

# Public Works *Digest*

*In this issue:*

## Energy Management and Conservation



*Special Report on  
MILCON Transformation  
see pages 4–9*





## U.S. Army Installation Management Agency

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A worker installs photovoltaic solar panels on Bldg. 1315 at Fort Sam Houston, Texas. The panels augment electricity from the local power company and are saving the installation nearly \$1,000 a month in energy costs.

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## L E T T E R F R O M T H E E D I T O R



*C*over to cover, this issue of the Public Works Digest packs a lot of information on key and current subjects. Energy management and conservation is the theme, and there is also a promised special report on Military Construction (MILCON) Transformation, as well as several articles on other public works subjects.

*Energy is essential, and it is also essential that we use less of it. Tight budgets and the need to conserve resources make energy efficiency a powerful element in smart installation management. Many programs, many projects and much discussion have been generated on the subject.*

*Plug into this **energy management and conservation** issue to read more than 20 articles related to energy use on Army installations. Topics include: meeting renewable energy goals, the Natural Gas Risk Management Program, energy security and independence, resource efficiency managers, metering, tips on ways to reduce energy costs, solar power, energy plant assessment, heat pumps, water heaters, the Energy Program web site, the Energy and Water Campaign plan, the Energy and Water Reporting System, certified energy managers and a feature on Paul Volkman who manages the Installation Management Agency's energy and utilities program.*

*And, as pledged in our last issue, this Digest contains more information on **MILCON Transformation**, the way forward to meet the Army's challenging facilities needs. Commentaries by the Assistant Chief of Staff for Installation Management, the director of the Installation Management Agency and the commander of the U.S. Army Corps of Engineers lead the special report section. They are followed by an in-depth article on MILCON Transformation by the Corps' director of Military Programs, Brig. Gen. "Bo" Temple. A piece on the Army Facilities Standardization Program by Al Young concludes the section.*

*Other subjects covered in this issue include: structure removal, the handling of demolition and construction debris, storm water storage, master planning and the installation support professional of the year. Another article by Lt. Gen. Carl Strock — on Career Program 18 and how it can help public works professionals — leads the Professional Development section. That section also offers information on courses, workshops and publications of interest to careerists.*

*Our next issue will be the **annual report**, which provides an opportunity to display and acknowledge achievements accomplished over the past year. I invite you to submit an annual report — an article about what your installation, organization or agency has undertaken and accomplished in terms of installation support in the previous year. The subject of the article may encompass the entire post or just one completed project, but it should be an overview — a summary of what has been completed. The deadline is Oct. 27.*

*I can be reached at 202-761-0022 or [Mary.B.Thompson@usace.army.mil](mailto:Mary.B.Thompson@usace.army.mil). I look forward to hearing from you and reading what you have been doing at your location.*

*Mary Beth Thompson*

Mary Beth Thompson, Managing Editor **PWD**



## ACSIM view of MILCON Transformation

by Lt. Gen. Robert Wilson

**M**ilitary construction (MILCON) Transformation is a collaborative Office of the Assistant Chief of Staff for Installation Management (OACSIM) and U.S. Army Corps of Engineers (USACE) strategy to transform the Army's capital construction process to provide quality facilities faster, better, cheaper, greener and safer with lower operating costs. The process encourages the implementation of modern technology and industry best practices to deliver the best possible facilities to Soldiers and their families. It also fosters the trust necessary for the Army and USACE to build a closer partnership with private industry leaders within the architectural, engineering and construction communities.

As the challenges facing today's Army continue to build within the constraints fueled by shrinking resources, it becomes incumbent on the Army to continue to lead the way in innovative thinking and technology. As the Army transforms the military construction process it is imperative that the installation community endorse MILCON Transformation in order to fully achieve the potential efficiencies and benefits from this strategy.

The past few years have seen rapid growth in the capability and utility of the construction industry and building technology, enabling constructive change in the execution of capital programs and in the management of facilities assets. Better decisions earlier in the design process, with complete owner awareness, are not only possible but also probable. Many natural and man made disasters have impacted energy and other resources on a global scale. The financial impact from these disasters, on current and future projects, emphasizes the need for a decision-making process that combines the priorities of the financial community and building owners with those of the architects, engineers, and contractors. This compels the Army to transform the construction process. Resulting from this transformation are facilities that are more effectively meeting owner expectations, being built sooner at lower cost, and yielding benefits to the

owners earlier while reducing long-term costs to operate and maintain our facilities. With the focus on capital construction and facility asset management in the federal marketplace, the goal of MILCON Transformation is to provide projects and initiatives that implement interoperable data solutions, improve decision making on capital construction, operations and maintenance programs, and enhance design and construction programs.

Success of the MILCON Transformation initiative requires the Army to partner with the construction industry, embracing the best of industry construction practices to deliver the needed facilities at our installations at this critical time, when the Army is transforming and on the move. It stresses the use of installation master planning and requires MILCON to be executed as a program, not as individual projects. The Army will plan, acquire and execute facility construction more like the private sector.

MILCON Transformation depends on standardized facilities but also changes the Request for Proposal (RFP) process as we transition from prescriptive requirements to more performance-based criteria. The criteria will help ensure that new Army MILCON projects meet the mandates of the Energy Policy Act of 2005, including the requirements to be 30 percent more efficient than the American Society of Heating, Refrigeration and Air-conditioning Engineers standard and use of Energy Star equipment, and requires the Army to achieve 2 percent energy use reduction each year from 2006 thru 2015 (totaling 20 percent reduction) based on the 2003 baseline. This RFP process will capitalize on industry strengths and best practices, encouraging non-traditional builders to compete. It provides repeat business incentives for good performance with the awareness that the repetitive nature of work then reduces the learning curve, providing for lower cost, faster delivery and improved quality.

MILCON Transformation does not forego the previous mandates on new construction. Projects constructed before 2008 must still achieve the SPiRiT gold



Lt. Gen. Robert Wilson

standard and those constructed after 2008 must achieve the new LEED silver rating criteria for environmental and energy sustainable design criteria. In addition, MILCON Transformation projects must still encompass the building performance and operational requirements set forth in Army standards that have been approved by the Army Facility Standardization Committee. These Army standards have been incorporated into the Corps of Engineers standard Designs that lay out the building parameters the contractors follow as they develop the new facilities. And lastly, MILCON Transformation incorporates the local architectural and functional requirements identified in the respective Installation Design Guide (IDG). As such, the Army achieves the savings and construction efficiencies envisioned in the MILCON Transformation approach while achieving the new requirements of EPA Act '05 and still meeting established LEED, Army standards and local IDG expectations.

The Army's facilities construction program was developed with MILCON Transformation embedded throughout the program. Current expectations for MILCON Transformation include up to 15 percent cost savings and 30 percent time savings for facilities with 50-year life cycles that are sustainable and adaptable facilities with lower life-cycle costs.

MILCON Transformation is a viable and practical strategy that will bring long-lasting benefits to the Army.

Lt. Gen. Robert Wilson is the Assistant Chief of Staff for Installation Management. **PWD**



# Design standardization vital to meeting transformation needs

by Brig. Gen. John A. Macdonald

The Army is embarked on a transformation effort of a scope not experienced since the massive expansion in the early years of World War II. Now, as then, the great challenge is providing new facilities for relocating Soldiers within a time frame and cost not attainable with traditional military construction (MILCON) procedures.

While wooden, “temporary” facilities were the cornerstone of the program begun in 1942, the Army is now looking at the design and construction of permanent, 50-year-life facilities using an expedited, standardized process the U.S. Army Corps of Engineers has designated as “MILCON Transformation.”

This new process will enable Soldiers, as their units return from overseas deployments or transform in the continental United States, to move into new barracks and work in new maintenance, operations and other facilities that have been constructed faster, better and at less cost than Army engineers have ever been able to accomplish before.

The key to this effort is the use of standard designs. The Army has developed standard designs for: 1) barracks; 2) dining facilities; 3) tactical equipment maintenance facilities; 4) company operations facilities; and 5) battalion headquarters and brigade headquarters. These five standard designs

have been coordinated with the Army commands; Headquarters, Department of the Army staff proponents and the Installation Management Agency and have been approved by the three-star Army Facilities Standardization Committee.

These facility designs are standardized for efficiency and cost saving. Local modification will be restricted to the choice of color scheme and exterior façade, both of which must be based on the Installation Design Guide. As the Army implements transformation and Base Realignment and Closure requirements, the maximum possible design standardization enables dollar savings that will allow building as many facilities as possible with the funding available. In addition, using standard designs will allow the Corps to more quickly put facilities in place by using standard contracting procedures both regionally and nationally.

Using standard designs and MILCON transformation contracting methods will enable the Army to provide new, high quality facilities for our Soldiers. At the same time, we can potentially leverage more of the MILCON dollars available in the Army’s budget to provide facilities not currently in the POM (Program Objective Memorandum). Additionally, as construction costs continue to rise due to Katrina reparations and the rising cost of fuel and



Brig. Gen. John A. Macdonald

international construction programs, MILCON Transformation can help the Army offset some of those rising costs.

MILCON Transformation is a key aspect of the Army achieving its goal of transformation. Its success is dependent on all of us in the Installation Management Agency. I believe that as we work with the Corps of Engineers and the Office of the Assistant Chief for Installation Management to manage the military construction process, our installations will become the recipients of new, high quality, environmentally friendly and safe facilities, delivered in less time and at or under budget.

Brig. Gen. John A. Macdonald is the director of the U.S. Army Installation Management Agency.

PWD

# Constructing quality facilities for our Soldiers

by Lt. Gen. Carl A. Strock

As the commander of the U.S. Army Corps of Engineers, the Army’s construction agent, I am excited by the challenges and the opportunities that the massive construction program facing the Army presents to the Corps, the Army Directorates of Public Works, and the nation’s engineering and construction communities. We are facing the most significant realignment of Army forces since World War II, with Base Realignment and Closure 2005, the re-stationing of forces

and families from overseas to continental U.S. installations and the conversion of units to the Army Modular Force structure. To accomplish this construction program, we must change the way we plan and execute our MILCON mission.

In November 2004, Deputy Assistant Secretary of the Army (Installations & Housing) Joseph W. Whitaker directed the Corps of Engineers to develop a strategy and implementation plan to provide the Army the ability to establish, reuse/re- ➤



Lt. Gen. Carl A. Strock



# MILCON Transformation: Delivering quality, sustainable facilities in less time at lower cost

by Brig. Gen. Merdith W.B. "Bo" Temple

To keep pace with the most comprehensive restructuring of the Army since the years immediately following World War II, essential changes are taking place in our military construction program.

The Army is transforming from a division-oriented structure into a more brigade-centric, modular force as rapidly as possible while maintaining the war-fighting readiness of its operational units. This change brings unique challenges and opportunities in many areas, including military construction (MILCON).

Over the past few years, the U.S. Army Corps of Engineers' program has steadily increased, while our staffing to execute the program has steadily declined. Despite this disparity, we've done a good job leveraging assets in order to accomplish our diverse mission requirements.

Today's workload is even larger and will continue to grow as a result of several factors. One of these is the construction requirements from the latest round of the Base Realignment and Closure. BRAC 2005 is focused more on realignment than past BRAC rounds, which means "gaining" posts will need to have facilities built.

In addition, the Army is changing its global footprint through the Global Defense Posture Realignment. More units are returning from overseas locations. Before these units can be brought stateside, the facilities and infrastructure have to be in place to house them, train them and provide their families with the quality of life they deserve.

At the same time, the conversion to a modular force will have certain unique facility requirements that will need to be



Brig. Gen. Merdith W.B. "Bo" Temple

in place as units are stood up. And finally, many of the existing facilities at our posts are near or have surpassed their design life and need to be replaced or rehabilitated.

The result of these factors is that our MILCON workload will likely reach or exceed \$40 billion over the next few

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purpose facilities with minimum lead-time, leverage private industry standards and practices, and reduce acquisition/lifecycle costs. His direction recognized the urgent need for a massive, multi-year construction program to provide new facilities for Soldiers and their families to support the comprehensive transformation of Army forces.

The initiative developed in response to Mr. Whitaker's tasker is now known as MILCON Transformation and is an important element of the Army's Business Transformation. This strategy was worked out in partnership among the Corps, the Office of the Assistant Chief of Staff for Installation Management, the Installation Management Agency, private industry and Mr. Whitaker's office. Key elements include standardization in acquisition processes, standardization of the design of facilities and expanded opportunities for use of alternative construction methods such as manufactured building solutions.

MILCON Transformation, to include a disciplined emphasis on standardized facilities for core Army functions, is designed to provide Soldiers with quality, sustainable facilities less expensively, in less time and on-time to allow the Army to meet its transformational schedules. MILCON Transformation is focused on the five primary facilities needed for the Brigade Combat Teams. Quality-of-life facilities are also important to the Army, and they, too, will be constructed more quickly and more economically.

There are challenges ahead for all of us in making the transformational changes in our construction delivery processes. Existing engineering, design, acquisition, standards, roles and relationships, and construction management processes are all affected by the MILCON Transformation initiative. All of the Army, to include the Corps of Engineers as well as the engineering and construction industry supporting the Army, have to adjust to the changes in the way facilities will be acquired and

constructed. We have a phased approach to help mitigate risks. We began with selective pilot projects in fiscal year 2006, and initial indications are that MILCON Transformation principles have a lot of potential. We plan to fully implement the changes with the execution of the FY 2008 program.

The Army leadership has directed that we all must embrace these changes and quickly work through the challenges to ensure that our Soldiers and commanders are provided quality facilities when they have to have them, within the available resources of the Army. I am confident that we all will rise to these challenges and, in the process, develop a better way to deliver construction while ensuring our Soldiers, their families and our commanders have the infrastructure to support our nation's needs. Essayons!

Lt. Gen. Carl A. Strock is the commander and chief of engineers, U.S. Army Corps of Engineers.

**PWD**



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years, and we cannot expect any additional human resources to execute the increased workload. Add to this the requirement that BRAC and re-stationing initiatives must, by law, be completed by September 2011 and that the Army's eventual goal is not just sustainable buildings, but sustainable installations, and you can see that the Corps and our military customers have some tremendous challenges ahead.

As the Army's construction agent, we must help ensure the Army has the quality, sustainable facilities and infrastructure it needs to meet future capabilities and missions. Now more than ever, our business processes need to allow us to deliver faster, less expensive, safer and greener facilities to our Soldiers and their families.

#### **Cannot achieve with 'business as usual'**

Our current business processes and organizational structure will not support the new requirements, so we must find new, innovative ways to plan, program, design and build facilities. Over the past year and a half, we have looked across our MILCON program to identify efficiencies and processes that we can change and have gained private industry and senior Department of Defense and Department of the Army leaders' perspectives.

As a result of these efforts, we have developed a number of changes in our organization, business processes and technology that we think will make our MILCON program less prescriptive in the way of requirements and place more emphasis on performance-based criteria. The strategies and process changes are transforming our MILCON program, allowing us to meet our goal of continuing to deliver quality, sustainable facilities in less time and at a lower cost.

We are now using the business processes of MILCON Transformation at several BRAC 2005 projects. In fiscal year 2007, MILCON Transformation will be employed to the maximum extent possible on all Army MILCON and BRAC 2005 projects in the United States.

#### **What is MILCON Transformation?**

MILCON transformation means several things:

First, the Corps will provide additional *master planning* support to the primary customer, the Assistant Chief of Staff for Installation Management, laying the foundation for better facilities in the future.

Second, we will increase our use of *standard designs and processes* that includes a transition from design-build in FY 2007 to the use of prototype adapt-build models by FY 2008. Centers of Standardization will allow us to manage this effort better and capture shared lessons learned more seamlessly, while maintaining our core technical competencies.

Third, we will employ *regional acquisition approaches* as described in the National Acquisition Plan, expand use of all types of construction, including *manufactured building solutions*, and emphasize *partnering* with customers and with industry, to include our small business community.

Fourth, we will apply *new technologies and tools* generated by industry and the Engineer Research and Development Center — tools such as the Building Information Model, the Land Use Evolution Model and the Antiterrorism/Force Protection Planner, parts of our "Fort Future" suite of Simulation and Modeling for Acquisition, Requirements and Training tools set. To make our buildings more sustainable, we are looking at and incorporating more efficient energy systems and new technologies that conserve water, such as waterless urinals.

Helping to pull together these points is the establishment of a *continuous building program*. This program will provide contractors with greater predictability in funding, which will allow them to keep building at multiple sites across multiple facilities without having to wait for phased funding. The continuous building program also provides contractors with the opportunity to make improvements as projects move forward and incorporate lessons learned, which will lead to a reduction in project costs and time.

The essence of MILCON Transformation can be summarized in three major components — facilities, acquisition strategy and people.

#### **Facilities**

When we talk facilities, we mean the standardization of processes, facilities and product types. From acquisition to execution, consistency in processes and implementation will be the key to a successful program. The standardization of facilities and processes will result in consistent engineering and construction applications that will allow for the expansion of the use of all types of construction and benefit the Army by providing a greater pool of capable contractors. The standardization of facilities will result in more consistent solicitations via standard Requests for Proposal (RFPs). This will reduce contractor uncertainty about requirements for like facilities from installation to installation, as well as provide for more productive time spent on proposals. And, the standardization of product and facility types will allow us to focus more on actual construction and delivery.

At the same time, each facility we build will need to attain a silver rating on the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system, a nationally recognized measure of sustainability. The silver rating is one of the most stringent goals in the program. It will be a challenge to consistently meet the silver rating level within the constrained resources available. We will need to find new and better ways to incorporate sustainable features without exceeding cost limitations.

To facilitate the focus on construction, Centers of Standardization have been identified and will serve as the technical and acquisition resources for the districts. These design centers will employ contractual vehicles that districts will use to fulfill installation standard facility needs. For example, centers will be responsible for design refinement and for selecting, in coordination with Corps regions, a design-build contract primarily through regional



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Indefinite Delivery Indefinite Quantity (IDIQ) single source selections. When an executing district calls, the center will issue a delivery order for construction to be managed by the district. With the center issuing the delivery order, we expect a greater consistency of product. The centers will also capture lessons learned and adjust processes based on feedback from the customer, the contractor and servicing Corps district.

Through this acquisition strategy, and using standard RFPs, we will realize greater consistency in the quality of construction and a lessening of the risk to the contractor, which will move us closer to achieving lower costs in less time.

### Acquisition strategy

The USACE (U.S. Army Corps of Engineers) Programmatic Acquisition Strategy provides guidelines to major subordinate commands/regional business centers to develop regional contracting tools to implement MILCON Transformation and to ensure we have sufficient consistency and flexibility. Applicable regions will have their acquisition plans in place and ready for the FY 2007 construction season.

