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D I G E S T

Volume XX, No.5,
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Chuck Andraka of Sandia National Laboratories is dwarfed by the dish/Stirling at Fort Huachuca, Ariz. Photo by Rich Diver, Sandia National Laboratories. Page 14

U.S. ARMY INSTALLATION MANAGEMENT COMMAND

IMIGOM



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USACE supports Army enterprise energy transformation

by Maj. Gen. Merdith W. B. (Bo) Temple

The importance of energy conservation and efficiencies within the Army has escalated. The shortage, dependency on and high costs of petroleum-based products together with other market conditions could adversely impact our nation's security. Technological and resource challenges are among several issues we face in implementing the *Army Energy Strategy for Installations and Campaign Plan*. The Army's newly formed Senior Energy Council will direct the enterprise energy transformation initiatives that will address how the Army intends to deal with these challenges. The U.S. Army Corps of Engineers has always supported Army energy reduction goals and is poised to support new initiatives in accordance with SEC guidance.

In February, the Defense Science Board published *More Fight – Less Fuel*, a report that is critical of the Department of Defense's management of its energy supply and consumption activities with regard to national security. In March, the Government Accountability Office published a similar report.

In response to these reports, Secretary of the Army Pete Geren issued a memorandum Apr. 15 calling for the creation of the



Maj. Gen. Merdith W. B. (Bo) Temple
Photo by F.T. Eyre

Army Energy Security Task Force with the objective of developing recommendations to address the following Army Enterprise Energy Strategic Goals:

- Create a culture of energy accountability across the Army.
- Reduce Army energy consumption and increase efficiency to enhance operational capabilities.
- Increase the use of new sources of alternative energy; establish appropriate levels for energy security and independence.
- Establish benchmarks the Army's environmental/energy footprint.
- Champion investment strategies supporting Army energy programs.

USACE will continue partnering with the Army secretariat, Department of the Army staffs, commands, installations, and the public and private sectors to successfully achieve the new Army Strategic Energy Goals and fully develop a responsive Army Enterprise Energy Strategy.

Several USACE programs are positioned to support these goals with unique capabilities that have helped Army installations achieve real and significant energy savings. Support ranges from assistance in the development of policy at the Headquarters, Department of the Army level to Military Construction, real estate, technical support, energy-related research and development, and central management of various energy programs for our many installation customers.

Military Construction

MILCON Transformation: The Corps has implemented applicable Energy Policy Act of 2005 guidance in its fiscal year 2007 construction programs and is committed in accordance with the MILCON Transformation process to save 15 percent in cost and 30 percent in time while delivering safe, quality projects. The EAct requires improvements in metering, products, motors, equipment and design, and a reduction by 30 percent of energy consumption in all new construction starting in FY 2007. For example, metering of Reserve centers at Fort Benning has realized about 5 percent energy cost savings in those facilities alone.

Our Engineering and Construction Directorate assisted in the incorporation of EAct and Executive Order 13423 into paragraph 2 of the Unified Facilities Criteria 3-400-01, *Energy Conservation*. These requirements include: the design of new buildings to use 30 percent less energy than a baseline building per American Society of Heating, Refrigerating and Air-Conditioning Engineers 90.1; the purchase of Energy Star and Federal Emergency Management Program equipment and premium motors; the installation of metering on all utilities; and that new construction and major renovation of agency buildings comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, which requires 30 percent minimum.

The requirements of the Energy Independence and Security Act of 2007 will be included in the UFC after the Department of Energy and the Office of the Secretary of Defense issue their implementation guidance. Meanwhile, USACE will continue to incorporate all the above guidelines into new construction.

Energy Conservation Investment Program: USACE constructs energy projects under ECIP. The Army programmed 15 projects for FY 2008 at a cost of \$23.5 million, of which six projects totaling \$10.9 million are for renewable energy and

Acronyms and Abbreviations

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
CERL	Construction Engineer Research Laboratory
CUP	Commercial Utilities Program
DA	Department of Army
EEAP	Energy Engineering Analysis Program
ECIP	Energy Conservation Investment Program
EISA	Energy Independence and Security Act
EAct	Energy Policy Act of 2005
ESPC	Energy Savings Performance Contract
FY	fiscal year
LEED	Leadership in Energy and Environmental Design
MILCON	Military Construction
REM	resource efficiency managers
SEC	Senior Energy Council
UFC	Unified Facilities Code
USACE	U.S. Army Corps of Engineers



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one \$408,000 project is for water conservation. The remaining nine projects included traditional retrofit application projects. For FY 2009, the Army programmed 15 projects at a cost of \$26.8 million, of which 14 projects totaling \$23.9 million are renewable-energy related.

Sustainable design and development:

All newly built climate-controlled vertical facilities, irrespective of funding source, are required to achieve a Silver level in the Leadership in Energy and Environmental Design rating system. USACE, in coordination with the Office of the Assistant Chief of Staff for Installation Management, the Installation Management Command and Department of Army staffs, developed guidance on meeting this requirement and began implementation in FY 2007.

Starting with FY 2009, programming documents will permit 2 percent premiums to support EAct and sustainable design and development, which will provide funding to meet the Silver rating. Experience will tell us whether 2 percent is about right to meet this requirement.

To better prepare employees to support Army Energy initiatives, USACE plans a day-long training course for our Centers of Standardization and Military Programs districts during FY 2009. In addition, USACE centrally procured several spaces of a U.S. Green Building Council web-based course to enhance our energy-related experience.

The EISA requires DA to formally certify 5 percent of the facilities to LEED Silver certification by an independent agency. In our case, the independent agency will be the U.S. Green Building Council. USACE has contacted the Office of the Assistant Chief of Staff for Installation Management, Facilities Directorate, to start working the details to implement this requirement in FY 2010.

Energy Savings Performance Contracting

With Energy Saving Performance Contracting, contractors provide the financing

and perform energy-related infrastructure improvements. The government repays them from the resultant energy cost savings over a period of up to 25 years. Our Huntsville Engineering and Support Center provides project management, contracting and technical support to the ESPC Program.

Our energy contractors have invested more than \$418 million in 70 energy-related infrastructure projects at 30 Army installations. During FYs 2008 and 2009, we project a total contractor investment of about \$193.9 million, of which \$58.4 million is for renewable energy-related projects. In return, in both cases, the Army gets newer, more efficient energy-related infrastructure without requesting appropriated funds.

With the emphasis that the Army Enterprise Energy Strategy will bring, we expect this program to be one of the major tools to be used for renewable energy and other energy-conservation measures in the future.

Energy Engineering Analysis Program

Huntsville Center also provides EEAP support. The EEAP analyzes energy use at installations and provides options for reducing energy consumption.

Working with the Construction Engineering Research Lab and other partners, Huntsville Center completed 15 surveys this year. Of the reports completed to date, 1,396 energy conservation measures have been identified with annual savings of \$70.2 million (if fully implemented).

Army Metering Implementation Program

During FY 2007, specifications were developed for the implementation of advanced metering equipment. Huntsville Center personnel met with installation energy managers to establish the minimum functional requirements of the meter data management system, and extensive market research was performed on industry advanced metering offerings.

The FY 2008 funding of \$22.6 million includes the completion of meter surveys at

31 installations, installing advanced meters for electricity and natural gas at 15 major installations within the continental United States, with another 11 pending award. Huntsville Center also plans to award a centralized Army meter data-management system software and support contract (subject to possible FY 2009 funding of \$11 million to \$22 million).

Resource efficiency managers

The Huntsville Center contracts for and oversees REMs. REMs increase the effectiveness of installations' energy programs by reducing energy and water costs through the development of more cost-effective programs and practices.

The program is designed to be self-sustaining in that the savings generated offset the costs. Huntsville has worked with DA stakeholders to develop contract requirements for a nationwide REM indefinite-delivery indefinite-quantity contract expected to be awarded in FY 2009.

Commercial Utilities Program

The USACE Installation Support Branch continues working on the revitalization of the chief of engineers' Army staff CUP functions. Among the current projects are:

- Army Regulation 420-41, *Acquisition and Sale of Utilities Services* rewrite;
- *Army Utilities Acquisition and Sales Handbook* development;
- CUP Oversight/Management web application development;
- web-based utilities contracting course development;
- utility rate intervention study;
- strategy for the acquisition of renewable electricity development; and
- utility rate development guidelines;

Huntsville Center executes the CUP. It is responsible for utilities acquisition and sales contract approval, providing utilities contracting technical and legal support, managing and providing technical support on utility rate intervention efforts and assisting installations in performing utility rate surveys.

In a joint effort with the U.S. Army ➤



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Regulatory Law and Intellectual Property Office, the CUP ensures that the costs of utility services remain fair and reasonable for Army installations. Since 1999, this program's utility rate intervention has achieved more than \$88.6 million in cost savings and cost avoidance for the Army.

In support of and funded by the Installation Management Command, Huntsville Center performs installation utility and assessment surveys to identify billing errors, most advantageous rates and energy conservation measures. To date, Huntsville Center has identified \$17.2 million in savings and cost avoidances, resulting primarily from installations switching to the correct tariff schedules, taking advantage of demand-side management actions and installation of energy-management control systems

Research and development

CERL's Energy Branch provides full-service power and energy strategy support plus research, development and field engineering for power delivery and distribution, energy storage and demand-side energy-efficiency expertise. CERL has testing facilities for heating, ventilation and air conditioning, fuel cell, and thermal energy storage and efficiency systems.

CERL has provided energy performance benchmarks for MILCON Transformation projects to ensure that our facilities meet

or exceed the standard set by the EPA. The lab also actively supports installation building automation, master planning and renewable energy systems.

All of these services are available to installations on a funded reimbursable basis.

Water conservation

USACE assists with the *Army Water Conservation Plan* in several areas. Metering is critical to monitoring the impact of attempted improvements. All new military projects are provided with water meters. Faucets, flush valves, showerheads, toilets and urinals in new projects are the low-flow type. Waterless urinals are used at appropriate locations, in accordance with Army standards.

Huntsville Center has assisted various installations with ESPC projects to install low-consumption water valve fixtures. In addition, USACE is part of a DoD ad hoc committee to develop the necessary knowledge, subject matter experts and training to address water conservation goals.

Energy-related real estate and environmental designs

USACE also provides real estate and environmental support to energy-related initiatives. Baltimore District is responsible for energy-related enhanced-used leasing through which the Army leases unutilized land and/or facilities to private or public

entities in exchange for cash or in-kind consideration, such as energy-related services and products.

Norfolk District provides support on the Residential Communities Initiative Program, including utility reimbursement issues. Our districts also supply real estate support on Army utility privatization initiatives.

Conclusion

USACE will actively support the SEC initiatives, continue monitoring renewable energy and emerging strategic issues, and incorporate EISA requirements into the UFC 3-400-01 as we move forward with our DA partners and stakeholders in meeting DA's energy goals.

Meeting the Army energy and water resources conservation and management requirements is a great challenge. However, the Army, including USACE, is up to the task. USACE has assembled a team of project managers, engineers, architects, real estate, and environmental and research experts to help lead the way towards energy independence. This is a worthy goal and one that is critical to our installations' and to our nation's security.

Building Strong!

Maj. Gen. Merdith W. B. (Bo) Temple is the deputy commanding general for military and international operations, U.S. Army Corps of Engineers.



Pentagon Memorial

Next time you go to the Pentagon, take the opportunity to see the just completed Pentagon Memorial. Dedicated Sept. 11, the memorial park honors the 184 individuals who lost their lives at the Pentagon Sept. 11, 2001. The U.S. Army Corps of Engineers, Baltimore District, managed the project from its inception just five weeks after 9/11 through the selection of the design in February 2003. The Pentagon Memorial team involved all stakeholders, including the families of the victims, handled site selection, the design competition, jury selection, and family involvement and media events, resulting in a successful design selection in just 15 months.





Energy and water resources – a leadership perspective

by Brig. Gen. Dennis Rogers

Garrison energy managers are facing a complex set of challenges regarding management of energy and water resources. These challenges include increasing costs, aging and constrained delivery infrastructure, and customers not motivated to conserve.

To reduce the potential impact of these escalating issues, the federal government has passed energy legislation requiring continuous improvement in energy and water demand reduction, development of on-site renewable energy, deployment of new technology for improving efficiency and increased awareness of emerging vulnerabilities that could adversely impact the security of garrison energy supplies.

I am pleased to report that Installation Management Command continues to be a leader in complying with the legislation. However, more work is required.

The good news is that overall energy demand is declining due to the hard work of our garrison energy personnel. But, as Figure 1 highlights, we face one key challenge — rising costs. In fiscal year 2007, annual utility costs eclipsed \$1 billion for the first time. Funding is strained with the effort to keep pace with rapidly escalating costs.

In response to the present set of challenges, we developed a portfolio of centrally funded programs designed to assist garrisons as they respond to the shifting natural resource environment. Table 1, illustrates the enterprisewide support available to garrisons.

Let me highlight a few of these important programs. Regarding improvements in



Brig. Gen. Dennis Rogers
U.S. Army photo

demand and efficiency, garrisons are able to train their staff through the Certified Energy Manager Training Program and contract for resource efficiency managers. As subject matter experts, REMs augment the garrison's energy team with their efforts to improve operating conditions as well as comply with federally legislated demand reductions.

Another important set of programs focuses on improving the operating environment. Those programs are the Energy Awareness and Conservation Assessment and the more extensive Energy Engineering Analysis Program.

The objective of an EACA is to focus on capturing “quick wins” through the identification of low-cost or no-cost energy-savings opportunities that the garrison could execute immediately. In FY 2007, 12 assessments were completed with more than \$12 million in savings opportunities identified.

When a garrison commits to an EEAP, an assessment team visits the installation. The assessment team identifies large, cap-

ital-intensive energy-savings projects. The time and resources invested in EEAPs by the seven garrisons that took advantage of the opportunity in FY 2007 were rewarded by the identification of an aggregate potential of \$65 million in energy savings.

IMCOM relies on several trusted partners when developing energy programs to help us achieve our goals. I am proud to say that the Pacific Northwest National Lab is actively assisting IMCOM with a number of energy initiatives, most notably the recently launched Renewable Energy Resource Assessments that are a continuation of the study PNNL completed for the Department of Defense in 2005. The RERA provides the installation with a detailed assessment on the potential renewable resources that may be commercially harvested to comply with federal legislation and also as a long-term hedge against future price increases.

Our newest initiative, which will kick off in FY 2009, is the development of an Energy and Water Master Planning Template. The template will be a road map for garrison energy managers as they prepare their long-term plans to achieve compliance with the currently enacted energy legislation and meet the respective missions they support. This is an important step ▶

Acronyms and Abbreviations	
CEM	certified energy manager
EACA	Energy Awareness and Conservation Assessment
EEAP	Energy Engineering Analysis Program
FY	fiscal year
IMCOM	Installation Management Command
PNNL	Pacific Northwest National Lab
REM	resource energy manager
RERA	Renewable Energy Resource Assessments

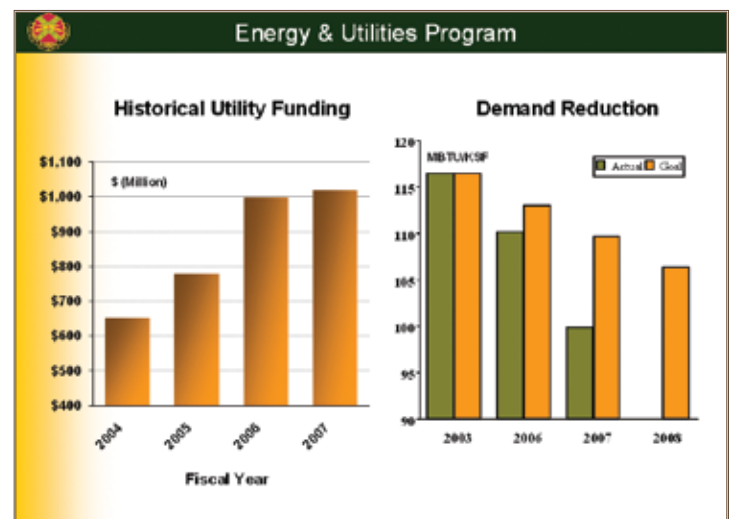


Figure 1: IMCOM Utility Costs and Demand Reduction
Graphics by Paul Volkman, IMCOM



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as the numbers and complexity of the currently enacted energy legislation illustrates in Table 2.

To raise awareness of these growing natural resource challenges, as well as changing the culture in which we operate, IMCOM committed to a series of Energy Summits, at which garrison energy managers are brought together with subject matter experts in an environment that fosters collaboration as they work to resolve the major energy issues facing IMCOM.

I am pleased to report that Energy Summit III, which was hosted by PNNL in Richland, Wash., July 15-17, was a resounding success. Underpinning the success was the fact that we changed the format of the summit from a lecture series to a hands-on working session for the participants.

The objective for the participants was to develop on-site renewable projects that could be commercially viable. The potential projects were classified into two categories — enterprise and nonenterprise. Enterprise projects reflect large opportunities that require third-party financing and are scalable and repeatable. Nonenterprise opportunities are usually small and localized.

After three days of hard work, the participants developed 27 projects, with 21 representing enterprise opportunities. In addition to working with subject matter experts in the breakout sessions, garrison energy managers participated in a tour of PNNL's electricity operations center and Energy Northwest's Nine Canyon Wind Farm project.

The energy challenges we face today are not limited to our garrisons but are national in scope. If left unchecked, they could adversely impact our way of life.

In the past when faced with similar national challenges, the Army has led the way in finding a solution. I ask you now to join me again in our efforts to find solu-

Energy & Utilities Program			
Increased Focus on Energy			
Recommendations from the Defense Science Board on Energy Strategy has increased the focus on a very visible issue that is facing both the Department & the Nation			
Legislated Renewable Energy Targets			
Drivers	EPAct 2005	E.O. 13423	NFDA 2007
Renewable Target	Increasing targets reaching 7.5% renewable supply of electricity used	At least 50% of renewable supply from new renewable sources after 1/1/99	25% of all energy consumed will be from renewable sources of supply by 2025
Mandatory	Yes	Yes	No
Thermal Supply	No	No	Yes

Table 2: Energy Legislation Summary

Energy & Utilities Program			
Energy Cost & Consumption Reduction Programs	Utility Programs	Support Programs	Improvement Programs
<ul style="list-style-type: none"> • Energy Assessments (EACA & EEAP) • Resource Efficiency Managers (REMs) • Utility Tariff Rate Surveys • Utility Rate Intervention • Natural Gas Risk Management Program • Energy Savings Performance Contracts (ESPC) • Utility Energy Services Contracts (UESC) • Energy Conservation Investment Program (ECIP) • Net Zero Energy Initiative 	<ul style="list-style-type: none"> • Utilities Privatization • Municipal Services Agreements • Utilities Recapitalization & Modernization • Renewable Energy Assessments/Supplies • Energy Security • Corrosion Prevention & Control 	<ul style="list-style-type: none"> • POM Development • Army Energy & Water Reporting System (AEWRS) • Utility Metering • Boiler Inspections • Energy Program Awards • Training, Workshops & Energy Summits • Energy & Water Master Plans 	<ul style="list-style-type: none"> • Common Levels of Support (CLS) • Business Process Review (BPR) • Lean Six Sigma (LSS) • Utility Budgeting & Forecasting • Organizational Inspection Program (OIP)

Table 1: Centrally Funded Programs

tions that will help us overcome our energy and water challenges. The answers we find will not only help the Army but the nation as well.

