

# Hospitals reduce demand charges by supplementing existing cooling systems with ice storage

**California hospital expects \$17,000 annual energy cost savings and 3-year payback**

A common misconception among some facility owners and managers is that if a building requires air conditioning around the clock it is not a suitable application for thermal energy storage. This would seem to preclude ice storage in hospitals, nursing homes, hotels and the like. These buildings, however, can use their conventional mechanical cooling system for the night load and ice to handle the peak cooling load during the day when utility rates are at their highest. Using ice storage in conjunction with regular air conditioning can mean big utility cost savings.

Grossmont Hospital, a 490,000 square foot medical facility in La Mesa, California, is doing just that. The hospital's engineering staff had been aware of the cost-saving advantages of off-peak cooling for several years. They hired a consultant to do a feasibility study for a supplementary thermal storage system. The study determined that the hospital had an additional design day cooling requirement of 740 tons which could be met with only a 320 ton chiller and 22 Calmac ICE BANK tank. Ice storage would also qualify the system for a sizable cash subsidy from the local electric utility. This convinced hospital officials to proceed with the project.

Bill Keaton, the hospital's chief engineer, stated that the new ice storage system enabled Grossmont to shift 232 kW off-peak and avoid a non-ratcheted \$14.42 per kW time-of-use demand charge. Keaton estimates the energy cost savings to be \$17,000 per year and the payback period to be about three years.

"We're constantly looking at ways to reduce energy costs," said Keaton. "We decided to use off-peak cooling because of the demand savings and the cash incentives offered by San Diego Gas & Electric. We also wanted to use a modular ice bank system because of its greater reliability and the need for future expansion. We're adding a new 60,000 square foot Women's Center next year and Ice Bank Tanks will be used to cool that, too."



Owner: Grossmont Hospital, La Mesa, CA.  
Engineer: Verle A. Williams & Associates San Diego, CA.  
Contractor: Astro Mechanical, San Diego, CA.

## Oklahoma City's Deaconess Hospital Shifts 250 kilowatts off-peak with ice storage.



Another hospital which has turned to ice storage to reduce energy costs is Deaconess Hospital in Oklahoma City, Oklahoma. The hospital recently installed a 120-ton air cooled chiller and eight Calmac ICE BANK® tanks to meet a need for 250 tons of additional air conditioning. Ice storage cut the required chiller size in half, and resulted in a shift of 250 kW off-peak, thereby saving a \$9.15 per kW unratcheted utility time-of-use demand charge.

Dan Lohman, engineering manager for the 210-bed facility, stated, "With the thermal storage cash

incentive we received from Oklahoma Gas and Electric added to the monthly demand savings, plus additional savings from our energy management system, we are calculating our payback to be about five years."

Lohman added that he decided to bury the tanks and the installation went smoothly. "It's a simple system that makes future additions easy," he said. "There's a possibility that four more tanks will be added to the system next year."

Owner: Deaconess Hospital, Oklahoma City, OK.  
Engineer: Cooper Engineering, Oklahoma City, OK.  
Contractor: Air Engineering Co, Oklahoma City, OK.

## A partial listing of hospitals with Calmac Thermal Storage Systems



Athens Regional Medical Center, Athens, GA.



St. Luke's Hospital, Saginaw, MI.

Children's Hospital, Birmingham, AL  
Kaiser Hospital, San Diego, CA  
Abbott Critical Care, Mountain View, CA  
Oak Valley Hospital, Oakdale, CA  
Halifax Medical Center, Daytona Beach, FL  
Athens Regional Medical Center, Athens, GA  
South End Medical Clinic, Louisville, KY  
Saginaw General Hospital, Saginaw, MI

Carolina Medical Center, Charlotte, NC  
Dartmouth Hitchcock Medical Center, Lebanon, NH  
St. Antoninus Hospital, Cincinnati, OH  
Veterans Administration Hospital, Muskogee, OK  
Methodist Hospital, Philadelphia, PA  
Kent County Hospital, Warwick, RI  
Baylor Hospital, Dallas, TX  
Southampton Memorial Hospital, Franklin, VA



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