow to ventilate appropriately, reducing fan power consumption when cooking is not occurring and increasing exhaust flow when cooking is taking place.
- Installation of new, high-efficiency laundry water heaters.

"We have achieved close to a 20% reduction in energy use. As a result, we recently garnered the number one ranking for efficiency in the U.S. versus other properties in Hilton's LightStay program."

- Tip Jozsa,
Hilton San Diego Bayfront
Director of Property Operations

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