To maintain our commitment to discussing commercial best practices regarding energy and water, Energy Summit IV will

be held Jan. 27-30 in Chicago. Please mark your calendars and plan on attending. The focus will be on energy and water efficiency and conservation.

Brig. Gen. Dennis E. Rogers is National Capital Region district director and director of operations and facilities, IMCOM.





15 low-cost or no-cost energy conservation measures

by Don Juhasz

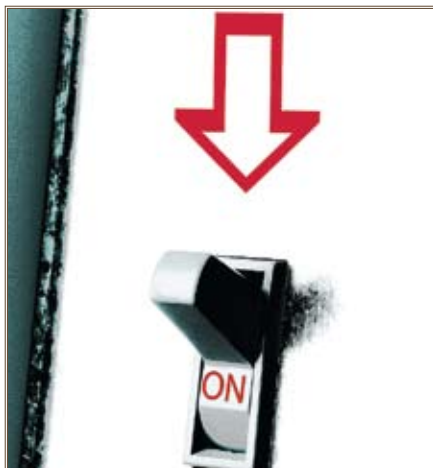
Not long ago, in a meeting with the senior leadership of the Office of the Assistant Chief of Staff for Installation Management and the Installation Management Command about energy security, I was asked what installations could do right now to make a difference in energy consumption. I responded that, off the top of my head, I could state 15 ways to reduce energy caused by wasteful behaviors and practices.

I wrote down the 15 and realized that I had many more. However, I will concentrate on these first 15. I will address additional opportunities when I receive a report that an installation has implemented all of these.

The first 15

1. **Computers and monitors** should be **turned off** every day when not actively in use (Army Regulation 420-1, chapter 22). If the equipment is Energy Star rated as required by statute and regulation, then it has a sleep mode. If the sleep mode is activated after any 20 minutes of inactivity, then the equipment is not required to be turned off when not in active use.

However, few computers or monitors are enabled for the sleep mode even though they have the capability. Computer support personnel disable most, as there are no consequences for doing so. Disabling energy reducing capabilities



Don Juhasz
Photo courtesy of Miami Veterans Administration Health Center

- in any equipment is paramount to waste and abuse of Army resources.
- 2. **Stop idling government vehicles** when unattended or waiting for more than 30 seconds. Installation commanders should add this as a violation that is ticketable with a warning and then a consequence for second and follow-on violations.
- 3. **Turn off all interior lights** in unoccupied areas, even when one intends to return immediately. If funds are available, install occupancy sensors in hallways, common areas and individual offices. Until occupancy sensors are installed, have procedures to turn off light switches or circuit breakers. Sometimes circuit breakers are the only way to turn off lights, as is the case in many maintenance and mess facilities.
- 4. For scanners, copy machines, faxes, printers and other **office equipment**, program the **sleep modes to activate automatically** when not actively in use. All of this equipment is required to be Energy Star rated and have a sleep mode by the Energy Policy Act of 2005, Energy Independence and Security Act of 2007 and AR 420-1. Purchase of equipment that does not meet

Energy Star requirements should have a consequence to the manager and agent who authorized it.

- 5. Use **setback temperatures** on all **heating, ventilation and air conditioning equipment**, including window air conditioners. If automated controls are not installed, activate procedures for manual adjustment of all heating and cooling equipment at the end of the every work day and for any periods areas such as locker rooms, lunch and break rooms are unoccupied during work hours. Required setback temperatures are found in AR 420-1, chapter 22.
- 6. **Turn off all outside lights** during the day. Guardhouses, access points, gas stations, maintenance areas and storage areas are common locations where outside lighting is left on during daylight hours because of lack of attention, education and consequences.
Vending machines should be delamped whether they are inside or outside. Seek changes to the contracts with vending machine owners paying a utility charge for connecting to government-supplied energy.
- 7. **Doors and windows** between conditioned spaces and nonconditioned spaces are not to be propped or left open. **Active management** of doors and windows that control conditioned spaces is critical to reducing energy waste.

In addition, heating and cooling of vestibules (entry areas) should be eliminated except to prevent freezing of pipes in those areas. Thermostats for heating of vestibules should be set at no higher than 45 degrees and, in most cases, can be set at 40 degrees where the weather stripping is properly installed for entry doors. Air conditioning of vestibules should be shut off.

- 8. All **motors and pumps** that have automatic controls should be **operated** in the **auto mode** and not in the manual mode that causes them to run 24/7. ➤

Acronyms and Abbreviations

AR	Army Regulation
HVAC	heating, ventilation and air conditioning system



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Very few systems require 24/7 operation, and a review of the requirement can reduce the operating hours of many pumps and motors.

Disable systems such as domestic hot water circulating pumps than run 24/7 in facilities where the hot water is not required immediately at the faucet. Consider timing controls for the pumps' motors during high-use or high-demand times, such as early mornings and/or late afternoons, allowing the motors or pumps to be off during unoccupied or low-use times.

- 9. **Remove** all **incandescent lights** from the installation. Prohibit lamps and fixtures that have incandescent lights from offices, maintenance areas, boiler rooms and janitor closets. Require existing incandescent bulbs to be replaced with compact florescent, florescent, LED or Energy Star-rated laminars. Remove all incandescent lights from supply inventories and prohibit the purchase of incandescent replacement bulbs.
- 10. **Eliminate** and remove all **extra refrigerators, microwaves, coffeepots** and other **appliances** that service only one or two persons except as permitted by AR 420-1, chapter 22. Permit only the quantity of appliances needed for the number of personnel.

Remove non-Energy Star appliances from the workplace by requiring all appliances to bear the Energy Star label by Sept. 30, or provide another date this year after which compliance is mandatory. Remove noncomplying appliances, cut off their cords and remove them from the installation so that they do not find a home in another office. Prohibit personally owned appliances in the work place, and provide a date by which they must be removed.



- 11. **Replace** all **exit lighting** with LED lighting fixtures.
- 12. **Install** or replace all **weather striping** on every entry way where a gap or light is visible. Calk all joints, window frames, door jambs and any penetrations from the outside of the building. Infiltration, including propped doors and open windows, is one of the main causes of wasted energy in conditioned spaces.
- 13. **Rewire** all **indoor lighting that is on 24/7**, except LED exit fixtures required by code, to be on either switches or motion sensors. If there is a security or safety issue, motion sensor control meets the requirement.
- 14. **Replace** the **filters and check** the tension on **fan drive belts** where installed every 30 days during the heating season — normally November through March but varies based on climatic region — and the same during the air conditioning season — July through September based on climatic region. For nonheating and noncooling months, replace and check every 90 days as a minimum.
- 15. **Replace** all **motors and pumps** with high-efficiency Energy Star equipment every time a replacement is required. Prohibit rewinding or replacing with the same efficiency. Do not yield to the arguments that it is more convenient or less costly to rewind or replace with in-kind as the extra energy used by the less-efficient motors will pay the difference in less than five years and, usually, in less than three years.

Inexpensive ways to save

The first 10 recommendations can be accomplished with no additional costs other than behavioral changes and the involvement of installation command and management at all levels and among all tenants. No entity, manager or person is exempt from application of these 10 no-cost efforts.




The last five require an investment that, in most cases, is recovered in less than two years and almost always in less than five years. Reduction in energy consumption of 15-20 percent is easily reachable by the application of these recommendations and, at some installations, as much as 30 percent is reasonable when the setback temperatures are applied to all HVAC systems.

However, command involvement makes or breaks the potential energy reductions by endorsing and enforcing programs that reward those who make an effort and provide consequences to those who do not comply.

Energy managers need to create a program of auditing — walking through facilities with a check list — and providing commanders and managers with reports of building-by-building, facility-by-facility compliance. Competitions and time-off awards for those found in compliance, and reporting in the installation newspaper the building numbers and organizations that are not complying can be the difference in an installation accomplishing its energy reduction goals.

All these efforts go a long ways in making our country and our Army energy secure.

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Alternative financing programs for energy projects

by Randy Smidt

Energy managers today face a world of ever-increasing requirements with chronically short budgets in a time of war. First, the Energy Policy Act of 2005 mandated a 2 percent annual reduction in facility energy consumption. Then, Executive Order 13423 upped this to 3 percent annually. That action was followed by the Energy Independence and Security Act of 2007, which codified the 3 percent requirement.

Energy Conservation Investment Program funds are limited and more and more often are being focused on renewable energy projects. Sustainment, Restoration and Modernization funds may be available for some low cost projects but may not be enough to meet the goals. This is the time to look for “OPM” funds — “other people’s money.”

Alternative financing is funding from third parties that can be invested in energy projects and then paid back through the savings achieved over a long term contract. The two major types of alternative-financing contract vehicles are Energy Savings Performance Contracts and Utility Energy Services Contracts. Both are similar concepts, with ESPC working through private industry and UESC working through utility providers.

ESPCs encourage private industry to invest in energy- and water-efficiency improvements and renewable energy projects in return for long-term cost recovery through the resultant utility savings generated. These private industry energy service companies are also known as ESCOs. ESPCs have a maximum contract term of 25 years.



Randy Smidt
Photo by Josephine Smidt

Four different contract vehicles are available for ESPC projects. The Corps of Engineers’ Huntsville Energy Center of Expertise has an indefinite-delivery indefinite-quantity contract. Currently, this contract is being re-competed, with the new contract expected to be awarded by December.

The old contract covering Virginia, North Carolina, South Carolina and Georgia has expired, but the 46-state contract covering the rest of the continental United States has been extended through August 2010. Contract administration and project facilitation services are available through Huntsville Center.

The Department of Energy also has an IDIQ contract that is currently being re-competed. Award of the new “super” ESPC contract is expected in October. The new contract will combine renewable energy into the main contract rather than separate it into technology-specific contracts as in the past.

This new contract will also be available for use by Army facilities worldwide. Contract administration may be provided by the Defense Energy Support Center or local Army Contracting Command offices.

Project facilitators are available from the Federal Energy Management Program at DOE. Use of project facilitators is now a requirement on Army ESPC projects as well as DOE ESPCs. It is Installation Management Command’s intent to provide for project facilitators on either USACE or DOE contracts at IMCOM installations in fiscal year 2009.

ESPC projects may also be performed under the General Services Administration ESPC IDIQ contract or by setting up a site-specific contract with your choice of contracting office. Though these contracting methods have been successfully used, they are not as common because they often require more effort to see through to award.

Both online and in-person training resources are available on ESPCs from FEMP. Information is available at <http://www1.eere.energy.gov/femp/financing/superespcs.html>.

UESCs allow utility service providers to design, install and finance the capital costs of energy- and water-efficiency improvements and renewable-energy projects with repayment from the cost savings over the contract term. Simple payback of 10 years is required. If your utility provider offers UESC and has a good relationship with your installation, UESC may be a good choice, enabling continued work with a proven partner.

UESCs may be accomplished through a variety of vehicles, including GSA area-wide contracts, a basic ordering agreement, a model agreement, an attachment to your existing installation utility contract or creation of a stand-alone contract.

If your utility provider does not yet offer UESC, it may be convinced to do so. Both the Edison Electric Institute and FEMP are kicking off efforts to reinvigorate the use of UESCs to provide energy efficiency, renewables and energy security. FEMP offers online and in-person training as well as free project facilitation services for UESC. More information is available at <http://www1.eere.energy.gov/femp/financing/uescs.html>.

With energy costs rising, the Department of Defense has placed renewed emphasis on attaining our energy goals and is now requiring each service to award ESPC and UESC with investment value equivalent to 10 percent of annual energy consumption costs. For the Army, this is \$100 million annually. ➤

Acronyms and Abbreviations	
DOE	Department of Energy
ESCO	energy services company
ESPC	Energy Savings Performance Contract
FEMP	Federal Energy Management Program
GSA	General Services Administration
IDIQ	indefinite-delivery indefinite quantity
IMCOM	Installation Management Command
UESC	Utility Energy Services Contract
USACE	U.S. Army Corps of Engineers



Army headquarters energy team growing stronger


by William F. Eng

The Army Headquarters Energy and Utility Branch, Facilities Policy Division, is an element in the Operations Directorate, Office of the Assistant Chief of Staff for Installation Management. The contact table provides information for Energy and Utilities Branch members.

During the last year, the team added three valuable staff members: Cecile Holloway from the Naval Facilities Engineering Command in Washington, D.C.; Randy Smidt who was the Fort Belvoir, Va., energy manager; and Bill Stein, who previously served as the energy manager at Fort Huachuca, Ariz.

For policy guidance or assistance with a particular energy or utilities program area, the other table identifies the designated subject matter expert.

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William F. Eng is the Army Solid Waste and Recycling program manager and the staff action officer for water and wastewater issues, Facilities Policy Division, Office of the Assistant Chief of Staff for Installation Management 

Acronyms and Abbreviations	
CEM	certified energy manager
CBEP	certified business energy professional
CEPP	certified energy procurement professional
CSDP	certified sustainability development professional
PE	professional engineer
PM	program manager

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What is 10 percent of the annual energy consumption cost at your installation?

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Jeff Ward	Program manager	jeffrey.ward@hqda.army.mil	601-0364

¹ DSN – 329; ² DSN – 332; ³ DSN – 664

Energy and Utilities Program Managers		
Major Functions	Primary PM	Alternate PM
Army Energy Prgm (AR 420-1, Chap. 22)	Don Juhasz PE, CEM	David Purcell, CBEP, CEPP, CSDP
Alternative Fuels	Ronald Diehl, PE, CEM	Bill Stein, CEM
Energy Strategy and Campaign Plan	Jeff Ward	Randy Smidt
Energy Conservation Investment Program	Ron Diehl, PE, CEM	Cecile Holloway, CEM
Energy Saving Performance Contracts	Randy Smidt	Bill Stein, CEM
Utility Partnerships (UESC)	Randy Smidt	Bill Stein, CEM
Energy Security	Jim Paton, CEM	Cecile Holloway, CEM
Energy Awards	David Purcell	Cecile Holloway, CEM
Energy Sustainability	Randy Smidt	Bill Eng, PE, CEM
Utilities Policy (AR 420-1, Chap 23)	Don Juhasz, PE, CEM	Bill Eng, PE, CEM
Renewable Energy Sources	Bill Stein, CEM	Ron Diehl, PE, CEM
Utility Systems & Modernization	Jeff Ward	Ron Diehl, PE, CEM
Utility Project Approval	Ron Diehl, PE, CEM	Jeff Ward
Solid Waste Management Policy	Bill Eng, PE, CEM	Cecile Holloway, CEM
Source Reduction / Recycling	Bill Eng, PE, CEM	Cecile Holloway, CEM
Water Supply and Wastewater	Bill Eng, PE, CEM	Cecile Holloway, CEM
Other Programs & Issues		
AEWRS - Energy & Water Reporting	David Purcell	Jim Paton, CEM
Corrosion Prevention & Control	David Purcell	Randy Smidt
Metering	David Purcell	Jim Paton, CEM
PEG/POM MDEP J-Acct Functional Mgr	Jim Paton, CEM	Jeff Ward
ISR Functional POC (Service #44, 47 & 48)	Jim Paton, CEM	Bill Eng, PE, CEM
ISR Functional POC (Service #45, 46 & 60)	Bill Eng, PE, CEM	Jim Paton, CEM



Don't let your utility systems succumb to forces of nature

by Jeff Ward

Your utility system is near physical wear-out or has become obsolete due to changed mission. You have identified a need to raise the performance of your utility system to a new level beyond original performance — you are ready to modernize.

Modernization is the alteration of facilities solely to implement new or higher standards, to accommodate new functions or to replace components that exceed the overall service life of the facilities.

In ideal times, you would choose to both sustain and recapitalize your utility infrastructure to maintain high performance levels. Sustainment is required to pay for routine maintenance and repair to control deterioration. Recapitalization, which is required in addition to sustainment, controls obsolescence.

Without full sustainment, the expected service life is reduced, requiring an accelerated recapitalization rate to restore lost capability. In reality, this scenario sounds all too familiar at your installation.

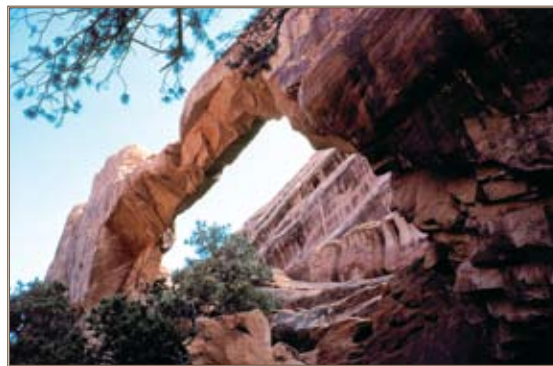
Under stressed Army funding, insufficient sustainment and recapitalization investments have failed to successfully offset nature's forces that continue to reduce Army-owned utility service life. Furthermore, acceptable utility performance may not occur even where some sustainment and recapitalization investments have been made. The result can be a rapid decline in utility system performance and even catastrophic failure.

The stark realities are that the Army's Utilities Modernization program funding, included within the Army Energy and Utility Program Management Decision Package, was zeroed out in fiscal year 2004 and is currently zeroed out again from FYs 2009 to 2015. Headquarters, Department of

the Army budgeters have shifted sourcing emphasis for modernization projects for the foreseeable future to the Real Property Maintenance MDEP, "where installations receive their real property maintenance money."

Installations must face a continued funding moving target and work through their region offices to establish a well-balanced utility-modernization funding strategy. Funding strategies must consider:

- planning and design funds that support the recapitalization of existing facilities;
- all unspecified minor construction funds, including QRPA MDEP;
- operations and maintenance resources that contribute to recapitalization;
- Defense working capital fund revenues that pay for recapitalization; and ➤



The author warns against allowing the forces of nature to overcome your utility system — like Wall Arch, Arches National Park, Utah, shown before and after its Aug. 4 collapse. In geologic terms, arches are temporary features that will eventually succumb to the forces of gravity and erosion. National Park Service photos

Key MDEP definitions:

- MDEPs account for Army resources. Individually, an MDEP describes a particular organization, program or function and records the resources associated with the intended output.
- The Revitalization MDEP is part of Military Construction and provides for systematic replacement and modernization of facilities to current construction standards. This includes projects that address functional as well as physical obsolescence. Facilities support current mission requirements and will not include any new mission initiatives.
- QRPA provides the principle funds to sustain Army real property. Sustainment addresses maintenance and repair of real property. QRPA can also fund minor construction up to \$300,000, except safety and health up to \$1 million, to add, expand, extend, alter, convert, replace or relocate existing real property facilities.
- QUTM provides funds for specific policies, programs and projects identified in the *Army Energy and Water Campaign Plan for Installations* to comply with statutes, executive orders, the Army Energy Strategy and Department of Defense-mandated requirements; provides security and reliability for utility and energy systems; and improves infrastructure performance and efficiencies for nonprivatized systems, including buildings and facilities. Unfortunately, the budgeters have moved funding out of this MDEP into QRPA.

