

Project Profile

Waldo County General Hospital

Belfast, Maine



New cooling system brings reliable comfort, redundancy and energy efficiency

Waldo County General Hospital is a not-for-profit community hospital committed to providing excellent care for patients and their families in a friendly, caring atmosphere in line with its mission to be the best. Focused on patient comfort, energy savings and improved operational efficiency, the hospital contracted Johnson Controls to replace its cooling system. As a result, the hospital will save an estimated \$47,785 annually in electricity costs, provide reliable cooling and achieve a four-year return on its investment.

Challenged with an inefficient chiller that required a high level of costly maintenance, the hospital needed a cost-effective solution for replacing the chiller, in an effort to reduce energy and operating costs. In addition, the hospital wanted to create a level of redundancy in its cooling system to ensure the consistent comfort of its patients and staff.

Johnson Controls has been servicing the hospital's Metasys® building management system since the early 1990's and the existing chiller since its installation. After conducting a study of the hospital's cooling needs, the Johnson Controls service team proposed a solution that would not only meet the hospital's requirements, but also reduce future costs and eliminate the environmentally unfriendly refrigerant used in the existing chiller. In addition, Johnson Controls leveraged available funding to offset the cost of the project itself.



Two are more efficient than one

The solution Johnson Controls provided involved replacing the existing 270-ton chiller with two 150-ton chillers equipped with variable speed drives, which operate more efficiently. Having two chillers provides the hospital with built-in redundancy, ensuring critical areas remain cool if a problem should occur with one of the chillers. And, a total capacity of 300-tons allows for future expansion. The new chillers also use R134a refrigerant, which is much more environmentally friendly.

The Metasys system was expanded to control the operation of the two new chillers, allowing the cooling load to be sequenced from one chiller to the other or have both running as needed. This not only saves energy, but also maximizes the performance and lifecycle of the new chillers, since the run-time is spread evenly amongst the units' compressors. The previous chiller ran 24/7 for as many as 10 months of the year, far exceeding ASHRAE recommended limits. As a result, one of the unit's three compressors needed to be rebuilt every year at a substantial cost. The new chillers each have two compressors, which are warranted for five years.

Staged installation minimizes downtime, ensures comfort

Maintaining a comfortable environment within the hospital was key to the success of the project. To maintain comfort and minimize downtime, the chillers were installed on separate days. One new chiller was lifted to the hospital roof, installed and started - leaving the old unit in operation. At a later date the old unit was removed, the second chiller was lifted and installed, and the new system brought online. In addition, Johnson Controls began the project at 4:00 am to avoid the heat of the day

and minimize disruption to the facility. As a result, the building temperature rose only a few degrees during the four-hour cutover period to the new system.

Energy savings and incentive bring quicker return on investment

Maximizing the hospital's return on investment was a key component of the solution Johnson Controls proposed. Because the new chillers are significantly more efficient than the old chiller and their operation can be sequenced in response to demand, the hospital will save an estimated \$47,785 in electricity costs per year.

But the returns don't stop there. Prior to making their proposal, Johnson Controls leveraged its knowledge of Efficiency Maine, a statewide effort to promote more efficient use of electricity. Efficiency Maine helps residents and businesses reduce energy costs through incentive and grant programs.

Working with Efficiency Maine and its independent engineering firm, Johnson Controls applied for and secured a custom incentive of \$142,000 for the hospital. The program takes into consideration the scope of work and projected energy savings involved with the new chiller project. Johnson Controls used its YORKcalc modeling software to build a performance profile and demonstrate the expected savings, which were verified by the engineering firm. Efficiency Maine then determined the incentive amount based on those projected savings.

Taking into consideration the anticipated savings in electricity costs, the incentive, and the maintenance costs of the old chiller, the new chillers are expected to pay for themselves in less than four years rather than the seven years it would have taken without the incentive. After payback, the new chillers should continue to generate significant savings that the hospital can use to offset future utility and other operational costs.

"In addition to a reduction in maintenance costs and the added protection of a reliable cooling system, the hospital had an energy savings goal in mind. The team at Johnson Controls has helped us achieve all three of these criteria at once."

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