AIRSIDE / **APPLIED** / CONTROLS / **SERVICE** / **SPECIAL SOLUTION** / TOTAL SYSTEM / UNITARY

Case Study – University of Rochester

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

Refrigerant/Chiller Upgrades Deliver Performance and Sustainability at University of Rochester

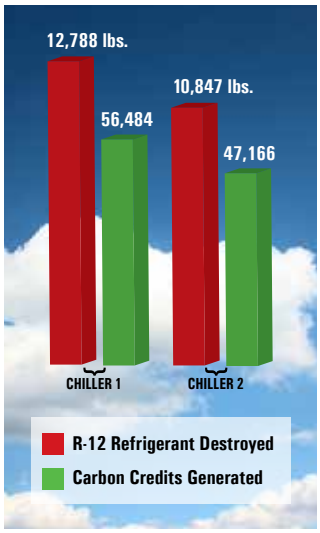
Objectives:

The University of Rochester Central Utilities plant provides steam, chilled water, hot water and electricity to the university's River Campus and Medical Center. The facility's main chilled water plant contains five water-cooled chillers with a total cooling capacity of 21,000 tons, including four Carrier chillers. The facility also includes steam turbines that can generate up to 25 megawatts of electricity. In accordance with campus sustainability goals, the University of Rochester wanted to modernize two older chillers that contained R-12 refrigerant. R-12 is a chlorofluorocarbon (CFC)-based refrigerant that is subject to a global phase-out due to its ozone-destroying qualities. Steve Mischissin, Director of Utilities and Energy Management, collaborated with Carrier on the refrigerant upgrade and equipment improvements to enhance chiller efficiency as well as remove and destroy the R-12 refrigerant.

Solution:

The University of Rochester worked with Carrier and EOS Climate, Inc. — a company that specializes in safe and environmentally correct management of refrigerants — to remove and destroy 12,788 pounds of R-12 refrigerant from the first chiller, and 10,847 pounds from the second. Subsequently, Carrier provided a full refurbishment and complete rerate of the chillers and their steam turbine drives; new digital controls; a heat exchanger re-tube; division plate modification; nozzle relocation and new valves. The chillers were then charged with R-134a, a refrigerant that causes no ozone depletion with over 7.5 times less global warming potential than R-12. The safe destruction of R-12 prevented greenhouse gas emissions equivalent to 103,650 metric tons of CO_2, equal to taking more than 21,000 cars off the road for a year. Carrier worked with EOS to use these verified emission reductions ("carbon offsets") to reduce the cost of the project. While the project benefited from an environmental aspect, the destruction program included a financial payment for the refrigerant, which helped the project's financial return.

University of Rochester Projects Generate Carbon Credits and Safely Destroy Harmful Refrigerant



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Case Study – University of Rochester

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"After 40 years of service, we reinvested in chillers #2 and #3 to increase efficiency, extend machine life and finally eliminate CFC based refrigerant."

Steve Mischissin, P.E.
Director of Utilities &
Energy Management,
University of Rochester

www.eosclimate.com

SYNOPSIS:

The University of Rochester is one of the top research universities in the nation, with more than 10,500 students and more than 22,000 faculty and staff occupying 158 buildings on campus. The university's Central Utilities plant provides steam, chilled water, hot water and electricity to the River Campus and Medical Center. Its main chilled water plant contains five water-cooled chillers with a total cooling capacity of 21,000 tons, including four Carrier chillers.

Inspired by the university's record of reducing an average of 95 metric tons of CO_2 emissions annually, Central Utilities, led by Steve Mischissin, Director of Utilities and Energy Management, sought to begin modernization of two older chillers that contained R-12 refrigerant. R-12 is a chlorofluorocarbon (CFC)-based refrigerant that is subject to a global phase-out due to its ozone-destroying qualities. Two Carrier chillers were selected for overhaul.

Steve Mischissin collaborated with Carrier on the refrigerant upgrade and equipment improvements to enhance chiller efficiency as well as remove and destroy the R-12 refrigerant. "After 40 years of service, we reinvested in chillers #2 and #3 to increase efficiency, extend machine life and finally eliminate CFC-based refrigerant." he said.

The University of Rochester worked with Carrier and EOS Climate, Inc. — a company that specializes in the safe and environmentally correct management of refrigerants, and a leading global provider of high-quality carbon offset credits — to remove 12,788 pounds of R-12 refrigerant from the first chiller, and 10,847 pounds from the second. EOS Climate then destroyed the R-12 refrigerant in a third-party verified process that is registered with the Climate Action Reserve, a national program to protect the integrity of the carbon offsets process.

Subsequently, Carrier provided a complete refurbishment of the chillers, including a full rerate of the chillers and their steam turbine drives; new digital controls; a heat exchanger re-tube; division plate modification; nozzle relocation and new valves. Finally, the chillers were charged with R-134a, a refrigerant that has over 7.5 times less global warming potential than R-12 and does not cause ozone depletion.

The safe destruction of the CFC refrigerant prevented greenhouse gas emissions equivalent to 103,650 metric tons of CO_2 — equivalent to taking more than 21,000 cars off the road for a year, and effectively neutralizing the commuting emissions of the university's entire faculty and staff for a year. Carrier worked with EOS to use these verified emission reductions ("carbon offsets") to reduce the cost of the project as the destruction program included a financial payment for the refrigerant.

David Bryant, Service Account Manager for Carrier, said, "With the second chiller overhaul completed, the university has taken a major step forward in reducing carbon emissions, promoting sustainability and demonstrating environmental leadership in keeping with their commitment to 'Go Green.'"

Project Summary

Location: Rochester, NY

Project Type: Refrigerant upgrade and chiller overhaul

Building Size: Central Utilities serves River Campus and Medical Center; 158 buildings of various sizes.

Chiller Age: 40+ years

Building Usage: Central Utilities provides steam, chilled and hot water and electricity to the university campus.

Objectives: Replace ozone-depleting R-12 refrigerant in two chillers; overhaul chillers for efficiency.

Equipment: Two Carrier chillers

Total Cooling Tons: 10,800 tons after rerate

Major Decision Drivers: Sustainability mandate to remove ozone-depleting refrigerant and maximize chiller efficiency.

Unique Features: 40+ year old chillers upgraded to energy efficient performance; R-12 refrigerant destroyed in a safe and accountable process; replacement of R-12 with non ozone-depleting R-134a.

Installation Date: 2011-2013

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

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