

"Make Energy a Consideration in All We Do"

ENERGY express

The Air Force Facility Energy Center Newsletter

March/April 2011

CEMIRT Partners with Facility Energy Center to Cool Down Energy Costs

John Burt
HQ AFCESA/CEBH

Temperatures are warming in many parts of the U.S. and hot summer days are not far behind. As the mercury rises, so can facility electricity consumption and costs. The Air Force Facility Energy Center is working with the Civil Engineer Maintenance, Inspection, and Repair Team to improve the efficiency of heating, ventilating, and air-conditioning systems at various bases and facilities. This HVAC recommissioning program, funded by AFFEC, is a tool to help rein in runaway energy costs due to HVAC systems with out-dated, inefficient or inoperable components. Occupants in recommissioned buildings also enjoy better air quality and improved comfort.

AFFEC provides CEMIRT a list of bases with HVAC systems to recommission. The list is prioritized by facility size to maximize the overall energy reduction and return on investment. The average structure size that a single CEMIRT technician usually services is 120K square feet but Air Force buildings can be as large as 500K square feet or more requiring as many as three CEMIRT team members. Through this process, CEMIRT technicians thoroughly examine and test each HVAC element to locate points in the system where the HVAC system's efficiency is compromised. The recommissioning teams then provide the base civil engineer, energy manager

and the AFFEC a detailed trip report outlining not only their findings, but also their response and recommended plans of action. The reports submitted thus far tell a compelling story about the poor condition of much of the HVAC equipment in use at many Air Force facilities. Robert Gingell, CEMIRT

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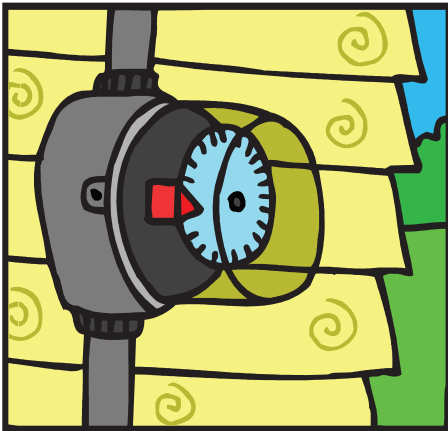


Mr. David Kapoi uses an Air Data Meter with a VelGrid attachment to read velocity pressure discharged from the supply air grille.
(photo by Mr. Eddie Green)

The 61st Civil Engineer Squadron has solar panels installed above a parking lot to augment use of electrical power at Los Angeles AFB, Calif., Space and Missiles Systems Center. (photo by Mr. Lou Hernandez)



AF Makes Progress with Meters



Mr. Mike Ringenberg
AFCESA/CENE

The Department of Defense requires that all Air Force bases install meters to measure electric, gas, water, and steam by October 2012 and collect data daily. The Air Force has spent \$90M and has installed 71 percent of required meters. With equipment installation nearly complete, the next hurdle is to acquire a standardized software platform and approved communications. The Air Force Facility Energy Center (AFFEC), part of the Air Force Civil Engineer Support Agency (AFCESA), Tyndall Air Force Base, Fla., is working with Headquarters Air Force Information Technology Branch (A7CRT) on acquisition of Advanced Meter Reading (AMR) software and IT hardware to standardize data collection using as much existing infrastructure as possible. "We know that our major commands have been clamoring for an enterprise solution, and we are beginning to see that solution materialize," said AFFEC Conservation Branch Chief Ken Walters.

Meter data is valueless if it is not collected and shared on an AMR system for analysis and reporting. Meter data is currently collected in three ways: 1) through an Energy Management Control System (EMCS) that communicates on the base's Local Area Network; 2) via a wireless communication system to a dedicated AMR front end; and 3) by manually reading the meter. While the Air Force has invested a significant amount of funding in both the wireless

and existing EMCS for energy data collection, 27 percent of large Air Force bases cannot transmit meter data and must read it manually.

