# CASE STUDY

## Crouse Hospital

# CROUSE HOSPITAL RENOVATES CHILLER PLANT FOR THE FUTURE, SAVES COSTS TODAY

## THREE EVERGREEN® 19XRV CHILLERS REDUCE ANNUAL ENERGY COSTS BY $80,000

*Three Carrier Evergreen® 19XRV chillers employ variable frequency drives (VFDs) to run efficiently at full or partial load, delivering targeted comfort conditions as needed in different parts of the Crouse Hospital campus while saving the facility approximately $80,000 per year in energy costs.*

## Project Objectives

Crouse Hospital serves the Syracuse, New York area with 506 patient beds and 57 bassinets in a full-service medical campus comprised of four connected buildings. In order to continue providing state-of-the-art care to the community, Crouse Hospital planned to incorporate 14 new operating rooms in a 60,000 $ft^2$ (5,574.2 $m^2$) addition to the facility. However, the existing heating, ventilation and air conditioning (HVAC) infrastructure—while still operational—was outdated and undersized and needed to serve the new, larger facility and future planned additions. Clearly, a more energy efficient and state-of-the-art solution was required. As a long-time Carrier customer, Crouse Hospital turned to Carrier once again for assistance with the upgrade.

> "We've had very favorable results with the 19XRV chillers. Now we're focused on our service relationship with Carrier to provide proper longevity for the new equipment."
>
> – Jeffrey Tetrault,
> Director of Facilities and Construction,
> Crouse Hospital

## Project Solution

Carrier recommended that the hospital replace its eight existing chillers with three Evergreen® 19XRV chillers rated at 1,000 tons each, enabling the hospital to consolidate their mechanical services into one central location. The high-efficiency 19XRV chillers feature variable frequency drives that enable each chiller to run efficiently at full or partial load. This reduces energy costs and enables the chiller system to respond quickly and with finesse to occupant comfort needs and the operational requirements of atmospherically sensitive equipment in diverse parts of the facility. In addition to receiving a rebate from the New York State Energy Research and Development Authority (NYSERDA) for efficiency features in the HVAC system upgrade, Crouse Hospital is saving approximately $80,000 per year in energy costs while operating a substantially larger facility.

## Synopsis

Crouse Hospital serves approximately 24,500 patients per year in the Syracuse, New York area, offering 506 patient beds and 57 bassinets in a full-service, 853,000 square foot medical campus comprised of four buildings. The facility offers a comprehensive range of care, including services as diverse as neo-natal intensive care, neurology, sports medicine, cardiac and cancer care. In order to continue to provide state-of-the-art care to the community, Crouse Hospital planned to add 14 operating rooms in the new 60,000 $ft^2$ (5574.2 $m^2$) Witting Surgical Center. However, the existing heating, ventilation and air conditioning (HVAC) infrastructure—installed in the 1970s and '80s—while still operational, was outdated and undersized to serve the new, larger facility and future planned additions. The facilities staff encouraged hospital executives to take this opportunity to prime the HVAC system for maximum future performance. As a long-time Carrier customer, Crouse Hospital turned to Carrier once again for assistance with the upgrade.

Carrier recommended that the hospital replace the eight existing chillers with three Carrier Evergreen® 19XRV chillers rated at 1,000 tons each, consolidating mechanical services from six separate locations into one central 2,800 square foot mechanical room. Although the new surgical pavilion expansion required only 1,750-1,800 tons of cooling to create a comfortable environment for patients and to provide redundancy in case of equipment service issues, Carrier recommended the third chiller to meet the needs of expansion projects planned for the future.

The high-efficiency 19XRV chillers feature variable frequency drives (VFDs) that enable each chiller to run efficiently at full or partial load. This reduces energy costs and enables the chiller system to respond quickly and with finesse to occupant comfort needs and the operational requirements of atmospherically sensitive equipment in diverse locations around the hospital campus.

Jeffrey Tetrault, Director of Facilities and Construction for Crouse Hospital, visited the Carrier factory in North Carolina to witness the final factory testing of the chillers. His positive impression then has been confirmed by experience. Tetrault said, "We've had very favorable results with the 19XRV chillers, a lot of efficiencies and energy savings from them. The design and installation process also went very smoothly. Now we're focused on our service relationship with Carrier to provide proper longevity for the new equipment."

The HVAC upgrade, conducted while the hospital was in full operation, also incorporated new cooling towers, a free-cooling plate heat exchanger, a dozen new pumps and additional piping. In other parts of the facility, however, existing Carrier rooftop units continued to provide excellent occupant comfort, so they were retained in the revamped design. A temporary chiller was leased and installed to support hospital operations during the critical change-over period, then removed after the new system was fully operational.

Thanks to the increased efficiency delivered by the HVAC system upgrade—in particular the variable speed drives on the Evergreen 19XRV chillers—Crouse Hospital received a rebate from the New York State Energy Research and Development Authority (NYSERDA) of approximately $60,000. In addition, the high-efficiency chillers save the hospital about $80,000 per year, enabling the facility to operate a substantially larger campus with lower energy costs. And finally, through good planning by Crouse officials and Carrier, the cooling infrastructure is already in place for the upcoming construction of a nine-story, 21,000 $ft^2$ (1,951 $m^2$) private patient room tower.

## Project Summary

**LOCATION:** Syracuse, New York

**PROJECT TYPE:** Campus-wide heating, ventilation and air conditioning (HVAC) and controls upgrade, in particular chiller replacement

**BUILDING SIZE:** 853,000 $ft^2$ (79,246.3 $m^2$)

**BUILDING AGE:** Original facility built 1972; new surgical expansion built 2010.

**BUILDING USAGE:** Healthcare

**OBJECTIVES:** Replace outdated and undersized equipment with state of the art water-cooled chillers large enough to serve present expansion and planned future building projects; maximize HVAC efficiency; provide occupant comfort and safe operating conditions for advanced healthcare equipment; provide redundancy for patient well-being in case of equipment service issues; provide facilities staff access to chillers from web-enabled locations through integration with the building management system.

**EQUIPMENT:** 3 Evergreen® 19XRV chillers; existing Carrier chiller retained in new design.

**MAJOR DECISION DRIVERS:** Long relationship with Carrier; known quality and reliability of Carrier equipment. High-efficiency features such as variable frequency drives on 19XRV chillers.

**UNIQUE FEATURES:** Multiple mechanical rooms streamlined into one central location; chiller tonnage planned to serve not just present expansion but those planned for the near future as well.

**INSTALLATION DATE:** 2010

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