Within the framework of this strategy, the following contracting approaches are intended to connect the requirement to a completed product or facility:

- a single awarded IDIQ;
- unrestricted awards;
- set-asides;
- local and/or regional contracts; and
- contracts awarded by facility type or product line.

The strategy also encourages site and local market research to determine final acquisition methods. It provides the flexibility, where appropriate, to group projects smartly to allow for a balance between economies of scale and small businesses as primes, including programs such as 8a, HUBZone and small, disadvantaged, veteran-owned businesses.

And finally, it provides the opportunity to evaluate potential contractors based on

all experience, not just past government experience. The goal is to enhance competition to give us the best chance of selecting the contractor most likely to succeed in meeting our quality, sustainability, cost and time goals.

Through this acquisition strategy, and using standard RFPs, we will realize efficiencies that will reduce the construction-execution learning curve, as well as costs and time.

### People

The last component of MILCON Transformation is people — making sure we are able to maintain our core technical competencies well into the future.

With MILCON Transformation, the Corps will be moving away from full-service design capability in every district. This does not mean we will lose our core competencies. Rather, technical competencies will be concentrated in the Centers of Standardization and distributed to construction locations where district technical oversight is needed.

Competency task forces at Corps Headquarters and at several Regional Business Centers are looking at the effects of this shift and the types and amount of re-training needed for our workforce. Our technical competence must be broadened to include “full-service” engineers and scientists who understand and contribute to various aspects of the facilities life cycle and can readily move from one phase into another.

### Training

For MILCON Transformation to succeed, ACSIM, IMA and the Corps are working to develop a training program. We are looking at two phases for this training program. Phase I would be a corporate leadership overview of Army and MILCON Transformation and their goals. Phase II would be individual Programs of Instruction (POIs) for IMA installation and Corps district staffs needed for execution of MILCON Transformation. Once the training POIs are established, a schedule of instruction — coordinated among ACSIM, IMA and the Corps — will be published.

### Achieving success

There are many measurements of success. To me, success is defined by our process changes and efficiencies that enable us to deliver to our customers’ quality, adaptable, sustainable facilities on time and on budget. Fundamentally, MILCON Transformation is expected to deliver Army facilities that are more adaptable and sustainable at less cost (15 percent cost savings) and less time (30 percent time savings). Success is also defined by the realization on the ground at Army installations that our process changes and efficiencies have delivered to our customers the high-quality, adaptable, sustainable facilities that they critically need, on time and on budget.

We have just begun to use MILCON Transformation principles in some pilot projects (at Forts Campbell, Knox and Bliss, for example). Initial indications are these projects were awarded at full scope and within the construction cost limits (which already reflects a 15 percent savings). The Corps will keep you posted as we learn (and adapt) more about MILCON Transformation implementation.

We cannot do this alone. We need everyone’s support. We need everyone to help make these changes possible and to work through solving the details and defining the problem areas so that we can improve together. MILCON Transformation is truly transformational and will require essential culture change in three key communities: the Corps, garrisons and industry. All of these communities are partners in every Army project, and all three will have to adapt to new ways of doing business to be successful in the future.

We have a great opportunity to prove our relevance to the nation, the Army, our Soldiers and their families. By implementing MILCON Transformation strategy, staying focused on the execution and continually looking for process improvements, we will be successful. Working together, we can meet our huge facility requirements over the next several years.

*Brig. Gen. Bo Temple is director of Military Programs, U.S. Army Corps of Engineers.* **PWD**





# Army Facilities Standardization Program continues to move forward

by Al Young

Since its inception in 1985, the charter of the Army Facilities Standardization Program (AFSP) has been to develop Army facilities standard designs to support military construction (MILCON) programming, design and construction. At that time, Headquarters, U.S. Army Corps of Engineers (HQUSACE) through the program's USACE Centers of Standardization (COS) was responsible for coordinating facilities requirements with Headquarters, Department of the Army facility proponents and translating the requirements into affordable and constructible standard designs to meet the Army mission. At the same time, the program allowed the Army to get favorable acceptance of its MILCON program from Congress because of the use of standard designs.



Al Young

paramount. Executing the program under the auspices of the Office of the Assistant Chief of Staff, Installation Management (OACSIM) and partnering with Headquarters Installation Management Agency (IMA), HQUSACE, through its COS, is working to achieve standardization for critical facility types needed to ensure successful implementation of the Army's current stationing initiatives.

Standard designs in the program's inventory that have been identified as those of critical immediate need to support Army Transformation are barracks, brigade and battalion headquarters (BDE-BNHQ), tactical equipment maintenance facility (TEMF), company operations facility (COF) and dining facility (DFAC). Of these, standard 1+1 criteria for barracks and a modified COF standard design to accommodate medical space requirements are in place. Working with OACSIM and HQDA facility proponents, there is interim standard design criteria for BDE-BNHQ and TEMF that will continue to evolve both in design and scope as the Army transforms from a division-centric organization

to a brigade-centric organization. For DFAC, the HQDA facility proponent, the Army Center of Excellence, Subsistence, worked with the USACE COS in developing a Request for Proposal (RFP) based on "outside-the-gate" commercial dining establishments. The goal of the RFP is to acquire a DFAC that can be developed into an Army standard that will be less expensive and of less scope and yet still achieve the Army mission of feeding our Soldiers effectively and efficiently.

Quality-of-life facilities under the Army Facilities Standardization Program that are being looked at per direction of the vice chief of staff of the Army are child development centers (infant-toddler and school-age), youth activity centers, physical fitness facilities and chapels. For chapels and school-age child development centers, standard designs have been developed, approved and implemented for use. The challenge is to procure these needed facilities quicker, less expensively and of acceptable quality. HQUSACE and the COS are working with the Army Community Family Support Center to revise and update existing standard designs for the infant-toddler child development centers, youth activity centers and physical fitness facilities.

As they execute the Army mission without reservation, our Soldiers and their families deserve the finest facilities possible in which to live, work, learn, train and eat. Anything less is unacceptable.

POC is Al Young, (202) 761-7419, e-mail: albert.young@usace.army.mil.

Al Young is the Department of Defense engineering and construction support team leader at Headquarters, U.S. Army Corps of Engineers. **PWD**

*The challenge is to procure these needed facilities quicker, less expensively and of acceptable quality.*

— Al Young

With the advent of Army Transformation, Global Defense Posture Realignment and Base Realignment and Closure 2005 and the subsequent MILCON Transformation approach to ensure needed facilities to meet today's Army mission, the role of the AFSP, the Facilities Design Teams within the program and the COS is ever more



## 28th annual Army energy, water management awards presented

by David Purcell

The winners of the 28th Annual Secretary of the Army Energy and Water Management Awards for accomplishments during fiscal year 2005 were approved by the secretary Aug. 15 and presented during a ceremony at the World Energy Engineering Congress meeting in Washington, D.C., Sept. 13. The awards are made annually to recognize Armywide accomplishments in the area of energy and water management by Army installations and individuals.

This year's awards for small group accomplishments include:

- **Fort Gordon, Ga.** – Energy Efficiency/Energy Management – Michael McTier, Kenneth Coleman, Wayne Griner and James Pavliscsak;
- **Fort Knox, Ky.** – Renewable Energy/Alternative Energy – Gary Meredith, Frank Baker, Steve Fries and Patrick Walsh;
- **Fort Sam Houston, Texas** – Water Conservation – Gene A. Rodriguez, Pepe Calderon and Robert L. Jay;
- **New Jersey Army National Guard** – Renewable Energy/Alternative Energy – Thomas G. Comyack and John L. Hastings;

- **Picatinny Arsenal, N.J.** – Energy Efficiency/Energy Management – Richard Havrisko, Sandy Chisholm, Edward Brice, Thomas Struble and Robert Smith; and
- **Washington Army National Guard** – Energy Efficiency/Energy Management – Jeff Baker, Roger Christie, John Lindstrom and John Havens Jr.

This year's list of winners for individual accomplishments in energy efficiency and energy management or water conservation and water management include:

- **Dugway Proving Ground, Utah** – Morgan Benson;
- **Yongsan Garrison, Korea Region** – John D. Ghim; and
- **Arizona Army National Guard** – Jeff Seaton.

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Winners of the 28th annual Secretary of the Army Energy and Water Management Awards.



## Army sets strategy to meet the renewable energy goals of EPAct

by Mike Warwick and Jim Paton

The Army has begun implementing its strategy for responding to the renewable goals imposed by the Energy Policy Act of 2005 (EPAct) (see *Public Works Digest* Sept/Oct 2005) by incorporating them into the ongoing Army Energy and Water Campaign Plan for Installations (see related article in this issue). The strategy responds to the “Reduce dependence on fossil fuels” initiative in the Army Energy Strategy for Installations by establishing a goal of 65-percent use of renewable power by 2030.

The renewable strategy builds on the Department of Defense (DoD) Renewable Energy Assessment Final Report and Implementation Plan completed in 2005, available at <http://www.acq.osd.mil/ie/irm/Energy/Energy.htm>. The DoD assessment established a maximum practical goal for renewable power use of 45 percent by 2020, in addition to the current 7 percent, for a DoD total of 52 percent.

The DoD Renewable Energy Assessment evaluated potential from “green” power purchases to on-site projects. Few DoD facilities are situated in the best locations for renewable resource development, and such development faces many mission-related conflicts. As a result, 90 percent of the 45-percent goal will have to come from green power purchases. The Army’s share of this goal is 30 percent, but the Army is expected to contribute 50 percent of the on-site production for DoD and make up about 30 percent of DoD’s green power purchase total.

DoD adopted an initial goal of 25 percent by 2025 in November. A lower goal was adopted due to the slow start necessitated by the ongoing war and a lack of procedures. The Air Force currently leads the services (and the nation) in the renewable energy area at more than 11 percent, but most of this is coming from purchases

of renewable energy credits rather than on-site resources or purchases of green power. However, that is about to change because it is actively exploring on-site biomass and waste energy projects.

The Army’s more aggressive target of 65 percent by 2025 is a stretch goal that recognizes the Army’s dedication to the Army Energy Strategy for Installations, its ability to use its extensive land holdings in innovative ways to expand opportunities for on-site projects, and the understanding of how our dependence on imported energy sources threatens our energy security and our economic security as well.

The DoD assessment focused on “utility-type” projects, for the most part. These are large-scale projects, competitive with utility power plants, that can be developed by third parties rather than with scarce military appropriations. The assessment did not fully explore opportunities for smaller-scale projects and use of Army lands for power projects using biomass, landfill gas or waste, or gas from sewage treatment plants.

Achieving the full potential of the Army’s renewable strategy will require additional effort. Renewable technologies are constantly changing, enabling use of lower-quality resources and changing economics. As a result, assessments will need to be revisited and revised frequently. For example, there have been recent advances in the use of lower-temperature hot water for geothermal power production. Also, increasing steel prices and global demand for renewable equipment are driving up the cost of utility-scale wind turbines. And small wind turbine equipment and operating costs are continuing to decrease. Each of these factors changes the options available to the Army and affects its strategy.

In addition, the DoD assessment overlooked the potential from generation

on-site using biomass, waste and green methane sources from off-site. These resources are more generally available than the wind, solar and geothermal resources included in the DoD assessment. Adding them to the resource mix will significantly increase the Army’s flexibility to economically meet its goals.

The Army’s renewable goal will require innovative procurement and contracting approaches as well. Use of alternative financing for on-site projects dictates use of enhanced use leasing (EUL) and public-private ventures (PPV). EUL is currently being explored as an option for a utility-owned wind farm on Army land, and a PPV has been proposed for location of a biomass project on Army land in the Southeast.

Because many renewable resource projects enjoy significant tax benefits and other incentives, procurements will have to be structured to protect the resulting substantial price discounts for the potential benefit to the Army.

The Army has set a challenging renewable energy goal for itself. Achieving it will require a sustained and united effort involving energy and utility program managers, installation management and procurement professionals, command staff and the specialized skills provided by national labs and consultants. Success is an essential element in the nation’s efforts to reduce dependence on fossil energy use and improve energy security.

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# IMA employs Natural Gas Risk Management Program to combat effects of rising prices

by Paul M. Volkman and Scott McCain

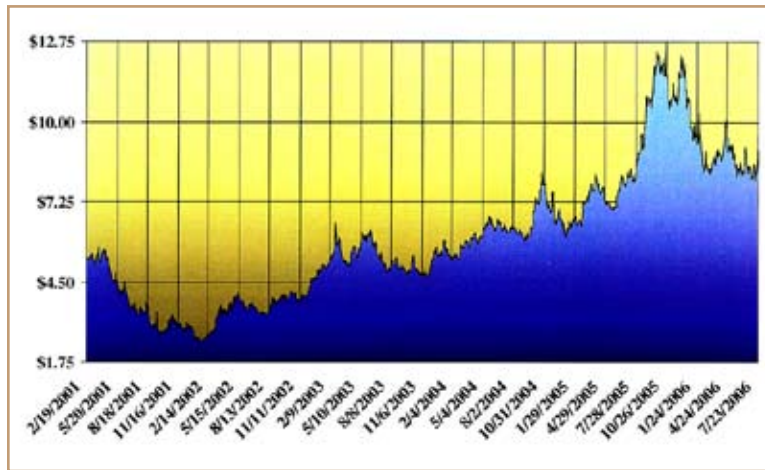
Natural gas prices continue to rise year after year. This steady increase represents a greater burden on installation operating budgets. To minimize the impact of rising prices and reduce the need to use non-utilities program funds to cover shortfalls, the Installation Management Agency has implemented the Natural Gas Risk Management Program.

As illustrated in Figure 1, prices have increased from about \$2 per dekatherm to a record \$12.50 per dekatherm for annual 12-month strip pricing. Strip pricing is the average natural gas price for a specific time (3, 6, 12 or 18 months are the most common) on the New York Mercantile Exchange (NYMEX). During this period,

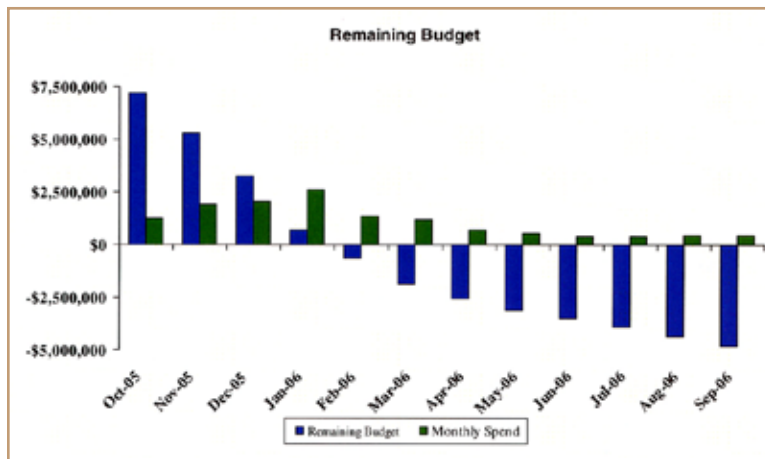
short-term price “spikes” have occurred. The most recent price spike occurred when Hurricanes Katrina and Rita sent the 12-month strip price to \$12.50 per dekatherm. Prices fell after the hurricanes as a result of the record high average temperatures enjoyed during the 2006 winter.

Even with the ensuring high natural gas storage and other positive natural gas news, the 12-month strip price is more than \$8 per dekatherm. This fact reaffirms the continuing trend of rising natural gas prices. Installations must be prepared with the knowledge and tools needed to stabilize their natural gas costs.

The impact of this trend is that natural gas prices represent an ever increasing percentage of an installation’s operating budget. In fact, successful installation energy demand reduction and conservation programs have been unsuccessful in keeping pace with rising natural gas prices.



NYMEX Rolling Natural Gas 12 Month Average Prices



Installation Natural Gas Budget versus Expenditure.



utility invoices are “must-fund” bills, and this obligation carries a potentially greater impact outside of energy.

In the event funding requirements for natural gas invoices exceed programmed levels, the practice is to reprogram funds from non-utilities programs to cover the shortfalls. Figure 2 is an example of an installation that has not fixed its natural gas prices in a rising market. The installation’s utility funding for natural gas is depleted by February, the fifth month of the fiscal year, resulting in non-utilities program funding being reprogrammed to meet the obligations of a “must-fund” bill.

The objective of the Natural Gas Risk Management Program is to provide price stability and budget certainty, as well as complement the installation’s energy efficiency programs and demand reduction initiatives. The primary benefits of the programs are:

- minimizes the impact of rising natural gas prices;
- provides utility budget stabilization;
- secures price certainty;
- improves monthly cost forecasting;
- reduces disruptions to non-energy programs caused by unanticipated requirements to fund higher-than-expected “must-pay” energy bills; and
- supports planning and budgeting.

Headquarters, Installation Management Agency (IMA) recognized the value of



# Army studying ways to achieve energy security, independence for mission readiness

by Roch Ducey

*Editor's note: This article is a brief recap and update of a more comprehensive article that was published in the March-April issue of Public Works Digest.*

Increasing energy security and decreasing dependence on fossil fuels are major objectives of the 2005 Army Energy Strategy for Installations. Both of these goals suggest that the Army consider diversifying its current use of the local electric utility for primary power and engine-driven generators for emergency back-up power, and expanding use of renewable energy systems like wind, solar, geothermal and biomass, along with other advanced distributed generation (DG) technologies like fuel cells and microturbines. Increased energy reliability, environmental sustainability, security and, therefore, enhanced mission readiness, are achieved by networking these power systems together in an "intelligent" microgrid that operates onsite at the installation.

The Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) is studying the use of microgrids in partnership with the Assistant Chief of Staff for Installation Management (ACSIM), Headquarters, Installation Management Agency (HQ IMA), the Research and Development Engineering Command (RDECOM) and the Department of Energy's Sandia National Laboratories (SNL). The team is conceptualizing how this microgrid power

architecture can be implemented not only at the installation and remote training facility level, but at forward base camps, tactical operation centers, and individual Soldier power levels — in other words, "home station to foxhole."

The capability to model energy microgrids is a fiscal year 2006 Department of Energy effort conducted by SNL. The resulting power architecture modeling tools will be demonstrated in FY 2007 at an Army installation. ERDC-CERL is assisting SNL in FY 2006 activities, including military mission decomposition into specific power needs, development of demonstration installation test protocol and site selection. ACSIM is budgeting FY 2007 funds to support ERDC-CERL's continued participation.

This ERDC-CERL and SNL effort is helping the Army to be able to: comprehensively review an installation, with emphasis on its mission and associated energy security requirements; determine through modeling the consequences of a variety of energy disruptions on the base mission; assess whether a microgrid can improve the situation; and, if appropriate, develop an optimally designed power architecture. For example, a microgrid power architecture will likely include grid-

parallel operation capability, existing DGs and energy storage capability, distribution switching hardware, and load flow management software that includes load shedding capability. These capabilities would significantly augment existing installation energy security planning.