Acronyms and Abbreviations

FY	fiscal year
MDEP	Management Decision Package
QRPA	Real Property Maintenance
QUTM	Army Energy and Utility Program



Army presents 10 energy and water awards

by David Purcell

The winners of this year's *Secretary of the Army Energy and Water Management Awards* were recognized at the Department of Defense All-Hands Energy meeting Aug. 6 in Phoenix. Paul P. Bollinger Jr., deputy assistant secretary of the Army for privatization and partnerships, presented the awards.

Each awardee received an engraved plaque, a certificate and a monetary award. The categories and winners are:

Installation awards

- *Renewable/Alternatives* – **Fort Carson, Colo.** – Vince Guthrie, Scott Clark, Stephanie Carter, Susan Galentine and Melanie Reed
- *Energy Efficiency/Energy Management* – **U.S. Army Garrison Vicenza, Italy** – David Murr, Giampaolo Rizzo and Linda Eckley

- *Energy Efficiency/Energy Management* – **U.S. Army Garrison Japan, Camp Zama** – Sidney Malone, Philip Tedpahogo, Robert Weaver, Tetsu Tomota and Shinji Kato
- *Innovative/New Technology* – **Chief Joseph Dam, Washington State** – John Skibby, Lee Sheldon, Ed Miska, Alvin Carlson and Tom Murphy
- *Energy Efficiency/Energy Management* – **Fort Campbell, Ky.** – Al Nayadley, John Wheeler, William Henson and Neal Smith

Small group awards

- *Innovative/New Technology* – **Fort Hood, Texas** – Bobby Lynn, Dick Strohl, Tony Estes, Aaron Fry and Bill Mallow
- *Energy Efficiency/Energy Management* – **U.S. Army Garrison Bamberg, Germany** – Juergen Engeter, Dieter Gerber and Reinhold Schiller

- *Water Conservation* – **Fort Knox, Ky.** – Warren Clifford, Mardis Lynch, Clyde Hill and Randy Moore
- *Energy Efficiency/Energy Management* – **Radford Army Ammunition Plant, Va.** – Randolph Evans, Donald Clark, Douglas Messner, Donald Yee and Donald Moore

Individual award

- *Energy Efficiency/Energy Management* – **Glenn Stubblefield, Fort Gordon, Ga.**

Kudos to all winners. Continue to develop energy conservation awareness at your installation.

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David Purcell is a program manager, Facility Policy Division, Office of the Assistant Chief of Staff for Installation Management. ★



Recipients of the 2008 Secretary of the Army Energy and Water Management Awards pose for the camera after receiving their awards in Phoenix in August. Photo by Terry Shoemaker, Pacific Northwest National Laboratories

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- military construction funds used to renovate or replace (recapitalize) existing facilities.

Do not wait to get your story of deteriorating systems out there. Shifts in funding amounts and sources do not change the modernization requirement. Position

yourself to receive funds wherever they become available.

As always, the challenge for every Directorate of Public Works overseeing Army-owned utility systems is to identify requirements, obtain resources and implement necessary utility upgrade projects that require the prioritization of limited resources.

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Jeff Ward is manager, Utilities Modernization Program, and is responsible for the U.S. Army Energy and Water Campaign Plan for Installations, Facilities Policy Division, Office of the Assistant Chief of Staff for Installation Management. ★



Solar energy 101

by Bill Stein

Renewable energy is pushing its way to the top of every installation's to-do list, so this is a good time to talk about one type of renewable energy — solar. Solar energy is the conversion of the sun's radiation into some other form of energy.

The first type of solar energy conversion was designed into plants — photosynthesis. Photosynthesis is the process whereby a plant turns sunlight into food sugars.

The space program was the motivation to look at man-made devices to use the sun's radiation to make electricity. Invented for the space program, the *photovoltaic* panel converts solar radiation directly into electricity.

PV is currently the most popular of solar conversion processes. Since the PV system produces direct current electricity, one has the choice of charging a battery or using an inverter to convert the electricity to alternating current to use in buildings or to connect to the electrical grid. That puts the PV systems into two categories — grid-connected and nongrid-connected.

For the Army, most grid-connected systems at 50 kilowatts and below are installed on or near a building and supply electricity through one of the building's electrical circuits. Above 50 kw, the PV systems are typically connected to the electrical distribution lines. The nongrid-connected systems in the Army are usually used on remote testing equipment and keep a battery charged that provides the needed energy when required.

Another type of PV is called *concentrated PV*, which is done in one of two ways. A set of mirrored surfaces in a dish or a trough parabola can be used to focus the sun's rays on a relatively small PV panel to increase the light energy available for production of electricity. The other way

to concentrate the sun is with magnification, such as a Fresnel lens. Both types normally follow the sun to maximize the concentration, so they require a mechanical tracking system.

The next major category is *concentrating solar thermal power*. Concentrating solar thermal power is achieved by parabolic trough systems, heliostats, a dish/Stirling or a dish/Brayton.

Parabolic trough systems track the sun and focus its rays on a receiver tube that contains a heat transfer fluid, usually oil or water. After the sun's focused rays heat the fluid, it is used to make steam and drive a steam turbine connected to an electric generator.

The heliostat, also known as a power tower, uses a large number of ground-mounted mirrors to focus the sun's beams on a central receiver at the top of a tower. That receiver uses either water or molten salt as a heat transfer fluid. The fluid is pumped to a storage tank, where it is used to make steam and drive a turbine generator just like the line focusing parabolic trough. Because of the higher temperatures with this system, storage can be added to extend the time after sunset that the system can produce electricity.

The dish/Stirling system uses a parabolic dish of mirrors to focus the sun on a Stirling cycle engine coupled to a generator



Photovoltaic panels at work at Fort Huachuca, Ariz. Photo courtesy of Bill Stein



The dish/Stirling system at Fort Huachuca, Ariz., the only one in the Department of Defense, uses a parabolic dish of mirrors to focus the sun on a Stirling cycle engine coupled to a generator to produce electricity. Photo by Rich Diver, Sandia National Laboratories

to produce electricity. This system tracks the sun, and the engine is held at the focal point of the dish by a tripod or cantilevered arm. The dish/Brayton is similar, but uses a hot-air turbine cycle engine generator.

There are also *solar thermal systems*. These systems can be active or passive.

An active system has some type of moving part and controls. Active hot water systems typically have a solar hot-water collector piped into a solar storage tank and/or heat exchanger piped into a standard hot water tank. There is a pump-and-differential controller that tells the pump when to run. Pool solar systems typically use unglazed solar collectors, a control- ➤

Acronyms and Abbreviations

Kw	kilowatt
PV	photovoltaic



California installations eligible for energy-efficient product rebates

by Steve Perez

California utility customers, including U.S. government installations, are eligible for a wide variety of cash rebates when they purchase and install qualifying energy-efficient appliances, fixtures or materials, according to the Food Service Technology Center. The FSTC is a nationally recognized program funded by California utility customers and administered by Pacific Gas and Electric Company that provides energy-efficiency consulting services to the commercial food service industry.

Many of the qualifying products are identified by the Environmental Protection Agency's Energy Star rating and are

available through the federal supply system. For other products, a spec sheet must be reviewed to ensure the product being installed is eligible for the rebate.

Some examples of qualifying products include Energy Star ice machines, high-efficiency clothes washers and dishwashers, advanced evaporative coolers, room air conditioners, compact and linear fluorescent lighting fixtures, and room occupancy sensors. Examples of qualifying materials include wall and ceiling insulation and thermal window film.

Details can be found at <http://www.fishnick.com/saveenergy/rebates/>

Participating utilities are: Pacific Gas and Electric – <http://www.pge.com/index.html>; Southern California Edison – <http://www.sce.com/>; Southern California Gas – <http://www.socalgas.com/index/>; and San Diego Gas and Electric – <http://www.sdge.com/index/>.

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Steve Perez is a management analyst, Green Products Program, Defense Logistics Agency.



Acronyms and Abbreviations

FSTC	Food Service Technology Center
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ler and piping to divert the pool pump water through the collectors. The pool itself acts as the storage.

Active hot-air systems have a solar air collector and a fan-and-differential controller. Hot-air systems seldom have storage, but, like the hot-water system, the differential controller tells the fan when to run. Building air is circulated through these solar air collectors to increase the air temperature.

Another kind of active system is the transpired-air solar collector. This system has no glazing and is installed on a south-facing wall and pulls in outside air using a fan and a differential controller. The Army has installed them on hangars and vehicle maintenance shops, but they can also be used on buildings for solar-preheated fresh or make-up air.

Passive solar thermal systems have no moving parts. The panels for a passive solar water-heating system typically hold 25 to 50 gallons of water in a tank or serpentine copper tube configuration in a glazed insulated panel. These can weigh more than 600 pounds, so the roof structure and weight limits are a consideration.

Solar water-heating systems are piped



Photovoltaic panels power the light for this entrance sign to Melvern Lake, Kansas, a U.S. Army Corps of Engineers recreation area. Photo by Solar Electric Systems of Kansas City

directly into the hot water tank with additional cold water and safety tempering mixing valves. There are passive air panels that are the same type as on the active systems, but they do not use fans to move the solar-heated air. The panels are installed on a south wall and use the natural convective currents to circulate inside air through them from a lower and upper vent. They use a back draft damper or other type closure to prevent cold air from flowing into the building at night.

Other types of passive solar are the Trombe wall and passive solar orientation of a building. In the interest of brevity, these approaches require architecture and engineering expertise from trained engineers in sustainable design methodology.

The last type of passive solar is daylighting. Advanced use of daylighting involves retrofitting a roof with daylighting units and including a controller that turns off or dims the lighting during the day. It is wise to use the opportunity of retrofitting an existing building to also increase the roof insulation and make sure the roof is sealed.

Advanced daylighting units can also be installed in new buildings along with the automatic lighting controllers. This is typically more economical than designed architectural daylighting, such as light shelves or clerestories.

There are solar cookers, solar flashlights, solar lawnmowers, solar lawn lights, PV-powered attic fans, and some new solar-powered device will be marketed between the time this article was written and published. Solar has come into its own. It is readily available as a viable renewable energy resource.

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Bill Stein is the manager of the Renewable Energy Program and the Net Zero Energy Installations Program, Facilities Policy Division, Office of the Assistant Chief of Staff for Installation Management.



ECIP becomes more customer friendly

by Ron Diehl

The Army wages a constant battle against increasing utility costs caused by higher demand and an increased Army mission. The only direct-funded program to help the Army improve energy efficiency and install renewable energy is the Energy Investment Conservation Program, which is funded by the Office of the Secretary of Defense with Military Construction funds.

Congress appropriates funds for this program to accomplish projects at installations that improve the energy efficiency of existing buildings and utility systems and

that install renewable energy systems. The net effect is to reduce consumption of fossil fuels and replace existing systems with renewable systems to totally eliminate fossil fuel use.

ECIP projects are generated by installations using the DD Form 1391, the standard form to describe the scope, impact and cost of MILCON projects. Because the ECIP project documentation is simpler than that for regular Military Construction, Army projects, a new, friendlier track in the Office of the Assistant Chief of Staff for Installation Management's Programming Administration and Execution processor is being created for ECIP projects. This track is expected to be functional by October.

In addition, a life-cycle cost analysis is done for each project to determine if the project would be cost effective and save energy in excess of its original cost. A project is expected to save at least 125 percent

of its initial cost, or 100 percent for renewable projects, and the more a project saves, the more likely it is to be approved and funded.

Once a project is approved by OAC-SIM, it is mandatory that the Directorate of Public Works actively participates in the design and accomplishment of the project. The DPW must provide resources for maintenance and operation of ECIP projects after their construction.

Examples of typical ECIP projects include: computer energy monitoring systems; energy efficient lighting systems; "gray" water systems, which reuse drain water and rainwater to reduce water demand; wind turbines; photovoltaic cells; solar walls; solar water heating; and geothermal systems.

In fiscal year 2008, OSD received \$70 million in ECIP funds, of which the Army received \$23.5 million for 16 projects. ➤

Acronyms and Abbreviations	
DPW	Directorate of Public Works
ECIP	Energy Conservation Investment Program
FY	fiscal year
MILCON	Military Construction
OACSIM	Office of the Assistant Chief of Staff for Installation Management
OSD	Office of the Secretary of Defense

INSTALLATION	FISCAL YEAR	DD 1391 FORM NO.	PROJECT TITLE	PROG AMT (\$000)	EST ANNUAL SAVINGS (\$000)	EST ANNUAL SAVINGS (MBTU)	SIR	PAY BACK YRS	LIFECYCLE SAVINGS (\$000)
Fort Knox, KY	2009	65004	Barracks Geothermal Phase 4	\$ 3,500	\$ 335	16,844	1.50	10.10	\$ 5,250
Fort Drum, NY	2009	64590	Solar walls & rehab shops	\$ 2,500	\$ 395	13,790	2.67	5.49	\$ 6,675
Pohakuloa Training Area, HI	2009	67483	Solar Hot Water & Daylighting	\$ 150	\$ 31	602	3.01	4.80	\$ 452
McAlester Army Ammunition Plant, OK	2009	67440	Geothermal Heating and Cooling Systems	\$ 2,600	\$ 424	24,985	2.21	6.11	\$ 5,746
Fort Buchanan, PR	2009	67517	Solar Water Heaters & HVAC Replacement	\$ 770	\$ 675	11,518	6.56	1.03	\$ 5,051
Adelphi Lab, MD	2009	69710	Install solar thermal roof tile heating system	\$ 950	\$ 106	4,458	3.16	4.78	\$ 3,002
Aberdeen Proving Ground, MD	2009	69722	Install Solar Tubes and Controls	\$ 840	\$ 159	4,925	3.10	4.75	\$ 2,604
Schofield Barracks, HI	2009	69577	Solar Water Heaters & Lighting Retrofit	\$ 1,250	\$ 239	2,699	2.73	4.75	\$ 3,413
Fort Bliss, TX	2009	69799	Solar Daylighting	\$ 2,250	\$ 175	7942	1.40	10.00	\$ 3,150
Benelux, Belgium	2009	69788	Install solar water heating	\$ 600	\$ 58	2,606	1.43	9.68	\$ 858
Fort Dix, NJ	2009	340616	Photovoltaic Roof System 500kW	\$ 2,976	\$ 386	4,982	1.36	7.90	\$ 4,047
Fort Knox, KY	2009	62473	Geothermal Domestic Hot Water & Exit Lighting	\$ 1,200	\$ 366	30,540	4.20	3.30	\$ 5,040
Fort Sill, OK	2009	64878	Geothermal heating & cooling	\$ 3,550	\$ 333	14,428	1.25	9.58	\$ 4,438
Fort Sill, OK	2009	64893	Geothermal Heating Plant	\$ 750	\$ 81	1,326	1.52	9.43	\$ 1,140
Blue Grass Army Depot, KY	2009	67472	Energy Efficiency Improvements, mult. locations	\$ 2,950	\$ 354	21,109	1.25	8.25	\$ 3,688
White Sands Missile Range, NM	2009	64880	Install Direct Digital Controls	\$ -	\$ 116	5,493	3.41	4.70	\$ -
Fort Wainwright, AK	2009	69413	Facility Energy Improvements	\$ -	\$ 611	16,117	4.63	3.16	\$ -
USAG Ansbach, Germany	2009	64924	UMCS System at Energy Plant	\$ -	\$ 231	21,275	3.10	2.44	\$ -
Subtotal				\$ 26,836	\$ 5,075	205,639	2.03	5.29	\$ 54,553
Backup Projects									
Torii Commo Station, Japan	2009	69611	Lighting Retrofit, Upgrade HVAC	\$ 950	\$ 221	5,020	1.75	4.88	\$ 4,636
Camp Humphreys, ROK	2009	67539	Geothermal Heat Pumps	\$ 2,750	\$ 266	7371	1.60	8.50	\$ 4,400
Fort Bragg, NC	2009	69770	EMCS	\$ 1,000	\$ 230	16,002	1.67	4.40	\$ 1,670
Anniston Army Depot, AL	2009	67395	Install Wind Turbine 1MW	\$ 3,000	\$ 237	13,454	1.18	12.62	\$ 3,540

This chart shows the current FY 2009 ECIP program. Renewable energy projects are in green. Chart courtesy of Ronald Diehl



Installations to get help with energy security plans

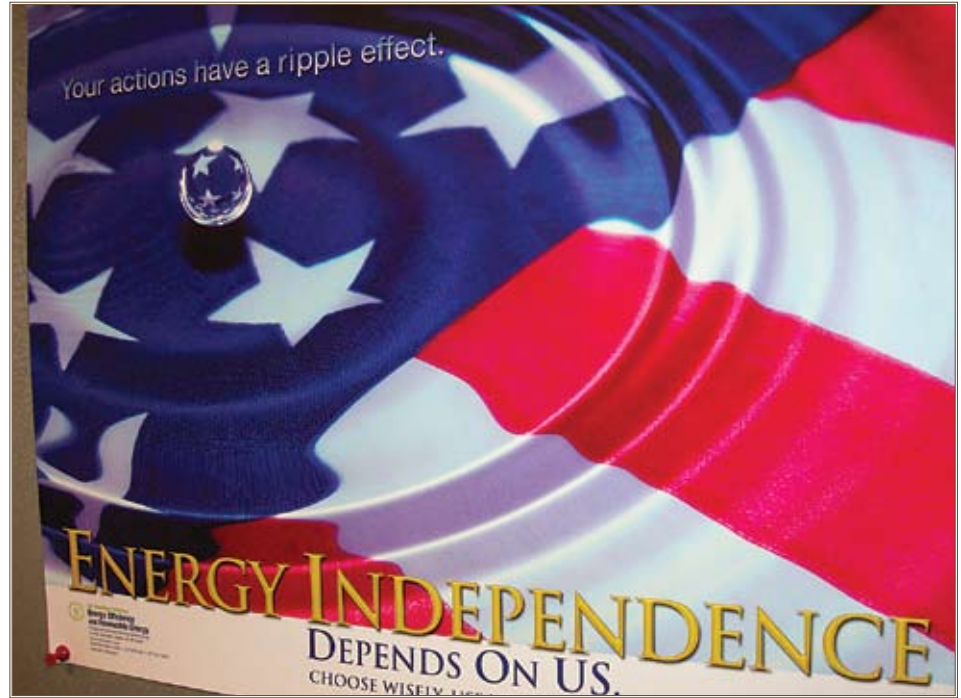
by James Paton

The term *energy security* has become very popular lately, primarily in the media as it relates to our country's dependence on imported oil. Although the majority of imported oil in this country is used for transportation, there are still energy security concerns related to the availability and reliability of electricity through local and regional transmission and distribution networks.

As we have seen in recent years, real potential exists for disruptions due to weather. Recent studies speculate about the potential for disruptions caused by vandalism or terrorism. Whether electrical disruptions are the result of natural, accidental or intentional causes, installations need to consider the potential and plan accordingly to ensure continuity of mission-critical operations in the event of a disruption.

The Army Energy Office and the Office of the Secretary of Defense have issued very general guidance on what constitutes an installation energy security plan over the years. Army Regulation 190-13, *Army Physical Security Program*, touches on energy security by prescribing installation physical security plans that include consideration of power supply transmission facilities and water sources as mission essential assets.

The Department of Energy's Oak Ridge National Laboratory collaborated with the Army's Installation Management Command to publish a guide on performing energy security assessments that includes a



sample installation energy security plan.

