

Energy Efficiency Case Study



Facility: Medical Outpatient Facility

A mission critical medical outpatient facility with operating rooms that has to maintain HVAC and comfort control for daily operations.

Problem: Inefficient operation without reserve capacity

Two original 179-ton constant speed chillers with Y delta standard starters providing a combined 358-ton cooling capacity, however, there was a loss of cooling capacity over time of 20%, down to a combined 285-tons. The documented energy consumption to cooling capacity ratio was .95Kw per ton. Whereas, advanced technology at design conditions provides an efficiency level of .55Kw/Ton to .65Kw/Ton availability. Furthermore, with these losses the two original chillers were borderline at maintaining the present cooling load without reserve capacity.



Solution: Replace one of the existing chillers

with a Variable Speed Drive (VSD) driven 350-ton chiller. The improved chiller capacity provides the needed cooling capacity at a reduced level of energy consumption, with one of the original chillers left in place for reserve capacity. A design efficiency level of .62Kw/Ton was gained, and with an integrated part load value of .394 now achieved, only by having the Variable Speed Drive, the system is much more energy efficient. In other words the system actually becomes more efficient at part load, which was not possible with the standard constant speed chiller.



Payback: 4.5 Year Payback

Using a simple payback method based on the present utility costs, the cost of the project and a reduction in yearly maintenance costs anticipated the payback for the project will be 4.5 years. This payback for the retrofit combined with the reserve capacity gives peace of mind that this mission critical facility will continue to operate.



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