## Workshop in December

In a related effort, ERDC-CERL is funding an Energy Security Workshop Dec. 12-13 in partnership with North Carolina A&T University. The workshop will focus on: 1) What are today's policies for energy independence and energy security? What are the issues facing Army installations?; 2) What are the Army's visions for installation energy security and energy independence?; 3) What is the reliability of U.S. power grid and distributed energy resources?; 4) What emerging power, distribution and storage technologies can contribute to energy independence and energy security? All Army energy personnel are welcome to share their views at this conference. Agenda, speakers and other details are forthcoming.

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this commercial best practice and committed to centrally funding the program. The Natural Gas Risk Management Program provides a decision support service to installation utility management personnel at continental U.S. installations. Included in the support services are fundamental market insights, comparative fuel cost analysis, strategy development and price risk assessment.

Participation in the program is free and requires minimal input from installations.

The program is an integrated service offering that uses a proven six-step process:

1. Analyze historical natural gas load and cost data.
2. Prepare energy market outlook.
3. Develop program target prices.
4. Prepare customized strategies.
5. Continuously monitor energy market.
6. Execute strategy execution and reporting.

The Natural Gas Risk Management Program has successfully provided value

to participating installations in the form of increased market intelligence, improved decision making, enhancement to the procurement process, stabilized prices and a reduction in disruptions to non-energy programs.

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# Resource efficiency managers earn their keep, then some

by Ralph Totorica and Steve Sain

During the last few years, rising energy costs and shrinking budgets have made energy management a critical issue for the federal government. Some of the challenges facing federal managers include increased energy consumption and costs, reductions in staff, reductions in operations and maintenance (O&M) budgets, and energy disruptions that affect national security. To address these energy management concerns, the Installation Management Agency, Southwest Region (IMA SWR) has initiated a program to provide garrisons with the services of a resource efficiency manager (REM).

The REM is an on-site, full-time energy consultant who investigates and recommends energy saving projects and O&M best practices. The REM's goal is to initiate actions that significantly save energy/utility costs relative to the cost of the REM contract.

The IMA SWR awarded a five-year regional REM contract in September 2004. The contract includes line items for all 17 IMA SWR installations. The intent is to provide "seed" funding to garrisons to cover the first year of the contract. Subsequent years are then funded by the garrison through the energy/utility cost savings generated.

The REM concept is fairly new but is

gaining increased popularity due to successful implementation within the federal sector and the Army. IMA SWR currently has two REM contracts in place, one at Fort Sill, Okla., and one at Fort Polk, La. In addition, REMs are planned in the near future for Forts Sam Houston and Bliss in Texas.

## Fort Polk

The REM contract at Fort Polk has been in place for four years. The contract has proven to be perhaps the most successful REM program in the federal government. Nancy Varner and David Hopper, both certified energy managers, were combined as a tag-team to serve Fort Polk's REM needs. Among other initiatives, Varner attained over \$2 million in savings utility and ESPC (Energy Savings Performance Contracts) overpayments. Her results were so noteworthy that, in fiscal year 2004, the Assistant Chief of Staff for Installation Management (ACSIM) named her its Army "Energy Champion."

When Varner transferred to Lackland Air Force Base, Texas, last year, she was succeeded by David Hopper. In his first year, Hopper surpassed Varner's award-winning savings achievements. Within a few weeks of his arrival, Hurricane Rita left the post isolated from the local electrical grid. With his extensive background in electrical power transmission and distribution, Hopper led the



David Hopper is the Fort Polk resource efficiency manager.

power restoration team in bringing Fort Polk back online about 12 hours earlier than expected. This action alone resulted in over \$1.2 million in productivity savings.

Hopper also implemented numerous low- or no-cost projects, including locking-in natural gas purchase rates immediately following Hurricanes Rita and Katrina, which saved about \$70,000. He also renegotiated a discount for electricity to one of Polk's two major electric service points, resulting in annual savings of more than \$36,000 for three years, and revamped the water billing rates to tenants, increasing reimbursements to the local Directorate of Public Works by \$800,000.

Combining the efforts of Varner and Hopper, Fort Polk's REM service provider, Sain Engineering Associates, has been able to save Fort Polk about \$5.2 million. This, in turn, has achieved a benefit-to-cost ratio of more than 8-to-1, sustained over four years. This means that for every dollar Fort Polk has invested in its REM contract, Varner and Hopper have returned it with over \$8 in savings.

## Fort Sill

The Fort Sill contract, with Michael Baird serving as the post's REM, has been in place for two years. Coming from an O&M background, Baird has focused on low- or no-cost operational improve- ➤



Michael Baird is Fort Sill's resource efficiency manager.



# German district heating systems assessed for CONUS application

by Alexander Zhivov

The Assistant Chief of Staff for Installation Management asked the Engineer Research and Development Center's Construction Engineering Research Laboratory (ERDC-CERL) to investigate novel district heating (DH) and co-generation systems in Germany, both at Army installations and German cities. The purpose was to identify and study DH methods and systems, and offer recommendations for the Army's DH systems in the continental United States with an overall goal to improve heat and power reliability at U.S. installations at a reduced life-cycle cost.

District heating has been used successfully in Europe, mainly due to its low costs to consumers, and is the "standard" for providing energy to millions of Europeans. Plant efficiencies are in the range of 70 percent to 80 percent, well above that of a modern electrical generation plant. To help evaluate the performance of DH, the ERDC-CERL team visited six sites in Germany and found the following common themes:

- Almost all German DH use variable temperature (low-medium hot water, below 130 degrees Centigrade), variable flow

systems using proven technologies. This type of operation reduces heat and water losses, improves overall thermal efficiencies and eliminates the high cost of steam or high-temperature piping.

- These heating systems were used in conjunction with co-generation to optimize system efficiencies.
- Most of the piping has built-in leak detection, which, in the alarm mode, identifies the exact location of the leak, ultimately reducing repair costs.
- The use of improved monitoring and control equipment has allowed some plants to continue to operate efficiently even with a limited plant labor force. Other than for maintenance, staff only needed to visit the remote sites every one to three days to observe the equipment performance. It was not uncommon to have a shift crew of four to five workers operate a large (300- to 600-megawatts) power plant that normally required a crew of 20 or more workers.

The U.S. Army has a number of installations that use central energy plants to heat and in some cases cool buildings; most are centrally located. The installations' buildings are located in close proximity and are

large enough to justify a central heating and cooling system. A major concern is that many of these central energy systems are aging. The systems have: 1) exceeded their expected useful lives, 2) high operation and maintenance costs, 3) large capital replacement costs and 4) significant energy and water losses. Without adequate maintenance and repair, these systems could experience a catastrophic failure, ultimately threatening mission performance and readiness.

The results of this investigation were published in ERDC-CERL Technical Report 06-20, for use by Army investment policy makers, installation planners, U.S. Army Corps of Engineers district designers and others. You may access the report at: [http://www.cecer.army.mil/techreports/ERDC-CERL\\_TR-06-20/ERDC-CERL\\_TR-06-20.pdf](http://www.cecer.army.mil/techreports/ERDC-CERL_TR-06-20/ERDC-CERL_TR-06-20.pdf).

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ments for Fort Sill such as reducing waste in boiler water treatment, finding and repairing leaks in water distribution systems and optimizing the chilled water supply temperature setting for relatively-large central cooling plants. These initiatives have saved more than \$56,000 annually, and there are several others projected to save much more upon completion.

Another way that REMs can add value is to attain funding from external sources. Baird led the effort to apply for over \$13 million in ECIP (Energy Conservation Investment Program) funding from the ACSIM. Baird's submittal resulted in a \$1

million grant which will cover the design and installation of geothermal heat pumps.

Baird spent a few years in the wind power industry and is using this expertise to develop a wind power generation project. Like the geothermal heat pumps, the wind power project can help Fort Sill achieve its renewable energy goals. Finally, Baird is assisting Fort Sill to qualify for an energy security study and possibly an ESPC (Energy Savings Performance Contracting) project that has the potential to save several thousand dollars with no capital investment.

Overall, Fort Sill's benefit-to-cost ratio has been approximately 3.5 to 1, sustained

over two years. Even though these economics are extremely fruitful for Fort Sill, there is significant potential for them to get better over the next few years once all of Baird's initiatives come to fruition.

Due to the remarkable successes achieved by the REMs at Forts Polk and Sill, it is no wonder the REM concept is rapidly gaining popularity within the Army and other federal agencies.

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# SERO sites use prioritization tool to meet metering requirements

by Amy Solana and Greg Sullivan

Section 103 of the Energy Policy Act of 2005 requires all federal agencies to install metering and advanced metering, wherever practicable, by Oct. 1, 2012. The Department of Energy (DOE) developed a set of guidelines for agencies to apply to their own policies to meet the EAct metering requirement.

The DOE guidelines ([www.eere.energy.gov/femp](http://www.eere.energy.gov/femp)) require electric metering to be installed on all buildings where feasible, where energy cost savings are possible and where cost-effective based on a 10-year simple payback and an annual savings of at least 2 percent. At the agency level, implementation plans were due by Aug. 3, and agencies are required to establish plan deadlines and progress reporting guidelines for individual installations.

To assist sites in selecting and then prioritizing buildings to be metered, the Army Installation Management Agency, Southeast Region Office (SERO) commissioned Pacific Northwest National Laboratory (PNNL) to develop and implement a standardized methodology. To do this, PNNL explored three ways to determine the building energy use of non-metered buildings. The three approaches included: 1) the square footage method, 2) the energy use intensity (EUI) method, and 3) the model-based method.

While each method has its benefits and drawbacks, the model-based method was found to offer the best trade-off of accuracy versus level of effort and consistency. The square footage and EUI methods, while straightforward, potentially suffer from inaccuracies due to poor correlation between energy use and square footage coupled with the lack of region- and building-specific EUI data.

The model-based method used previously completed Facility Energy Decision System (FEDS)

models. FEDS is an energy modeling program designed to determine and allocate energy consumption and costs and to find life-cycle, cost-effective energy projects for all buildings and end uses at large, multi-building sites. FEDS analyses have been completed at sites throughout the United States for the Army, DOE and other organizations. The data helped the 13 SERO installations select and prioritize appropriate buildings to meter, as well as gather information for the required metering plan. All fuel utilities were included in the analysis.

This information was provided in a spreadsheet tool for each installation. Each spreadsheet tool contained the following:

- summary of utility costs and cost-effective meter installations by building number;
- summary of building utility costs and consumption, meter installation calculations and metering tracking information by utility;

- suggested installation years to allow budget planning;
- guidelines to calculate potable water consumption per building;
- chart that summarizes costs and savings by year for all cost-effective meter installations;
- progress report for annual reporting to DOE;
- flexibility to adjust key inputs (meter cost and associated savings) and recalculate cost-effectiveness of meter installations according to accurate meter costs and savings; and
- instructions for spreadsheet use.

To determine the cost-effectiveness and, therefore, the priority of meter installations, current energy prices were entered into the original FEDS models developed for each SERO site. Building utility costs were determined from these new FEDS results and compared with the installa-

Category	Value	Typical Range/Notes
Estimated Electric Meter Cost per Metered Point	\$5,000	\$2,000 to \$10,000
Estimated Natural Gas Meter Cost	\$5,000	\$2,000 to \$10,000
Estimated Steam Meter Cost	\$5,000	\$2,000 to \$10,000
Estimated Chilled Water Meter Cost	\$5,000	\$2,000 to \$10,000
Estimated Potable Water Meter Cost	\$5,000	\$1,000 to \$10,000
Estimated Annual % Utility Savings Resulting From Meters	2%	0% to 15%
Estimated Annual Data Collection and Processing Cost	\$243	Estimate based on assumption of \$20 per month service charge
Estimated Annual Meter Maintenance Cost	\$40	Estimate based on assumption of \$5 per month maintenance charge
Desired Payback (years)	10	5 to 15 years

	Total	Electric	Natural Gas	Steam	Chilled Water	Potable Water
Number of cost-effective meter installations on site:	53	44	7	2	0	0
% of cost-effective meter installations on site:	2.38%	8.99%	0.71%	2.00%	0.00%	#DIV/0!
Number of buildings analyzed:	1051	1051	935	97	95	0
Number of existing meters:	0	0	0	0	0	0
Number of existing meters meeting DOE requirements:	0	0	0	0	0	0

This sample page of the Metering Prioritization Tool includes the variable inputs and a summary of the number of cost-effective meters by fuel type.





# EPA ranks Fort Carson as a Top 10 Federal Green Power Partner

by Susan Galentine

The U.S. Environmental Protection Agency ranked Fort Carson, Colo., fifth on its first list of Top 10 Federal Green Power Partners June 26. Fort Carson was recognized for its voluntary purchase of 40,000 megawatt hours of green power.

The Top 10 list highlights the largest renewable-energy purchases among federal agencies. "Green power" is a designation commonly used for electricity-generated products that are partially or entirely generated from renewable resources such as solar, wind, geothermal, biogas and low-impact biomass and hydro methods.

According to EPA, the combined renewable energy purchases of the 10 agencies amount to about 1.6 billion kilowatt-hours (kWh) of green power or the equivalent of the energy required to power about 156,000 homes in the United States or remove emissions from 204,000 vehicles annually.

Fort Carson partnered with eight other government agencies in July 2005 and signed a landmark agreement with the Western Area Power Authority, an agency of the U.S. Department of Energy, to purchase renewable energy certificates. The credits come from a combination of renewable energy from wood biomass (76 percent) from sawmills in California and wind farms (24 percent), located in California and Nebraska.



Part of Fort Carson's green power ranking comes from supporting the Mountain View wind facility in San Geronio Pass, Calif. Photo courtesy of the Mountain View Power Partners' web site.

At about \$1 per million watt-hours (MWh), the 40 MWh of certificates Fort Carson purchased equates to about 2,450 hours of renewable energy produced or the annual power needs of 3,700 homes. Fort Carson currently purchases 29 percent of its energy from renewable sources.

Buying the credits does not mean Fort Carson uses the renewable energy produced. Instead, the purchase gives Fort Carson credit for supporting renewable energy production and, thereby, the companies producing the energy.

"Fort Carson is just doing its part to reduce our nation's reliance on fossil fuels," said Vince Guthrie, utilities program manager for the Fort Carson Directorate of

Public Works. Guthrie is confident that a proposed wind farm at Fort Carson and planned renewable energy purchase for the local military installations will provide even more renewable energy and help stabilize utility costs.

"This recognition is indicative of the drive and commitment of Fort Carson to reach its 25-year energy sustainability goal," said Mary Barber, deputy director of the Directorate of Environmental Compliance and Management. "We have made great progress toward our goal in a relatively short amount of time and are aiming to operate off of 100-percent renewable energy sources in the future."

The most commonly used energy sources — coal, oil and natural gas — are limited in supply, taking thousands, even millions, of years to regenerate. In contrast, renewable energy sources — such as wind, sun and wood — are created daily, offering a limitless supply. By backing renewable energy use, Fort Carson reduces the nation's dependency on foreign energy sources, thereby helping to improve our national security and avoid rising costs.

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tion, operation and maintenance costs of metering each utility.

Meter installations with a simple payback of fewer than 10 years were considered cost-effective. These were prioritized so that the most cost-effective 15 percent are to be installed during 2007, the next most cost-effective 15 percent are to be installed during 2008, and so on until all remaining cost-effective meters are installed during 2012.

Across all SERO sites, using conserva-

tive estimates for cost and percent savings — \$5,000 per meter and 2 percent savings, on average only about 5.7 percent of buildings per site can have their electricity metered cost-effectively. Using less conservative estimates — \$2,000 per meter and 10 percent savings, about 24.8 percent of buildings can meter electricity cost-effectively.

These numbers vary by site depending on climate, utility cost, building inventory and building efficiencies. Each site will choose appropriate inputs. Meter cost will depend on the type of meter installed and

prices available to that site. Percent savings resulting from meters will depend on the site's responsiveness to the metered data.

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# 10 ways to reduce facility energy costs: what to look at first

by Don Juhasz, adapted with permission from a paper by Terry Niehus

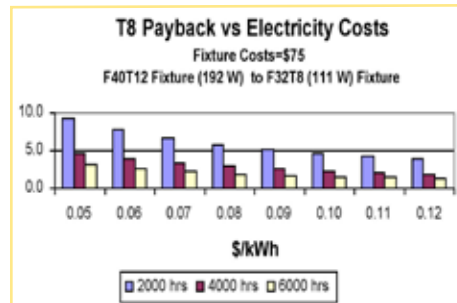
Certain items always seem to be included in the list of energy saving recommendations. They tend to have a reasonable, simple payback for the effort. Here is a list of the “top ten” of these energy saving measures. These measures apply to nearly every type of military facility. They are not in the order of highest to lowest payback but logically listed based on how often they appear in energy audits.

This list may be used as a general guide as to what to examine first when looking at ways to save energy and reduce operating costs. The paybacks shown are based on a range of average electrical costs and assume a capital cost for the energy conservation measure. When evaluating these measures, ensure that the utility rates accurately reflect the charges for the specific facility and obtain pricing data and technical specifications from reputable vendors. Operating hours also affect the calculations, so make sure that estimates are reasonable.

## 1. Replace fluorescent 40W-T12 lamps with 32W-T8 lamps and electronic ballasts.

**Why:** The T8 lamps with electronic ballasts are more efficient than the standard T12 lamps with standard ballasts. In addition, the quality of lighting may be improved due to the higher CRIs (Color Rendition Index) of the T8s as compared to the standard T12s. The “T8 Payback vs Electricity Costs” chart illustrates the paybacks for various average electric costs if a 4-lamp, 4-foot, fluorescent fixture with standard ballasts and 40-watt, T12 bulbs (192 watts per fixture) was replaced with a 4-lamp, 4-foot fixture using 32-watt T8s with electronic ballasts (111 watts per fixture).

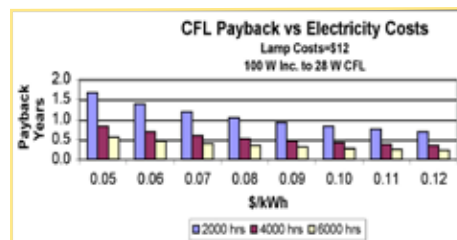
At an average electric cost of 8 cents per kilowatt hour (kWh) and a fixture cost of \$75, the payback is 5.8 years for 2,000 hours of annual operation, 2.9 years for 4,000 hours, and 1.9 years for 6,000 hours. Obviously, more operating hours and/or higher electric costs will result in lower paybacks.