The Office of the Assistant Chief of Staff for Installation Management has also recently conducted an analysis of the methodology needed for preparing a comprehensive installation energy security plan and is currently developing updated Army guidance with assistance from the Department of Energy's Pacific Northwest National Laboratory.

The updated guidance currently being developed by the Office of the Assistant Chief of Staff for Installation Management will contain the recommended procedures,

participants and considerations for developing an installation energy security plan. It will be published on the Army Energy Program web page, <http://army-energy.hqda.pentagon.mil/>, during the first quarter on fiscal year 2009.

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In FY 2009, OSD expects to receive \$80 million, of which the Army receives \$26.8 million, although the Senate Armed Services Committee has proposed an increase in this amount to \$160 million.

Typical problems with ECIP project execution include cost overruns based on market conditions and world demand, delays in obtaining equipment such as

wind turbines, and competition for engineering resources by the MILCON and Base Realignment and Closure programs.

It is extremely important that projects are carefully scoped and described in a detailed way so the design agent is able to create an accurate design package. In addition, it is the responsibility of each installation to provide a way to measure and verify actual energy savings for each project. In the near future, the savings

results for ECIP projects will be entered into the Army Energy and Water Reporting System database to meet Department of Energy reporting requirements.

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Everything you need to know about Water Conservation Program

by William F. Eng

If all the world's water would fit into a gallon jug, the fresh water available for us to use would equal only about **one tablespoon**. With the relative scarcity of this essential resource in mind, let's look at a few things Army water conservationists should know.

Army policy under the 1992 Energy Policy Act and Executive Order 13123 required installation water management plans and the adoption of at least four of the 10 Department of Energy's best management practices. Both assumed that compliance would result in water-use reduction.

All Army installations were well on their way to having a current water management plan and on target for 100 percent adoption of DOE's BMPs, when new legislation was enacted and a new EO issued that changed the Army's water conservation strategy. The Energy Policy Act of 2005; EO 13423, *Strengthening Federal Environmental, Energy and Transportation Management*; and the Energy Independence and Security Act of 2007 focused primarily on energy, but parts of each are aimed at conserving water use.

The EPA has one water-related requirement without metrics for measuring progress: if water is used to achieve the mandated 30 percent below American Society of Heating, Refrigerating and Air Conditioning Engineers standard for energy efficiency in new construction, water-conservation technologies shall be applied to the extent that they are life-cycle cost-effective.

The EO goals are definable and measurable in most cases. The EO requirement is dissected below.

Reduce water consumption intensity beginning in fiscal year 2008, relative to the agency's baseline in FY 2007, through life-cycle cost-effective measures by 2 percent annually through the end of FY 2015 or 16 percent by the end of FY 2015.

To help federal agencies meet this requirement, DOE's Federal Energy Management Program issued guidance in January that supplemented previously issued instructions. Entitled *Establishing Baseline*



William F. Eng
Photo by Alex Stakhiv

and Meeting Water Conservation Goals of Executive Order 13423, the guidance outlines these steps:

- 1. Baseline development** – Calculate FY 2007 water use intensity baseline in gallons per square foot per year. This baseline will be used to measure all future reduction goals.
- 2. Reduction of water use intensity** – Identify and implement life-cycle cost-effective water-savings measures for a 2 percent per year reduction or 16 percent total reduction by FY 2015.
- 3. Reporting** – Army will report to the Office of the Secretary of Defense, which will report to the chairman of the Council on Environmental Quality as required. DOE will include guidance on accurate reporting of data beginning with the 2008 energy data report.

These definitions apply:

Water use – All water used at federal facilities obtained from public water systems or from natural freshwater sources such as lakes, streams and aquifers, where the

water is permitted for human consumption. Examples are: potable water used for drinking, bathing, toilet flushing, laundry, cleaning, food services, watering of landscaping, irrigation and process applications such as cooling towers, boilers and fire suppression systems.

Square footage – To avoid challenges and confusion, the square footage reported for a facility subject to both the energy and water requirements relies on the value reported for the energy use of that facility. The resulting water-use intensity will not be usable to make comparisons with other agencies or other published standards; the results can be used to assess the progress of reducing water use within each agency.

Facility – "Facility" means any building, installation, structure, land and other property owned or operated by, or constructed or manufactured and leased to, the federal government. It includes a group of facilities at a single or multiple location(s) managed as an integrated operation, as well as government-owned contractor-operated facilities. Some adjustments to square footage will be required if certain facilities are exempted from either the water or energy goal but not both. In addition, water consumption for a facility occupied by a non-Army agency on an Army installation will be reported by the Army host in its energy consumption report.

Exemptions – The Secretary of the Army could request an exemption to the EO 13423 water conservation requirements from the chairman of the Council on Environmental Quality for specific facilities or processes. However, rather than submitting exemption requests, installations should focus on reducing water consumption across their mission areas, concentrating on the facilities with the most water-savings potential.

Water used at certain types of facilities, i.e., nonfederal buildings for which the utility costs are not paid by the reporting agency, should not be included in water reporting. Examples are: ➤

Acronyms and Abbreviations	
BMP	best management practice
DOE	Department of Energy
EISA	Energy Independence and Security Act of 2007
EO	executive order
EPA	Energy Policy Act of 2005
ESPC	Energy Savings Performance Contract
FEMP	Federal Emergency Management Program
FY	fiscal year
UESC	Utility Energy Service Contract
WMP	water management plan



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Leased facilities – Facilities for which the landlord is responsible for paying all water bills and at which agencies cannot implement water conservation measures.

Privately owned facilities – Buildings or facilities on federal lands but privately owned, such as fast food restaurants and privatized Family housing.

Baseline development

All potable water use in covered facilities, whether metered or not, should be reported, whether used for human consumption, building processes, power plant or building cooling, landscape watering, irrigation or industrial uses.

Metered facilities: Consumption for all Army installations and facilities with water meters is to be included in the total water use for the baseline period. Water consumption will include all uses of potable water. Each year, the Office of the Assistant Chief of Staff for Installation Management develops a water use intensity number, which is defined as annual potable water use divided by total gross square footage of facility space. Potable water used for landscape irrigation is to be reported in the agency total water use, but the amount of turf or landscape area is excluded from the gross square footage reporting.

Unmetered Facilities: Army installations and activities that have unmetered potable water use must estimate their water consumption. Agencies should give auditing priority to unmetered facilities and support the incorporation of metering to the extent that it enables both baseline development and annual reports to be current and accurate indicators of the agencies progress toward the water-use reduction goal.

It is important to document the assumptions and estimating techniques used so that they can be repeated. Of equal importance is documenting the adjustment to baseline consumption data once efforts are implemented to account for unmetered facilities either through metering or estimating. All baseline adjustments must be documented and submitted with annual data reports.

Army installations and activities that produce potable water from wells should

consider installing water production meters. In the absence of water meters, well production can be estimated using pump flow rates at the given well depth multiplied by known run time. Pump flow rate data is typically specified at design; run time can be monitored easily and inexpensively for representative intervals and then applied to annual calculations.

Installations and activities that are producing their own water should report water consumption data consistent with their own measuring methods, i.e., the use of daily logs, metered data or flow estimates. The intent is to account for and record what the agency is currently using relative to its established baseline consumption.

Efficiency opportunity identification

In addition to the baseline, DOE advised agencies to conduct water audits for at least 10 percent of agency square footage annually, including exterior potable water. The newer EISA requirements increase the frequency of these audits to 25 percent of the inventory every year, or once every four years. These audits will help identify potential water-efficiency opportunities.

About half of the potable water consumed by the federal government is used for domestic purposes, with the remainder attributed to engineered-related uses. Based on recent data, there is a significant opportunity to capture savings from application of cost-effective water-conservation measures. Estimates of water-use reduction based on off-the-shelf technology do not account for engineered-related uses, but these estimates suggest that a reduction of 35 to 50 billion gallons per year is achievable.

Identify relevant BMPs and efficiency opportunities: Each agency is encouraged to prioritize the installation of water conservation measures based on its own practices and applications. This is a natural extension of the water management plans recommended by DOE under EO 13123. While no longer a specific requirement, WMPs provide a more formal framework, enabling end-users to prioritize implementation strategies.



Leaking steam from distribution systems, like this one at Radford Army Ammunition Plant, Va., cause water use to rise. Photo courtesy of William Eng

The Environmental Protections Agency's WaterSense Office is updating the BMPs for FEMP to account for recent changes in technology and water-use patterns. Information on WMP development and currently available BMPs can be found at http://www1.eere.energy.gov/femp/water/water_bmp.html.

Collect background information: Establish the number of facilities, current technologies deployed, historical use (process vs. non-process), projected use (expansion-contraction), applicability (metered potable, unmetered) and information regarding performance contracts in place, water rates and water sources.

Categorize water type and use: Determine whether water is potable or nonpotable. Identify its ultimate use. Determine if the use is metered. Find out whether the water is supplied by another entity or if it is produced on site.

Establish life-cycle cost/cost to implement: According to the FEMP Instructions for Implementing EO 13423, life-cycle cost-effective measures should be implemented. If more than one measure is identified for the same process or use, the measure reporting the lowest life-cycle cost (highest net present value) should be implemented. More resources on life-cycle cost calculations can be found at http://www1.eere.energy.gov/femp/procurement/eeep_eccalculators.html.

Implementation: Once identified as life-cycle cost-effective, project implementation should begin. Careful attention should be paid to product or system selection, ➤



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installation and cost during this phase.

Measurement and verification: Quantifying the benefits of the project should be part of the overall plan. Facility managers should insist on permanently installed water meters for all major water uses, retrofit projects and tenant organizations. Current measurement and verification guidance for water projects can be found at http://www1.eere.energy.gov/femp/financing/superespcs_measguide.html.

Assessment, prioritization of opportunities

To provide a more descriptive approach to the water conservation goal, a distinction in efficiency opportunities needs to be made. For the purposes of this article, “off-the-shelf technologies” are those that use domestic, potable water and are easily purchased and installed, such as toilets, urinals, showerheads, faucets and nonindustrial clothes washers.

A key tool in making off-the-shelf decisions is the EPA’s WaterSense program, a voluntary public-private partnership that identifies high-performance products and programs. More information can be found at www.epa.gov/watersense.

“Engineered-related uses” are those technologies likely requiring a higher capital investment and some engineering or design support to implement. While these technologies may be more difficult to apply, they can produce savings.

Implementation strategy

Because the execution of any strategy will most likely be a combination of “soft” practices, such as public information and education programs, and “hard” practices, such as replacing high-volume showerheads with low-volume fixtures, implementation should be site-specific to account for variances in water source, cost (incoming and disposal), distribution and allocation, the existing infrastructure and current practices. Reviewing water reduction opportunities in these terms will enable end users to tailor their programs around attainable goals.

Methods of funding

Water projects may use any of the fund-



The world’s population is growing, but the amount of water on the planet has remained about the same for two billion years. Photo by R. Stockli, A. Nelson and F. Hasler, NASA

ing mechanisms for energy projects, as appropriate. Funding comes from appropriations, Energy Savings Performance Contract and Utility Energy Service Contract programs, rate-payer incentive programs, and the retention of energy and water cost savings.

Appropriated funding: At times, large projects are funded directly as specific projects. An installation is sometimes able to implement smaller projects using its Operations and Maintenance dollars. In addition, special programs are available to provide money specifically for energy and water projects. One example is the DoD Energy Conservation Investment Program, which is a subset of Military Construction with dedicated funding.

Appropriated funds may be difficult to secure, and difficult to secure consistently, for such projects.

ESPC and UESC programs: These programs enable agencies to contract with private sector firms that design and implement projects and guarantee savings to the government. The private sector firm or utility makes the up-front capital investments and is paid through realized energy and water savings.

An ESPC permits energy service companies to assume the capital costs of installing, operating and maintaining energy and water conservation measures and equipment. The energy service company guarantees a fixed amount of energy cost savings throughout the term of the contract — up to 25 years — and is paid directly from the cost savings generated by the project. An ESPC must include methods for establishing a baseline

water use and cost and for measuring and verifying the savings each year.

Originally, water projects could be funded under ESPCs only if there was also an energy savings component. However, the current definition of “energy savings” for the purpose of an ESPC includes a reduction in the cost of energy, water or wastewater treatment.

Under a UESC, the installation’s servicing utility provides financing and expertise for energy and water projects. The utility is repaid over the contract term from the cost savings generated by energy-efficiency measures, such as retrofits.

The net cost to the installation is minimal, and it saves time and resources by using the one-stop shopping provided by the utility. UESC projects can include services such as energy audits, project design and installation, construction management, commissioning, measurement and verification, and operations and maintenance.

Not all utilities will enter into a UESC, so consult the servicing utility prior to considering this option. A UESC is slightly different from an ESPC because of rules about established-source purchases and other requirements. Information is available at <http://www1.eere.energy.gov/femp/financing/uesc.html>.

Utility rate-payer incentive programs: Some water utilities provide technical assistance to their customers for water conservation and water reclamation projects, including rebates for water-efficient equipment. The most comprehensive programs are typically associated with utilities in areas that are experiencing reduced water supplies, such as the Southwest. Austin (Texas) Water is an example. Information about its program can be found at <http://www.ci.austin.tx.us/water/default.htm>.

Agencies are encouraged to contact their respective water utilities to determine what resources are available to them. In addition, some states have agencies that provide technical information and assistance related to water conservation and reclamation projects.

Reporting progress

To determine progress toward reduction goals, it is necessary to determine water use intensity, as was done for the baseline ➤



Energy markets: Fundamentally driven or artificially inflated?

by Scott McCain

Ad day rarely passes without another dire prediction of further increases in energy prices. These predictions provide little value and only act to fuel the growing level of concern resident in the market.

Yes, the economies of China and India are contributing to the rise in global energy demand, acts of terrorism targeting the world's petroleum infrastructure and continued civil unrest in several Organization of Petroleum Exporting Countries-member countries are well documented as reasons for the increase in prices. But could they be responsible for the doubling of the price of oil since the third quarter of last year?

There is a growing sentiment among analysts that the markets are not undergoing a major shift to a higher level of sustained energy prices as many would have us believe. Just the opposite is occurring. Short-term prices are being driven by fear, and fueling the fear has been the rise in managed investments and speculators moving into the commodities markets.

While the long-term fundamentals of the global energy markets accurately reflect increasing demand, short-term price escalation and volatility are a result of the

large amount of new money moving into the markets. Since 2003, the commodities markets have received an increase in new money from \$13 billion to a staggering \$260 billion, as institutional investors representing hedge funds, pension funds and index funds see an opportunity for quick profits.

Energy commodities are traded globally in U.S. dollars and, as such, share an inverse relationship. Energy prices move in the opposite direction of the dollar. Lately, energy prices have been higher due to the falling value of the dollar.

This emerging pattern has attracted new market participants. Speculators, driven by their desire for quick profits, have transitioned their positions in equities, opting for the increasingly more volatile energy commodities. Unfortunately, their aggressive repositioning of capital in energy has fueled a short-term price escalation rarely witnessed in recent years.


Their haste to profit from the rise in energy prices may have inadvertently sparked the end of the run-up in prices, because there was no true increase in demand. The rise in prices appears to have been created by artificial or manipulated

means. By artificially fueling the increase in energy commodities speculators may have inadvertently created a bubble.

Proponents of this hypothesis believe that the "speculative bubble," as it is being called, is set to collapse sending prices plummeting. This outlook is based on similar experiences in the technology and real estate markets where a similar set of conditions developed.

To minimize the impact of rising energy prices on garrison energy budgets, Installation Management Command's Public Works Division centrally funds an enterprisewide Natural Gas Risk Management program. This commercial best practice is designed to assist energy managers with budgets for energy commodity prices and help them develop risk management strategies to minimize the impact of rising and volatile prices. To learn more about this program, contact the author at the POC information below.

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period, and calculate the percent of change. Being consistent in the methods used to determine water use intensity during the baseline and in the out years is important.

Facilities with metered or estimated use:

Facilities that have direct metered water use or estimated water use should report their annual water use using the same method used for the baseline period.

Sites with newly installed water meters:

If a water meter was installed after the baseline was determined using estimating techniques, repeat the estimating technique in the current year. Compare the current-year estimated value with the actual metered data. If the two values are significantly different, revise the baseline value. The use of verifiable (metered) data should always supersede estimates.

EISA

This latest legislation requires energy managers to conduct comprehensive energy and water evaluations for about 25 percent of each agency's facilities so that an evaluation is completed at least once every four years. This requirement supersedes the EPAAct requirement. EISA further requires that not later than two years after an evaluation is completed, the identified energy and water efficiency measures that are life-cycle cost-effective will be implemented.


EISA allows individual conservation measures with varying paybacks (returns on investments) to be bundled into one project. The law requires that all equipment and controls are fully commissioned to operate at design specifications, that performance is measured throughout the service life to ensure proper performance

and that energy and water savings are measured and verified.

Final words

The Army's Water Conservation Program has come a long way from a program with soft targets to one with real metrics and tools to help accomplish them. Whether we're talking about kilowatt hours of electricity or thousands of gallons of water, real savings begin with the finger on the light switch or the hand on the faucet handle.

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Rock Island Arsenal, Fort Polk Level I energy assessments begin

by Becky Proaps

To ensure the Army provides safe, secure, reliable, environmentally compliant and cost-effective energy and water services to Soldiers, Families, civilians and contractors on Army installations, the *Army Energy Strategy for Installations* and the *Army Energy and Water Campaign Plan for Installations* were developed. These formed the foundation for the future direction and resource requirements for effective energy and water management for the Army.

In fiscal year 2006, the Installation Management Command initiated and funded the Energy Engineering Analysis Program. A critical part of this initiative consists of energy optimization assessments conducted at selected U.S. Army installations inside and outside the continental United States.

These assessments identify and analyze energy inefficiencies and waste that can initiate energy related projects. They also identify applicable funding and execution reduction requirements mandated by Executive Order 13123 and the Energy Policy Act of 2005.

The EEAP team with the U.S. Army Engineering and Support Center, Huntsville, Ala., serves as program manager. The team recently performed Level I energy assessments and installationwide Facility Energy Decision Screening analyses at Rock Island Arsenal, Ill., and Fort Polk, La. In addition, team members contributed expertise in life-cycle cost analysis and Energy Savings Performance Contracts contracting.

They were joined at both installations by subject matter experts, researchers and



Brian Johnson (left), an electrical engineer with the EEAP, and Dave Osborn, energy manager for Rock Island Arsenal, discuss one of the 259 ECMS identified by the IMCOM-funded EEAP energy assessment. Photo by Eric Cramer, IMCOM Public Affairs Office

expert consultants from the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory and the Pacific Northwest National Laboratory. The Oak Ridge National Laboratory and a number of private sector companies also participated.

"The scope of the Level I assessment included central energy plants and associated steam distribution systems providing heat to buildings, representative administrative buildings, warehouses and small repair shops and an analysis of their building envelopes, ventilation air systems and lighting," said Tammie Learned, EEAP program manager.

For the first time, subject matter experts' evaluations were combined with the Facility Energy Decision Screening modeling tools, Learned said.

Rock Island

For Rock Island, the team recommended 259 energy conservation measures, bundled into maximum cost and energy savings packages. The packages addressed the central energy plant; steam distribution system; building envelopes; heating, venti-

lating and air conditioning; potable water; and lighting.