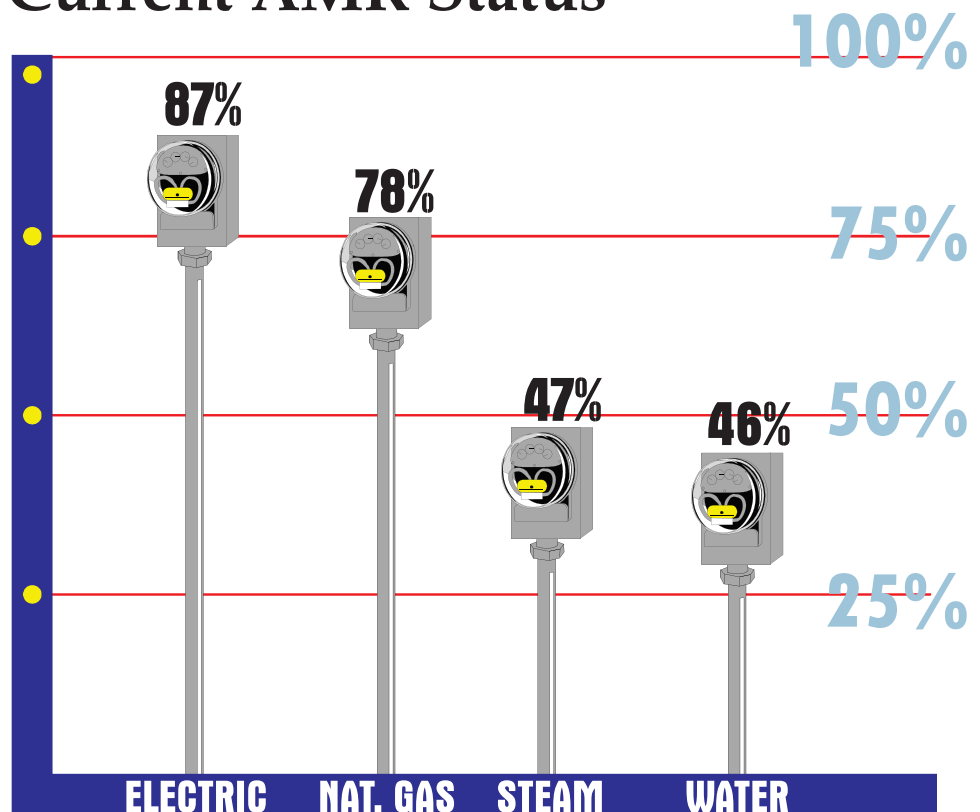
AFCESA is pushing to award a contract in 2011 that would include AMR front-end (software and IT hardware), training, support, as well as standardized wireless communication equipment for bases that have not yet deployed meter communication systems. "Wireless communications for AMR is the preferred method for data collection, however EMCS is acceptable if compliant with Engineering Technical Letter 9-11," said Mr. Walters. The standardized platform



Vandenberg AFB Energy Manager Bradley King and Resource Efficiency Manager Scott Bly troubleshoot a communications relay for the base-wide automated meter system. There are more than 400 meters in operation across 99K acres. (Courtesy photo)

will also provide a benchmarking tool required by the Energy Independence and Security Act of 2007, as well as support measurement and verification and mock billing for awareness purposes.

Current AMR Status*



*Based on the Annual Energy Management Report to Congress.

2010 Energy Audit Results

Mr. Ken Walters
AFCEA/CENE
Mr. Bill Proffitt
AFCEA/CENI

The Energy Independence and Security Act of 2007 (EISA07) requires comprehensive energy and water evaluations (audits) for a majority of federal facilities. The Air Force is complying with this requirement by performing audits at all major installations on a four-year cycle. Currently, each installation-level audit covers 75 percent of the installation's square footage with the presumption that the "highest energy consumers" are included in the audited building list. Of course, the Air Force does not audit any facilities where the utility costs are not paid for by the Air Force (i.e. tenants on Air Force installations).

The specific list of buildings audited at each installation is determined by the base civil engineer and submitted to the major command. Typically, these buildings (AFCEA is beginning to use the term "covered buildings") will not only receive audits; they should be metered and considered for benchmarking and re-commissioning



A thermal imaging camera is used during an audit to identify building envelope problems and faulty HVAC and boiler system components. (photo by Jennifer Elmore)

as required under EISA07, section 432. In order to ensure a systematic and standardized process, AFCEA manages the audit program with priority given to installations that will have the most impact on achieving Air Force energy goals. MAJCOMs and bases then identify which buildings at those bases have the largest energy-savings potential.