## 2. Replace incandescent bulbs with compact fluorescent lamps.

**Why:** Compact fluorescent lamps (CFLs) are very efficient when compared to the standard incandescent bulb. CFLs use about one-third to one-fourth the wattage of incandescent bulbs to produce an equivalent amount of light. In addition, CFLs can have a rated life as high as 10,000 hours, as opposed to 750-1,000 hours for most incandescents.

The “CFL Payback vs Electricity Costs” chart illustrates the paybacks from changing a 100-watt incandescent lamp to a 28-watt CFL. For this example, the price of the CFL was estimated at \$12. As the price of CFLs continues to drop, the paybacks will get lower. For an electric cost of 8 cents per kWh, and with more than 2,000 hours of operation, the payback can be about one year; for more than 4,000 hours, about six months; and for more than 6,000 hours, less than 4.2 months.

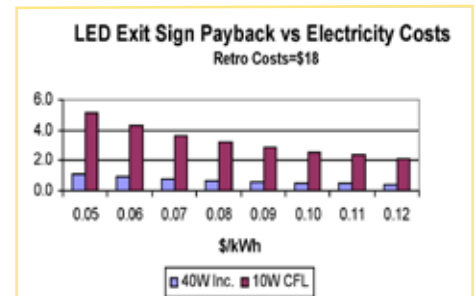


## 3. Replace incandescent or fluorescent exit sign lights with LEDs

**Why:** Exits signs operate continuously by law, or 8,760 hours a year. If these signs are illuminated by incandescent bulbs, the

wattage can be as high as 40. The fluorescent signs typically have lower wattages, in the 10- to 15-watt range. The LED (light emitting diode) signs operate on about 2 watts and, therefore, consume significantly less energy.

The “LED Exit Sign Payback vs Electricity Costs” chart shows the paybacks for different electric costs if a 40-watt, incandescent exit sign is retrofitted with LEDs. Paybacks are also shown for retrofitting a 10-watt, CFL exit sign with LEDs. Note that the LEDs have a life of more than 25 years, so that the maintenance and associated costs are much less. For an electric cost of 8 cents per kWh, the payback can be about eight months for incandescent replacement and about 3.2 years for fluorescent lamp replacement.



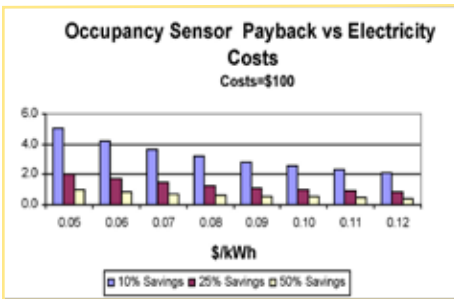
## 4. Use occupancy sensors in areas where lighting is left on when no one is there.

**Why:** In most facilities, there are places where lights are typically left on when the areas are unoccupied. Occupancy sensors, when properly installed, can ensure that the lights are turned off when the area is vacant and turned on when occupied. The energy savings from occupancy sensors depends on the total hours that the lights are normally on and the percentage of hours that they can be turned off. Savings for an office building operating 4,000 hours annually can be in the range of 10 percent to 50 percent, depending on area traffic. The actual percentage of hours that the lights can be turned off can be tracked with an inexpensive lighting data logger. ➤



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The "Occupancy Sensor Payback vs Electricity Costs" chart shows the paybacks that could be realized for various electricity costs by installing occupancy sensors in a room with six fluorescent fixtures consisting of four 34-watt T12 lamps with standard ballasts (164 watts per fixture). For an electrical cost of 8 cents per kWh, the payback for a 10-percent reduction in lighting hours is about 3.2 years. For a 25-percent reduction, the payback drops to around 1.3 years, and for a 50-percent reduction in lighting hours, the payback is under eight months.



### 5. Install programmable thermostats.

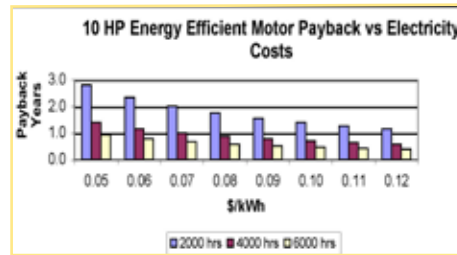
**Why:** Programmable thermostats can offer effective and quick returns on investment. They adjust temperatures during non-occupied hours, reducing energy costs. The increases in temperature during the cooling season and decreases in temperature during the heating season can result in significantly reduced energy use.

The savings realized from installing programmable thermostats are not easy to quantify, as they depend on numerous variables that include: efficiencies of the heating and cooling equipment, weather, facility integrity, hours of operation and set-back/set-up duration. Manufacturers typically overstate the energy savings with estimates as high as 50 percent. A more reasonable estimate is 1-percent savings for each degree of an eight-hour set-back. Experience has been that the paybacks for installing programmable thermostats in office buildings ranges from eight months to 3.5 years. The cost of programmable thermostats varies from \$50 to more than \$200, depending on the functions.

### 6. Replace motors that have burned out with energy-efficient ones.

**Why:** Energy-efficient motors use less energy to operate than standard motors. A few percent increase in efficiency can save a significant amount of money in the course of a year, especially if the motor operates for long hours.

The "10 HP Energy Efficient Motor Payback vs Electricity Costs" chart shows the paybacks for various electric rates for changing a burned-out, 70-percent-loaded, 10-horsepower (HP), 86.5-percent-efficient motor to a 10-HP, 91.7-percent-efficient motor. The cost of the standard motor was \$294, and the high-efficiency one was \$390. With an average electric cost of 8 cents per kWh and 4,000 hours of operation, the payback is less than 11 months. For 6,000 hours, the payback drops to about seven months.

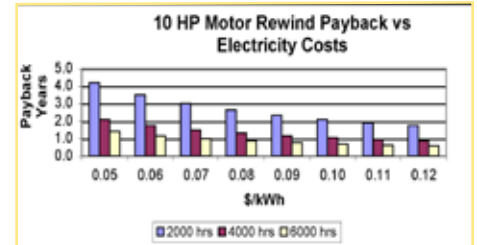


### 7. Replace motors with energy-efficient ones rather than rewind.

**Why:** Rewinding motors can lower their efficiency and consequently increase operating costs. It is generally better for motors less than 25 HP to replace the motor with a high-efficiency equivalent rather than rewind. Also, rewind motors may not last as long as new ones, so the long-term economics will generally favor the new motor.

The "10 HP Motor Rewind Payback vs Electricity Costs" chart illustrates the paybacks realized by purchasing a new energy efficient motor rather than rewinding the existing one. A 2-percent loss in efficiency of the rewind motor was assumed. The cost of the rewind was estimated at 50 percent of the cost of a new motor. The motor parameters used were the same as in the previous example. At 8 cents per

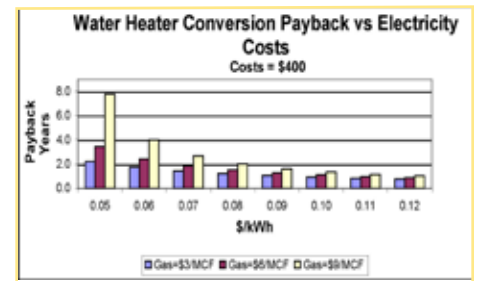
kWh, motors operated 4,000 hours annually had paybacks of about 1.3 years. For 6,000 hours, the payback drops to about 11 months.



### 8. Replace electric water heaters with gas water heaters.

**Why:** Heating water with electricity can be more expensive than heating it with gas even though electric water heaters are more efficient than gas ones, because the cost of gas has typically been less than that of electricity. However, note that if this pricing hierarchy changes due to gas shortages or other economic conditions, the electric-to-gas conversion may not be favorable.

The "Water Heater Conversion Payback vs Electricity Costs" chart shows the paybacks for changing an electric water heater to a gas equivalent at various gas and electric rates. The payback calculations assume an annual hot-water use of 30,000 gallons a year, a 60-degree temperature rise and a \$400 installation cost for changing an electric water heater to a gas one. The electric and gas water heater energy factors used were 90 percent and 70 percent respectively. At an average electric cost of 8 cents per kWh, the paybacks range from 1.2 years with gas at \$3 per mcf (thousand cubic feet) to two years with gas at \$9 per mcf.



Environmental Protection Agency charts



# Fort McCoy work force asked to reduce energy use, costs

by Rob Schuette

With the increasing cost of energy pushing up against constrained Department of Defense budgets, Department of the Army employees can help stretch funding by taking steps to save money by reducing the use of energy. At Fort McCoy, Wis., the work force has been asked to do just that.

Some installations have reported that budget shortfalls have required cuts to services, ranging from office supplies to not being able to pay monthly utility bills on time. Fort McCoy has paid all of its utility bills on time, but members of the installation work force are being actively encouraged to conserve energy to help ensure the installation has enough money to meet all of its energy funding needs.

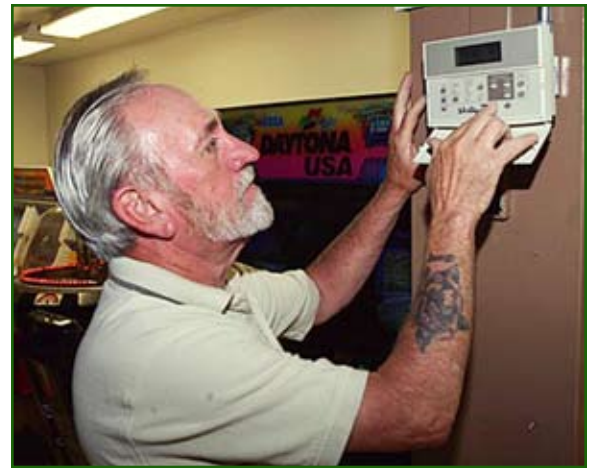
Scott Naeseth, the Fort McCoy Directorate of Support Services (DSS) energy manager, said many of the strategies included in the Army Energy Conservation Interim Policy Guidance, dated December 2005, can help reduce energy use and costs at

work. These guidelines are being incorporated into Army Regulation 11-27, the Army Energy Program. Naeseth said many of these common-sense strategies can be used by members of the work force to save money at home, as well.

## Appliances, lighting, computers

Any electrical equipment or appliances that are not needed at a particular time — for example, when not being used and during non-duty hours — should be turned off, if feasible, Naeseth said. Day-lighting and occupancy controls are used when they are cost-efficient.

Off-hour and exterior lighting are being eliminated, except when it is essential for safety and security purposes, as required by Army Regulation 190-11. If lighting is required, use of motion-sensor controls will be evaluated for cost effectiveness.



Otto Peterson, recreation center manager at Fort McCoy, checks the setting on the thermostat that controls central air conditioning in the facility. Photo by Rob Schuette

Any new lighting fixtures for new construction, remodeling and modular office furniture will be the T-8, 32-watt lamp with instant start electronic ballast or the T-5 lamp, he said. All new or replacement electrically operated appliances and heating, ➤

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## 9. Understand the utility rate structures and track billing histories.

Some facility managers know their building operation and equipment inside and out, yet they do not take the time to understand how they are being billed. Many have never seen the utility bills. To control utility costs, it is necessary to fully understand how the demand and energy charges are calculated and how they affect facility operating costs.

Also, to save energy, it helps to understand how a building has performed in the past. Track and graph utility use for at least the previous 12 months. Commercial software programs designed to do the tracking and graphing are readily available, or develop your own with spreadsheets. At a minimum, track monthly demand, energy use and dollar amounts. This will enable

you to quantify savings due to energy management improvements and can even help you spot billing errors.

## 10. Work with the utility representative.

The utility representative can be a valuable asset in controlling energy costs. Deregulation has placed pressure on utilities to keep their customers, especially larger facilities, from thinking about switching to other suppliers or generation alternatives. This means that most utilities want to do all that they can for their customers. Here are some questions to ask the representative:

- How do my rates (schedules) work? How can I get copies of them?
- Am I on the best possible rate (schedule)? If not, how can I get on it?
- What are my rate options (for both demand and consumption)?

- Does my demand rate include a ratchet charge?
- What is the demand period?
- Do you offer any incentives or rebates for equipment replacement?
- Can you help me reduce my utility costs?

Many of these principles apply to homes as well as to stewardship of government facilities. Application of these low-cost items can have a relatively short return on funds invested.

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ventilation and air-conditioning equipment will be ENERGY STAR rated at a minimum.

Replacing light bulbs also can be an expensive operation, so McCoy personnel are asked to be patient, he said.

"If you have only one light bulb to change, it is very costly in the time and gasoline it takes to get somewhere," he said. "It's more cost-effective to do a number of them at the same time." The Fort McCoy DSS is working to establish a regular schedule to inspect and change lights that are flickering or need to be replaced.

Computer processing units are mandated to remain on for information technology purposes, such as virus updates. However, the post's personnel have been asked to turn off monitors, printers and other peripheral accessories whenever the computers are not being used.

Refrigerators are authorized in work and office areas with sizing based on number of personnel supported, generally one cubic foot per person. With few exceptions, refrigerators in work areas and offices intended for only one person's use are prohibited.

### **Temperature settings**

Heating and cooling temperature ranges are established to help ensure general employee comfort. During the heating season, temperatures in general occupied office space are maintained in the range of 70-74 degrees Fahrenheit during working hours. During nonworking hours, the temperature is set between 50 and 60 degrees.

In warehouses and similar active working spaces, the temperature is set between 55 and 65 degrees during times of occupancy, and between 40 and 50 degrees during unoccupied periods. When cooling is authorized, the cooling season temperatures are maintained at 72 to 76 degrees. Cooling setup temperatures during unoccupied times are set at 80 to 90 degrees. All

temperatures, including those for medical and medical research operations, comply with these standards, except where the mission or Department of Defense standards require otherwise, Naeseth said.

"These guidelines provide a little more leeway than President Carter's guidelines did in the 1970s and recognize that people need to be comfortable while they're working," Naeseth said. "Personnel also contribute to their comfort by dressing appropriately according to weather conditions — lighter clothes in hot weather and warmer clothes in colder weather."

The operation of portable heating and cooling devices is prohibited where the intent is to circumvent the heating and cooling standards. Use of personal supplemental heating or mechanical cooling devices must have supervisor written approval and can be used only when an area is occupied.

Supplemental heating and cooling sources may be used when cost-effective energy reductions can be achieved by reducing the use of primary heating and cooling systems or personal comfort levels cannot be achieved by reasonable adjustments of the primary system. Such devices often are effective when only a few people occupy a portion of a large building, and heating and cooling needs for individuals exist only in that small section of the facility, he said.

### **Vehicles**

Jane Schmidt, DSS transportation officer, said that administrative vehicle use is monitored for abuse and unnecessary use beyond that needed to maintain readiness.

Schmidt encourages members of the Fort McCoy work force to conserve energy when using government vehicles. She said that the best way to ensure a vehicle gets optimum gas mileage is to ensure all maintenance services are taken care of on schedule. Another good way to get maximum gas mileage is to consolidate vehicle trips, whenever possible, she said.

"It doesn't make sense to go to just one place when you know during the day you will have other places to go," she advised installation employees. "Be sure to coordinate with other members of your office when you go somewhere, such as to pick up supplies, so they don't have to make a separate trip."

If more than one member of an office is attending a meeting, they should ride together whenever possible, Schmidt said. To eliminate unnecessary trips, people are asked to use the post mail distribution system rather than hand carry packages or paperwork to other activities on post.

Members of the work force also are asked to make the appropriate vehicle choices when planning a trip. If employees have a choice between using a pickup or sedan to attend a meeting in the cantonment area, for example, they get better gas mileage using the sedan. Likewise, it probably would be better to choose the pickup when employees go to the ranges.

Employees who need a vehicle to drive to a temporary duty site off-post are encouraged to check with the Transportation Motor Pool to determine if a more fuel-efficient vehicle is available, she said. The motor pool has procedures in place to replace leased vehicles with more fuel-efficient vehicles, whenever possible.

Energy awareness tips also are posted on the Fort McCoy Corporate Network Site on a weekly basis. These are provided by VT Griffin, which is contracted to provide DSS services.

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*Rob Schuette is the assistant editor of the Triad at Fort McCoy, Wis. The article was reprinted with permission from the Triad.*

**PWD**



# Solar panels help cut energy costs at Fort Sam Houston

by Debra Valine

San Antonio, Texas, gets plenty of sunshine, so why not convert that natural power to usable energy? Solar power creates green energy. It is good for the environment and saves money.

Bldg. 1350 at Fort Sam Houston in San Antonio now uses a 180-kilowatt-hour photovoltaic (PV) solar panel system to augment electricity from the power company. The system saves the installation nearly \$6,000 a month in energy costs and provides clean energy, no carbon dioxide emissions and less dependence on foreign oil.

The solar panels produce DC electricity and route it through an inverter where it is turned into AC energy that is accessible to anyone on the power grid in San Antonio. Once on the grid, the solar energy is used just like electricity that comes from the power company; this energy just comes from the sun. It is seamless to the end user.

The project is part of the Energy Conservation Investment Program (ECIP). Funding comes from Congress through the Military Construction Program. ECIP judges the different projects that installations submit. All the proposals include an economic analysis that includes cost, savings on investment ratio, payback, etc. Other types of projects include increased insulation, high-efficiency boilers and motors — basically anything you can replace with a high-efficiency device, lighting and direct digital controls.

“ECIP likes funding PV because it is green energy,” said Will White, the lead program engineer of the Utility Monitoring and Control System (UMCS) team at the U.S. Army Corps of Engineers, Engineering and Support Center in Huntsville, Ala.

“The workmanship and the engineering on this job impressed me,” White said. “We finished the job on time and within budget. We actually had some contingency funds that we did not use that we will return to the program. It was, in all respects, one of the most satisfying and successful jobs I’ve



*A worker installs photovoltaic solar panels on Bldg. 1350 at Fort Sam Houston, Texas. The panels augment electricity from the local power company and are saving the installation nearly \$6,000 a month in energy costs.*

been associated with. No safety violations, no re-submittals, no unhappy customers ... the guys just worked hard and did all they promised.”

Rob Jay, the installation energy manager at Fort Sam Houston, and Gene Rodriguez, the post’s in-house technical consultant for PV systems, submitted the project to ECIP. The project was funded in September 2005 and completed seven months later.

“Initially, our primary objective for going with PV was to try and not exceed the demand charge from City Public Service, our local utility company,” Rodriguez said. “The solar constant is something like 1500 Btu per square foot per day. That is a lot of energy going to waste. Our chillers are drawing the most current flow from 3 to 5 p.m., almost matching the peak output of the PV system that it is interfaced with.”

The corresponding reduction in maintenance dollars adds to the appeal of the PV system.