A major consideration of which combination to implement depends upon their effect on the size of a new power plant required in the very near future.

The Huntsville Center team, consisting of Brian Johnson, the EEAP electrical engineer; Bruce Forsberg, the ESPC mechanical engineer; and Learned worked with the Department of Public Works and Dave Osborne, energy manager at Rock Island Arsenal, to determine which ECMS for what funding will be requested and implemented.

"The Huntsville Center 1391 development team aggressively worked to develop 1391s for the selected ECM packages," Learned said. "After 1391s are developed, they are placed in the IMCOM Project Prioritization System and the Assistant Chief of Staff for Installation Management Energy Conservation Investment Program.

"Rock Island Arsenal has been very aggressive and successful in pursuing energy savings opportunities. This is apparent by the decrease in energy consump- ➤

Acronyms and Abbreviations	
EEAP	Energy Engineering Analysis Program
ESPC	Energy Savings Performance Contracts
ECM	energy conservation measures
FY	fiscal year
HVAC	heating, ventilation and air conditioning
IMCOM	Installation Management Command



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tion from 200 MBtu/ksf [million British thermal units/thousand square feet] in FY 1985 versus 137 MBtu/ksf in FY 2003. If the packages are implemented for maximum energy savings, they would reduce Rock Island's annual energy use by up to 225,000 MBtu/year, or 26 percent. Four of the eight ECM packages had simple paybacks between 4.7 and 6.1 years," she said.

Fort Polk

The study at Fort Polk identified 248 potential ECMs. They were presented in four packages — low cost improvements, lighting improvements, HVAC improvements and central energy plant improvements. These packages have simple paybacks between 0.8 and 4.2 years.

If these ideas are implemented, they have the potential to save Fort Polk about \$3.7 million per year in energy costs and an additional \$1.1 million in maintenance costs while reducing annual energy consumption by as much as 27.9 percent. These projects have an estimated total capital cost of \$17.3 million with a simple payback of 3.6 years.

An energy optimization assessment conducted in August 2006 at Fort Polk identified 247 potential ECMs that were also presented in four packages — low cost improvements, lighting improvements, HVAC improvements and central energy plant improvements. These packages have simple paybacks between 0.8 and 4.2 years.

If these ideas are implemented, they can save Fort Polk about \$3.6 million per year in energy costs and an additional \$547,000 in maintenance costs while reducing annual energy consumption by as much as 26.2 percent. These projects have an estimated total capital cost of \$13.6 million with a simple payback of 3.3 years.

"There are numerous energy-savings opportunities at Fort Polk," Learned said. "Some of them are straight forward, requiring minor investment for each measure, and can be implemented using installation

operation and maintenance funds. Other recommended opportunities are either more complex or large in scope, requiring significant capital investment, and may be best suited for implementation using third-party financing."

There are numerous benefits to energy assessment, she said. The primary benefit is to identify projects with the potential to reduce an installation's energy use and operational costs. However, very real but often difficult to quantify benefits of energy audits are increased process capacity, better labor utilization/productivity and enhanced quality of life for Soldiers.

"These results can sometimes be far more significant than the direct energy and environmental benefits," Learned said. "All of these issues, however, must be considered together to accomplish the facilities' mission in the most efficient and cost-effective way."

There are always challenges. Funding outside the installation is scarce and the number one challenge. Alternative financing modes are Energy Savings Performance Contracts and Utility Energy Savings Contracts.

The other significant challenge is the ever changing missions of installations.

"Energy conservation measures identified for a facility, for example, that is using 40 hours a week today may be required to utilize 24/7 at a later date due to a change in mission requirements," Learned said.

Robert Hennessee, a public utilities specialist, accompa-

nied the team to Fort Polk because of his expertise in electric and natural gas rate structures. Hennessee was able to help determine which improvements offered better return on the long-term investment.

"Fort Polk is a training garrison, so its population changes greatly as units come and go," he said. "This offers many opportunities to reduce energy use but makes it extremely hard to quantify how those improvements will pay off in the future."

He cited an instance of change in mission that was noted during the Fort Polk assessment.

"For example, Fort Polk has two main electric bills — north and south post," he said. "For the last year, south post had its highest consumption in the summer — as I expected. But north post was the exact opposite. I asked Cy Stell, the resource energy manager, why they didn't correlate. He explained that many units on north post deployed that summer so the population was much less than in the winter."

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The Central Energy Plant at Fort Polk is one of the buildings that received a review of energy conservation measures by the Energy Engineering Analysis Program team from Huntsville Center. Photo courtesy of Huntsville Center



Fort Meade demonstrations test LEDs in freezer rooms, fiber optics in display cases

by Steven Parker and Graham Parker

Demonstration projects at Fort George G. Meade, Md., substituted LED lighting for incandescent bulbs in commissary walk-in freezers and fiber optic lighting in reach-in display cases. The goal was to reduce energy consumption, and the results were positive in more ways than one.

LEDs in freezer rooms

To support the high business volume, the Fort Meade commissary has several large walk-in freezer storage rooms in the rear of the building. A typical 35-by-47 foot freezer storage room is kept at minus 15 F and is designed to accommodate large pallets of frozen food, including ice cream products.

The freezer lighting system consists of 36 100-watt gel-coated incandescent lamps in globe-type enclosed fixtures mounted on the ceiling. The storage rooms are very busy and thus consume considerable energy.

Conventional lighting and refrigeration systems typically work against each other in such facilities. Lighting systems generate heat, which the refrigeration system must remove. In addition, lower temperatures typically reduce the efficacy (lumens/watt) of lighting systems. Thus, more power is required to generate the desired illumination, which, in turn, increases the load on the refrigeration system.

Therefore, to reduce lighting and refrigeration energy consumption while also reducing maintenance requirements, the incandescent lights were replaced with 36 15-watt white LED fixtures.

The LED lights offer several advantages over the incandescent lamps. Specifically, the new LED lighting system provides more than 10 footcandles of illumination on the floor, an improvement over the incandescent lamps. And lighting power is reduced to 540 watts from 3,600 watts, a reduction of 85 percent.

In addition, the cold storage environ-

ment improves the efficacy of the LED light source since heat dissipation is improved. Unlike conventional lamps, the light output of LEDs improves in cold climates. At minus 15 F, the light (lumen) output of the LED light is about 18 percent greater than at normal room temperatures.

The new LED lights are expected to provide more than five years of useful service. This contrasts with the old incandescent lamps, which needed to be replaced more than eight times each year. Changing of burned-out lamps in a minus 15 F environment is an unpleasant task that can be done far less frequently, and significant labor is saved because the frozen foods do not need to be shifted to allow safe access to the overhead fixtures.

A full report on this demonstration can be found on the U.S. Department of Energy Federal Energy Management Program web site at http://www1.eere.energy.gov/femp/new_technology/techdemo_publications.html.

Fiber optics in display cases

The Defense Commissary Agency and the Fort Meade commissary also sought to demonstrate a new fiber optic lighting technology in a series of vertical reach-in freezer display cases.

The display case lighting system consists of 87 F40 T-8 (60-inch) fluorescent lamps with customized electronic rapid-start ballasts mounted inside the conditioned space of the display case. The operation of the lights is regulated by a digital control system. The operating hours vary based on the day of the week but average more than 94 hours per week.

As in the freezer storage rooms, conventional lighting and refrigeration systems typically work against each other in refrigerated display cases. Lamps and ballasts generate heat, ➤



Incandescent light fixtures in a Fort Meade commissary freezer room consume considerable amounts of energy. Photo by Energy Focus Inc.



LED lights installed in the freezer room for a demonstration project consume less energy, provide more light and will have to be replaced less frequently. Photo by Steven Parker



Fiber optic lighting installed in reach-in freezer display cases also reduced energy consumption. Photo by Steven Parker



How the Army in Europe saves energy, money

by Justin Ward

Here's the challenge: The Energy Policy Act of 2005 requires all federal facilities — including all military bases in Europe — to cut energy consumption 20 percent from 2003 usage by 2015.

Here's the problem: Energy prices have increased. In fact, so have the energy consumption levels of federal facilities, making energy one of the largest, and growing, operational expenses, especially considering that budgets at most facilities haven't kept pace with rising costs. To make matters worse, these increasing financial constraints often cause facilities to cut back on new infrastructure, such as heating and ventilation systems, which usually means decreased efficiency and increased energy expenses.

But through using certain tools and practices, the U.S. Army has implemented a few helpful programs to save energy and money at the same time.

Energy Savings Performance Contracts

One of the most popular tools is the ESPCs, offered through the U.S. Army Corps of Engineers.

"It's called a performance contract," said Dusty Stehr, the Corps' ESPC manager for Europe District. "It's much different than



Newly installed pumps at Camp Ederle in Vicenza, Italy, are the first completed portions of the Energy Savings Performance Contract to install new boilers and a cogeneration unit on the installation. Photo by John Rice, U.S. Army Corps of Engineers.

the other contracts we do; but it's a really great tool."

Here's how it works: Federal facilities in Europe can sign an agreement with one of three chosen energy services companies, referred to as "ESCOs," that will swap energy-efficient infrastructure for an agreed-upon monthly amount of guaranteed cost savings. Any additional cost savings resulting from the new infrastructure

can be added to the installation's bankroll, free of charge.

"It's a really smart way to do business," said Hunter Dandridge, Europe District's

Acronyms and Abbreviations

ESCO	energy service company
ESPC	Energy Savings Performance Contract
IMCOM	Installation Management Command
USACE	U.S. Army Corps of Engineers

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which the refrigeration system needs to remove. Also as in the freezers, lower temperatures reduce the efficacy of the lighting system, and more power is required to generate the desired illumination, which, in turn, increases the load on the refrigeration system.

To reduce energy consumption, the old fluorescent lighting technology was replaced with a new system that uses fiber optics. The fiber optic lighting system uses a remote source light. The light is channeled into a fiber optic distribution system

and emitted into the space by an illuminator. The illuminator uses optics designed to match the application to illuminate the product.

The existing lamp/ballast system was monitored for three months before the fiber optic lighting system was installed in the display cases. The new lights and refrigeration system were monitored for an additional two months after the installation.

The monitoring indicated that the fiber optic lighting system required less overall power and energy. Measured lighting power was reduced to 2,281 watts from

4,968 watts, a reduction of 54 percent. A full report on this demonstration can be found on the Federal Energy Management Program web site at http://www1.eere.energy.gov/femp/new_technology/tech_demo_publications.html.

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Steven Parker is a senior staff engineer, Technology Systems Analysis Group; and Graham Parker is a senior staff engineer, Technology Planning and Deployment Group; Pacific Northwest National Laboratory.



(continued from previous page)
previous contract manager. "It's like a mortgage. But you pay it off with your savings."

Other than a small supervision and administrative cost, all initial costs for the new infrastructure are funded by the ESCO. This could include upgrading the existing heating, ventilation, electricity or water systems; using renewable energy technology; installing better insulated windows and doors; or a combination.

"Sometimes an automatic thermostat could mean big savings," said Stehr. "Or sometimes you have to gut the whole thing. It just depends on the age of the building, what's currently there and how efficient it is."

The ESPC program, managed in Europe by Installation Management Command, Europe Region, has been helping federal facilities finance prohibitively expensive large-scale energy-savings projects for more than 10 years.

According to David Yacoub, IMCOM-Europe's ESPC manager, the program's strength lies in its ability to use private investment for public gain.

"The president has encouraged federal agencies to use the program extensively to achieve mandated energy and water reduction goals," said Yacoub. "Garrisons decide what they want to implement, provided that the measure generates savings. The only criteria to qualify for an ESPC project is that the project generate savings to amortize within the life expectancy of the system."

Most contracts, said Stehr, last five years with optional three-year and then two-year extensions.

"We're actually developing a new contract now that will allow for more competitive bidding," he said, "so it'll be a little different in the future."

Expectations for the program, implemented through the U.S. Environmental Protection Agency, are that each facility undergoing a comprehensive upgrade financed through an ESPC achieves a greater than 50 percent reduction from current energy consumption levels.

Maintenance on the new infrastructure is normally conducted by the ESCO, Yacoub said, but could instead be done by each facility's Directorate of Public Works to cut costs even further.

Currently, the largest executed contract is at the U.S. Army Garrison Vicenza, where ESCO Siemens AG is installing a new boiler plant, which includes a cogeneration unit that will simultaneously produce heat and power by using the escaping "waste heat" from electricity production to produce steam. The steam, in turn, helps heat the installation.

"We only just started," said Linda Eckley, project engineer administering quality assurance on the project. Siemens has begun building the cogeneration unit, and paperwork is being filed to authorize permits and begin clearing an area for it.

The next phase, Eckley said, is to reduce electrical demand even further by installing four high-efficiency boilers. The combination of the cogeneration unit and the boilers will result in more energy produced, and thus less energy purchased from the Italian electrical supplier and less gas oil used.

"I'm very committed and excited," said Eckley. "Very ready to get this project off the ground, especially with the increase in fuel price. I think this is becoming one of the most popular ways to conserve energy."

As with every ESPC, the payment to Siemens AG will be skimmed from the resultant cost savings, estimated to average \$874,000 per year.

"The ESPC is absolutely a win-win," said Stehr. "In fact, every organization involved wins."

Other alternatives

Other, less draconian energy- and cost-saving initiatives are implemented at installations across Europe every day.

In fact, during fiscal year 2006, the Army's top achievers in energy and water conservation saved a combined total of more than 737,132 million British thermal units of energy, 214 million gallons of water and \$9.2 million.

One person individually recognized by Secretary of the Army Pete Geren was U.S. Army Garrison Wiesbaden's Ernst Kusiak, who received the *Lifetime Impact Award* from the Army in 2007 for almost 30 years of energy-saving efforts.

"We've done a lot of initiatives in the entire Wiesbaden community," said Kusiak, "energy-saving, heat-saving, water-saving."

For example, Kusiak said, at all three major military Family housing areas in Wiesbaden, his team has awarded a contract to privatize all the heating distribution lines. This project, about 30 percent complete and expected to be done by 2011, would mean completely replacing or upgrading the 50-year-old lines, which would save unnecessary heat loss.

Kusiak is also overseeing other utility modernization initiatives like offering energy-saving light bulbs to facility managers, recommending heating control devices and Energy Star appliances during all design review meetings and installing hot-water circulation pumps that shut off automatic hot-water heaters from 11 p.m. to 5 a.m. at all military housing areas.

"If you have to guarantee savings," said Kusiak, "there are easy ways to do it."

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Fort Hood among federal government's top achievers in energy, water conservation

by Christine Luciano

Fort Hood, Texas, was named the 2008 Secretary of the Army Energy and Water Management, Innovative New Technology Award winner and the 2008 Federal Energy and Water Management Award winner. Fort Hood was recognized for leveraging technology to improve efficiency and promote energy awareness.

On Aug. 4, at the Army Energy Forum in Phoenix, the Fort Hood Directorate of Public Works and Energy Management Office were represented by Bobby Lynn, Dick Strohl, Tony Estes, Aaron Fry and Bill Mallow, who accepted the award. The DPW employees were recognized for the innovative technology that serves as the benchmark for the Army in managing utilities through an open communications system.

In October, Fort Hood employees will be recognized for their contributions in the federal sector at the U.S. Department of Energy award ceremony in Washington, D.C.

The Secretary of the Army Energy and Water Management Awards recognizes installations, small groups and individuals from the Army, Army Reserve and Army National Guard who make significant achievements in energy conservation and water management.

“Developing and implementing innovative approaches and advancements in energy efficient technologies is a priority at Fort Hood,” said Lynn, Energy Management team leader. “Fort Hood’s Utility Management and Control System is an innovative system that promotes conservation, lowers energy costs and protects the environment.”

The UMCS is a web-based system that manages the utilities of numerous facilities

on the installation. It serves as the primary collection point for building utilities metered data, which fits well with the Army Metering Plan for installing advanced metering.

The meter data is used in various ways, such as to develop energy-use trends that help determine valid energy-reduction projects or strategies. The data may also be used for billing reimbursable customers and inciting competition among organizations to be the best at conserving energy.

The DPW Maintenance Division and Energy Management Office access the UMCS online to control and manage heating, ventilation and air conditioning, and the water distribution systems on Fort Hood. The UMCS allows the operator to set schedules, change operating temperatures, turn equipment on and off, run diagnostics and identify systems that are not operating properly.

Fort Hood advanced the use of the system by developing a new tool called “Run-time Management” to watch the operating times of equipment on the system.

“The operating time is imperative to the equipment efficiency and life,” Lynn said. “When equipment is operating, run-time data provides a way to capture run time and evaluate it for energy consumption, dollar cost and environmental impact of that consumption.”

In fiscal year 2007, the UMCS generated more than \$200,000 in energy savings, and more is being saved as facilities are added to the system, he said. Lynn estimates that the savings for fiscal year 2008 will reach more than \$500,000 in energy savings due to the addition of new facilities to the system.



(Left to right) Richard Strohl, Mark Rainey, Bobby Lynn, Aaron Fry, Jeff Reith and Tony Estes are recognized for their innovative technology in managing utilities through an open communications system. Photo by John Reasoner

The total cost of project implementation was \$5.65 million. It will pay for itself in energy savings in 10 ½ years.

The UMCS not only reduces energy waste and saves dollars, but it also provides a standard platform for the Army, which will help reduce its dependency on proprietary control systems that cost the Army millions.

Army installations face challenges in procuring facility control systems through various contracts, resulting in incompatible control systems and making them difficult to manage. Fort Hood, like other Army installations, has several different brands of direct digital control systems in its facilities.

As buildings were constructed or expanded, multiple proprietary systems were procured. With each proprietary system, additional software and hardware was needed for maintenance and operation making it challenging for Fort Hood to efficiently manage its incompatible systems.

Fort Hood collaborated with the Construction Engineering Research Laboratory and the Army Corps of Engineers to implement an open communications system known as the Local Operating Network to serve as a single operating platform for facilities and utilities management. ➤

Acronyms and Abbreviations	
CERL	Construction Engineering Research Laboratory
DPW	Directorate of Public Works
UMCS	Utility Management and Control System



Yuma Proving Ground improves wastewater treatment facility

by Mary F. Flores

At Yuma Proving Ground, Ariz., construction crews excavated and moved about a million cubic-yards of soil to improve an antiquated wastewater treatment plant. The old wastewater treatment plant, built more than 50 years ago, included three ponds and measured 21 acres in size. The project increased the plant to an enormous 56 acres with five ponds.

Spearheaded by the Army Corps of Engineers, Yuma Project Office, the project cost more than \$6 million and was completed in February. Miramar Construction Company of San Diego did the bulk of the construction, working closely with subcontractors and collaborating with the Corps' Yuma Project Office.

With the use of earth-moving equipment, water trucks, bulldozers and graders, crews dug five giant ponds — equivalent to the size of about 48 football fields — to replace the original ponds. The project began in June 2007 and required tapping into the water source from the Yuma Proving Ground's main administrative area, under which the wastewater treatment facility is located.

That task entailed running a four-inch water line with a pump to the site in order to provide enough water for trucks to apply moisture to the soil for compaction requirements. In October 2007, crews began the process of laying a 60-mil, high-density polyethylene geomembrane liner at the fermentation pits, sealing them and placing a layer of compacted soil on top.

