

MERCY MEDICAL CENTER

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COMPANY BACKGROUND

Mercy Medical Center of Des Moines (MMC-DM) is an 802-bed, acute-care health facility located on three campuses in downtown Des Moines, Iowa. MMC-DM operates as a non-profit, Catholic healthcare facility, along with 72 other hospitals nationwide, as part of the Catholic Health Initiatives organization founded by the Sisters of Mercy. The hospital represents one of the largest employers in Iowa with more than 950 physicians on staff and 6,600 support positions. Mercy's areas of excellence include cancer services, heart and vascular services, diabetes and endocrinology, emergency medicine, medical imaging, birthing services, brain and spine services, orthopedics and rehabilitation, pediatrics, weight loss and nutrition services, and a wide array of specialty and outpatient services. In 2010 the hospital admitted almost 37,000 inpatients and more than 263,000 outpatients.

PROJECT BACKGROUND

The project's objective at Mercy was to determine potential savings from the installation and use of variable frequency drives (VFD) on the heating and chilled water pumps associated with the on-site radiant ceiling panels. The intern also reviewed a recent third-party energy audit and provided additional recommendations for follow-up and energy savings. Other operational projects and maintenance schedules were also identified for future consideration.

INCENTIVES TO CHANGE

Mercy has created a Green Team which investigates ways to reduce the hospital's ecological footprint and annual utilities costs. The central hospital's goals include improving its U.S. Department of Energy's Energy Star Portfolio ranking and increasing its overall energy efficiency. MMC-DM has recently completed a new facility, Mercy-West Lakes, which has been built to LEED specifications and the organization plans to continue implementing LEED design and construction practices in its new buildings and renovations.

RESULTS

Variable Frequency Drives on Radiant Ceiling Panel Pump Motors:

The intern investigated the potential economic benefit of installing variable frequency drives (VFDs) on the controls of the motors powering the radiant ceiling panel supply pumps. Using VFDs could reduce the flow rate and pressure on these lines by throttling the power

delivered to these motors to maintain a specified temperature drop between the supply line and the return line. The use of VFDs would save money by eliminating any wasted power currently consumed by these motors. VFDs would also prevent condensation and the need for continual repairs.

Install Heat Recovery Chillers: Mercy's HVAC system currently employs simultaneous heating and cooling. Chilled water is produced to first cool the supply air. Then steam heats water that is used to reheat the supply air either in the



hot deck or just prior to room delivery. The HVAC load for the building accounts for a majority of the building's chilled water, steam and electrical requirements. Heat recovery chillers would reclaim the heat dumped into the chilled water lines and use it to reheat the air in the HVAC system. Minimal building chilled water loads ensure year-round potential for the use of these chillers. In the process, these chillers would reduce steam consumption and take over some of the load currently on the main hospital chillers.

CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS

Total for all sectors					
CO ₂	SO ₂	CH ₄	N ₂ O	CFC	PM-10
329.18	1.70	10.72	0.02	3.85	0.04

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
INSTALL VFDS ON PUMPS	\$28,500	95,500 KWH	RECOMMENDED
DEDICATED HEAT RECOVERY CHILLERS	MORE RESEARCH NEEDED	MORE RESEARCH NEEDED	RECOMMENDED