“It hasn’t rained much lately in San Antonio, but, for the most part, an occasional rain is all that’s required to keep the

collectors clean,” Rodriguez said.

Using a renewable alternate energy source, in this case solar energy that is available in abundance, to achieve energy independence in America not only makes sense but soon may become mandatory, he commented.

Partners in the project included the installation, the Corps of Engineers Fort Worth District, the Huntsville Center, Williams Electric Company of Fort Walton Beach, Fla., and Meridian Energy Systems of Austin, Texas.

“We competed the job between our UMCS ID/IQ (indefinite delivery, indefinite quantity) contractors and received price proposals from three of them,” White said. “All the pricing came within 2-3 percent. However, due to the pressure of increased demand for PV panels from higher oil prices, they were all over the government amount allocated. We had to go back to ECIP for more money. Hank Gignilliat at Headquarters (Office of the Assistant Chief of Staff for Installation Management) in Washington, D.C., was instrumental in ➤



# Taking the myths out of energy consumption

by Don Juhasz

*The following myths, routinely held as fact, inhibit cost-saving practices. Significant utility savings with very little effort or inconvenience are possible when the workforce is educated about energy saving practices.*

## Energy myths:

**Myth:** The Army does not have to pay for utilities, so it does not matter how much is used. Besides, it is a “perk” — a fringe benefit.

**Fact:** The Army is one of the largest utility customers, spending nearly a billion dollars a year on utility costs. A 10-percent decrease in utility consumption will lower the government’s expenditures more than \$100 million a year.

**Myth:** It uses less energy to maintain a facility at a constant temperature because the heating or cooling unit would have to work harder to bring the building back to a comfortable temperature.

**Fact:** Not only do the laws of physics disagree with this widely held belief, but actual studies have proven it to be incorrect. The savings for every eight hours that a building is at a re-set (non-occupied) temperature can be approximated at 1 percent per degree of set-back for heating.

If a 15-degree difference is used for the non-occupied temperature, 15-percent



Don Juhasz

savings is achievable for each eight-hour period. Savings of 30 percent are well within the realm of reality when more than an eight-hour off-set a day is used and when all non-occupied hours are considered, including weekends, holidays and other non-use days when 24 hours of savings are possible. The impact is doubled for cooling. The savings for every eight hours that a building is at a re-set (non-occupied) temperature for cooling can be approximated at 2 percent per degree of re-set (higher set point).

**Myth:** It takes more energy to turn lights on and off than to just leave them on.

**Fact:** It does require a surge of energy (up to 300 percent) for one-half of a cycle (one-half of one-sixtieth of a second) after

which the energy flow becomes steady state. Human reaction time in turning a switch off and on exceeds this by about 15 times. Therefore, a person could stand flipping the switch off and on, and the off-time would offset any energy increase from the on-cycle.

Lamp life, is in fact, decreased with on and off switching, but because of the time the fixture is off during switching, the overall time between bulb replacement is actually increased by one second for every one second that the light is off, so that it takes at least the normal life hours (20,000 hours for a good fluorescent) to decrease its life to half by constantly switching it off and on. Bottom line: it saves utility cost if lights are turned off when the room is unoccupied, even for two seconds.

**Myth:** Computers and peripheral equipment last longer if left on all the time.

**Fact:** Computers are similar to lights and have an inrush of energy on start-up. However, contrary to popular belief, research has also demonstrated that turning computers and peripherals on and off as needed is not detrimental to the equipment.

Buildings with computers routinely use significantly more electrical energy than those without. A computer system with peripherals rated at 300 watts at 5 cents

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getting the additional funding for the project.”

The system is fully integrated through controls to produce power onto the energy grid. It is metered and monitored separately from the power provided by the local electric company. The power that is generated from the sun is metered separately and the cumulative kW and dollar savings are displayed on the monitor in the master control room of the Energy Monitoring and Control System (EMCS). It is helping to reduce the demand cost and base utility

cost while helping to meet Army energy goals.

“What is great about the use at Fort Sam Houston is that it provides additional energy for cooling during the peak demand periods,” White said. “You get more kilowatts of energy from the solar panels when the sun is the brightest. The solar energy powers the chillers in classrooms, barracks, etc.

“We had a challenge with the panels because, from the time the contractor put in the bid to the time he wanted to buy the panels, the price had gone up due to ris-

ing costs and demand,” White said. “The contractor honored their proposed price, and we ended up using a different source for the panels, but the panels were just as good.

“It was a team effort that turned out well,” White said.

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per kilowatt-hour will cost \$131 a year to operate 24 hours a day (300/1000 x .05 x 365 x 24). If the computer system is needed only eight hours a day, 365 days a year, then there would be a savings of \$88 a year (67 percent of \$131). This is a relatively small reduction when measured against the inconvenience of having to reboot every morning, but when multiplied by the number of computer systems on an installation, the savings add up significantly. For 1,000 computers, the savings would be \$88,000 a year, a big bang for a minor inconvenience.

**Myth:** Batteries and film need to be refrigerated.

**Fact:** The only items by regulation that require refrigeration are special batteries for aviation life support equipment — not the 9-volt or off-the-shelf ones, and a few medical items and medical specimens. Regular, off-the-shelf batteries and film will cost more to refrigerate than any increase in shelf life that results from maintaining them at a lower temperature.

It costs less to replace the batteries slightly more often than to maintain the number of refrigerators in supply rooms and individual offices with the justification of battery storage. Refrigerators also cost several hundred dollars a year to operate and are needed only in break rooms and conference rooms for support of employees and meetings. Personal room refrigerators for the personal convenience of only one individual are not authorized per Army regulation and policy.

**Myth:** Outside-building and motor-pool lighting is required to be on during all hours of darkness per security regulations.

**Fact:** Only the bunker lights at an ammunition supply point are required to be on during all hours of darkness. All other security lighting is at the discretion of the commanding general of the facility.

It has been proven that pilferage and vandalism have decreased at military facilities and on school grounds where the lights

have been turned out. The intruders then have to bring their own light and can be more easily spotted by security forces.

**Myth:** Use of low-mercury tubes will put less mercury into the environment.

**Fact:** Mercury is used as part of the process of illumination. When the mercury is expended, the ends of the tubes turn black. Low-mercury tubes do not last as long as regular tubes, despite the manufacturer's claim that they are comparable.

The low-mercury tubes cost more. A larger number has to be purchased because they do not last as long. As a consequence, nearly the same amount of residual mercury is put into the environment in expended tubes because more tubes are used, and the cost is nearly four times higher. Their initial cost is nearly twice as much per tube; they last a little more than half the time, and so they need to be replaced almost twice as often. Their recycle cost is the same per tube, so there is no financial or environmental value in using them.

**Other interesting points:**

**Comfort levels vary:** To feel comfortable, women, on average, need room temperatures higher by about 3 degrees Fahrenheit than men. Age, regardless of gender, also plays a role. For adults over age 30, the preference is warmer room temperatures by an average of one degree for every 10 years over age 30.

**Conclusion:** Any common areas or shared areas will not be comfortable to everyone. The change of an occupant will normally require an airflow adjustment to meet the new person's comfort level. The temperature that is comfortable to the majority will be 72 F plus or minus one degree.

**Personal resistance heaters.** Although not currently authorized by Army Regulation 11-27, they are the only way in some areas to solve personal comfort issues. They are authorized by the Interim Energy Policy, signed Dec. 27, that reflects the upcoming changes in AR 420-1, Chapter 23, which is the revised AR 11-27.

The problem with alternative heating and cooling devices is that they are not monitored, nor is there any accountability for the users or managers. If left on when no one is present, they continue to maintain the space at a certain temperature using electricity, a more expensive energy type, defeating any savings from the use of non-occupied set-backs. The devices also present significant fire hazards.

**Conclusion:** Resistance heaters and other supplemental environmental climate control devices should be authorized by exception in writing by the area supervisors. Individuals and supervisors should be held accountable for monitoring and turning off such devices when not needed.

Power strips that have occupancy sensors are available and go a long way toward solving the problems with resistance heaters. Placed near a desk or in an office, they will turn off an appliance when a person is not present.

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# Central energy plant assessment strategy used at Redstone, Fort Jackson

by William D. Chvala Jr., Daryl Brown and Jim Dirks

What do we do with aging central energy systems? Do we keep and upgrade them or replace them altogether? Conventional wisdom may say that central chilled water systems are desirable because of the benefits of running larger, water-cooled chillers that are more efficient than smaller units. Central heating plants, however, are believed to be big energy-wasters, because larger boilers are no more efficient than smaller ones, and the higher temperature differentials (steam temperature to ground temperature) lead to high heat loss.

Reality, of course, is never that simple. The decision to modernize or decentralize goes beyond simple fuel costs and should include existing system conditions, the size and types of loads, the density of loads, equipment replacement costs and future operational strategies based on whole-system life-cycle cost.

Pacific Northwest National Laboratory (PNNL) recently helped two installations take a hard look at their central energy systems with funding from the Department of Energy Federal Energy Management Program, the Assistant Chief of Staff for Installation Management and the Army's Installation Management Agency Southeast Region. Redstone Arsenal in Huntsville, Ala., operates a large steam distribution system with heating provided by a waste-to-energy plant located off post. Fort Jackson, S.C., operates three central energy systems that provide high-temperature water via an underground distribution system.

Both installations wanted in-depth assessments of their central plants to identify the proper option. Should the central plant be refurbished? Should the systems be decentralized? Was there an optimal solution somewhere in between?

Decisions about central energy systems do not have to be as simple as "keep" or "replace." In the middle ground lies a successful strategy called "pruning." Pruning involves maintaining central heat in areas where facilities and loads are densely locat-

ed while removing buildings with smaller loads with long distribution paths. Generally speaking, it means going after excess pipe energy losses, so the focus is on removing buildings that will also eliminate a section of pipe. In addition, it means being reluctant to prune buildings from central chilled water, because they have smaller heat gain than central heating (i.e., a lower temperature differential). Central chiller plants allow better staging of more efficient chillers and can be good candidates for chilled storage.

At Redstone Arsenal and Fort Jackson, PNNL used the Facility Energy Decision System (FEDS) simulation model ([www.pnl.gov/feds](http://www.pnl.gov/feds)), which provided building-by-building heating and cooling loads. PNNL then used existing CADD (computer-aided design and drafting) drawings of the distribution systems to determine the length and diameter of pipe for each building or group planned for pruning. During the process of developing the FEDS model, estimates of energy losses were developed for each distribution system. Energy losses were then allocated to each segment based on pipe length and diameter.

Once building loads and associated distribution system losses were evaluated, determining the cost effectiveness of selective pruning is relatively straightforward.



*A system leaks steam at Redstone Arsenal, Ala. The system was part of a central energy plant assessment. Photo courtesy of Pacific Northwest National Laboratory*



*The Fort Jackson, S.C., central energy plant boilers were part of the energy plant assessment conducted there. Photo courtesy of Pacific Northwest National Laboratory*

However, the actual decision of which segment to prune is more complicated. Determining how much load overall should be trimmed and how building energy needs will be met is a delicate process. Complicating factors may be: seasonal versus year-round heating needs, and process-energy versus domestic-energy needs. There is never a single, simple way to optimize the system.

This type of whole-system approach provides detailed cost estimates for all elements affecting life-cycle cost (i.e.,



# Ground-coupled heat pumps save energy, money at Fort Knox's Disney Barracks complex

by Gary Meredith

For new construction, the guiding principle at Fort Knox, Ky., is *Build in energy efficiency — don't add it on later*. This principle is emphasized by the leadership and guides the actions of numerous staff sections and contractors as the energy team coordinates new construction, renovation and repair projects. The initial scope of every construction project requires specific, cost effective Energy Design Guide criteria that include installing wireless automation with geothermal heat pump technology.

The 2.2 million-square-foot of conditioned space at Fort Knox is the largest known site behind one meter in the nation. More than 20 percent of the existing square footage is now serviced by automated HVAC (heating, ventilation and air conditioning) from geothermal energy and ground-coupled heat pumps. This automation efficiently satisfies the occupants' HVAC needs during 60 occupied hours a week, while minimizing output during about 108 unoccupied hours a week in applicable buildings.

For buildings that are continuously occupied, such as barracks, the postwide automation system enables and disables the buildings when the temperatures are appropriate. An example of the use of this system can be found at the Disney troop barracks complex. The complex — named for Gen. Paul Disney, a World War II veteran and the first Armor School commander — is a grouping of 38 buildings, including 14 barracks buildings, six dining facilities, six classrooms, a battalion headquarters, a chapel, a movie theater and storage and maintenance buildings. These buildings contain 811,435 square feet of conditioned space.

When the buildings were constructed in the 1960s, energy efficiency

was not a priority. The entire complex was heated from an inefficient centralized high-pressure, high-temperature water system. The design, age and operation of the central heating plant were also inefficient. The underground hot-water distribution had many thermal leaks due to age, resulting in energy waste. The buildings were cooled from a mixture of decentralized cooling ➤



An earth-coupled/hybrid cooling unit provides peak cooling for the buried parade field loop. Photo by Stephen Moore

(continued from previous page)

initial capital, annual energy, and annual and periodic operations and maintenance). Looking holistically at the system is extremely important because these systems are often expanded, sometimes beyond what they should be, based on what is best for an individual building. A whole-system, life-cycle cost analysis is critical prior to any major construction projects, plant expansion or major replacement of plant or loop equipment.

Experience provides some general observations about central energy systems:

- Central chiller plants allow better staging of chillers for operating at optimal system efficiency.
- Larger water-cooled chillers are more efficient than most smaller-building cooling systems.

- Central heating should be limited to densely located buildings to minimize heat loss from long pipe-distribution runs.
- Focus on pruning buildings when sections of pipe can be removed from the distribution system and those distribution losses can be captured.
- Installing building-level boilers may be more difficult to maintain than a single, large central energy plant.
- Central heating plants provide easier dual-fuel flexibility.
- Return as much condensate as possible in any steam heating system.
- Steam systems are much more difficult to maintain than hot-water systems and typically have greater energy losses.
- Central heating systems offer the possibility of burning lower-cost solid fuels (e.g., coal, wood, municipal waste).

At Redstone Arsenal and Fort Jackson, many options were considered, from pruning one building to groups of buildings to complete decentralization. Both installations are not likely to completely replace their central energy systems in the near future. However, according to the findings, selectively pruning where it makes economic sense and refurbishing the remaining system is a strategy that will prove to be particularly successful at Redstone Arsenal and at Fort Jackson.

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equipment of different ages, efficiencies and conditions. None of the buildings were on an automation system that efficiently staged or controlled the buildings.

Many indoor air-quality issues were related to the previous systems. Only four of the buildings had ventilation equipment, and that equipment was not functioning. The windows were often left open, a very inefficient means of ventilation. The temperature and humidity were causing discomfort and mold issues.

The Fort Knox energy team analyzed the energy consumption of the Disney complex. The centralized heating and inefficient cooling systems were consuming 39 percent more energy than they should. The team focused on the life cycle cost of the existing facility and turned an unfunded problem into an opportunity for savings.

To update the energy efficiency, installation of ground-coupled heat pumps was chosen. Of the existing systems, 70 percent were replaced with geothermal heat pumps, taking advantage of a renewable energy source. Ventilation systems were added to the barracks facilities, improving the indoor air quality. All of the buildings were integrated into the world's largest wireless Tracer Summit system for control and energy management, and all of this work was paid for and funded with energy savings.

The project cost was \$10,449,540. Construction began in June 2004, and the old boiler plant was shut down at the end of that year.

This energy conservation project helped the Army save more than 102 thousand cubic feet (mcf) of natural gas at a cost of \$7.92/mcf for an overall savings of over \$807,000 in 2005, as measured by master metered utility bills. It is anticipated that about 102,000 mcf of natural gas will be saved every year for the next 20-plus years.

Geothermal systems use the Earth's surface as a reliable heat exchanger. The geothermal loop piping has a 50-year warranty and was leak tested prior to being tied into the individual heat pump units. Coupling the use of the renewable energy source and this durable piping, these systems should last well into the future. It is feasible that,

with proper planning, the buildings could be replaced with new structures fed from the same geothermal well complex.

The Disney area barracks is one example of an energy efficient renovation and one of many geothermal installations that the Fort Knox energy team has been able to put into operation. The use of geothermal systems, direct digital controls and an ongoing maintenance program help the system to sustain ongoing energy efficiency and comfort.

Direct digital controls eliminate many of the pitfalls associated with other control alternatives. These state-of-the-art systems are self-calibrating and have minimal moving parts. In addition, these controls can pass much more information to the end user. This allows the energy manager to collect more "real-time" energy data, aids the technicians in trouble-shooting and maintaining the systems, and assists the tenants in operating the system in each facility.

This automation system puts all of the facilities into one easy-to-use system, creating a backbone for an installationwide energy management program. Today, more than 130 Fort Knox facilities are tied in, with an additional 150 being added.

The ongoing re-commissioning maintenance program helps to keep the systems operating at peak efficiency while increasing the life of system components. Water treatment services and other measures have helped to reduce water consumption by about 12 percent and have also helped to prevent pipe corrosion. To recapitalize on energy inefficiencies, the energy team has developed an ongoing program to define the post's construction efforts. This reliability means fewer complaints and more productivity for building occupants.

### **Benefits**

When the Energy Program was initiated at Fort Knox, it was viewed only as a tool for lowering the amount of energy that the installation was consuming. Today, it is used to create sustainable systems that improve the quality of life for Soldiers and government employees.

An exact economic analysis of the savings to investment ratio can be difficult because exact metering often does not exist in buildings on post. It is known that high

temperature, high pressure, underground feed and condensate lines were often being repaired. When additional funding was available to replace more underground lines, the garrison commander directed the energy office to work toward more efficient, long-term fixes. Therefore, the dollars were not spent on more steam lines in the ground but on a new ground-coupled heat pump system.

Since the start of the program, the installation has received fewer discomfort complaints, and the response rate of those complaints has been reduced by an average of three days. The preventative maintenance program includes education of the facility occupants. Tenants are advised how the updated systems operate and are encouraged to ask questions and look for ways to help reduce energy. The response has proven positive, boosting the morale of all involved.

This program garnered significant attention at Fort Knox because many of the existing facilities have long been a source of risk and high-energy consumption. These state-of-the-art systems have helped to alleviate that risk through a comprehensive 10-year maintenance program. Innovative construction processes and streamlined contracting have dramatically shortened the construction cycle for Fort Knox, providing an operable facility in a fraction of the time the traditional procurement methods require.

Numerous boiler plants fueled by natural gas and fuel oil have been closed. Wells were placed under now green-grass parade fields. The energy conservation projects have served as examples of what the Fort Knox energy team can do and have significantly increased awareness of the program and what it can accomplish. Prior to these projects, the energy team would have to seek out opportunities for improvements, but now, tenants often contact the energy team and ask for assistance.