(continued from previous page)

"This effort was a logical follow on work I had previously been involved in at CERL," said Strohl, Fort Hood UMCS subject matter expert, formerly of CERL. "Fort Hood helped CERL in the development of guide specifications by implementing the early draft guidance and providing feedback on lessons learned. They provided a lot of technical support, which was instrumental in developing the



Construction crews roll out hundreds of feet of high-density polyethylene geomembrane lining at the sewage lagoons. Photos by Mary F. Flores

"We had two shifts working around the clock to apply shot-crete on tops and edges of the slopes," said Wil Gonzales, Miramar Construction superintendent. "This spray-on concrete substance covers a metal wire fabric and filler that hardens the area to keep the soil from eroding."

The project, which was required by the Clean Water Act and the Arizona Department of Environmental Quality, was designed in 1996 and funded by Congress as one of many Military Construction projects geared toward improving the quality of life for military and civilian Families at the proving ground.

"The Clean Water Act requirement says that wastewater cannot be allowed to seep into the soil, which may cause poten-

tial contamination of ground water," said Ernesto Elias, project engineer with the Corps' Yuma Project Office. "A big component of this wastewater treatment project is laying the liners in the ponds after construction to protect ground water sources on and off the installation."

The life expectancy of the newly constructed sewage treatment plant is 50 years. The Directorate of Public Works will oversee the maintenance of the plant.

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Mary F. Flores is a public affairs specialist, Yuma Proving Ground. 


UMCS we have today.

"Unlike working at CERL where you provide support to numerous Army facilities, I had the advantage of working with Fort Hood co-workers and with former CERL cohorts, concentrating on a solution just for Fort Hood. That collaboration paved the way for this accomplishment."

Now, due to the efforts of Fort Hood's DPW and Energy Management Office, the innovative technology is being imple-

mented by other Army installations and is practical for Department of Defense use, which can result in millions being saved by the federal sector.

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Christine Luciano is the environmental outreach coordinator, Directorate of Public Works, Fort Hood, Texas 



Fort Lewis enlists kids to help keep streams, lakes clean

by Barbara L. Sellers

The entire Fort Lewis, Wash., community plays a part in keeping its lakes and streams clean. Some of the post's younger residents are taking action to remind others of that fact.

Fourth- and fifth-grade volunteers from the North Fort Youth Center teamed with Public Works during the summer to place markers on about 120 residential storm drains with messages that remind the community, "No Dumping; Drains to Lake." Additional marking sessions will be scheduled in the future, and the team will eventually place the message tags on all 250 residential storm drains.

"The kids do community service projects as part of their curriculum," said Brendalyn Carpenter, sustainability outreach coordinator, Public Works. "Doing this seemed like an excellent solution for the storm-water program and the kids, because this age group can retain the information and get really excited about it."

First, storm water management staff gave each group of youth participants a close look at the largest residential storm-water outfall on post, which drains into American Lake. Jennifer Smith, storm water specialist, held a large photo showing



Jennifer Smith, storm-water specialist, helps volunteers place markers next to a storm-water drain. Photo by Brendalyn Carpenter

trash covering the entire grate.

"This is what this storm-water outfall looked like in February," she said. "It was cleaned up in March."

Linda McGuiness, water technician intern from Oak Ridge Institute of Science and Education, shined a big flashlight through the grate and gave the youth the opportunity to look at the pollutants accumulating inside, as she explained what they would be doing and why.

"This storm-water outfall pipe is connected to a network of many other pipes that are buried beneath the streets," McGuiness said. "What we have on the streets are storm drains."

She talked about treatment used for some outfall pipes, such as sedimentation ponds lined with black plastic designed to let the water sit long enough for trash to settle out and filtration ponds designed to allow the water and smaller pieces of debris to seep into the ground.

The only kind of treatment that particular storm-water outfall at American Lake has is the grate across the front of it to catch larger pieces of trash, so all of the small pollutants go right into American Lake, she said.

"Many people are still unaware that storm drains are directly connected to our local streams, wetlands, creeks and lakes," Carpenter said. "Marking the storm drains helps to remind visitors and residents that storm drains are not trash cans. Only rain belongs down the storm drains."

The storm-water staff showed the youth volunteers how to place markers by each storm drain, before they left in buses to put the markers next to the storm-water drains in the residential areas. The youth volunteers also cleaned debris from the drains,



Linda McGuiness, water technician intern for Oakridge Institute of Science and Education, shines a light into the largest residential storm water outfall on post to show youth volunteers an example of the kind of water pollution they hope to prevent. Photo by Barbara Sellers

picked up trash and placed door-hangers on homes in the neighborhood.

"This project is really cool," said Emilly Hubbard, 9. "I think we have taken a half-step toward a better planet."

Throughout the event, the youths switched jobs with one another, so those who really wanted to could place the markers, Carpenter said.

"They got to use many different skills in this project," she said. "I was amazed by how well they could read the map [showing the location of the drains], and they even pointed out drains that were not on the map."

As they placed the markers, the youth volunteers checked off the storm-water drains they had done.

"By giving the youth volunteers a first-hand look at the impact their lifestyles have on the communities where they live, we are teaching them behavior that will, hopefully, have a positive impact over time," Carpenter said. "This was definitely a win-win project for everyone."

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Barbara L. Sellers is a reporter with Fort Lewis's Northwest Guardian. 



Energy Summit III – moving forward with renewable projects

by Paul Volkman

Selected garrison energy managers attended an Installation Management Command Energy Summit hosted by the Pacific Northwest National Laboratory in Richland, Wash. July 15-17. “Moving Forward with Renewable Energy” was the theme of the third summit in a series developed by Maj. Gen. John A. Macdonald, deputy commanding general, IMCOM, and commanding general, Family and Morale, Welfare and Recreation Command.

The energy summits represent his continued commitment and vision to creating an IMCOM-wide increased awareness of energy conservation and renewable energy. PNNL is a strategic energy partner and is fully engaged in assisting IMCOM to achieve its energy objectives.

PNNL’s mission is to facilitate the increase in domestic energy capacity that will lead to a reduction in the nation’s dependence on imported oil. PNNL is also building a bridge from a carbon-based energy economy to one based on renewable, nuclear and zero-emissions hydrocarbon energy systems while advancing reliable, sustainable and efficient energy use.

Energy Summit III differed from the previous summits as it represented a hands-on working session for the participants.



Paul Volkman
Photo by Mary Beth Thompson

The objective was to develop economically viable, on-site, renewable energy projects at garrisons invited to participate, in keeping with Macdonald’s long-term goal of having a renewable project at every garrison.

To advance this renewable initiative, in addition to the series of energy summits, the Energy and Utilities Program has developed a centrally funded program to support garrisons with the evaluation of their renewable resources and determine the best course of action to harvest the resource. The Renewable Energy Resource Assessment is administered by PNNL and stems from the 2005 Department of Defense Renewable Energy Assessment that focused on evaluating renewable resources on and near garrisons.

The assessment team, led by PNNL and comprising subject matter experts, travels to each garrison interested in evaluating its renewable resources to determine if they are commercially viable for harvesting. Over the period of a week, the team gathers information to complete an in-depth assessment of the indigenous resources, both on and off the installation, that could support four renewable sources of energy — solar, wind, geothermal and biomass.

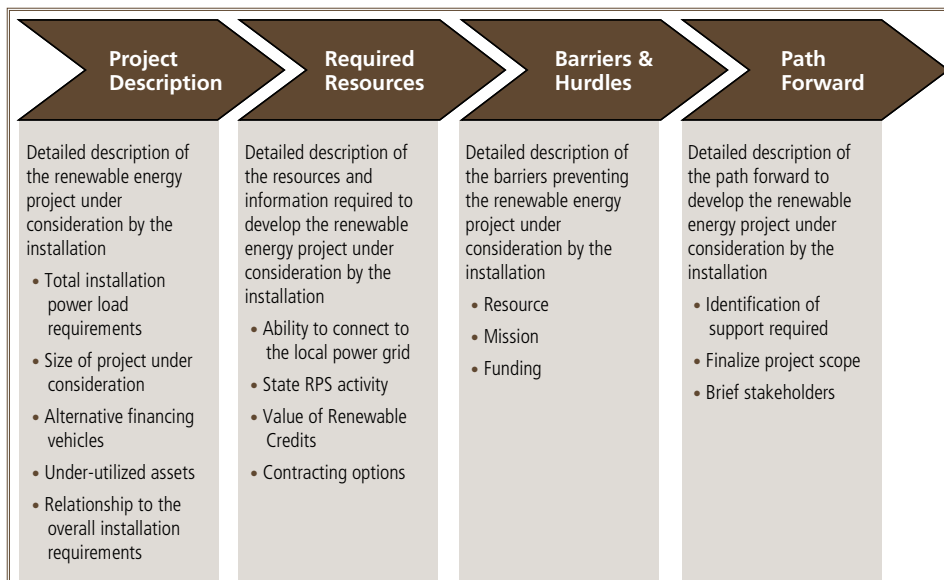
Those interested in scheduling a renewable assessment should contact one of the POCs listed at the end of this article.

Energy Summit III was structured with four breakout sessions led and staffed by subject matter experts who assisted energy managers with development of their renewable projects. Wind, solar, biomass and ground-source heat pumps represent the four renewable energy resource areas on which the breakout sessions focused.

Highlighting the importance of renewable energy for the Army, and IMCOM’s commitment to sustainability and reducing its reliance on imported oil were representatives from the senior Army leadership, including Paul P. Bollinger Jr., deputy assistant secretary of the Army for privatization and partnerships, Macdonald, and Brig. Gen. Dennis E. Rogers, director of operations and facilities, IMCOM.

In addition to working with subject matter experts in the breakout sessions, garrison energy managers toured PNNL’s electricity operations center and Energy Northwest’s Nine Canyon Wind Farm project, located near Kennewick, Wash., which is one of the largest public-owned wind projects in the nation, consisting of 63 wind turbines with a total generating capacity of 95.9 megawatts.

After three days of working with their respective subject matter experts



Acronyms and Abbreviations	
IMCOM	Installation Management Command
Mw	megawatt
PNNL	Pacific Northwest National Laboratory



Presentations sizzle at GovEnergy 2008 Conference

by Jeff Ward

At GovEnergy 2008, held Aug. 3-6 at the Phoenix Convention Center, a general session was followed by 113 technical training sessions and 161 energy and utility products and services exhibits for the about 2,400 attendees. The training sessions were packed with information and provided continuing education credits required for certified energy managers.

R. James Woolsey, vice president of Booz Allen Hamilton and former director of the Central Intelligence Agency from 1993 to 1995, delivered the keynote speech. Woolsey said the United States needs to become oil independent, especially from nations that “do not particularly like us.” He proposed utilization of existing battery technology to have “plug-in hybrids” that use nighttime, off-peak electrical charges and deploy technologies to reach vehicle efficiency of 100 miles per gallon.

Jim Paton of the Office of the Assistant Chief of Staff for Installation Management presented at a session entitled “Energy Markets.” Paton shared insights and strategies designed to successfully navigate today’s volatile energy markets.



GovEnergy 2008 attendees visit the exhibition. Photo courtesy of GovEnergy

Bill Stein, also of OACSIM, spoke on “Meeting Your Renewable Energy Goals.” This presentation covered the new federal guidance on meeting the renewable energy requirements of the Energy Policy Act of 2005 and Executive Order 13423.

Stein also presented the “Renewable Energy and Sustainability” session, discussing the basics of renewable technologies including solar, wind, thermal, alternative fuels, biomass and biogas technologies.

Randy Smidt, OACSIM, gave a presentation on American Society of Heating, Refrigerating and Air Conditioning Engineers 90.1, the underlying industry standard for building energy performance. Smidt explained how EPAAct established

federal building performance standards requiring energy consumption levels that are at least 30 percent better — more efficient on a British thermal unit/square foot energy consumption basis — than the current ASHRAE 90.1-2004 standard.

(Editor’s note: Articles on most of the subjects mentioned above may be found in this issue of Public Works Digest.)

Ron Diehl of OACSIM served on the GovEnergy Planning Committee. He participated in six planning sessions in the months leading up to the conference and organized one of the education tracks.

GovEnergy offers training, resources and networking opportunities to improve energy performance at federal facilities.

POC is Jeff Ward, 703-601-0364, jeffrey.ward@us.army.mil.

Jeff Ward is the manager, Utilities Modernization Program, and is responsible for the U.S. Army Energy and Water Campaign Plan for Installations, Facilities Policy Division, OACSIM.

Acronyms and Abbreviations	
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
EPAAct	Energy Policy Act of 2005
OACSIM	Office of the Assistant Chief of Staff for Installation Management

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and intensely focusing on their charge from Macdonald, the garrison energy managers successfully developed 27 projects totaling 650 Mw of potentially new sources of renewable power. Examples of the projects developed are:

- Fort Bliss, Texas/White Sands Missile Range, N.M. – 200 Mw wind project;
- Fort Irwin, Calif. – 50 Mw solar photovoltaic project;
- Fort Bragg, N.C. – 35 Mw waste-to-energy project; and

- Aberdeen Proving Ground, Md. – ground-source heat pump system.

The energy managers used a simple, straight-forward process to develop their projects as illustrated in the chart on page 30.

Garrisons that did not participate in the summit but are interested in developing on-site renewable energy projects are encouraged to apply the development process. For additional information, contact the POCs below.

Building on the momentum generated by developing the renewable projects, Macdonald announced that Energy Summit IV will be held in January in Chicago.

POCs are Paul Volkman, 703-602-0142, paul.volkman@us.army.mil; and Doug Dixon, PNNL, 509-372-4253, doug.dixon@pnnl.gov.

Paul Volkman is the Energy and Utilities Program manager, Public Works Division, IMCOM.



GovEnergy conference offers hot solutions for energy managers

by Cecile Holloway

A value-added opportunity for energy managers was available during the GovEnergy 2008 Conference providing “Hot Solutions for Prickly Problems.” The conference was held in the Phoenix Convention Center Aug. 4-6. Immediately after the conference, the Office of the Assistant Chief of Staff for Installation Management sponsored an Army Energy Manager Training course.

More than 2,500 participants from various government sectors—including energy service companies, contractors, vendors, government lawyers, contracting officers and other energy professionals—were there.

Attendees benefited from opportunities to network with other energy professionals.

Sessions were held on new and innovative technology, alternative renewable energy, financing, building management, water conservation techniques and other energy-efficient measures. The ultimate objective was to enhance the over-all performance of energy managers at the Army installations worldwide.

Each participant received training certificates upon completion of the technical sessions, an excellent manner of obtaining continuing education credits through recertification as a certified energy manager or obtaining credit points towards certified energy manager examination.

The technical sessions were divided into various tracks, including Finance and

Funding, Metering and Energy Monitoring Control Systems, Renewables, Transportation, Water, Energy 101, Acquisition, Sustainability, Building Operations, Technology, Legislation, Energy Lawyers and Grand Canyon, which encompassed useful ideas for meeting energy goals.

The GovEnergy 2009 Conference will be held in Rhode Island Aug. 9-12. All are encouraged to fully participate.

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Cecile Holloway is a support staff engineer, Office of the Assistant Chief of Staff for Installation Management.

Army holds energy manager training at GovEnergy 2008

by Jeff Ward and Graham Parker

The latest information on Army energy management was in the limelight at the Army Energy Manager Training '08 in Phoenix Aug. 7 and 8. More than 160 energy managers, region staff as well as staff from Headquarters, Department of the Army attended the day-and-a-half event held in conjunction with the GovEnergy 2008 Conference.

Presenters came from installations; the Office of the Assistant Chief of Staff for Installation Management; the Installation Management Command; the Engineering Research and Development Center, Construction Engineering Research Laboratory; the U.S. Army Engineering and

Support Center, Huntsville; the Concurrent Technologies Corporation; and the Pacific Northwest National Laboratory.

Topics included: updates on policies and requirements for metering, energy efficiency and water conservation; renewable energy goals; project funding and financing; and energy security planning. Other presentations included updates from IMCOM and OACSIM; barracks energy and moisture control; net zero energy installations; the Army Energy and Water Reporting System; Program Objectives Memorandum planning; and new and emerging technologies.

Four case studies were presented:

- low- and no-cost energy savings at Fort Bragg, N.C.;
- a sustainable installation project at Picatinny Arsenal, N.J.;
- a Fort Carson, Colo., Solar 1 project; and
- water reductions at Fort Huachuca, Ariz.

Presentations on the final day of the training included an update on energy conservation in new Army facilities and Army installation waste-to-energy opportunities. The training ended with a time for general comments and questions.

The AEMT 08 agenda, presentations and attendance list can be found on the Army Energy Program web site at <http://army-energy.hqda.pentagon.mil/>. Click the “Training/Workshops” button on the left.

POCs are Jeff Ward, 703-601-0364, jeffrey.ward@us.army.mil; and Graham Parker, 509-375-3805, graham.parker@pnl.gov.

Jeff Ward is the manager, Utilities Modernization Program, and is responsible for the U.S. Army Energy and Water Campaign Plan for Installations, Facilities Policy Division, Office of the Assistant Chief of Staff for Installation Management. Graham Parker is a senior staff engineer, Pacific Northwest National Laboratory.

Acronyms and Abbreviations	
AEMT 08	Army Energy Manager Training '08
IMCOM	Installation Management Command
OACSIM	Office of the Assistant Chief of Staff for Installation Management



Corps' North Atlantic Division engaged in LEED

by Katisha Draughn

The U.S. Army embraces a concept in environmental stewardship that offers the opportunity to protect the environment and showcase the art of “building green.” That concept is the Leadership in Energy and Environmental Design.

LEED was developed by the U.S. Green Building Council, which is a nonprofit organization that encourages sustainability in how buildings are designed, built and operated. LEED is a voluntary, consensus-based rating system that provides standards for construction and design of sustainable or green buildings, which is the design practice of increasing the efficiency with which buildings use resources.

North Atlantic Division gets involved

Reorganization of many military installations as part of the Base Realignment and Closure program — including \$ 7.1 billion worth of work for the U.S. Army Corps of Engineers, North Atlantic Division — provides increasing opportunities to employ the LEED concept. LEED has transformed into a regional approach for the division, as many of its districts capitalize on this staggering concept.

“It’s a means of quantifying the sustainability of the construction of a project,” said Alan Eidsmore, chief of the Architecture Section, Engineering Division, Baltimore District.

Construction of the National Geospatial-Intelligence Agency at the Fort Belvoir, Va., Engineer Proving Ground, which is being managed by the Baltimore District, incorporates the LEED model by using low-emitting materials, such as paint and carpet, reducing site disturbances



The National Geospatial-Intelligence Agency at the Fort Belvoir Engineer Proving Ground is one of the many projects implementing the LEED concept. Photo courtesy of the National Geospatial-Intelligence Agency

and implementing water-use reduction by including low-flow and low-flush fixtures in the design.

“BRAC is an important part of the LEED facilitation and progress,” said Michael Hurley, senior design manager for the NGA campus. “BRAC is embracing LEED, and the Energy Policy Act requires all federal buildings to be energy efficient.”

Another Baltimore District project capitalizing on LEED is the Fort Meade (Md.) Technology Center, which will feature green building construction.

Construction of the new Fort Belvoir hospital, managed by the Norfolk District, furthers the concept by using construction practices that promote environmental sustainability, including recycling construction waste and specifying building materials that are regional, contain recycled content and comply with volatile organic compounds limits established by LEED.

