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Case Study – Fremont Hotel and Casino

EDUCATION / HEALTH CARE / LODGING / MANUFACTURING / OFFICEBUILDING / RETAIL / SPECIAL



Carrier Automation Wins Big for Las Vegas Hotel/Casino Saving Over \$130,000 Per Year

Project Objectives

The Fremont Hotel and Casino in Las Vegas, NV, depends on a comfortable indoor environment to keep its patrons happy and its bottom line healthy. With an aging HVAC system and minimal automation, cooling was inefficient at best – and at worst, ineffective. Five chillers and three cooling towers were spread over three central plants, serving different parts of the facility, with no communication between them. What's more, maintenance costs were increasing dramatically as the equipment got older and three of the existing chillers used R-11, an ozone-depleting refrigerant.

Solution

Carrier combined technical ingenuity, efficient equipment and automated system controls to modernize, consolidate and dramatically improve the delivery of conditioned air at the Fremont. Power consumption was reduced by approximately 10%, saving more than \$100,000 annually. And with the reliable performance of the new system, maintenance costs were slashed by 61%, saving \$30,000 annually. The unique installation created a primary/secondary pumping loop from the existing constant flow piping system. Carrier provided three Evergreen® 19XR chillers, variable frequency drives for efficient part-load operation, and the Carrier Comfort Network® (CCN) with ComfortWORKS®.

Maintenance costs were slashed by 61% with new Carrier HVAC systems.

Maintenance Cost Comparison





Case Study – Fremont Hotel and Casino *continued*

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“Our solution was to adapt the existing systems to a primary/secondary loop. By understanding our equipment and the application, we gained virtually all the efficiencies of a new primary/secondary system, with a very competitive first cost and minimal disruption to the hotel’s operations.”

Dan McGinty,
project manager,
Carrier Commercial
Systems & Services

Project Synopsis

The Fremont Hotel and Casino, in Las Vegas, NV, had a sprawling chilled water system, spread over three central plants. The equipment ranged in age from 15 to 46 years old and there was no automation nor communication between components. In addition to ozone-depleting R-11 refrigerant and inefficient operation, building managers were concerned with escalating maintenance costs and worried about system failure. The Nevada gaming commission estimates that a casino would lose an average of \$10,000 per hour if unable to provide a comfortable atmosphere for its patrons. Carrier’s solution reduced power consumption, saving more than \$100,000 annually, while increasing reliability. With the improved performance of the new system, maintenance costs were slashed by 61%, saving \$30,000 per year. The installation was completed with just three days of cooling system downtime.

With a 20-year service relationship, Fremont managers relied on Carrier’s technical expertise to find a creative and cost-effective system solution. Because the existing system had been expanded over the years, no accurate plans existed of the piping and valve locations. “There was no way to have a 100% understanding until we started, so as we discovered more about the system, we had to make changes on the fly,” said Dan McGinty, Carrier project manager. “This called for flexibility, as well as a solid relationship between Carrier and the Fremont. Success required trust, commitment and expertise on both sides and Fremont facility director Dave Foster exemplified all of these.”

Carrier replaced the five existing chillers with three high efficiency 600-ton Evergreen® 19XR chillers, which use chlorine-free, non-ozone depleting R-134a refrigerant. Their bolt-together construction allowed installation in a new central plant, which was constructed in a basement area accessible only by a tunnel, making equipment size a critical issue.

Carrier’s creative engineering approach converted the existing constant flow piping system to a primary/secondary loop. Variable frequency drives (VFDs) were used on the chiller pumps to create variable flow from the chillers, in effect using them as building pumps. “The cost to change the Fremont’s system to a typical primary/secondary system was prohibitive. We were able to capture much of the benefit without adding to the cost of the job,” said McGinty.

The primary/secondary loop greatly increased efficiency, especially at part-load conditions, matching chiller operation to varying building conditions. Automation was achieved with control valves, automatic equipment starts/stops and additional VFDs on the cooling tower fans. The system is managed with the Carrier Comfort Network® (CCN) and ComfortWORKS®. The result is an efficient, cost-effective cooling system that keeps the Fremont’s patrons comfortable year-round and racks up savings for the building’s owners.

Project Summary

Location: Las Vegas, NV

Building Age: 45 years

Project Type: Retrofit

Building Type/Size:
Cantilevered concrete structure,
two towers: five-story, 14-story

Building Usage: Hotel/casino

Objectives: Upgrade equipment; increase system efficiency; replace R-11 refrigerant

Major Decision Drivers:
Equipment age; operating costs; maintenance costs

HVAC Equipment: Three model 19XR Evergreen chillers; CCN; ComfortWORKS

Design Considerations:

Consolidation from three central plants; automation; first costs; minimal down time during installation

Unique Features: Adapted existing system to primary/secondary loop, using variable-flow chiller pumps; equipment installation underground, through tunnel

Project Cost Range:

\$1 million to \$5 million

Installation Date: Completed June 1999

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