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## Advice from Fort Lee: When it's time to replace water heaters, consider tankless units

by Curt Savoy

None of our residents or organizations uses hot water 24 hours a day, but we pay to heat water 24 hours a day. With a standard water heater, we heat and reheat the same water over and over, even when quarters are empty. New technologies have improved the efficiency of standard water heaters, but a detailed comparison before replacing water heaters may show that tankless is the way to go. This article is intended to provide some basic information to assist in determining whether tankless systems are the right choice.

Tankless water heaters are simply a more efficient way to heat water. Tankless water heaters heat water quickly and produce an endless supply of hot water for as long as it is needed. The great part about tankless water heaters is that you only pay to heat water when you need it. Tankless water heaters come in gas and electric models, and most gas models utilize an electronic ignition system so there is no standing pilot, which promotes further savings.

There are basically two types of tankless water heaters for home use: "point-of-use" and "whole-house units." Point-of-use water heaters are typically small units that are installed under sinks; they supply hot water to one device. Whole-house units are larger and can handle a variety of hot water needs. This discussion relates to the whole-house variety.

**Advantages:** Tankless systems save energy. In fact, the federal government is acknowledging the benefits of gas tankless water heaters and has authorized a \$300 tax credit for new purchases. However, the models that qualify for the tax credit are required to have an energy factor of 0.80.

Tankless water heaters have a life expectancy of more than 15 years, and many manufacturers carry warranties of 10 years and longer. All of the major components of a tankless system are recyclable.



Tankless water heaters like this one have been installed in family housing units at Fort Lee, Va. Photo by Jerry Martin.

**Concerns:** Tankless water heaters are initially more expensive, therefore the payback period may not be as fast as one would like, and there are an array of bells and whistles that can have an impact on your overall savings and payback period. It is advisable to thoroughly research all options before making a final decision.

Fort Lee, Va., installed 10 natural gas tankless units as a test and did not purchase any of the optional equipment. To date, the installation has had no customer complaints or problems with the new units.

**Facts and figures:** Heating water accounts for about 20 percent of the average household's annual energy costs. The actual savings that can be achieved have been highly debated, and there are too many variables to discuss here. However, the Internet has several sites devoted to comparisons of standard and tankless water heaters.

Standard water heaters maintain the water temperature at the setting on the temperature sensor installed in the tank (generally between 120 degrees and 140 degrees Fahrenheit). Due to the design of a standard water heater, some heat loss

occurs. This is known as "standby heat loss." Standby heat loss occurs when heat is radiated from the walls of the tank. Standby losses represent about 10 to 15 percent of a household's annual water heating costs. As a standard water tank ages, the efficiency of the unit is reduced due to mineral buildup in the tank and on the sensing element.

**Background:** Tankless units are common in Europe and some parts of Asia. They began appearing in the United States about 35 years ago. A tankless hot water heater is activated by a flow switch when a demand for hot water is sensed. Gas tankless water heaters utilize a heat exchanger. Electric versions use heating elements to transfer heat to the flowing water.

**Practicalities:** While tankless water heaters can provide an endless supply of hot water, there are limitations as to how much hot water can be produced at any given time. Determine the number of hot water devices you expect to have open at peak periods, and then add up their flow rates. This information will be used in determining which model to ultimately choose. The chart below gives an idea of general flow rates.

Appliance Flow Rates	
Appliance	Flow rate GPM
Bathroom faucet	1.0
Bathtub	4.0 to 5.0
Shower	2.5
Kitchen sink	1.5
Dishwasher	1.5
Washing machine	2.0

It is important to note that tankless systems are more efficient when used with low-flow fixtures. The tankless system should be capable of providing hot



# Confidence builds in structure removal projects

by Debra Valine

**Y**ou work on a small military installation with some small structures you no longer need, and you are looking for a cost-effective way to remove them from your inventory. The U.S. Army Corps of Engineers, Engineering and Support Center in Huntsville is looking for the same thing.

In July, Huntsville Center joined with Sierra Army Depot in Herlong, Calif.; Sacramento District, U.S. Army Corps of Engineers; Frankie Friend and Associates of Englewood, Colo.; B. Starling & Associates Inc. of Mount Holly, N.C.; ICONCO/LVI Demolition Services of Oakland, Calif.; and R.J. Diven Consulting LLC of Coeur d'Alene, Idaho, to test a new concept that may provide another avenue for removing unwanted structures from Army installations while reducing costs.

The concept, the Regional Mobile Demolition Team (RMDT) Program, provides a simpler, time-saving means to remove smaller, abandoned or other excess structures that are not normally large enough to constitute a cost-effective, stand-alone project.

“The intent is to offer a cost-effective solution for removing ‘nuisance’ structures by overcoming the overhead cost and administrative burdens associated with removing structures that are not normally ‘worth all the effort’ for such a small project,” said David Shockley, the Facilities Reduction Program manager at the Huntsville Center. “As envisioned, the success of this concept is contingent on the saving of time and money through centralized, streamlined procurement and administrative processes and the predictability and productivity of an



*An excavator looks like a Tyrannasaurus Rex as it “eats” the building and drops the debris into a dump truck for removal to the landfill. Photo by Debra Valine*

RMDT contractor.”

The Facilities Reduction Program has several options available for installations that need to remove unneeded structures. A Best Practices Toolbox that provides information on those options is located on the Internet at: <https://eko.usace.army.mil/frptoolbox/index.cfm>. Anyone with access to Army

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water without derogation of flow or temperature to at least two, preferably three, water sources at one time for housing units consisting of three or more bedrooms.

Next, determine the “rate of rise” required to heat the water to the desired temperature. As an example, assume that the incoming water temperature is 50 degrees. Water should be heated to 120 degrees for most uses. Determine the rate of rise by subtracting the incoming water temperature from the desired output temperature. In this example, the needed rate of rise is 70 degrees. Thorough research is extremely important in order to choose the

manufacturer and model that suits best, because prices, styles and capabilities vary greatly.

Tankless water heaters save space and can be mounted directly on the wall (interior or exterior — exterior installation requires no venting). They can be vented vertically through ceilings or horizontally through walls. Gas tankless systems are considered category III appliances, so local codes for proper venting requirements must be checked.

With rising utility and maintenance costs and falling tankless water heaters prices, installing tankless systems is an option to consider.

For detailed information on water heater comparisons and a good starting point for information gathering, visit the following web sites; American Council for an Energy-Efficient Society website, <http://www.aceee.org/consumerguide/topwater.htm>, Partnership for Advancing Technology in Housing (PATH) web site, <http://www.toolbase.org/techinv/index.aspx>, and U.S. Department of Energy, <http://www.eere.energy.gov>.

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Knowledge Online can access the site.

The test conducted July 18-21 at Sierra Army Depot successfully removed three structures that had long been on the list of buildings that needed to be removed from inventory. While the cost to remove the buildings was a little higher than expected, it was still about half what demolition usually costs.

"We had what I consider a great success at Sierra," said Bob Starling, president of B. Starling & Associates Inc., who is project coordinator for Frankie Friend and Associates Inc. "We got Bldg. 597 removed, the coal bin on main post near the front gate removed, and Bldg. 402, the old boiler plant, removed. We were not able to remove the two boilers completely from the site of 402, but Carol Gordon fully agreed with leaving them behind." Gordon is the Sierra Army Depot real property specialist.

"I believe that we proved beyond a shadow of any doubt that the concept can work," Starling said. "Part of the solution and execution must be a supportive Directorate of Public Works staff like Carol Gordon, Heather Coursey and Larry Duncan and a flexible demolition contractor. Andres Velazquez of ICONCO/LVI Demolition Services tried his very best to provide quality work in a timely fashion, and I believe he was successful in his endeavor."

The Huntsville Center project manager contacted Sierra Army Depot officials about conducting the test. The center offered to remove the structures at no cost to the depot for a chance to test the concept.

"Every other year, we provide building demolition statistics in our facilities reduction plan," Gordon said. "The test helped us get rid of some eyesores and reduce our inventory. If this works out really well, I would like to have them come back and demo more facilities."

The RMDT Program will reduce the installation's demolition project workload by removing several administrative, finan-

cial and management burdens and shift them to a more efficient and productive central manager.

"The installation benefits by having a single central expert to manage the contract, assist with demolition contractor coordination and provide hands-on technical assistance for project preparation and execution," Shockley said. "The demolition contractor benefits by getting more work, greater project scheduling flexibility, a centrally awarded and managed Indefinite Delivery Indefinite Quantity-type contract and a more stable and reliably managed project.

"RMDT is a win-win proposition based on centralized contracting/management, expert assistance and leveraging the economy of scale by competitively awarding an overall larger quantity of work to a single regional contractor," he said.

"I am really excited and grateful that Huntsville Center reached out to the little guys that need more help for this project," said Coursey, who is chief of Engineering, Plans and Services at Sierra Army Depot. "It provides a mutual benefit. We are helping Hunts-

ville establish a process for the future, and we get something out of it. This is a five-year program. We could have an opportunity each year to have more structures removed."

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*Jose Avalos, ICONCO/LVI Demolition Services, keeps the building wet during demolition to ensure particles of asbestos are not released into the air. Photo by Debra Valine*



*Alex Villalazo, ICONCO/LVI Demolition Services, picks up the smaller pieces of debris with a bobcat. Photo by Debra Valine*



# Fort Lewis to exceed Army mandate for handling demolition, construction debris

by Brendalyn Carpenter

**R**oughly 300 Fort Lewis, Wash., World War II-era wood buildings are scheduled for removal over the next four years. The majority of the material will be salvaged or recycled rather than deposited in a local landfill.

Fort Lewis expects to exceed the new Army Chief of Staff for Installation Management mandate requiring a 50-percent diversion of non-hazardous construction and demolition debris generated by the removal of buildings, renovations and construction on military installations.

“In fact, the contractor for this current project, MCS Environmental, is well on its way to achieving above 95-percent diversion,” said Elizabeth Chien, an environmental engineer with the Seattle District of the U.S. Army Corps of Engineers.

Chien wrote the contract for the removal of 12 buildings on North Fort Lewis, which includes two-story barracks, classrooms and a gym. It calls for a minimum 50-percent diversion rate with additional financial benefits for contractors achieving diversion ranges of up to 95 percent.

The installation has set the bar high with its first attempt at this new form of deconstruction that removes buildings in partitions rather than by demolition. The partitioned removal increases the contractor’s ability to recover reusable and recyclable materials in a more efficient manner.



Contractors remove reusable products for resale in the marketplace. Resale of recovered materials allows the contractors to recover much of the labor costs associated with deconstruction.

“The concept 15 years ago was to look at an old building as something nobody wants, smash it to the ground and send it to the landfill,” said Matt Schultz, project manager for MCS Environmental.

“Thankfully, the Army and the Corps of Engineers have recognized that, first of all, it costs us money to dispose of things in the landfill. Second, we’re running out of real estate for landfills...., so let’s try to do deconstruction rather than demolition.”

To be completely accurate, the work being done on North Fort Lewis is neither deconstruction nor demolition.

“100-percent deconstruction — pulling things apart board by board, nail by nail — is very expensive labor wise, but the other side is traditional demolition where you don’t save anything,” Chien said. “So, you want to find that spot where you get maximum recovery without significant increase in cost.”

Contractors say reaching this new standard requires a change in their approach to building removal.

“Efficiency is the key,” Schultz said. “We start off looking at a building and trying to understand what markets exist for what you’re looking at.”

Markets for the majority of material have already been identified. Porcelain bathroom fixtures, aluminum, steel, clean wood, concrete, brick and painted wood are all segregated on site for future transport to reuse markets. Additional items such as roofing material, plastic, carpet and window glass will go to recycling. The remaining materials are distributed to alternative markets.



During the deconstruction process, World War II buildings at Fort Lewis, Wash., are stripped of their first layer of siding. The white building at left is an example of a World War II building that is representative of their current state.

For example, two-by-fours, plywood, flooring materials, electrical power boxes and lights were donated to the detainee training facility on North Fort Lewis.

“We have a need for wooden structures that we can’t purchase, so we’re reusing the materials to build additional guard shacks and repair facilities, and that way, we don’t cost the government any more money,” Maj. Andrew Fairchok, the facility’s operations officer, said.

One of the driving factors to finding alternative uses for some of the materials comes from people driving by the site and seeing something different from a typical demolition.

“When you do traditional demolition and all you do is turn old buildings into toothpicks and shreds and throw it in the bin, people look at that and say, ‘it’s garbage.’” Chien said. “But when you do something like this, rather than seeing a pile of trash, people driving by see a resource.”

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# AEWRS offers new features

by James Paton, Benu Arya and Doug Dixon

The Army Energy and Water Reporting System (AEWRS) is the primary means for Army installations to report energy and water consumption and progress toward achieving energy reduction targets to the Department of Energy and Congress. This system replaced the Headquarters redesigned Army DUERS (Defense Utility Energy Reporting System) data system in August 2005. During fiscal year 2006, AEWRS has been enhanced to meet the reporting requirements of the Energy Policy Act of 2005 (EPAc) and greatly expand the project-tracking capabilities.

The enhancements to AEWRS include greater capability to track and analyze energy consumption and costs, and an energy managers' module that provides more detailed information on installation characteristics, specific projects and other EPAc goals (renewable energy sources, water, etc.). The focus of these changes was initially to meet the EPAc reporting requirements for the Annual Energy Report, but it was expanded to include data to track and manage appropriated and alternatively financed projects.

Specific enhancements made to AEWRS during FY 2006 include:

- conversion of the energy glide path to a FY 2003 baseline,
- ability to summarize data by IMA region,
- adjustment of energy consumption data to account for privatized family housing,
- ability to report water consumption and costs quarterly,
- elimination of mobility fuel reporting,
- additional reports that can be downloaded to Excel,
- elimination of "inactive installations" and
- ability to track renewable energy under the energy managers' module.

In addition to the enhancements to AEWRS, the energy managers' module will include:

- installation contact information,
- servicing utilities information (POCs, rate structure),
- utility privatization data,
- best management water practices,
- detailed energy project tracking information (Energy Savings Performance Con-

tract, Utility Energy Services Contract and appropriated projects), and

- renewable energy information (purchased and produced energy).

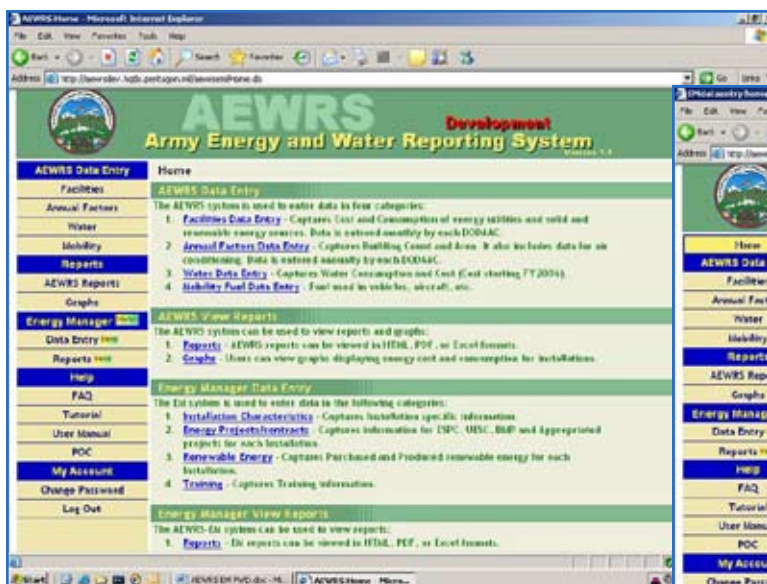
The energy managers' module was fielded in September and may be used for the FY 2007 annual reporting process. Army installations will begin populating this module during FY 2007. Region- and installation-specific energy- and water-related information will be password protected and available only to authorized AEWRS users. Additional capabilities will be included in the energy managers' module during FY 2007.

AEWRS is available at <https://aewrs.hqda.pentagon.mil/aewrs>.

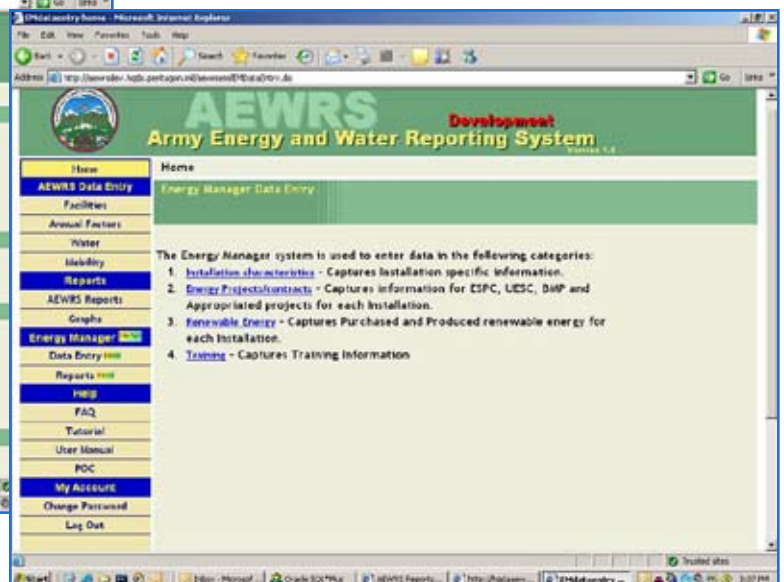
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**PWD**



AEWRS home page with energy managers' module



Energy managers' module





# What's new on the OACSIM Energy Program web site

by David Purcell and Rosemarie Bartlett

The Army's Office of the Assistant Chief of Staff for Installation Management Energy Program web site is the place to get the latest information on Army energy policies, funding and financing, new technologies, award winners, and training and workshops, as well as hundreds of links to other useful sites. Recently updated items include progress on the Army's energy and water management program goals, the fiscal year 2005 Annual Report, the FY 2005 Data Report, the FY 2006 Implementation Plan and information on winners of the Presidential Award for Leadership in Federal Energy Management, the Secretary of the Army Energy and Water Man-

agement Awards and the Federal Energy Management Program Federal Energy and Water Management Awards.