In 2010, six engineering firms audited 84M square feet at 40 Air Force locations. The results of the audits were impressive. There were approximately 2K buildings visited by the engineers who identified 15K energy and water conservation opportunities. If the Air Force could implement all these improvements we would save over six billion BTUs annually. Among all the conservation opportunities identified, 365 projects were created, for an investment of \$175M for energy and \$10M for water. The total project energy savings of more than two billion BTUs and 340M gallons saved annually if funded and implemented.

This year (FY11) a similarly large but more extensive audit program is underway. The year's program includes space optimization, facility condition, and high performance sustainable building assessments. This change to the program is designed to leverage civil engineering dollars and increase efficiency.

Engineers at AFCEA's Air Force Facility Energy Center appreciate your continued support as the Air Force strives to meet congressional and executive order energy and water conservation goals for our installations.

Revision to AFI 32-1061, Providing Utilities to US Air Force Installations

Good news for energy managers and utility engineers at MAJCOMs and installations. The Air Force Departmental Publishing Office has published the revision to AFI 32-1061, Providing Utilities to U.S. Air Force installations, to the e-publishing website. This instruction pertains to managing, supplying, purchasing, and selling utility services on Air Force installations and applies to the Air Force, Air National Guard, and Air Force Reserve Command.

The revision updates energy policy and guidance that have changed since the March 2002 edition. It also improves rate calculation formulas, reimbursable customer determinations, figures, tables, and accounting codes. If you have questions or need additional

information, please contact the AFCEA POC, Mr. Frederick Cade at DSN 523-6463, commercially at (850) 283-6463 or at frederick.cade@tyndall.af.mil.



WE WANT YOU



Does your base or major command have a website dedicated to energy news and tips? We'd like to know about it. Do you have a great story idea for the next Energy Express? Do you have energy or water conservation pictures you'd like to share?

We want to hear from you. Please contact Jennifer Elmore and/or Christine Walker, AFCEA/CEBH.

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EMCS Analyst Pilot Program a Success

Mr. Francis Sheridan
673 CES/CEAOE

In FY07, the Elmendorf AFB Energy Team, now the Joint Base Elmendorf-Richardson (JBER) Energy team, set out to see if the base Energy Management Control System (EMCS) could be operated in such a way as to further increase energy savings. After many discussions with the CE HVAC shop, and



Ms. Kristan Meyers, a contractor and the EMCS Analyst at Joint Base Elmendorf-Richardson, Alaska, discusses EMCS programming changes with Facility Manager John Sanchez. (photo by Steve White)

the PACAF energy team, PACAF agreed to provide one year of funding for a new, contracted position at JBER called the "EMCS analyst." (This term was chosen

to differentiate the position from "EMCS Operator," a long-held government position within the HVAC shop.) The new full-time employee would use the EMCS to concentrate solely on energy savings. This contrasted with the HVAC shop's use of the EMCS, which encompassed somewhat competing goals such as HVAC troubleshooting, diagnostics, efficient dispatch, and emergency shutdown – mostly traditional HVAC shop duties.

The EMCS analyst started work in each facility by establishing a strong working relationship with the facility managers and reinforcing these key points:

- The Air Force expects all JBER employees to save energy.
- The EMCS offers a path to significant energy savings in every building.
- The goal of the EMCS analyst is to promote and never hinder the mission.

The vast majority of facility managers quickly joined the effort. Only after these relationships were initiated did the EMCS analyst begin to change the HVAC operation of their facilities.

In the first year of the program (FY10), the EMCS analyst achieved significant savings in 45 buildings by reducing HVAC

energy consumption during unoccupied periods. Reductions in natural gas usage alone produced savings of more than \$250K in 45 facilities, which translates to an average natural gas decrease of more than 18 percent per building.

