US Department of Veterans Affairs

VHA Power Watch

Volume 5, Issue 1

November 2013

Recycling Proceeds Fund Pilot Programs for New Technology

LED 2x2 Lensed Troffers in Elevator Lobby

The engineering staff at the Erie VA Medical Center (VAMC) has long understood the labor and resource cost impacts associated with maintaining the existing florescent lighting system that most hospitals and commercial buildings own and operate. Changing lamps and ballasts have become a staple duty of staff electricians and the continuous maintenance is viewed as a necessary evil to keeping up the system. In considering alternatives, Light Emitting Diode (LED) lamps emerged as a promising option. LEDs claim to have a lamp life greater than 50,000 hours, use much less electricity to provide equivalent light output, and produce less heat during operation - therefore reducing the load on the building Heating, Ventilation, and Air Conditioning System (HVAC) system. While the engineering team appreciated the positive claims made by the LED industry, the technology would first need to be tested to confirm that the fixtures could live up to the performance claims, before being fully embraced and funded for upgrade projects. The challenge was to provide local testing and verification.

This challenge was met through collaboration between the station Green Environmental Management Systems (GEMS) manager and the Energy Manager to propose a method for putting station recycling proceeds to use for a sustainable purpose. The result was an on-going station-level pilot study to field test promising new energy conservation technologies. The first focus of the pilot study has been the LED fixtures.

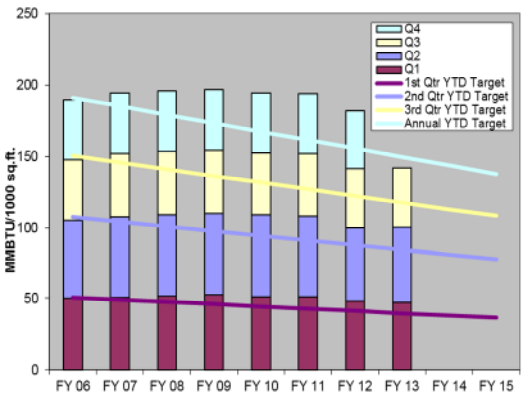
Materials Management and Engineering worked together to establish standards for LED fixtures that met VA Purchasing guidelines, warranty requirements, and best value/low cost limitations. The selected fixtures were purchased, installed, and continuously evaluated by VA staff and patients. The evaluation focused on key metrics, such as: maintainability, lighting efficacy, achieved energy savings, equivalent illuminance and color, reduced hazardous materials (i.e. mercury), cost value, and user acceptance. Direct input from space occupants, service technicians, and management has led to the installation of over 100 new LEDs in select test locations throughout the medical center. Based on average local electricity rates, the cumulative installation is saving approximately $7,000 per year in electricity costs. Of equal interest, the projected annual maintenance savings, from avoided lamp and ballast replacements, are around $3,500. These combined savings result in a simple payback of less than 6 years with a Savings to Investment Ratio (SIR) of 1.5 years.

By means of the pilot study, the energy management program has convinced the engineering maintenance department to locally adopt LED fixtures as the standard replacement model for lighting used in corridors and non-clinical spaces on future station-level repair projects. Working with manufacturer's representatives and staff, the pilot program identified specific LED fixtures that save the most maintenance resources, meet VA photometric requirements, provide the most improved aesthetics, and reduce energy consumption. In working directly with the fixtures, staff has discovered firsthand that the new fixtures are easier to install, clean, and convert to dimmable control. The improved visual appearance of the fixtures has also been well received by patients and staff. Due to overwhelming positive response, more test projects are being planned, as funding from the pilot study and NRM sources becomes available. *See Page 3 for additional pictures of Erie's pilot lighting installations.*

Vital Signs

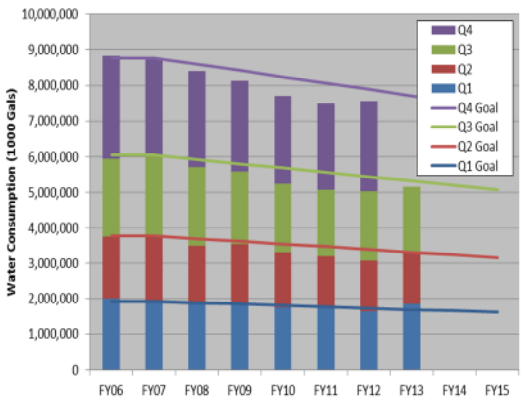
VHA Energy Consumption vs. Energy Goals by FY

