



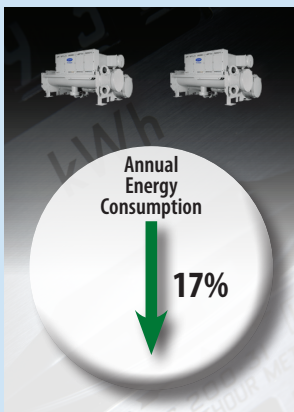
CASE STUDY



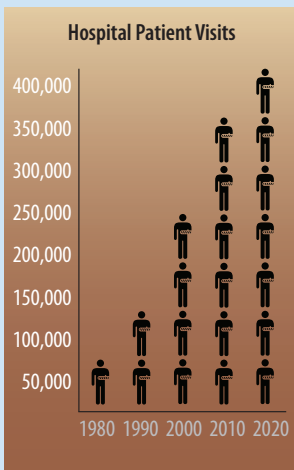
Cherokee Nation W.W. Hastings Hospital

TURNKEY CHILLER INSTALLATION DELIVERS EFFICIENCY FOR INCREASING COMFORT AND COOLING DEMAND

CHILLER PLANT IMPROVEMENT ESTIMATES



Computer modeling estimates - approximate energy savings of new system vs. existing system at time of replacement.



Carrier AquaEdge® 19XRV
Chillers Economically and Efficiently
Meet Increasing Cooling Demand

Project Objectives

Cherokee Nation W.W. Hastings Hospital, in Talequah, Oklahoma, was constructed in 1984. The original system consisted of two Carrier 19D chillers which served the facility for more than three decades. The hospital staff and number of patient visits per year have grown substantially in the intervening years, prompting the facilities staff to propose a chiller plant upgrade to meet increasing cooling demand.

One challenge became apparent immediately: due to infrastructure and cost considerations, the original chilled water piping system could not be expanded. The chiller plant retrofit would have to deliver more tons of comfort cooling while using the same piping configuration.

"When it came time for the chiller plant upgrade, we knew from past performance and our relationship with Carrier that we wanted Carrier to do the job."

— Dale Dreadfulwater,
Supervisor of Facility Management,
Cherokee Nation W.W. Hastings Hospital

Project Solution

Carrier custom-engineered two new 400-ton AquaEdge® variable speed 19XRV chillers that could accommodate a larger than normal difference in the temperature of water entering and leaving the chillers. As part of the turnkey solution, Carrier also provided rental chillers during the project so the hospital experienced no cooling downtime. Additionally, Carrier i-Vu® chiller controls are integrated with the existing building's automation system which enable the facilities staff to respond quickly to changing conditions, whether from the hospital campus or remotely.



Synopsis

Located in Talequah, Oklahoma, the Cherokee Nation W.W. Hastings Hospital is a 150,000 ft² (13,935.5 m²) facility. The original chillers, dating back to the hospital's 1984 construction, were two 250-ton Carrier 19D units, which served the facility for more than three decades. Over the years, however, patient visits have grown from 60,000 to 400,000 per year, with an attendant increase in staffing numbers. Heat generated from advanced healthcare equipment has also added to the cooling demand. These conditions prompted Dale Dreadfulwater, Supervisor of Facility Management and Jason Helsley, HVAC Technician for the Cherokee Nation W.W. Hastings Hospital, to propose to the Cherokee Nation Health Team of Directors and Chief Bill John Baker that the hospital should implement a chiller plant upgrade.

The team immediately discovered, however, that due to the existing infrastructure and cost considerations, the original chilled water piping system could not be expanded. Therefore, the final chiller plant solution would have to utilize the existing piping configuration to deliver more tons of comfort cooling. The hospital's facilities staff then turned to the Carrier team in Tulsa for a successful solution.

Carrier delivered a turnkey equipment replacement solution by custom-engineering two new 400-ton AquaEdge® 19XRV chillers to provide more cooling from the existing piping system by accommodating a larger than normal ΔT —the variation in temperature between water entering the chiller versus water exiting the chiller. In addition, a plate frame heat exchanger will provide free cooling in the winter. By integrating a plate frame heat exchanger into the piping

system, the hospital can take advantage of cold condenser water in the winter months and satisfy their cooling load with less energy consumption.

The new system integrates into the existing building footprint and infrastructure delivering 60% more cooling capacity with an expected annual energy savings of approximately 17%. Through variable speed chiller technology, plate frame heat exchanger utilization and new Carrier i-Vu® controls, major improvements in building comfort and energy efficiency are being achieved.

Cooling is critical in healthcare facilities and the hospital could not afford any downtime during the project installation. As part of Carrier's overall turnkey solution, rental chillers and related equipment were provided for temporary cooling during the modernization. The transition from the old system to the new system occurred seamlessly without any interruption to the facility's indoor environment.

The project—which is now producing substantial improvements in all aspects of comfort level, reliability, redundancy and energy savings—is a big win for the Cherokee Nation. Key to the project's success was the entire hospital engineering staff's technical expertise, facility knowledge and thorough understanding of the requirements to achieve all the project's goals. Dale Dreadfulwater said, "The Carrier team engineered and delivered the complete solution we wanted. After 20 years of running both original chillers year-round, it's great to have a better way to serve our patients and staff."

Project Summary

LOCATION: Talequah, OK

PROJECT TYPE: Modernization

BUILDING SIZE: 150,00 ft² (13,935.5 m²)

BUILT: 1984

FACILITY USAGE: Full-service inpatient hospital with outpatient facilities, medical and dental offices.

OBJECTIVES: Expand cooling capacity to meet contemporary demand, using existing chilled water piping; introduce plate frame heat exchanger for winter cooling.

EQUIPMENT: Two 400-ton Carrier AquaEdge® 19XRV water-cooled centrifugal chillers; 8 Carrier air handling units; cooling tower; plate frame heat exchanger.

CONTROLS: Carrier i-Vu chiller controls

SERVICE & MAINTENANCE: Carrier Tulsa

MAJOR DECISION DRIVERS: Carrier's capacity to custom-engineer a solution which kept within infrastructure restraints; turnkey solution including rental chillers, new equipment and controls delivering improved chiller plant efficiency.

INSTALLATION DATE: 2015-2016

For more information, contact your [Carrier representative](#), call 1.800.CARRIER or visit [carrier.com/commercial](https://www.carrier.com/commercial)

