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Case Study – Waikiki Beach Marriott

EDUCATION / HEALTH CARE / **LODGING** / MANUFACTURING / OFFICE BUILDING / RETAIL / SPECIAL



Efficient New Chiller System Means Sunny Forecast for Waikiki Beach Marriott Energy Costs

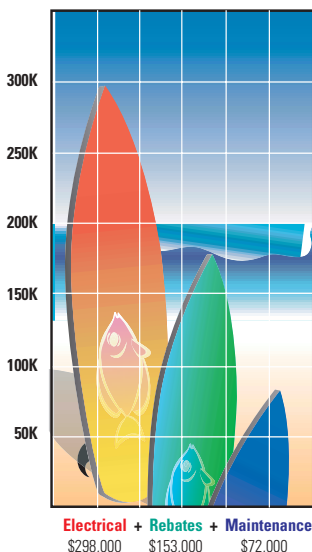
Project Objectives

Aging chillers at the 1,310-room Waikiki Beach Marriott Resort were the source of increasing operational costs, as well as concerns about guest comfort. Hotel management wanted to increase energy efficiency and lower electrical costs, while reducing maintenance time and expenses. But a chiller system replacement would be challenging, due to a very limited downtime window and an almost inaccessible mechanical room in one of the hotel's two towers.

Solution

Carrier Commercial Service's creative solution overcame the mechanical room access problems, and allowed for staged chiller removal and installation to minimize downtime. The energy efficiency of Carrier's 19XRV chillers was enhanced by variable frequency drives (VFDs) and high efficiency pump motors. With the added benefits of a new controls system, the hotel's estimated annual operating cost savings are more than \$350,000. The award-winning project earned energy rebates totaling \$153,000. And the work was completed with no disruptions to hotel occupants.

First Year Savings = \$503,000



Electrical consumption dropped by nearly 24 percent, maintenance costs were dramatically reduced and the project earned substantial energy rebates.



Case Study – Waikiki Beach Marriott *continued*



This project had multiple challenges, and Carrier really stepped up to the plate. Their commitment to meeting deadlines moved the work along more smoothly than anticipated. Overall, Carrier did a very good job."

*Gerald Okamoto
area director of engineering
Pacific Islands, Marriott*

Project Synopsis

With 1,310 guest rooms, the Waikiki Beach Marriott Resort is the third-largest hotel on Oahu — and it uses a lot of electricity. But with 23-year-old chillers past their useful life and becoming increasingly inefficient, utility bills were much higher than they needed to be. Maintenance costs were also a concern, as was the constant worry about occupant comfort in Hawaii’s tropical climate. So, as part of a massive renovation project, hotel management put an energy conservation upgrade on the agenda.

With one of the two hotel towers closed for construction, it was critical to maintain the comfort of guests in the remaining building. The window for downtime was slim to none. An even greater challenge was the location of one of the mechanical rooms — under the parking garage, with only a four-by-four-foot opening for access. In addition, its hollow core concrete ceiling couldn’t be used for rigging to remove and install the chillers.

After studying structural drawings, the Carrier Commercial Service team offered a solution that didn’t require a complete shut-down and draining of the hotel’s water systems. Access was created through an adjacent maintenance shop wall, which allowed the existing chillers to be removed while the new ones were being brought in. Combined with prefabrication of the condenser water piping, this strategy reduced the anticipated 24–48 hour downtime to just eight hours.

The four new Carrier 19XRV 450-ton chillers were equipped with VFDs and high efficiency pump motors to reduce energy usage. And the addition of Carrier Comfort Network (CCN) controls added automated efficiency, saving both time and money. Reduced maintenance costs and a total of \$153,000 in energy rebates rounded out a very profitable picture, with a total estimated operating cost reduction of \$350,000 annually. These impressive results earned the project the 2002 Hawaiian Electric Company, Inc. (HECO) energy efficiency award for commercial properties.

The project was completed with minimal downtime and no disruption at all to the hotel’s operations or the comfort of its guests. This was accomplished with a tightly coordinated schedule and the cooperation of all of the subcontractors. Hotel managers are so pleased with the results that they’re planning to use the energy rebates to help fund more energy management initiatives.

Project Summary

Location: Waikiki, Hawaii

Building Age:
Two Towers: 26 & 30 years

Project Type: Retrofit

Building Type/Size:
Concrete, 25 & 33 stories /
1,032,140 sq. ft. total

Building Usage: Hotel

Objectives: Replace aging chillers, reduce energy costs

Major Decision Drivers:
Timing — equipment availability & almost no downtime

Design Considerations:
Location & configuration of mechanical rooms; downtime limitations

Total Cooling Tons: 1800

HVAC Equipment: 4 model 19XRV chillers w/ R-134a, VFDs, pumps; CCN controls with ComfortVIEW™; mechanical room upgrades, including refrigerant monitors, exhaust fans, duct work

Unique Features: Creative solution to mechanical room access & chiller removal; minimal downtime

Project Cost Range:
\$1 million to \$5 million

Installation Date:
December, 2001

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at www.carrier.com