(3rd Quarter FY 2013)



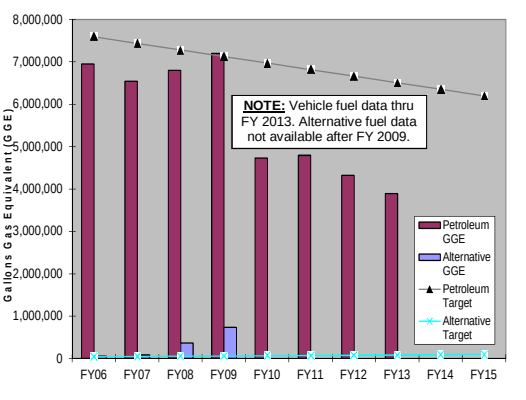
VHA Water Consumption vs. Water Goals by FY

(3rd Quarter FY 2013)



VHA Vehicle Fuel Use vs. Fuel Use Goals by FY

(3rd Quarter FY 2013)



Vital Signs Data Source: OAEM Dashboard

Going Digital Saves at Salt Lake City VAMC

Most of the buildings on the VA Salt Lake City campus utilize mechanical pneumatic thermostats. These units adequately control space temperature, but are unable to support modern energy saving strategies, therefore causing the facility to expend needed capital to pay higher utility bills. Additionally, trouble shooting is problematic and uncomfortable conditions must be reported by the occupants, rather than the maintenance team receiving an alarm – identifying both the location and failure.

Control panel wiring linking the new thermostats back to the existing Building Automation System

For years the Salt Lake City VAMC wanted to upgrade to Direct Digital Control (DDC) thermostats and controllers, however, the high cost of direct conversion could not be justified. Not only does this approach include changing out the thermostats, it also requires new dampers, controllers and actuators. Further complicating the project, the areas approved for system improvement must be vacant during execution of the work – increasing the overall cost of conversion.

Given the constraints, a new *non-invasive* technology called the Wireless Pneumatic Thermostat was evaluated and a pilot system installed in 25,000 square feet in an administrative/ clinical area. Each thermostat took 15 minutes to replace with little disruption to the occupants and easily integrated into the existing energy monitoring and control system (EMCS). With cost savings of 25%, the ease of installation, and the wireless connection to the existing EMCS, the project promised improved comfort, better maintenance, and reduced energy use.

Wireless thermostat that has been installed throughout the Salt Lake City VAMC

As a result, the facility now monitors and controls these zones similar to a DDC system, enjoying improved occupant satisfaction and energy reduction. Since completion, control strategies, such as occupancy schedules to reduce thermal and fan loads when spaces are unoccupied, have resulted in approximately 10% reduction in energy use. Further energy savings are expected as additional strategies are programmed into the system. The facility now has the capability to actually see the temperatures in every room with a new wireless thermostat, allowing maintenance to remotely troubleshoot and make adjustments to control the space temperature. The Wireless Pneumatic Thermostat from Cypress Envirosystems definitely provided a cost-effective solution to a difficult and lingering problem at the Salt Lake City VAMC.

Utility Bill Audits Lead to Big Savings at Miami VAMC

Mr. Robert Fasco, who initiated the rate structure change and Mr. Bob Sloan (seated) who monitors the system to ensure demand is kept low while maintaining a high load factor.

In preparation for project development for FY14, engineering staff at the Miami VA Healthcare System noticed that the cost for power on a kilowatt hour (kwh) basis dropped from nearly 10 cents per kwh in 2008 to 7 cents per kwh in 2012. There had to be a cause, so the energy manager met with the utility company and discovered that the power company reduced energy costs by passing on electricity generation cost savings, due to falling natural gas prices.