“Sustainable design and construction practices will contribute not only to improved building performance, but will also promote a healthy indoor environment so crucial in health-care facilities,” said

Lidia Berger, sustainable project manager with HDR/Dewberry Joint Venture, the design team for the hospital. “Sustainable features such as access to natural light and views, low-emitting products, improved thermal control and high-performance lighting will benefit the building’s occupants by creating a comfortable and safer working environment.”

Philadelphia District is designing the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Center of Excellence at Aberdeen Proving Ground, Md. This project is a series of technological research and development facilities. The project will implement several LEED features, such as geothermal renewable resources, green roofs and preferred parking for fuel-efficient vehicles and carpools.

New England District is constructing the 39,700 square-foot, \$11.5 million Acquisition Management Facility at Hanscom Air Force Base, Mass. The requirements for LEED are to integrate sustainable strategies and features into the design to minimize the energy

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
LEED	Leadership in Energy and Environmental Design
LEED-NC	LEED for New Construction
NGA	National Geospatial-Intelligence Agency
USGBC	U.S. Green Building Council



Bulletin reports on field test kits for environmental sampling

by Giselle Rodriguez

The U.S. Army Corps of Engineers issued a new Public Works Technical Bulletin titled *An Evaluation of Field Test Kits for Environmental Sampling*. This bulletin identifies some field test kits available on the market and their effectiveness in identifying environmental contaminants.

Polychlorinated biphenyls; heavy metals; petroleum, oils, and lubricants spills; and explosives are common contaminants Armywide. Quick decisions are often necessary in scoping an environmental emergency and determining an appropriate response. In addition, screening a large area or a large number of items requires efficient tools.

Commercially available field test technologies are often the best alternative for providing the user with a quick response.

Potential uses include spill response, screening of recycling scrap or waste building materials, compliance, long-term monitoring and pre-screening of contaminated areas to determine future actions.

Modern technical approaches, such as the Triad for characterization and remediation of hazardous waste sites, encourage the use of real-time measurement technologies, including field analytical instrumentation. Some of the benefits of this modern approach are accelerated project schedules, cost reduction and improvement of project results.

This PWTB describes the most commonly used field testing technologies and



Field test technologies are often the best alternative for providing the user with a quick accurate response. Here, a field test kit is used to determine the presence of explosives in a soil sample. U.S. Army Engineer Research and Development Center photo

instruments based on these technologies. Performance, advantages and disadvantages of these instruments are discussed. Army examples where implementation of field testing technologies has saved operational costs and project time also are presented. ➤

Acronyms and Abbreviations	
PWTB	Public Works Technical Bulletin

(continued from previous page)

consumption of the facilities, conserve resources, minimize adverse effects on the environment and improve occupancy productivity, health and comfort.

Across the pond, Europe District applied an environmental benchmark in a new Army Family housing area. In addition to building a community of townhouses near Ansbach, Germany, that meet the German environmental standards, which are stricter than U.S. standards, Europe District is also planning a neighborhood of 22 ultra-low-energy townhouses that meet the *Passivhaus* standards.

These townhouses will employ specialized thermal insulation, triple-paned and insulated glazed window technology and sealed air barriers to retain existing and incoming solar heat. They will use less than a quarter of the energy required by other houses in the neighborhood.

LEED process

To begin the LEED process, the project has to be registered, which is done by submitting an application for the project.

According to the USGBC web site, LEED's rating system addresses six major areas: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and the innovation and design process. Each area is evaluated on a point system, and the accumulation of those points determines if the project will be LEED Certified (26-32 points); LEED Silver (33-38 points); LEED Gold (39-51 points); or LEED Platinum (52-69 points).

There are nine LEED categories; new construction, existing buildings, commercial interiors, core and shell, schools, retail, health care, homes and neighborhood development. Each category is targeted toward particular customers and promotes the design and construction for that project.

Beginning in fiscal 2008, the U.S. Army Corps of Engineers required all vertical construction projects with climate-controlled facilities to achieve a LEED-New Construction Silver rating.

The Fort Belvoir hospital is using LEED-NC and the major renovations version as an integrated design approach, while creating a healing environment and workplace that is environmentally friendly, energy-efficient and both healthy and pleasant to be in.

"It's great that we are taking a broader approach and looking at the health and well-being of the occupants," said Eidsmore. "LEED will help maximize the workers' safety."

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Katisha Draughn is a public affairs specialist, U.S. Army Corps of Engineers, Baltimore District.





6 ways AAFES tackles environmental sustainability

by Ann Scott

The Army and Air Force Exchange Service, the Department of Defense's oldest and largest retailer, has initiated several energy-saving initiatives to reduce its impact on the environment while strengthening the benefit it provides troops and their Families. The AAFES Energy Management Team established six sustainability goals to help shape the future of AAFES as well as the planet.

Reduce energy consumption – AAFES facilities are reducing energy consumption by installing LED lights in gas station canopies and motion-sensor controlled LEDs in reach-in convenience store coolers, as well as re-lamping jewelry showcases with LED lights.

In addition, AAFES is mandating that a minimum of 20 percent of equipment in new or renewed vending contracts each year use Energy Star-compliant machines. AAFES' primary vending providers are working toward cost-saving initiatives for their vending equipment.

AAFES is also working with restaurant franchises to convert to higher-efficiency, Energy Star-rated equipment and is currently installing this equipment at more than 200 AAFES fast food operations to produce an expected savings of \$741,000 by 2010.

Reduce water consumption – Following a study by the Food Service Technology Center, a scientific testing facility for equipment used in commercial kitchens, AAFES is incorporating several water-saving changes in equipment in its franchise restaurant kitchens. These changes include the installation of high-efficiency pre-rinse spray valves, replacement of steamers with a waterless Energy Star version, the installation of on-and-off valves on dipper wells at ice cream stores and the installation of Energy Star-rated ice machines and dishwashers.

Reduce waste – AAFES is testing an initiative for the sale of used cooking oil and grease at facilities in Arizona and other locations in the United States. If successful, this effort will recycle materials that would otherwise become waste, yielding environmental, financial and social returns in natural resource and energy conservation, pollution prevention and environmental stewardship.

AAFES is also testing a new recycling program that focuses on packaging waste in a "super sandwich bale." Plastic hangers, aluminum cans, books and periodicals, cardboard and shredded paper are compressed into large bales ready for recycling. This program is currently being tested at eight AAFES facilities.

Reduce dependency on fossil fuels – To reduce the AAFES fleet's dependence on fossil fuels, AAFES uses bio-fuel at 31 military installations throughout the United States with the goal of increasing bio-fuel use by an additional 20 percent by the end of the year. In addition, AAFES recently began testing an oil filtration system on its trucks that prolongs the life cycle of motor oil by filtering out residue that breaks down the oil's consistency.

Increase sustainable buildings – Through partnerships with the Army and Air Force, AAFES joined the U.S. Green Building Council in 2007 to promote buildings and communities that are environmentally responsible, profitable and healthy places to live and work. AAFES is currently planning construction on USGBC's Leadership in Energy and Environmental Design-certified shopping centers at four military installations that will set new standards in energy efficiency for the military community.

Increase procurement, marketing and selling of more environmentally friendly goods and services – In 2007, AAFES was named an Energy Star partner, enabling its base and post exchanges to provide guidance to military shoppers in choosing high-efficiency appliances and electronics that help conserve energy, protect the environment and reduce utility costs. AAFES currently offers more than 120 Energy Star-rated items in its stores, catalogs and online site, *aafes.com*. It has also seen a marked increase in the sale of compact fluorescent light bulbs.

AAFES' goal to purchase, market and sell more environmentally friendly goods and services that use sustainable environmental practices encompasses many initiatives. Those efforts include using "green" custodial cleaning products in the stores and at AAFES headquarters, Energy Star products in food courts and stores, and "green practices" on contracts.

With more than 3,100 facilities and some 6 million authorized shoppers worldwide, AAFES and its customers' impact on the environment cannot be overstated. Its military and civilian leadership is dedicated to ensuring AAFES' operations are taking the steps necessary to make the communities it serves better places to live, work and shop.

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PWTB 200-1-61 can be downloaded from the PWTB page of the Whole Building Design Guide, Construction Criteria Base, http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215.

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Giselle Rodriguez is a researcher, Environmental Processes Branch, U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory, Champaign, Ill.

Acronyms and Abbreviations

AAFES	Army and Air Force Exchange Service
USGBC	U.S. Green Building Council



Forts Knox, Carson win DoD Fire and Emergency Services awards

by Installation Management Command Public Affairs

Installation Management Command Fire and Emergency Services won two awards at the annual Department of Defense Fire and Emergency Services Conference Aug. 15 in Denver. The awards recognize the outstanding accomplishments of fire departments, firefighters and heroes.

The *DoD Civilian Fire Officer of the Year* award went to **Gerald William Schiedewitz**, assistant chief of Fort Knox, Ky., Fire and Emergency Services. Schiedewitz was described by peers as “the best and most committed professional.” Under his leadership, the department received a 98 percent Operational Readiness Inspection score, achieved the best E-911 dispatch system in IMCOM’s Southeast Region and established a first-responder training complex.

The *DoD Heroism Award* went to eight officers and firefighters from Fort Carson, Colo., Fire and Emergency Services who responded to the collapse of a 40,000 square-foot concrete operation facility that had been under construction July 9, 2007. Two workers were trapped in the debris and a third was hanging from a teetering pillar. Exposing themselves to considerable

risk, the rescuers extricated them and provided advanced life support.

Although one victim ultimately succumbed to his injuries, two of the workers are alive today thanks to the efforts of the crews of Engine 31 and Truck 32: **Capt. Kenneth Rhault, Capt. Steven Polizzi, Firefighter Patrick Tepley, Firefighter William McLaughlin, Firefighter Benjamin Robinett, Firefighter David Ulman, Firefighter Kevin Cain and Firefighter Nikalous Hasenauer.**

In addition to the above, the Army had nominated personnel and units in the six categories below for the calendar year 2007 DoD competition:

Fire Department of the Year (large): **U.S. Army Garrison Japan.**

With the largest response coverage in the Army, this fire department protects thousands of Department of Defense personnel, 5,400 buildings and \$40 billion in assets at 16 installations across 1,050 square miles. USAG Japan responded to more than 1,000 emergency calls in 2007.

Fire Department of the Year (small): **Pohakuloa Training Area, Hawaii.**

Located on the island of Hawaii, it pro-

TECTS more than 140,000 acres in support of Army, Air Force and Marine live-weapons-fire training. This fire department provides structural, wild-land and aircraft firefighting, rescue and ambulance service with 22 firefighters, two structural engines, one tanker and two brush trucks.

Fire Prevention Program of the Year: **Aberdeen Proving Ground, Md.**

Located at the Army’s most renowned proving grounds, it provides fire-prevention services to 25,000 Soldiers, Family members and civilian personnel. In 2007, this department provided 2,500 fire inspections, fire-extinguisher training for more than 2,000 federal employees, 341 fire drills for 10,563 employees, issued 1,386 flame permits and provided special inspections to 32 agencies.

Military Firefighter of the Year: **Spc. Scott Radtke, Fort Carson**

Radke was deployed for 15 months to Camp Anaconda, Balad Airbase, Iraq, as part of Operation Iraqi Freedom. Radke was a member of a Rescue Air Mobilization Squad and played a critical role in the search and recovery of 33 victims. In his career, he has responded to more than

300 incidents; including fires, aircraft crashes and rescues.

Civilian Firefighter of the Year: **Firefighter William J. “Jeremy” Magers, Fort Meade, Md.**

Magers was the 2007 *Garrison Employee* ➤



Assistant Chief Gerald William Schiedewitz of Fort Knox, Ky., was named the DoD Civilian Fire Officer of the Year. Army photos



The Heroism Award, the fire service’s highest honor, went to eight officers and firefighters from Fort Carson, Colo. (Left to right) Captain Kenneth Rhault, Firefighter Kevin Cain, Firefighter Patrick Tepley, Firefighter David Ulman, Firefighter William McLaughlin, Firefighter Nikalous Hasenauer, Firefighter Benjamin Robinett and Captain Steven Polizzi pose for the camera after receiving the award Aug. 15.

Acronyms and Abbreviations	
DoD	Department of Defense
IMCOM	Installation Management Command
USAG	U.S. Army Garrison



GFEBs and the best laid plans of mice and men ...

by Clyde Reynolds

This is the final installment in my series on the General Fund Enterprise Business System. Fort Jackson, S.C., will go live with GFEBs Oct. 1. The GFEBs saga doesn't stop there, but it will be my successor's responsibility, as I will no longer be its director of Public Works.

Before I delve into a new topic, I want to provide a quick update on some ongoing GFEBs activities. Recall the extensive training requirements for the 46 distinct roles for Directorate of Public Works personnel? (Editor's note: See Reynolds' article in the July/August Public Works Digest.) Well, that training began, and it was like a ghost town around the DPW.

The DPW has almost 60 people in the instructor-led training. Most of those are white-collar professionals responsible for the day-to-day operation of the DPW. Consequently, there has been a significant degradation of DPW service across the installation, which is being felt by everyone in the Fort Jackson military community.

As for the training itself, reports indicate that the information is difficult to comprehend and digest. The material is so different from the system we're used to that it is very much like learning a foreign language.

There are exams associated with these learning modules, too. The exams are difficult to pass, and there is a relatively high failure rate. Students must pass a module before they can proceed to the next. We're



Clyde Reynolds
Photo by Renee Sanders, Fort Jackson

working through these challenges, but it is significantly more involved and intense than we ever expected.

In this issue, I will discuss another aspect of GFEBs that hasn't had much coverage so far — plans. GFEBs is an extremely versatile system that has incredible functionality to do just about anything you need it to do. But therein lies the dilemma.

What do you need it to do? Is GFEBs merely another financial system to capture cost information? Yes, but it is so much more than that. The capability of the Plant and Equipment modules of GFEBs far exceeds the capabilities of the Integrated Facilities System.

The maximum potential of GFEBs can only be realized if one understands what it is designed to do. GFEBs presumes that you have a plan for everything — a preventive maintenance plan, a demand maintenance order (formerly known as a service order) plan, an individual job order plan, a standing operations order plan, among others. The sum of all those plans would constitute your annual work plan.

It's easy to say that you have a plan for everything DPW does, but it's much harder to actually produce a written plan for everything. And for GFEBs to function properly, all those plans not only have to be written, they have to be "programmed" into GFEBs up front.

For example, take preventive maintenance. You probably will not have a single PM plan. You may have a PM plan for each type of facility, or for each customer, or for geographic areas or certain types of Sustainment, Restoration and Modernization work. You will have to think through all this to determine the best way to build and program all your plans for the way you do business.

There is not a one-size-fits-all solution for GFEBs. In some ways, that is a good thing, as it affords you greater flexibility and makes GFEBs a more useful tool. In other ways, it is not so good, as it requires an incredible amount of time and effort to get GFEBs set up properly to manage all your work.

Your work can be managed down to the individual window, or door or light fixture level, but do you really need that level of detail? Only you can answer that.

Once your plans are set up properly in GFEBs, much of the effort associated with getting the right resources to the right place at the right time will be automatic. In fact, you can set up GFEBs to pass "bills of material" to vendors automatically, so that there are no internal bottlenecks or non-value-added steps in the process. You are limited only by your own imagination.

Bottom line: GFEBs is a great tool ➤

Acronyms and Abbreviations

DPW	Directorate of Public Works
GFEBs	General Fund Enterprise Business System
PM	preventive maintenance

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of the Year at Fort Meade, which earned the Army Communities of Excellence award. He played a significant role in the fire department's earning of the Life Safety Achievement Award, and achieving 96 percent in its Operational Readiness Inspection and a 75 percent completion rate for its Fire Service Accreditation.

Military Fire Officer of the Year: Staff Sgt. Lucius Kirkland, Fort Rucker, Ala.

As the senior noncommissioned officer for Alpha Company, Kirkland was responsible for the development and welfare of 46 firefighters at six stations. He is the safety officer for the Fort Rucker Hazardous Materials response team and is the Operations Sergeant for the U.S.

Army Aviation Warfighting Center Flight School, managing the crash rescue services for the school.

POC is Buddy Ey, program analyst contractor, Fire and Emergency Services, Headquarters, IMCOM; 703-602-9344, elwood.ey@us.army.mil.

Article provided by IMCOM Public Affairs.





Building the team for success

by Lt. Gen. Robert L. Van Antwerp

Like many of you, I watched the recent Olympic Games in Beijing with fascination and awe. Time and again, the concept of building the team for success was demonstrated by athletes in all of the Olympic sports, from swimming to gymnastics to basketball.

One example is the U.S. men's Olympic basketball team, built in cooperation with the National Basketball Association and U.S. Team coach Mike Krzyzewski. Each member of the team, including star players like Kobe Bryant and LeBron James, was asked to commit to the program for three years, to include participation in workouts and tournaments outside of the NBA season, and abide by the rules of conduct established by USA Basketball. The motivation was simple — to win the Olympic gold medal and demonstrate a superior mastery of the game of basketball to the rest of the world.

Another example is the U.S. women's beach volleyball team of Misty May-Treanor and Kerri Walsh. Paired together more than four years ago when their previous partners moved on, they have compiled a winning streak of more than 100 matches since 2004, defeating many talented teams and players to win multiple professional championships as well as Olympic gold medals. Misty and Kerri know each other's strengths well and optimize them to their full ability to be the best beach volleyball team in the world.

These are just two examples throughout the entire Olympic Games of teams built for success.

Building the team for success was also evident during my visit to the Career Program 18 Career Program Managers' Workshop in Baltimore. While talking to the group, I emphasized the four major tenets of what "great" looks like:

1. Delivering superior performance in all missions;
2. Setting the standards for our profession;
3. Having a unique, positive impact on our nation; and
4. Built to Last.

Even with the aggressive tempo of supporting the Global War on Terror, Base Realignment and Closure, Common Levels of Service and Growing the Force, this is the perfect time to invest in your organizations and find those "pentathletes" to build your bench and become your future leaders.

At this workshop, Bob Slockbower, the CP-18 functional chief representative, tasked a number of the attendees to take the lead on various initiatives. These include: recognition and awards, intern development, journeyman development, recruitment strategies, Regimental devel-



Lt. Gen. Robert L. Van Antwerp
Photo by F.T. Eyre

opment, activity career program managers and the Army Civilian Training, Education and Development System Plan refresh.

If you have a passion and ideas in any of these initiatives, please contact Bob at 469-487-7084 or robert.slockbower@usace.army.mil to volunteer your talents to the cause.

I recommend that everyone go to the CP-18 web site, <https://ekopowered.usace.army.mil/cp18/>, to read the presentations from the workshop. I especially suggest that you review the findings from our recent survey of Army intern employees, successfully spearheaded by Bill Sorrentino of the U.S. Army Corps of Engineers' Norfolk District. The findings will enlighten you and provide focus on the types of disciplined thought and disciplined action to properly develop our newest employees.

Trish Opheen and her project delivery team are completing the new *CP-18 Career Program Managers Handbook*, with final publication still on track for the end of fiscal year 2008. Contact Trish at 907-753-2662, patricia.s.opheen@usace.army.mil; or Mollie TeVrucht at 907-753-2695, mollie.l.tevrucht@usace.army.mil; if you have any questions or need a copy of the draft handbook.