The program paid for itself in less than one year. JBER has not claimed any credit for electrical savings stemming from reductions in run times for the HVAC electrical components. At this early point, JBER estimates the electrical dollar savings to be an additional 40 percent or \$100K. In the future through use of its new AMR meters, data loggers, and EMCS enhancements, JBER will be able to better measure and verify the electrical savings component of this program.

After reviewing program results in late FY10, JBER commanders decided these activities merit local financial support, and plan to fund the program through the end of FY11 then re-evaluate.

For more information, please contact base REM Francis Sheridan at DSN 317-552-4183, Comm 907-552-4183, or francis.sheridan.ctr@elmendorf.af.mil.

AFSPC's Multi-Year Lighting Study Benefits Entire Air Force

Mr. Fox Theriault
AFSPC/A7O

Air Force Space Command is working on a strategic sourcing opportunity using light emitting diode (LED) high efficiency lighting. A cross-organizational team made up of AFCESA/CEO, AFSPC/A7O, A7K, A7Z, FM, JA, and engineers from Vandenberg and Patrick Air Force bases met 20-21 January to work on LED investment opportunities following the Air Force Strategic Sourcing model. The team plans to define the requirements, and complete a market intelligence/analysis review and a business case analysis.



AFSPC's three-year test of LED fixtures helped AFCESA develop Air Force LED fixture specifications and application criteria outlining where LEDs are permitted to be used. AFCESA subject matter experts have determined using LED technology for street and parking

lot lighting has benefits. AFSPC has identified approximately 9,400 outdoor roadway and parking lot light fixtures that could be replaced with LEDs.

The team's key goals are to reduce energy consumption of exterior lighting by 50 percent, achieve a 5-year return on investment, improve lighting efficacy, purchase high quality LED fixtures using Air Force developed criteria, award 50 percent of construction projects to small businesses, and standardize street and parking lot lighting across AFSPC. POC: Mr. Wayne "FOX" Theriault, AFSPC Energy Analyst, DSN 692-5438.

Join the Air Force Energy Leaders!

INITIAL NOMINATION SUMMARIES DUE
April 8, 2011

FINAL NOMINATIONS DUE
April 29, 2011

AWARD CATEGORIES:
Project
Program
Exceptional Service
Contracting

Submit your nominations to compete for national recognition by the U.S. Department of Energy (DoE) Federal Energy Management Program (FEMP) for outstanding efforts supporting energy and water conservation.



Hickam AFB
reduced utility costs with a hydrogen refueling station and over 800 solar panels

Minot AFB
crushed AF energy and water intensity goals

Kadena AB
saved millions of gallons of water in FY 2009

The Federal Energy Management Program (FEMP) has issued its annual call for nominations for the 2011 Federal Energy and Water Management Awards. AFCESA is implementing a two-step submittal process in an attempt to reduce the burden on bases/MAJCOMs, increase the number of candidates, and streamline the process.

Initial nomination summaries are due by 8 April.

Submit via the FEMPCentral awards web page: www.fempcentral.com/awards. AFCESA will select the top 15 nominees to submit full narratives. These will be due 29 April.

Projects BIG and small move Air Force closer to energy goals

Jennifer Elmore
AFCESA/CEBH

The Air Force makes news for months each time it enters into an agreement with private industry to build large renewable energy projects. A deal with Arizona Public Service Company to build a 17MW solar array at Luke AFB, Ariz., led to headlines like "Luke Air Force Base Gets Colossal Solar Power Installation and 550 Green Jobs, Too." While the big projects grab national attention, they're not feasible at all installations. "Smaller renewable energy projects, along with awareness efforts and conservation initiatives are just as important," said MSgt Russ Fowler, Luke Energy Manager.

Renewable Energy

Luke AFB receives approximately 325 days of sunshine a year. "We're getting proposals to add solar roof technology on top of the commissary, mission support group headquarters building, the clinic and the fitness center," said MSgt Fowler. "We're checking with local vendors as well as UNICOR, the local prison system which is part of the Federal Bureau of Prisons. The prisoners manufacture solar panels and use contractors to install them." The plan is to

retrofit all four buildings to generate up to 2MW total. Luke AFB already boasts a 325kw building integrated photovoltaic system on the base exchange building, which was installed in 2006.