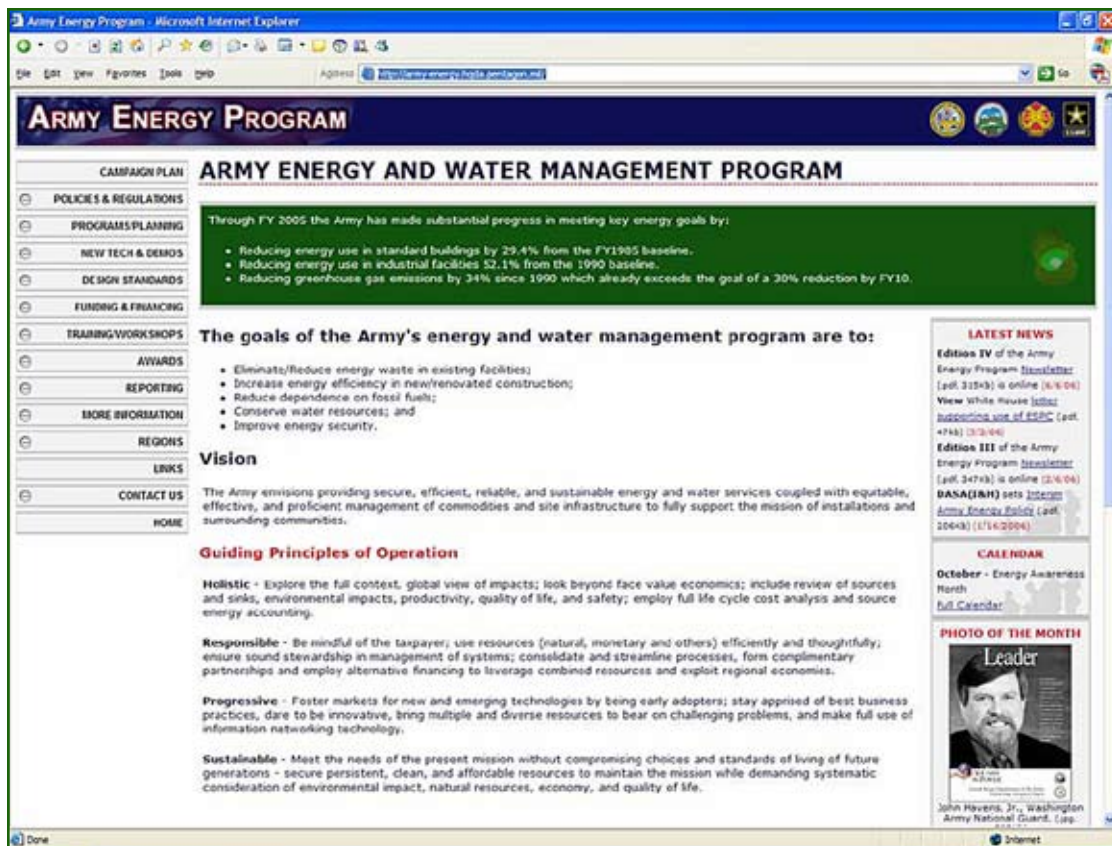
The web site also includes the Army Energy Strategy for Installations, which is a road map for the next 25 years, and the Army Energy Program newsletter, which provides alerts on activities and accomplishments of the Army Energy Program, as well as summaries of the latest useful information from the world of energy and water efficiency.

Future additions to the web site will include the FY 2006 Annual Report guidance, the Army Energy and Water Cam-

paign Plan for Installations, new award winners and presentations from the Army Energy Forum. Visit the web site at <http://army-energy.hqda.pentagon.mil>.

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Army Energy Program web site



# Draft Army Energy, Water Campaign Plan for Installations available online

by Jim Paton

Following release of the Army Energy Strategy for Installations in July 2005, the Army started developing the Army Energy and Water Campaign Plan for Installations to implement the strategy. After months of development that included collaboration with private industry, Department of Energy national laboratories, the U.S. Army Corps of Engineers, and installation, region and command energy managers, a draft version of the campaign plan has been posted on the Army Energy Program web page for public viewing (<http://army-energy.hqda.pentagon.mil/programs/plan.asp>).

The plan sets the direction for the five initiatives established in the strategy: eliminate energy waste in existing facilities; increase energy efficiency in new construction and renovations; reduce dependence on fossil fuels; conserve water resources; and improve energy security.

For each of these initiatives, the campaign plan identifies specific key actions with approaches for meeting them, technologies and tools required, specific projects and milestones, a description of the end state and metrics for success. Since the document is in draft format, it excludes reference to specific resource requirements

and funding being programmed to achieve these initiatives. The document will be updated biennially to coincide with development and identification of Army resource requirements.

Within the next few months, the Army Energy and Water Campaign Plan for Installations will be finalized and distributed to Army garrisons.

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James Paton works in the Facilities Policy Division of the Office of the Assistant Chief of Staff for Installation Management. **PWD**

## HQEIS Facilities Reduction Program disposal screen retires

Assistant Chief of Staff for Installation Management (ACSIM) Headquarters Executive Information System (HQEIS) users may have wondered why disposal data for 2006 has not been available on the Reported Facilities Reduction Program (FRP) disposal screen. This is because a new screen was being developed; it should be available as of September. The "retired" disposal screen will still be available to view historical disposal credits for 1992–2005. The new Army disposal screen will display disposal credits beginning with fiscal year 2006.

For HQEIS, the screens will be labeled as the Army Disposal Program (ADP) to incorporate both the FRP and other disposal actions (transfer outside Army, turn over to host nation, BRAC, MILCON 1-for-1, or sale).

For more detailed information about the new disposal screens, please go to the ACSIM home page at: <http://www.hqda.army.mil/acsimweb/homepage.shtml> and look for: "HQEIS Reported Facilities Reduction Program (FRP) Disposal Screen Retires." It should be highlighted under the Hot Topics section.

Look for the Army disposal screen after the Sept. 30 Real Property Inventory update.

POCs are: Randy Palmer, disposal program manager, Office of the Assistant Chief of Staff for Installation Management (ACSIM), (703) 604-2422, e-mail: [randall.palmer@hqda.army.mil](mailto:randall.palmer@hqda.army.mil); and Deb Gonzales, ACSIM HQEIS program manager, (703) 602-5800, e-mail: [deb.gonzales@us.army.mil](mailto:deb.gonzales@us.army.mil). **PWD**

## OACSIM bids Gignilliat farewell



September signaled the retirement of Henry (Hank) Gignilliat, senior energy engineer and national program manager for the Energy Conservation Investment Program at the Office of the Assistant Chief of Staff for Installation Management (OACSIM), after 37 years of service to the Army. During that time, Gignilliat's expertise and experience with Army energy programs yielded significant gains in the formulation and implementation of plans and policies governing the Army's worldwide energy and utilities operations and consumption as well as more than \$300 million in savings on return on investment from the projects he managed. **PWD**



# Bulletin outlines stormwater storage options

by Richard Scholze

A new Public Works Technical Bulletin (PWTB) is now available at [http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb\\_200\\_1\\_36.pdf](http://www.wbdg.org/ccb/ARMYCOE/PWTB/pwtb_200_1_36.pdf) titled Sustainable Stormwater Storage Alternatives for Army Installations. This PWTB transmits current information on a variety of alternative methods to store stormwater and applicability of these methods to Army installations.

The Army is transitioning to the use of sustainability guidelines. Army regulations and policy addressing water quantity from development sites include 40 CFR 122.26, the Clean Water Act, and Army Regulation (AR) 200-1. Sustainable stormwater management is also required under Executive Order 13123, Greening the Government through Efficient Energy Management.

The Army is pursuing sustainable installations and low impact development (LID) in many applications. In the area of stormwater storage, a large number of alternatives have recently emerged from private sector vendors claiming to cost-effectively store stormwater for beneficial reuse. These alternatives are being installed without any demonstrated performance data, in some cases, and can often be expensive compared with traditional storage and reuse options. Currently, no Army-specific guidance is available that addresses use of these alternatives.

Sustainable stormwater storage should be considered in the context of the LID approach to stormwater management, which follows the basic principles of nature: manage rainfall as near the source as possible using micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing/treating stormwater in facilities at the

bottom of drainage areas, LID addresses stormwater through small, cost-effective features at lot or local level.

LID can save money over conventional approaches by reduced infrastructure and site preparation work (up to 25 to 30 percent) through reductions in clearing, grading, pipes, ponds, inlets, curbs and paving, and through potential space recovery for other positive uses.

This PWTB summarizes the variety of storage alternatives available other than traditional detention ponds. The focus is on alternatives for smaller sites, addressing plastic, metal and concrete-type structures with an emphasis on underground storage so that surface areas may be used for other purposes. Alternatives discussed include pipe networks of various materials (corrugated steel, plastic and concrete); interlocking plastic block structures; French drains; and concrete vaults.

Appendix A, Stormwater Management Methods, reviews LID and other potential options for beneficial use of a valuable resource. Bioretention, constructed wetlands, water quality swales, green roofs, subsurface infiltration beds and trenches, porous paving, pipe detention systems, underground vaults and tanks, use of geosynthetics and aquifer storage and recovery are among the topics introduced.

Appendix B introduces other commercially available stormwater systems and alternatives while Appendix C reviews costs for alternative stormwater systems.



The "green roof" concept uses vegetation to help manage stormwater. Photo courtesy of Cabill, Inc. Used with permission.

Public Works Technical Bulletins are published by Headquarters, U.S. Army Corps of Engineers and are available on the TECHINFO website, [www.hnd.usace.army.mil/techinfo](http://www.hnd.usace.army.mil/techinfo).

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Richard Scholze is a project manager at ERDC-CERL in Champaign, Ill. **PWD**

Look us up on the web

For an electronic copy of the

Public Works Digest,

go to:

<http://www.ima.army.mil/sites/news/default.asp>



## Creating sustainable installations requires comprehensive planning

by Jerry Zekert

Most of us have heard about the merits of sustainable design and development and the value in the effective use of energy and infrastructure management. We have seen sustainable design parameters imbedded in the designs of our military construction projects, and we have seen sustainable principles imbedded into our process for disposal of facilities as well as in our manufacturing techniques. Generally, many of these approaches are project focused, rely on unique design and, while they vastly reduce long-term life-cycle costs, can increase present-year project costs.

Looking holistically, to pull together the cumulative effects of sustainable development requires us to think more strategically. We need to embrace the master planning process to imbed sustainable planning principles into the installations' goals and objectives and use them when implementing planning recommendations. We need to plan more holistically around focused area/neighborhood development, rather than project-focused initiatives. These are all good values, but how can sustainability be imbedded into the planning process?

The U.S. Green Building Council (USGBC), the Congress for New Urbanism, and the Natural Resources Defense Council have developed a set of standards for neighborhood (i.e., area) development that can be used as a tool for installation master planners to guide sustainable development. This tool is called the (Leadership in Energy and Environmental Design) Neighborhood Development standards (LEED-ND), and it is available from the USGBC web site: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>.

While the tool is still under development, it provides an invaluable reference to guide area development planning.

The LEED-ND tool is structured similarly to the traditional LEED rating system

*We need to plan more holistically around focused area/neighborhood development, rather than project-focused initiatives.*

— Jerry Zekert

for building systems. It is organized around four major principles.

**1. Location efficiency** focuses on siting considerations that reduce air pollution, energy consumption and greenhouse gas emissions generated by transportation by encouraging new development in locations that reduce automobile dependency and provide greater opportunities for walking. Further, this principle includes conserving natural and financial resources required for the construction and maintenance of infrastructure by encouraging new development within and near existing areas to reduce environmental impacts caused by haphazard sprawl.

**2. Environmental preservation** focuses on protecting imperiled species and ecological communities; protecting natural habitat; conserving water quality, natural hydrology and habitat through water conservation of water bodies and wetlands; reducing water pollution from erosion during construction and preserving irreplaceable agricultural resources.

**3. Compact, complete and connected neighborhoods** creates neighborhoods or areas which promote developments that are good neighbors to their surrounding communities and foster a sense of community and "connectiveness" beyond development. They also promote compact development by conserving land, promoting livability, transportation efficiency and "walkability," and creating areas with diversity of uses that

preserve community livability, transportation efficiency and walkability.

**4. Resource efficiency** develops areas where buildings are certified "green" and use such concepts as energy and water efficiency, heat island reduction, infrastructure energy efficiency, on-site power generation, reuse of grey-water and other materials, wastewater management and comprehensive waste management.

The LEED-ND tool provides a great resource to guide focused planning on our installations. Recently, during the Advanced Master Planning class, we used the LEED-ND standards to measure the sustainability of the class area-development plan project. By using the LEED-ND tool, the class solutions were certified "sustainable" without even leveraging any innovative technologies or special building modifications.

It is the Army policy that installations be planned for sustainable development, and the LEED-ND standards are a tremendous tool for planners to use to help. However, we must plan comprehensively, using holistic area development planning rather than short-sighted, reactionary, project-focused efforts. Quick fixes might meet the immediate need, but the tenets of sustainability address impacts to a generation.

Planners are encouraged to sign up for the Advanced Master Planning course, Course 952, a one-week, hands-on course hosted by the U.S. Army Corps of Engineers Professional Development Support Center. Call Betty Batts at (256) 895-7407 or Beverly Carr at (256) 895-7432 for registration information.

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Jerry Zekert is the chief of the Master Planning Team at Headquarters U.S. Army Corps of Engineers. **PWD**



# Grigg named Installation Support Professional of the Year

by Huntsville Engineering and Support Center Public Affairs Office

**J**ohn W. Grigg, program manager for the Access Control Point Program (ACPP) at Huntsville Engineering and Support Center, has been selected as the U.S. Army Corps of Engineers' Installation Support Professional of the Year. Grigg is assigned to the Installation Support Center of Expertise (ISCX).

Mirko Rakigijja, director of the ISCX, nominated Grigg for his leadership and innovative business practices. The ACPP delivers enhanced protection for Soldiers, their families and civilians from terrorist attacks by providing physical and electronic security equipment at Army installations and is part of the Global War on Terror (GWOT).

"Since January 2004, Mr. Grigg has led a large, multi-organizational team in the successful procurement and installation of security equipment for 350 Army installations worldwide," Rakigijja said.

The initial objective of the ACPP was to provide mobile security equipment, conduct on-site physical security assessments, and develop and execute facilities and equipment projects at all Army active component, Reserve and National Guard installations. Headquarters, Department of the Army has broadened the scope and size of the Huntsville Center's physical security mission.

"The ACP program set the standard for success by assembling a cross-organizational, multi-discipline project delivery team by seamlessly drawing on diverse (Corp) resources," Rakigijja said. "Mr. Grigg enlisted (Corps) Centers of Expertise (Protective Design and Electronic Security Centers) to mentor and support the executing district and public works personnel on how best to comply with Department of Defense standards for ACP design. Additionally, this mentoring and training has enhanced physical security expertise throughout (the Corps) by creating new



*John Grigg discusses projects with team members Amy Venable, center, and Carolyn Nation. Photo by Debra Valine*



*John Grigg is the U.S. Army Corps of Engineers' Installation Support Professional of the Year. Photo by Debra Valine*

subject matter experts on physical and electronic security."

Grigg aggressively pursued the use of technology as an enabler for the program. Grigg co-developed Engineering Knowledge Online (EKO) with Charles Schroeder of the Corps' Engineer Research and Development Center, Construction Engineering Research Laboratory and uses the web portal to maintain extensive coordina-

tion with stakeholders and ensure timely project tracking and status.

The Grigg-led ACPP Project Delivery Team consists of more than 100 people from Department of the Army, Office of the Assistant Chief of Staff for Installation Management, Installation Management Agency (IMA), IMA Regions, major commands, the Corps and private industry, located literally from Korea to Kuwait.

A key aspect of Grigg's team's efforts was the awarding of \$38.5 million of the \$79 million spent during Phase 1 to small businesses. So far, the ACPP has spent more than \$180 million on the improvement of security at Army installations, and more than \$150 million in future requirements have been identified.

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## CP-18 provides opportunity to develop your career

by Lt. Gen. Carl A. Strock

In this issue, let me answer a question many of you ask: “What is CP-18 and what can it do for me?”

First, let me provide some background on the Army’s civilian career programs. There are 22 separate career programs organized around professional occupations, such as human resources, comptroller, security and law enforcement, safety, information management and others. CP-18 is designated “engineers and scientists (resources and construction).”

The career programs are under the jurisdiction of the assistant secretary of the Army for manpower and reserve affairs (ASAMRA), whose office provides executive management and oversight. The ASAMRA assures that each Army career program creates and maintains a master training plan and career ladders for the advancement of civilian employees.

CP-18 maintains master training plans and career ladders for eight functional areas:

- engineering,
- research and development,
- public works,
- project and program management,
- civil works planning,
- construction,
- operations, and
- environmental and natural or cultural resources.

Each plan spells out the key training courses and developmental assignments that provide the competencies necessary for maximum effectiveness at each step of the career ladder. While the courses and assignments are not prescriptive, they give an overall picture of the competencies needed for both present and future positions and what careerists need to consider in formulating their professional goals.

As I indicated in the previous issue of the *Public Works Digest*, CP-18 is a resource for announcing training courses and programs, both inside and outside the Army, and for



Lt. Gen. Carl A. Strock

funding short- and long-term training opportunities. All opportunities are based on a competitive selection process, requiring both endorsement from the activity and justification from the candidate and the supervisor on how the requested training will benefit the Army. With fiscal resources being very tight for next year and beyond, this is a great opportunity for your command to supplement its training and development funds.

Now, let me explain what CP-18 is not. Many people remember the old centralized resume submission and evaluation process that the Corps oversaw through the late 1990s. That process was abolished in 1998 in favor of the current government-wide competitive process, allowing more candidates with diversity of background and experience to compete for CP-18 positions. With limited exceptions, none of the Army career programs use central selection for filling positions or intend to return to central selection. Our view is to focus our limited resources toward training and developing our future leaders versus establishing and maintaining a resume depository.

In addition, CP-18 is not a central career management agency. We create the career ladders and master training plans, and provide guidance to both individuals and career program managers, but we do not direct

people or organizations to take courses or make developmental assignments. The ultimate responsibility for career management rests with individuals along with their supervisors and career program managers. We can add valuable information and resources to improve the CP-18 workforce, but it remains with each one of you to take charge of your own career.

We are working to enhance accessibility to CP-18 career information through updating the current web site, <http://www.hq.usace.army.mil/cemp/cp18/index.htm>, and migrate it to the Engineering Knowledge Online (EKO) web portal later this year. EKO will allow greater access to career information to the entire CP-18 community, as well as easier updating of information, announcements and events. We will also create a chat room for sharing ideas and best practices among careerists and managers.

*All opportunities are based on a competitive selection process, requiring both endorsement from the activity and justification from the candidate and the supervisor on how the requested training will benefit the Army.*

— Lt. Gen. Carl A. Strock,

Look for more ideas on career development in the months ahead. The effort you place on developing your career and strengthening your skills will help us achieve our ultimate goal — to provide outstanding service in support of the war fighter, the Army and the nation.

