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Case Study – Creighton University

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

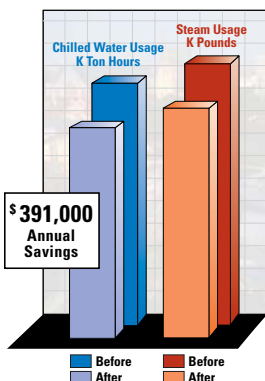


Engineered Solution Yields Campus-Wide Energy Savings and Improved Comfort

Project Objectives

Creighton University's Facilities Management Department sought to generate operating cost savings and eliminate chilled water utility penalties through better control of its intercampus chilled water loop. Creighton was paying central chilled water utility penalties because chilled water temperatures leaving its buildings were below a contractual threshold. Creighton was looking for a partner who could deliver a solution that solved its chilled water problems, integrate control of a multitude of system components, and provide savings to fund other campus facility improvements.

Before & After Energy Cost Comparison



Solution

Carrier Commercial Service responded with a design-build solution that modernized 14 separate chilled water control stations. Selected fan coil units were equipped with new valves and networked to a DDC controls system. Chilled water and steam condensate metering systems were installed in residence halls, a physical fitness center and the student center. Additionally, defective steam traps were replaced and upgraded, and piping and ceiling insulation were installed.

By retrofitting various chilled water control stations throughout their campus, Creighton University's Facilities Management Department realized energy and cost avoidance savings of \$391,000 annually.



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Case Study – Creighton University *continued*

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Lennis Pederson
Associate Vice President
and Director of Facilities
Management
Creighton University

Project Synopsis

Creighton University, founded in Omaha Nebraska in 1878, faces the same economic challenges as any university with a growing campus and higher energy costs. One key differentiator for Creighton is that its campus chilled water loop is operated by an outside utility. Under the utility contract, Creighton must maintain return chilled water temperatures within 14°F of their entering temperature (delta T), or pay a financial penalty to the utility provider.

Creighton commissioned Carrier to work with the university facility team to design and implement a system solution that would reduce overall energy costs and improve the cold water distribution system and controls within campus buildings to meet the delta T targets for chilled water.

Noting that chilled water was distributed through the campus at the same rate year round, the combined Creighton-Carrier team designed and installed stations in 14 separate buildings throughout the campus that included variable flow pumps. They also installed new valves in the fan coil units and linked them to a Carrier Comfort Network (CCN) communicating controls system. This ensured that chilled water distribution is driven by actual demand, and allowed Creighton's personnel to centrally manage each system element.

“Because the focus on this project was to achieve energy and cost avoidance savings through precise monitoring and management of existing equipment, Creighton's staff needed a system that gave them a 360-degree view of all their buildings' elements at any given time...the CCN controls system does just that,” said Dennis Haywood, Solution Sales Executive with Carrier Commercial Service.

With a payback of just under five years, Carrier's program also provides positive cash flow which will be utilized to provide facility upgrades identified by Creighton and Carrier's project development team. “As this project progressed, Creighton's personnel came to know us as a comprehensive solution provider... if it was energy- or performance-related, they felt comfortable that we could help them,” Haywood said.

With chilled water efficiency and temperature addressed, the team upgraded steam traps and systems to reduce campus-wide steam consumption and lower tunnel temperatures by 10–15°F. The team progressed to the campus Fitness Center and installed new lighting and insulation to reduce energy consumption and improve comfort.

“The Carrier-Creighton team met all their objectives, from energy conservation to delta T performance to delivering a more comfortable environment to the Creighton Campus. Everyone from Carrier brought a level of quality and professionalism to the table on this project,” said Lennis Pederson, Assistant Vice President and Director of Facilities. “Their honesty and ongoing communication with each of us here at Creighton made implementing our energy retrofit strategy extremely positive.”

Project Summary

Location: Omaha, Nebraska

Project Type: Energy Upgrade / Retrofit

Building Age: Various

Building Type / Size: 14 separate single- and multi-story structures

Building Usage: College Campus — residence, classroom, library, fitness center, tunnels, bio-information center, center for the arts

Objectives: Reduce energy consumption, improve campus comfort, improve central visibility of system performance, manage chilled water temperatures throughout campus loop to reduce financial penalties

Major Design Drivers: Optimize chilled water loop, connect disparate system components

Design Considerations: A targeted energy-saving retrofit without replacing existing chillers or AHUs. Implement all existing equipment upgrades to coincide with school operations

HVAC Equipment: Variable speed chilled water pumps, fan coil valves, communicating controls system

Unique Features: 10 distinct delta T control stations with variable pumping, data tracking for key system components across campus

Installation Date: 2004–2006

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