Finally, we are currently recruiting to establish the new CP-18 Propensity Office, to be located at Headquarters USACE in Washington, D.C. Contact Bob Slockbower at the phone number or e-mail address above if you or someone you know has the drive and desire to build a career program that lasts. *Building Strong.*

Essays!

Lt. Gen. Robert L. Van Antwerp is chief of engineers, commanding general of the U.S. Army Corps of Engineers and functional chief of CP-18.



Acronyms and Abbreviations

CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
NBA	National Basketball Association
USACE	U.S. Army Corps of Engineers

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that you can use for many purposes, all of which will help you better manage your business. Just remember that it is an information hog and its output is only as good as its input.

So, if you don't want GFEBs to go awry, you must have good plans!

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Clyde Reynolds was the director of Public Works, Fort Jackson, when this article was written. He is now the chief, Public Works Division, National Capital Region District, Installation Management Command.



CP-18 career program managers explore way forward

by Dawn R. Daw

Where is Career Program 18 heading and how will it get there? These questions describe the underlying themes of the CP-18 Career Program Managers Workshop held in Baltimore July 15-17. The workshop was open to all career program managers with CP-18 employees, and attendees came from across the world.

Positive energy flowed as attendees focused on three overarching areas: recruitment, training and retention.

Tyrone Taborn, chief executive of Career Communications Group Inc. spoke on "Recruiting the Workforce of the Future." He addressed issues such as minority enrollment in science and technical educational programs, development of youth interest in technical professions and recruitment of technical staff.

Other keynote speakers included Lt. Gen. Robert Van Antwerp, functional chief of CP-18, who talked about "Career Planning from Good to Great," and Steven Stockton, director of Civil Works, U.S Army Corps of Engineers, who spoke on "Capable Workforce Expectations."

A panel on national and regional recruitment strategies led the focus on "how we get there" with discussion of the need to hire a qualified workforce and the challenges currently faced with recruitment. Updates were given on the USACE and Engineer Research and Development Center Human Capital strategies, recruitment streamlining, bridging strategies and regional strategies.

Discussions on intern recruitment concentrated on ways to improve partnerships with universities, communication improve-



Dawn Daw
Photo by Mary Beth Thompson

ments and attracting potential interns to the program. Communication was identified as a major obstacle to recruiting college graduates and other qualified candidates. A lack of knowledge about the program's existence, process and benefits, as well as competition from private industry, associated salary gaps and funding issues have made it difficult to attract, develop and retain talent.

At the journeyman level (GS-11 to GS-13), there are more than 300 unfilled engineering and construction positions within the Department of the Army. Several ways to improve recruitment for journeyman-level positions were discussed. A pilot project to use the USACE Actions for Change funding to create a central advertisement for several open journeyman-level positions is being developed. The national recruitment strategy includes an "open continuous" announcement that can be used to fill several positions.

Training topics that centered around "where we are going" included functional and leadership competencies; the Army Civilian Training, Education and Development System plan; Training with Industry and the career program manager's guide. Each session discussed the need to enhance technical and professional expertise.

In order to determine competencies and the level of technical capabilities to support current and future missions and roles within the Army, an Army Competency Management System is being developed. This system will track about 600 technical

competencies within 70 job series, as well as technological, professional, planning, business and management competencies. The Army Competency Management System will identify gaps between current and future competency and capability requirements by incorporating a three-year projection of needs, a workforce analysis support system and the judgments of communities of practice and major subordinate commands.

The ACTEDS plan is being updated. The update began with the Master Intern Training Plan, which was implemented in January, and continued with sections I-III, which are complete. Currently, section IV is being updated to include new professional development maps.

The PDM is a new Army standard road map for career programs that features inputs for: the Civilian Education System and National Security Personnel System, career opportunities, common core and functional competency requirements, training requirements and opportunities, and other linked resources. This information is arranged by pay band.

The objectives are to build "as-is" professional development maps that draw upon the existing CP-18 web site, link the CP-18 Competency Management System, update PDMs as information becomes available and plan future integration and update of the CP-18 web site with PDMs, Competency Management System and ACTEDS sections.

To access sample PDMs on the web:

1. Go to www.train.army.mil.
2. Click "ACCESS ATIA."
3. Log in.
4. Click "PDM/Career Map" tab.
5. Select "810" or "830" from "Civilian" drop-down menu.

Because many new activity career program managers and supervisors don't know what to do or how to do it when it comes to career development, and many employees don't know where to look for guidance and information, the *CP-18 Career Program Manager Guide* is being developed. ➤

Acronyms and Abbreviations	
ACTEDS	Army Civilian Training, Education and Development System
CP-18	Career Program 18, Engineers and Scientists – Resources and Construction
FY	fiscal year
LDP	Leadership Development Program
PDM	professional development map
USACE	U.S. Army Corps of Engineers



Gervais takes over Army Environmental Command

by Alli Kartachak

Over the past 36 years, under various names and evolving missions, the U.S. Army Environmental Command has supported the Army's growing role as a world leader in environmental responsibility. Change came again July 29, as Col. Michael P. O'Keefe passed command to Col. Maria R. Gervais.

Lt. Gen. Robert Wilson, the Army's assistant chief of staff for Installation Management and commanding general of the U.S. Army Installation Management Command, presented the colors to Gervais at Aberdeen Proving Grounds, Md.

USAEC leads and executes environmental programs across the Army and provides environmental expertise that enables training, operations, acquisition and sustainable military communities. It became a subordinate command under IMCOM in October 2006.

Gervais, a chemical officer, is the 16th commander of and first woman to command USAEC or its predecessor organizations. She will be responsible for addressing environmental challenges that face the Army from issues such as Base Realignment and Closure, unit stationing, transformation, installation cleanups and growth of the force while preparing the command for its BRAC 2005-directed move to Fort

Sam Houston, Texas.

"My family and I are extremely proud to now be a part of the Army's environmental program," said Gervais. "This command will end one chapter in its history and will open another in San Antonio."

In her distinguished, 21-year career, Gervais served with the 11th Chemical Company as a platoon leader and executive officer during Operations Desert Shield and Desert Storm. She was also the company commander of the 101st Airborne Division's Headquarters and Headquarters Company and its Aviation Brigade chemical officer. She deployed to Turkey with the 21st Theater Support Command as a logistical planner during Operation Iraqi Freedom. At Fort Leonard Wood, Mo., Gervais commanded the 82nd Chemical Battalion and served as the chief of staff of the U.S. Army Chemical School and Maneuver Support Center.

Gervais has received many awards and decorations, some of which include the Meritorious Service Medal (with eight oak



Col. Maria R. Gervais receives the USAEC colors from Lt. Gen. Robert Wilson, assistant chief of staff for installation management and commanding general of IMCOM, during USAEC's change-of-command ceremony July 29 at Aberdeen Proving Ground. Photo by Neal Snyder, USAEC

leaf clusters), the Joint Service Commendation Medal (with two oak leaf clusters), the Southwest Asia Service Medal (with three bronze service stars), the Parachutist Badge and the Air Assault Badge.

She holds a bachelor's degree in biology from Lander College, a master's in military science from the U.S. Army War College and a master's in human resources from Webster University.

POC is the Public Affairs Office, USAEC, 410-436-2556.

From an Army news release.

Acronyms and Abbreviations	
BRAC	Base Realignment and Closure
IMCOM	Installation Management Command
USAEC	U.S. Army Environmental Command

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This guide will provide practical "how-to-get-there" information on career planning for employees and activity career program managers. It will also outline career paths and provide easy access to applicable guidance for all career levels. When the guide is completed, it will be available on the web.

A Training with Industry pilot project provides another helpful vehicle in the way forward. USACE partnered with Voith-Siemens Hydro for the pilot program, which is designed to provide training and build skills in business practices.

CP-18 engineering participants will be selected competitively to work with Voith-

Siemens Hydro on a turbine design project for four to 12 months. Participants will receive normal pay and allowances plus TDY allowance for the duration.

Only one or two positions will be available for this pilot program. When completed, the benefits will be evaluated, and a broader application will be considered.

The Leadership Development Program, another avenue for career development, received \$775,000 in funding for fiscal year 2008. This funding is applied toward executive and leadership courses, CP-18 LDP courses, Training with Industry, local LDPs and technical training for critical needs.

The LDP currently has 23 active participants, including 13 in the FY 2008

class. There were 143 graduates from the program as of July. More than 50 percent of the graduates have been promoted to leadership positions.

The workshop generated lots of animated discussion about where CP-18 is headed and how to get there. Ideas were generated, and new teams were assembled to continue the efforts of improving the program in several areas, including communication, collaboration and recruitment.

POC is Dawn R. Daw, 202-761-7589, dawn.r.daw@usace.army.mil.

Dawn R. Daw, a wildlife biologist at Fort Huachuca, Ariz., is currently completing a six-month developmental assignment for the CP-18 LDP, Headquarters, USACE.



Barracks, headquarters and fence projects win team awards

by Cliff Kidd

What do an Army barracks on the West Coast, a headquarters building in America's heartland and a fence project along the U.S. southern border have in common? Not much, except that the three teams that managed these projects were named as the best in the U.S. Army Corps of Engineers for 2008.

These project delivery teams, as USACE calls them, were selected from among 26 nominations submitted by the Corps' major subordinate commands; the Engineer Research and Development Center; the Engineering and Support Center, Huntsville; and the Transatlantic Programs Center. A multi-disciplinary team at headquarters rated the nominations on factors such as customer focus, quality, cost and time, teamwork, partnering, balancing competing demands, applying innovative technology and tools, and sharing lessons learned.

The 2008 Project Delivery Team of the Year Awards were presented during the USACE Summer Leaders Conference in Pittsburgh in August.

Merit Award

The Merit Award went to the Jackson Avenue Whole Barracks Renewal, Fort Lewis, Wash., Project Delivery Team of Seattle District.

The Jackson Avenue Whole Barracks Renewal PDT demonstrated outstanding teamwork on a project to provide more affordable and highly sustainable barracks facilities for the Soldiers at Fort Lewis. The PDT partnered with Military Construction leadership to make a major change in the barracks design approach.

The team used Building Information Modeling techniques to develop the first USACE in-house barracks design using Type V wood-framed construction. This innovative approach meant revision of previous barracks design requiring new

drawings, a multitude of new systems and new analyses of seismic and progressive collapse scenarios. A shortened 540-day construction period led to building occupancy in early 2008 and attainment of the Leadership in Energy and Environmental Design

Gold rating for the design and construction of the barracks facilities.

In exceeding current standards and striving to establish criteria for future work, the PDT exemplified the USACE principle, "Use best practices and seek continual improvement."

Honor Award

The Honor Award was presented to the Division Headquarters, Fort Riley, Kansas, Project Delivery Team of Kansas City District.

The Division Headquarters PDT delivered a command and control facility to serve as the new headquarters of the First Infantry Division. The PDT executed this complex project during the infancy of Army Modularity. The defined use of this facility, the first of 10 programmed throughout the world, was undetermined at project initiation when the concept of the Modular Army was being developed, and the standard design existed only in draft form.

This PDT embraced an early-contractor-involvement acquisition strategy. It



The 1st Infantry Division Headquarters main entrance features a three-story atrium lobby and glazing that uses a southwestern exposure to harvest sunlight and reduce lighting use. It also provides an expansive view of the post. Photo by Brandon Tobias



Each Jackson Avenue barracks kitchen has a stacked washer-dryer, under cabinet lighting, garbage disposal, separated toilet and bathing rooms and built-in electric range with microwave/hood. Photo by Douglas Symes, USACE, Seattle District

completed this project within 20 months and within the ceiling price. The team defined quality measures early and exceeded customer expectations in execution.

The Division Headquarters PDT's work demonstrated the USACE imperatives, "Plan for success and keep commitments" and "Measure quality with the goals and expectations of the customer in mind."

Excellence Award

The Excellence Award went to the Operation Border Brothers Project Delivery Team from South Pacific Division and Southwest Division.

The Operation Border Brothers PDT received the top award for its exceptional work on the construction of border protection measures from Texas to California for several agencies of the Department of Homeland Security responsible for the Secure Border Initiative.

The project involved complex coordination among governmental agencies, contractors and the private sector and provided myriad challenges, such as difficult terrain, disputed land acquisitions, multi-agency communications, tight deadlines and

Acronyms and Abbreviations

PDT	project delivery team
USACE	U.S. Army Corps of Engineers



It's a tie for Installation Support Professional of the Year

by Pete Almquist

This year's competition for the *Installation Support Professional of the Year* award was extremely high, resulting in co-winners. **Kelly Dilks**, from the Construction Engineer Research Laboratory, and **Mark Fleming**, of the Engineering and Support Center, received their awards from Lt. Gen. Robert L. Van Antwerp, chief of engineers, at the U.S. Army Corps of Engineers' Summer Leaders Conference in Pittsburgh Aug. 4.

(Editor's note: Articles featuring each of the co-winners follow this story.)

Both Dilks and Fleming were outstanding candidates who exemplify the highest levels of achievement and dedication to supporting Army installations.

The *Installation Support Professional of the Year* is a national-level award that recognizes individuals in senior management positions at the regional or installation level who distinguish themselves

in superior management skills and have been selected for special recognition for consistent outstanding performance.

POC is Pete Almquist, 202-761-7495, peter.w.almquist@usace.army.mil.

Pete Almquist is the manager of the *Installation Support Professional of the Year* award, Headquarters, U.S. Army Corps of Engineers.



Dilks earns accolades from Corps of Engineers

by Dana Finney

Kelly M. Dilks was named one of two co-winners of the *2008 Installation Support Professional of the Year* award by the U.S. Army Corps of Engineers. Dilks is a researcher with the U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory in Champaign, Ill.

In presenting the award, the Corps recognized Dilks for her many successful efforts in working at Department of the Army level to address installation technology needs. For the past four years, she has served as the ERDC liaison and technical



Kelly M. Dilks
Photo by Sandy Bantz, ERDC

advisor to the Office of the Assistant Chief of Staff for Installation Management in Washington, D.C.

In this role, she coordinates the Technology Standards Group, part of the Army

Facilities Standardization Committee, which is responsible for identifying long-range technology gaps at installations. The Technology Standards Group also evaluates Army facility and environmental challenges, investigates potential solutions and develops Armywide standards for new technology.

Dilks also is the program manager for the Installation Technology Transition Program, a \$75 million effort to infuse technologies into installation operations. She is responsible for supervising and reviewing technical research for this Army program and ensuring that the results are documented through official publications.

Another critical function that Dilks performs for the Army is as the Corps of Engineers' deputy program coordinator ▶

Acronyms and Abbreviations

CERL	Construction Engineer Research Laboratory
ERDC	Engineer Research and Development Center
GIS	geographical information system

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fence design decisions. The team led this massive effort on all fronts, including real estate acquisition, environmental compliance, engineering and construction oversight, and information and communications flow.

The PDT's focus on frequent communication with the customer and among

team members led to the creation of an "Operations Cell," the integration of geographic and automated information systems into a customer-oriented, web-based communication and reporting tool, and ahead-of-schedule project execution.

Comprising members from the Fort Worth, Galveston, Little Rock, Tulsa, Albuquerque, Los Angeles and Sacramento districts, as well as multiple other

federal agencies, this PDT highlighted the imperative, "One project, one team, one project manager."

POC is Cliff Kidd, 202-761-5765, clifford.j.kidd@usace.army.mil.

Cliff Kidd is a program manager, Headquarters, USACE. He compiled the project information from the nomination packages.



Fleming receives prestigious installation support award

by Jo Anita Miley

For the third time in four years, an Engineering and Support Center, Huntsville, Ala., employee received the U.S. Army Corps of Engineers' prestigious *Installation Support Professional of the Year* award. Mark Fleming, a program manager in the Installation Support and Programs Management Directorate, is co-recipient of this year's award.

Fleming joins fellow Huntsville Center employees Sally Parsons and John Grigg who were recipients in 2005 and 2006 respectively.

As a program manager for the Army Training Facilities Program Office, Fleming led the effort to provide installation master planning and military construction programming services to support Army Modular Force, Warrior in Transition, Grow the Army, Global Defense Posture Realignment, and Base Realignment and Closure stationing actions. Fleming's team's primary responsibilities include managing the performance of more than 200 facility requirement analyses and planning charters for more than \$70 billion in facilities over the next six years to support the restationing of 142,000 personnel.

Fleming doesn't take this responsibility lightly. He said his primary focus is finding innovative ways to provide quality customer service.

"Planning is very important in our busi-



Mark Fleming
Photo by Becky Proaps, Huntsville Center

ness process," Fleming said. "We are now looking six years into the future to identify requirements," he said. "With so much turbulence in our Army right now, we want to be proactive rather than reactive."

Fleming attributes the success of his program and his success as a leader to team effort. He works closely with the members of his team to support critical Armywide installation programs.

"I'm feeling equally honored and humbled, and feel I'm really representative of a lot of other people's hard work," Fleming said. "You have to have good people in motion behind you executing the work as you lead."

Fleming's capacity for leadership is shown by those he supervises. David Broyles, a project manager and team mem-

ber, said Fleming makes sure that every aspect of the program is addressed.

"Our team observes Mark's dedication to the program on a daily basis," Broyles said. "He enjoys working on the program, and it shows. He inspires and leads us to do a good job, because he does. He is so full of energy and enthusiasm that we can't keep up with him."

Fleming has a vast amount of experience and knowledge as a master planner that has helped him tremendously in his current program. He said he learned many of the complex planning and program processes involved with master planning early on as the master planner at the National Training Center at Fort Irwin, Calif.

"It was trial by fire," Fleming said. "I started out in 1981 at Fort Irwin, Calif., and knew nothing about the Army. They told me, 'Go build a city,' and I did it. I learned a lot during that assignment and got more than 20 years of experience during the 2 1/2 years I spent there."

Fleming hopes to continue his service by mentoring new leaders.

"I want to pass on all the knowledge I've gained during my 28 years of civilian service to others within the center and the Corps," he said. "I'm at a point within my career where I can mentor, and I'd like to do more of it. Mentoring can only take us from good to great."

Fleming said he is passionate about his job because his team is making it possible for Soldiers, their Families and civilians in the Army to have more improved working and living conditions.

"I love my job because my work results in a higher state of Army readiness," he said. "Being able to work for the Army is a good thing; being able to help the Soldiers and their Family members," he said. "I'm on the right bus and in the right seat."

Jo Anita Miley is detailed as a public affairs specialist, Public Affairs Office, Huntsville Center.



at Illinois State University. Dilks joined CERL in 1992 as a graduate student to work on the then-emerging geographic information systems technology.

She was part of a CERL team that developed several critical breakthroughs in this field, which jump-started the fledgling GIS industry and led to its rapid growth. An expert in geospatial modeling, Dilks continues to conduct research in this area, dividing her time between Champaign and Washington.

Dana Finney is a public affairs specialist, ERDC-CERL, Champaign, Ill.



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for modernization support. Wearing this hat, she works with military leaders in the plans and operations directorates at the Pentagon to identify facility requirements that align with the Army's training and warfighting missions. Technologies to address these requirements are then incorporated into the standard facility design criteria.

Dilks earned a bachelor's degree and a master's degree in geography from the University of Illinois. She is currently pursuing a doctorate in technical education

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