Thank you for your daily contributions and keep up the great work. *Essays!*

*Lt. Gen. Carl A. Strock is the chief of engineers and commanding general of the U.S. Army Corps of Engineers. PWD*



# Huntsville offers installation management courses in FY 2007

by Betty J. Batts

The U.S. Army Corps of Engineers Professional Development Support Center (PDSC), Huntsville, Ala., announces its installation management course offerings for fiscal year 2007. Spaces are available in all courses. Those interested in attending any of these sessions should contact Sherry Whitaker in the PDSC registrar's office, (256) 895-7407, e-mail: sherry.m.whitaker.@hnd01.usace.army.mil.

PDSC FY 2007 INSTALLATION MANAGEMENT TRAINING			
COURSE NUMBER, TITLE	TRAINING DATES	LOCATION	TUITION
252, DD Form 1391 Processor	Session 1, Oct. 2-6	Huntsville	\$1,550
	Session 2, April 16-20	Huntsville	
974, Performance Based Service Acquisition	Session 1, Oct. 16-20	Huntsville	\$1,510
	Session 2, Aug. 13-17	Huntsville	
950, Native American Environ Cultural Resources	Oct. 3-7	Huntsville	\$1,550
101, Economic Analysis	Session 1, Nov. 7-10	Huntsville	\$1,660
	Session 2, June 19-22	Huntsville	
990, Job Order Contract (JOC) Basic	Session 1, Jan. 9-12	Huntsville	\$1,730
	Session 2, Aug. 28-31	Huntsville	
971, Integrated Facilities System Introduction	Session 1, Feb. 5-9	Huntsville	\$1,640
	Session 2, June 4-8	Huntsville	
150, Real Property Skills	Feb. 13-16	Huntsville	\$2,420
253, DD Form 1391 Preparation	Session 1, March 12-16	Huntsville	\$1,620
	Session 2, July 16-20	Denver	
991, JOC Advanced	Session 1, May 1-3	Huntsville	\$1,410
	Session 2, June 26-28	Huntsville	
286, Real Property Mgt	May 7-11	Huntsville	\$1,950
980, DPW Work Reception	May 15-17	Huntsville	\$2,138
972, DPW Quality Assurance	Session 1, May 21-25	Huntsville	\$1,450
	Session 2, Aug. 27-31	Huntsville	
214, Space Utilization	July 9-13	Huntsville	\$1,965
981, DPW Budget/Job Cost Analysis	July 17-20	Huntsville	\$2,230
999, DPW Program Mgt	Sept. 11-15	Huntsville	\$2,070

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Betty J. Batts is chief, Installation Support Training Division, U.S. Army Corps of Engineers Professional Development Support Center. **PWD**

# Army energy managers earn national certification

by David Purcell

This year, 30 Army energy managers took their official training in Alexandria, Va., June 12-16. Course attendees came from six of the seven Installation Management Agency (IMA) Regions, Army Material Command and the National Guard Bureau.

Executive Order 13123 and the Energy Policy Act (EPAct) of 2005 mandate formal training for energy managers. Annually, the Office of the Assistant Chief of Staff for Installation Management sponsors the certified energy manager training to address this requirement.

The training is conducted by the Association of Energy Engineers and culminates in a four-hour certification examination. Upon successful completion of the training, examination and credentials review, the student receives the nationally recognized designation certified energy manager, or CEM. Of the 30 students, 17 earned their CEM.

As nationally recognized experts, the new CEMs are a valuable resource for the development and implementation of their installations' energy and water management and conservation programs as the Army strives to meet the challenge of compliance with EPAct 05.

The newly certified energy managers are: **James Averkamp**, **William Bringham**, **Scott Naeseth** and **Blane Short** of IMA's Northwest Region Office; **Ron Diehl** and **Bill Eng** of the Office of the Assistant Chief of Staff for Installation Management; **Christine Geier** and **Scott West** of IMA's Europe Region Office; **Robert Grantham** and **Jerry Robinson** of IMA's Southeast Region Office; **Gary Krauch** and **Joseph Moyer** of IMA's Northeast Region Office; **Rick Manis** and **William Meyer** of Army Material Command; **Ralph Totorica** and **Shawn Smith** of IMA's Southwest Region Office; and **Clay White** of the National Guard Bureau. The highest score on the certification examination was earned by Totorica.

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David Purcell is an energy program manager in the Facilities Policy Division, Office of the Assistant Chief of Staff for Installation Management. **PWD**



## Register for Energy Efficient Technologies Workshop

by Dahtzen Chu

The Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) is planning to hold a third Industry Workshop on Energy Efficient Technologies for Government Buildings – New and Retrofits in January in Dallas. The workshop will serve as a forum for information exchange among researchers, engineers, policy makers, heating, ventilation and air-conditioning (HVAC) and other systems manufacturers, Energy Services Performance Contract (ESPC) service providers, and end users on techniques and technologies to improve energy efficiency in existing government buildings.

The last Industry Workshop on Energy Efficient Technologies for Government Buildings – New and Retrofits, took place in Chicago January 19-20. This workshop was the second of a series first begun in Orlando, Fla., in February 2005. The 2006 workshop was organized and conducted by ERDC-CERL under the sponsorship of the Office of the Assistant Chief of Staff for Installation Management (OACSIM), Department of Energy (DOE), American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), International Energy Agency (IEA) Energy Conservation in Buildings and Community Systems (ECBCS) Program Annex 46, and a number of industry sponsors.

Almost 90 attendees from 12 countries participated in four workshop sessions addressing energy issues: National and International Energy Policies, IEA ECBCS Program Annex 46, Building Up the Database for Energy Efficient Technologies, and Implementing Energy Efficient Projects. Among the workshop attendees and presenters were proponents from OACSIM; Headquarters, Installation Management Agency; Army, Navy, and DOE laboratories; and U.S. and international academia and industry. Presentations given at the workshop documented domestic and international efforts in promoting energy policies and best practices and successful implementation of innovative energy technologies. The multi-disciplinary and international mix of workshop participants broadened their exposure to new technologies and business practices, and enhanced their awareness of contemporary energy-related developments in the United States, Canada and Europe.

The Energy Conservation in Buildings web site and the Chicago and Orlando workshop agendas and presentations can be viewed at: <https://kd.erd.usace.army.mil/projects/ecbcs/>. Information on the upcoming Dallas workshop will be provided in the coming months through a link at this web site.

For more information about the workshops, please contact Alexander Zhivov, (217) 373-4519, [alexander.m.zhivov@erd.usace.army.mil](mailto:alexander.m.zhivov@erd.usace.army.mil) or Dahtzen Chu, (217) 373-6748, [dahtzen.chu@erd.usace.army.mil](mailto:dahtzen.chu@erd.usace.army.mil).

Dahtzen Chu is a project manager at Engineer Research and Development Center, Construction Engineering Research Laboratory in Champaign, Ill. **PWD**

## Federal planning awards will acknowledge planning excellence

by Jerry Zekert

Master planning is very important to the long-term viability of Army installations. Many installations are championing innovative planning initiatives, while many U.S. Army Corps of Engineers research and development centers are investigating new planning innovations. There are a lot of good initiatives being sponsored through the Army Master Planning Community of Practice, and now is the time to acknowledge these efforts.

The Federal Planning Division of the American Planning Association conducts an annual awards program citing excellence in planning. The division sponsors the following awards:

- Outstanding federal program
- Outstanding federal project
- Outstanding area development plan
- Environmental planning excellence
- Outstanding sustainable planning or project excellence
- Outstanding collaborative planning project or program

Each submittal is judged by planning professionals from a leading university. The awards are presented during an awards luncheon at the annual Federal Planning Division Workshop, which will be held in Philadelphia, Penn., in April.

We encourage all planners to consider submitting their outstanding projects. The deadline for submittals is early December. For more information, please contact Federal Planning Division Award Chairman Dhruv Jain of Michael Baker Corp., at [jain@mbakercorp.com](mailto:jain@mbakercorp.com).

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Jerry Zekert is the chief of the Master Planning Team at Headquarters U.S. Army Corps of Engineers. **PWD**





# OSHA publication helps designers create 'better workplaces' for firefighters

by Charlie Butler

The Occupational Safety and Health Administration (OSHA) has recently produced a publication titled "Fire Service Features of Buildings and Fire Protection Systems," which is available at [http://www.osha.gov/Publications/fire\\_features3256.pdf](http://www.osha.gov/Publications/fire_features3256.pdf).

Firefighters typically perform in stressful, dangerous environments where time-sensitive operations can mean the difference between life and death to victims and minimal or great fire loss. Architects and engineers create the workplaces for firefighters, and the information in this publication will assist designers of street layouts, buildings and fire protection systems to better understand fire service needs. The designs can be tailored to better meet firefighter operational needs, thereby reducing the time it takes to respond to and mitigate an incident.

While the codes and standards governing buildings and fire protection systems are well understood by designers, the particular needs and requirements of firefighters are typically not known thoroughly by persons not associated with these operations. Designers routinely consider the needs and comfort of building occupants when arranging a building's layout and

systems. However, to provide the most effective protection, firefighters should be considered as users of building features and fire protection systems.

Construction features, including force protection requirements, can delay firefighting operations. Even slight delays, especially during the critical initial phase when the first arriving resources are committed, can adversely affect subsequent operations and the outcome. Delays caused by poorly located fire hydrants, confusing fire-alarm-panel information, ineffective communication systems or inaccessible valves will have a ripple effect on the other portions of the operation. During these delays, the fire will be growing exponentially.

Even simplifying the firefighters' job in small ways will increase the level of safety for them and, thereby, for building occupants. Design features that save time or the number of personnel required for fire operations can make a great difference. Any feature that provides additional information regarding the fire, the building or the occupants, as well as any method to speed the delivery of this information, also helps.

All architects and engineers designing facilities or infrastructure for Army instal-



lations should download a copy of this free publication from OSHA. Becoming familiar with the needs of the firefighter will enable safer designs that will benefit every Soldier, family member and Army employee.

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Charlie Butler, a 27-year veteran of the Department of Defense Fire Service, is a fire protection specialist at the Headquarters, Installation Management Agency in Arlington, Va. **PWD**

# The MPTM: a master planner's handbook

by Jerry Zekert

The Army master planning community has a new handbook on the way to help with the practice of installation real property master planning. The Master Planning Technical Manual (MPTM) is a great tool that provides the details about the process of Army real property master planning. It builds from the Master Planning Instructions — TM 5-803-1, Installation Master Planning; TB 353, Master Planning Overlay Method; and AR 210-20 — by providing helpful guidance on the

practice of real property master planning. It describes the formats and methodology on how to complete the various sections of the Installation Real Property Master Plan and provides a detailed explanation on required planning considerations that must be considered in performing planning services.

The MPTM working group held its last in-progress review in August, and the consultant is finalizing the comments. Fur-

ther, a part of the effort will be to develop the Real Property Master Plan Digest prototype for use by installations. Since the digest is the core of any Real Property Master Plan, this prototype will be invaluable to all. Look for further information on the MPTM on Engineering Knowledge Online (EKO) in the Master Planning Section, <https://eko.usace.army.mil/fa/arpmp>.

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## Volkman: in charge of energy, utilities

by Mary Beth Thompson

There is an upside and a downside to Paul Volkman's job — plus another downside that is really an upside for him. Volkman is the energy and utilities program manager for the Installation Management Agency (IMA).

On the upside, Volkman relishes the wide range of his duties. He has overall responsibility for the energy and utilities program at IMA headquarters. He also handles the Army's corrosion control program. Volkman coordinates with his counterparts at the Assistant Chief of Staff for Installation Management (ACSIM) to program, fund and execute these programs. He also manages certain programs that IMA centrally funds from the headquarters, such as the Energy Engineering Analysis Program, the Natural Gas Risk Management Program, utility privatization, electric tariff rate analysis and boiler inspection contracts.

"I very much enjoy the variety," he said. "I work on so many different things and get involved in different areas."

One of the issues Volkman was working the week he was interviewed was the budget for fiscal year 2007.

"I am trying to ensure that there are sufficient funds in the utilities account to pay for our utilities commodity costs and to pay for utilities privatization, the two main components in the budget that deal with utilities," he said.

Volkman was also working on Common Levels of Support, the Installation Status Report and metering.

"I am working with ACSIM to set up a metering program to comply with the Energy Policy Act of 2005," he said. "ACSIM has the lead, but, eventually, it will be passed to IMA to execute, and I'm working with them to develop their policy on metering — what will be metered, when

it will be metered, what type meters will be used."

Metering is a hot topic and a very big task, Volkman explained. The Energy Policy Act requires that all federal facilities that can be individually metered, within economical and practical considerations, must have electric meters installed by 2012.

In addition, Volkman was addressing utilities privatization issues.

"There's always something that's being worked on for both current year execution and future programming," he said. "That's basically what IMA does. We're an execution agency, so we're trying to work on execution of the privatization program.

"That's just this week," he said.

On the downside, Volkman cited the lack of resources as the biggest challenge. It is a fact of life that there are more tasks than there is money to accomplish them. He and others at headquarters try to stretch the dollars and apply them where they will do the most good.

"I know that's a big frustration for the folks at the garrison level," he said. "A big frustration for me is not being able to support them in the full manner that they'd like to be supported. I would like to be able to fund more initiatives, give them more resources to accomplish things on their own, but there just isn't enough money to implement all the good ideas that we have."

Another aspect of the job that some would consider a downside is that Volkman's responsibilities continually carry him into new territory.

"I'm into something new all the time," he said. "I'm always learning something, so that's a challenge."



*Paul Volkman is the energy and utilities program manager at Headquarters, Installation Management Agency. Photo by Mary Beth Thompson*

Having to learn something new all the time is the downside that is really an upside, because Volkman loves to gain knowledge.

"I'm learning something every day, and that appeals to me," he said.

Volkman's actions underline that statement. In May, he completed a master's degree in management from the University of Maryland, his fifth college degree. He also holds bachelor's degrees in civil engineering, business and management, Asian studies and history. Although he is not currently pursuing any coursework, it is clear that he is not done with formal education.

"I'm taking a break, but I'm thinking about starting my master's in engineering," he said. ➤



*“I am trying to ensure that there are sufficient funds in the utilities account to pay for our utilities commodity costs and to pay for utilities privatization, the two main components in the budget that deal with utilities,”*

— Paul Volkman, Installation Management Agency

*(continued from previous page)*

Learning is one of Volkman’s two major hobbies. The other is traveling. He has been to more than 70 countries and visited almost every state in the union.

“When I lived overseas, I spent a lot of time traveling,” he said. “My vacation was always traveling. I think that’s one of the great things about working overseas — you have a chance to learn the culture and mix in with the locals and get a chance to travel and see different folks, just become a better citizen of the world. You get a chance to understand people on a people-to-people basis versus a government-to-government basis.”

Volkman spent 19 years living, working and traveling overseas. He worked in the Directorate of Public Works (DPW) in Garmisch, Germany, for five years, and then in the DPW at Camp Zama, Japan, for 14 years.

He left Japan for a job with the Public Works Center at the Washington, D.C., Navy Yard. In 2004, after about 18 months with the Navy, Volkman came to IMA headquarters.

“Prior to this job, all my experience has been at the installation level, either with the Army DPW or the Navy Public Works

Center, which is equivalent to the DPW,” he said.

“I like to think that I’m trying to make a difference for the people at the garrison,” Volkman said. “Having worked at the garrison-level DPWs for about 20 years, I understand the problems that they face with funding and execution, so I hope, in some small way, I can influence the people, the policies, here at headquarters IMA and ACSIM to do things that benefit the garrisons.”

On the other side of that coin, it has become apparent to Volkman that working at a headquarters office means focusing on a much broader range of demands and requirements and that making changes requires a great deal of effort. He advised patience as headquarters labors to find a solution to a problem.

“I think people have expectations that things move much faster than they really do. There’s an awful lot of coordination and discussion here at the headquarters level,” he said. “It takes time to implement something or get agreement on something.”

Volkman described working at headquarters as eye-opening.

“After having worked at the installations for 20 years, it’s really been a great experi-

ence to see how the headquarters is run,” he said. “When you start out at the installation, that’s your world, and you don’t really understand what goes on beyond your world. So that’s why coming here to Washington, D.C., has been very good for me — to see the operation at the headquarters level.”

In the future, Volkman intends to return to his roots by taking a job at an installation. He believes that, just as his field experience is an asset at headquarters, so will his headquarters experience be an asset at a garrison.

“I’ll take with me that experience from the headquarters to hopefully do better at the installation, now understanding how the ‘big Army’ works,” he said. “If you’ve not worked here, you never get an accurate picture of how that works. Once you’ve learned here, it’s good to go back to the garrison and work there. You can become more understanding of how your piece fits into the big picture.”

And where does Volkman want to go next? Overseas, of course. In the meantime, he can be reached at (703) 602-1540, e-mail: paul.volkman@hqda.army.mil.

*Mary Beth Thompson is the managing editor of the Public Works Digest.* **PWD**



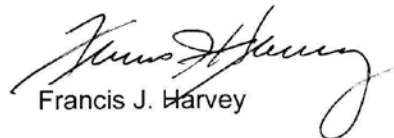
SECRETARY OF THE ARMY  
WASHINGTON DC 20310-0300

23 SEP 2006

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Energy Awareness Month – October 2006

1. October is National Energy Awareness Month and this year's theme is "*Energy Independence Depends on US.*" This annual event promotes a greater awareness of energy consumption, wiser use of limited energy resources, and highlights the importance of energy to the economic prosperity, security and growth of America. Keeping America competitive and independent requires conservation to reduce demand on limited energy resources as well as increased use of renewable and alternative energy solutions.
2. The Energy Policy Act of 2005 (EPAAct 05) charges each of us to significantly improve our energy management in order to save taxpayer dollars and reduce environmentally harmful emissions. The Department of Defense is the Nation's single largest energy user. The Army is the largest utilities consumer and therefore we must be the leader in energy efficiency and the use of renewable energy products and emerging technologies.
3. We are proud of many of the accomplishments made in promoting energy awareness on our installations. Since 1985, the Army has reduced energy consumption by 29.4 percent by increasing awareness and improving the energy efficiency of our facilities. Unfortunately, from 2003 to 2005 we increased energy use by 3.5 percent due to the Global War on Terrorism and a loss of focus on energy conservation. We must continue to excel in this area to exceed the mandate of a 2 percent reduction per year from 2006 to 2015 to meet EPAAct 05.
4. This October, I ask each member of the Army community to enhance their energy awareness and improve energy conservation. As energy users, we all have the power to make this program a success. Let's continue to make smart energy choices and improve our energy independence.
5. For more information about energy, visit the Army Energy Program homepage at <http://army-energy.hqda.pentagon.mil/>.

  
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