Energy Awareness

Luke's energy team is planning the base's first-ever energy fair set for April 21st. Rather than wait until October for Energy Awareness Month, the event is being coordinated around Earth Day events in April.

"April is when we really start to see a significant increase in Luke's electricity consumption, so that's when we want to really get people thinking about energy conservation," said MSgt Fowler. "We typically have mild winters. Since our largest utility bill by far is electrical, it makes sense to promote energy awareness the most in April."

Local electric provider APS and natural gas provider Southwest Gas will be on hand to distribute conservation tips and information about their rebate programs. More than two dozen vendors, including companies who install tankless water heaters and residential solar panels, have signed up to participate.



Conservation

The Luke energy team has plans to turn off hot water heaters in approximately 50 buildings this summer. "The groundwater heats up quite a bit during the summer so our water supply is naturally warm," said MSgt Fowler. "We plan to save some energy by turning off gas and electric water heaters that don't supply showers." The team is also developing a de-lamping plan. "We're also incorporating de-lamping in our building audit program using S-files and measurement tools to identify offices where we can remove bulbs that supply excess light," said MSgt Fowler. "We estimate we can remove 25 percent of the bulbs on base without any negative impact to the workspace."

CEMIRT Partners with Facility Energy Center...

STORY CONTINUED FROM PAGE 1

chief, says, "From the trip reports you can see that HVAC systems throughout the Air Force are in need of repair and commissioning. The base technicians just don't have the time to do all of the necessary work. Consequently, there is a huge opportunity for CEMIRT to go out there and make these repairs and commissionings so that the HVAC systems work as designed and the bases save energy."



HVAC Equipment Specialist David Kapoi prepares to use a strobe scope to measure the fan motor speed on a condenser unit. (photo by Mr. Eddie Green)

The program's main challenge according to Mr. Gingell is meeting the recommissioning demand with the current five-member team. Finding new personnel with the proper qualifications who are willing to endure the stringent travel schedule is difficult. With each HVAC recommissioning taking up to five weeks, technicians can be gone up to 270 days per year.

Mr. Frank Burrier, assistant manager of CEMIRT's operations at Tyndall AFB, Fla., is proud of the program's progress at the mid-point of the annual contract and

says CEMIRT is well ahead of schedule to recommission more than 30 facilities this year. "I would say that every facility we complete is a success story," Mr. Burrier said, "So far we've evaluated 20 facilities at 10 bases totaling 1.25 million square feet."

Although the work to reduce facility energy consumption presses forward, Mr. Gingell believes this program could benefit from additional improvements. He would like to see the scope of the initiative expanded to allow CEMIRT teams to perform minor HVAC repairs on the spot. "The thought is that if we changed this business model and provide the team the time and funding to make minor repairs, that when they leave, the Air Force will have a better operating system right then and there," said Mr.

Gingell. "The issue is how do you get that initiative channeled up to the right level so that you get the approval to go and do the good things that need to get done? Fortunately we're working with Mr. Rick Stacey (AFEC Chief) to help make that happen."

Both the Civil Engineer Maintenance, Inspection and Repair Team and the Air Force Facility Energy Center are divisions of the Air Force Civil Engineer Support Agency, headquartered at Tyndall AFB, Fla.

Renewable Energy RFIs Now Online

AFCEA has begun the process of posting Requests for Information on the FedBizOps website (www.fbo.gov) to gain industry ideas and inputs on the Air Force Renewable Energy program. The RFIs come as an outcome of the Air Force's first-ever Renewable Energy Industry Day held December 8th in Dallas.



F.E. Warren AFB, Wyo., and several other installations, use large wind turbines to generate power. Now the Air Force is interested in learning about proven small scale wind generation (under 500kw).

In February, AFCEA posted an RFI for small wind (<500 KW) and distributed generation with responses requested by the end of March. The newest RFI targets potential geothermal resources at a small number of bases. Responses are due 29 April.

"We will follow with additional RFIs every several weeks to address additional technology areas and space out the effort for (industry) participation and our reviews," said Mr. Ken Gray, AFEC Rates and Renewables Branch Chief.



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