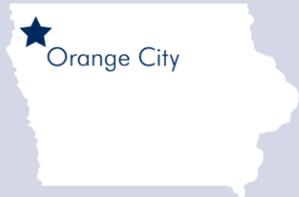


Orange City Area Health System

COMPANY BACKGROUND



Orange City Area Health System (OCAHS) strives to provide healing in all aspects of life for its rural Iowa patients. The new 25-bed, 128,000 square foot main campus facility supplements the high level of care already provided in the three other OCAHS facilities. OCAHS continually seeks to bring the foremost procedures to its clients. Core values of the nearly 500 employees are integrity, commitment to excellence, dedicated colleagues, and extraordinary customer experiences.



AMANDA ARKEMA
BIOMEDICAL ENGINEERING
DORDT COLLEGE

PROJECT BACKGROUND

OCAHS would like to become more environmentally sound through evaluation of its current operations and procedures. Focusing on the new facility, several areas were suggested for study. The primary undertaking was recapturing the exhausted heat from the boiler room and extra energy in chiller flow while reducing heat flow to the operation rooms. Other options explored were implementing a comprehensive recycling program and reducing cafeteria waste.

INCENTIVES TO CHANGE

A component of OCAHS' "Commitment to Excellence" is continuous quality improvement. Through implementation of the Reverse Ambient Solar Energy Reclamation RASERS® system, the hospital will reduce natural gas and electricity consumption. Recycling and waste reduction also promote quality improvement by reducing the landfill impact of the hospital. These major changes to the hospital demonstrate its pledge to "be good stewards." Executing these programs will also position the hospital to extend community relations and "do more than expected." Possible awards exist if the hospital is able to meet minimum requirements.

RESULTS

Energy Reclamation

A primary goal in evaluating heat transfers in the boiler room was to reduce heat flow to the operation rooms above the boiler room. This may be accomplished through the application of a radiant barrier to the boiler room ceiling. Two options exist – a paint additive or foil-bubble layer. The paint additive has been recommended due to its ease of application and cost.

After first assessing the feasibility of reclaiming energy from the chiller flow and exhaust air, the RASERS system appears to meet the demands for energy recovery. RASERS is a vapor-compression refrigeration operation that collects low-grade thermal heat and transfers it to a higher-grade usable heat. Two RASERS units will be necessary to meet the current hot water demand. Installation of this system will be minimally invasive to the current arrangement and has the possibility for various expansions. Considering the savings in natural gas and electricity, the RASERS unit will pay for itself in 1½ years.

Recycling

Recycling all non-HIPAA papers, magazines, plastics, and metal cans has the potential to reduce the hospital's waste generation by 35 percent (weight). Another option for reducing waste is sending discarded educational medical magazines to local high schools.



Grille Modification

By increasing the amount of dishes available in the Puddlejumper Grille, along with better disbursement, OCAHS could to reduce its waste by 12 percent. This reduction should pay for the extra dishes in three months. Substituting plastic or biodegradable dinnerware for Styrofoam should further reduce the payback period. In correlation with recycling implementation, changing collection procedures and receptacle locations will further reduce the amount of waste generated.

Memberships

OCAHS has the opportunity to join several organizations that will help to continually improve its environmental operations. Among these organizations are Hospitals for a Healthy Environment (H2E), U.S. EPA, Energy Star, and Waste Wise programs. Paralleling these efforts, forming a Green Team with representatives from each department was recommended to management to address environmental concerns.

Project	Annual Cost Savings	Environmental Results	Status
RADIANT BARRIER	\$230	7,800 kWh	RECOMMENDED
RASERS	\$28,445	551,000 kWh 12,230 THERMS	RECOMMENDED
RECYCLING	\$975	22 TONS DIVERTED FROM LANDFILL	RECOMMENDED
GRILLE MODIFICATION	\$600	6 TONS DIVERTED FROM LANDFILL	RECOMMENDED
MEMBERSHIPS AND GREEN TEAM	N/A	NOT MEASURABLE	RECOMMENDED

Air Pollutants Diverted in Tons

	Total for all sectors
SO2	1.21
CO	0.16
NOX	0.59
VOC	0.08
PM	0.03

Green House Gases Diverted in Tons (CO2 Equivalent)

	Total for all sectors
CO2	227.08
CH4	23.24
N2O	0.13
CFCS	2.79