However, the fuel cost decrease could not fully account for the cost savings; so engineering staff produced a detailed cost analysis for every month from the beginning of 2008 to the end of 2012. This analysis involved demand power, kilowatt hours used, time of use, maximum power demand, and cost per kwh. Analytical graphs of each variable along with load factors indeed depicted a gradual decrease in the facilities cost per kwh.

Energy Manager, Earl Morrison, performed the engineering analysis to quantify annual savings from the rate structure change.

It turns out, 4 years ago, during negotiations with the utility to obtain a credit for a Government owned transformer ($1,720/month), the facility switched rate structures, from a demand charge to a high load factor time of use tariff. The new rate structure proved beneficial, because the hospital operated 24/7 with a steadily improving load factor and a steadily decreasing demand. However, at the time, it was not fully apparent the new rate structure would result in a smaller electric bill.

After long negotiations with the local utility and detailed presentations to senior management, the rate structure was changed. After a period of time, the expected reductions in cost did materialize. Operations staff trained to monitor the electrical system, avoided spikes in demand, thus maximizing the new rate structure.

By using a simple comparison of the rate structure used four years ago with current billing factors for the present bill, the Miami VA Healthcare System Engineering Service revealed $17,000 per month in reduced costs, amounting to $200,000 per year. Monthly bills vary seasonally from $250,000 to $400,000.

Auditing, graphing and analyzing utility bills in detail can ensure each VA hospital is utilizing the best possible rate structure available to them, potentially saving significant utility costs. Reducing consumption may not be the only way to save from utility budgets.

Recent Changes to VA's Energy Design Standards

VA's Office of Facilities Planning, in the Office of Construction & Facilities Management (CFM), develops and maintains standards for VA design and construction projects. Those standards apply to all types of work on VA facilities – including construction, renovation, repair, and maintenance. The following changes to VA's standards may be of particular interest to Energy Managers:

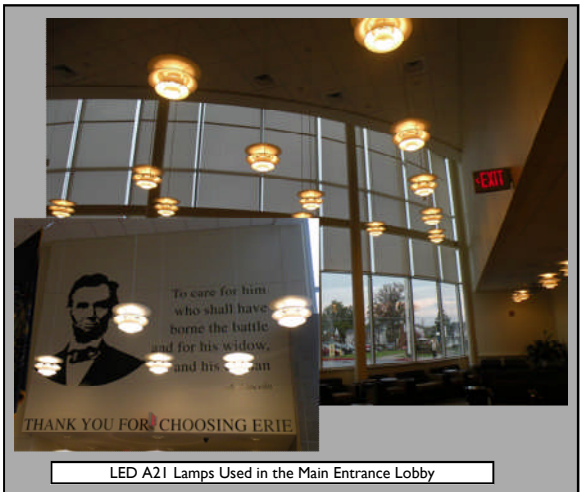
Standards Alert 005 – Renewable Energy Requirements (Jan 2013). This document established minimum requirements for renewable energy in Major new construction and renovation projects. In addition to requiring 30% of hot water be provided by solar hot water technologies, if lifecycle cost effective, VA now also requires all Major new construction and renovation projects install equipment capable of providing a minimum of 7.5% renewable electrical energy, if feasible and practicable.

Standards Alert 006 – Energy Efficient Design of Major Renovations (Aug 2013). This Standards Alert increases the energy efficiency requirement for Major renovations. The previous requirement of "20% better than the 2003 baseline" is now "30% better than ASHRAE 90.1-2007." This change will align Major renovation requirements with those of Major new construction projects and will better help VA meet its overall energy reduction goals.

Standards Alert 007 – Lifecycle Cost-Effective Renewable Energy (Aug 2013). This Standards Alert, developed based on May 2013 guidance from VA's Office of Asset Enterprise Management (OAEM), updates renewable energy guidance to clarify that all renewable energy systems must be lifecycle cost-effective. This requirement applies to all types of projects involving renewable energy equipment.

CFM's Technical Information Library is VA's source for all design and construction standards

VA standards published on CFM's Technical Information Library (TIL) are for all Major, Minor, and NRM projects. The standards apply to both new construction and renovation work. All standards directly related to sustainable design and energy efficiency can be found on the Sustainable Design webpage of the TIL.



LED A21 Lamps Used in the Main Entrance Lobby


2x2 LED Lensed Troffer Lights in the Pharmacy Counseling area

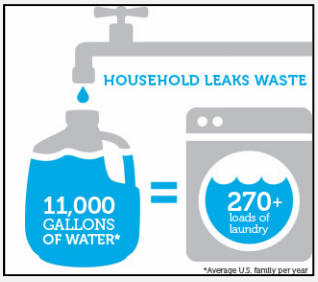
LED Par Lights used to highlight the Art Wall in Respiratory Therapy

Have Some Common Water Sense

Did you know only 1% of the earth's water is available for people's everyday use? Though 75% of the earth's surface is covered by water, most of it is salt water, locked in inaccessible locations underground or frozen in glaciers.

Though it may seem hard to believe, the average person uses 100 gallons of water per day—that's enough to fill 1600 drinking glasses. This water use can easily be cut by as much as 30% by taking a few simple steps:

- The average water faucet flows at a rate of 2 gallons per minute. By simply turning off your faucet while brushing your teeth in the morning and at night, you can save more than 100 gallons per person each month.
- Taking a 5 minute shower used 10-25 gallons of water, while a full tub requires about 70 gallons. If you do take a bath, stopper the drain immediately and adjust the temperature as you fill the tub.
- A leaky toilet can waste about 200 gallons of water every day. To tell if your toilet is leaking, place drop of food coloring in the tank; if the color shows in the bowl without flushing, you have a leak.



- If your toilet is from 1992 or earlier, you probably have an inefficient model that uses between 3.5 to 7 gallons per flush. New, high efficiency models use less than 1.3 gallons per flush, that's 60% to 80% less water than their less efficient counterparts.

US Environmental Protection Agency, Water Sense Program

Energy Word Search

Solve puzzle with words found in newsletter articles!

D	R	I	N	K	I	N	G	G	L	A	S	S	E	S	W	H
A	S	H	W	V	U	L	E	Y	D	R	E	W	T	I	H	N
V	E	R	L	O	A	D	F	A	C	T	O	R	H	E	Y	V
R	E	C	Y	C	L	I	N	G	P	R	O	C	E	E	D	S
F	O	N	I	C	A	A	R	P	R	V	N	T	R	L	L	E
A	L	X	I	B	E	N	M	E	T	M	L	E	M	Y	E	K
U	E	O	L	N	L	Y	M	R	I	K	A	E	A	R	A	A
C	N	D	R	Y	F	A	L	F	M	I	F	J	L	M	K	A
E	D	T	M	E	T	O	A	O	N	I	A	D	O	Y	Y	B
T	E	R	I	A	S	D	R	R	J	E	N	A	N	R	T	N
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E	A	Z	M	O	E	Y	E	A	A	P	A	M	R	L	I	J
O	N	H	I	N	A	A	R	N	O	T	N	J	A	A	L	C
K	D	I	E	J	E	N	N	C	T	J	I	A	C	I	E	I
A	B	B	W	I	R	E	L	E	S	S	Y	O	L	R	T	Y
E	N	E	R	G	Y	D	E	S	I	G	N	L	N	E	N	A

1. The ____ lighting system at the Erie VAMC requires continuous maintenance.

2. Page 3 provides an overview of recent changes to VA's ____ ____ Standards.

3. The average person uses enough water to fill 1600 ____ ____ per day.

4. Salt Lake City installed ____ Pneumatic Thermostats.

5. Control Strategies such as occupancy schedules reduce ____ and ____ loads.

6. VA Standards are published on CFM's Technical ____ Library.

7.Utility bill audits led to large savings at the ____ VAMC.

8. A ____ ____ can waste about 200 gallons of water per day.

9. LED lights were tested in Erie to be sure they could live up to the ____ claims.

10. Standards published on CFM's TIL are for all ____, ____, and ___ projects

11. The average water ____ flows at a rate of 2 gallons per minute.

12. Miami switched rate structures from a ____ charge to high ____ ____ tariff.

13. Erie used ____ ____ to fund the LED pilot study.

Provided By:
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