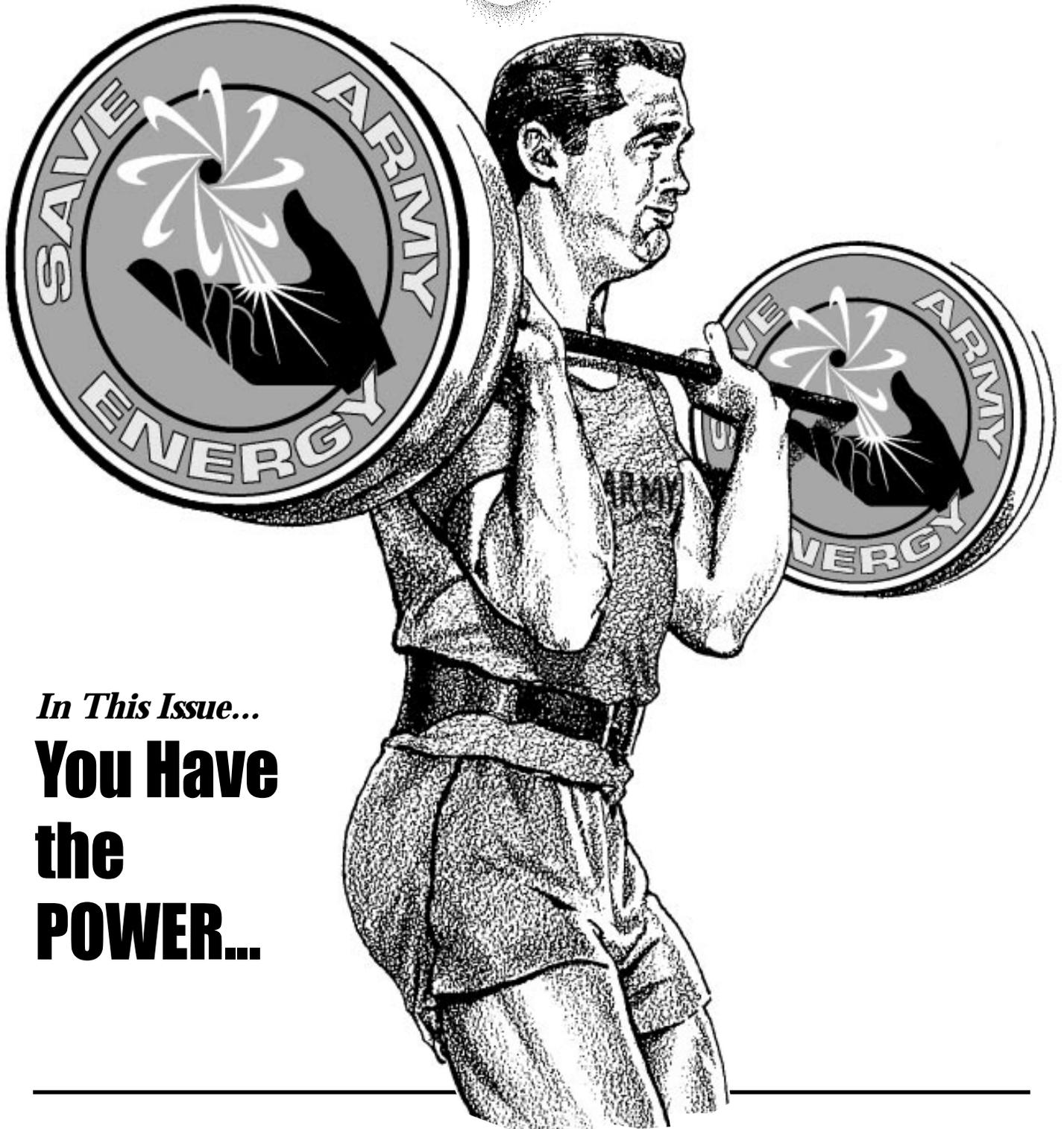

Public Works

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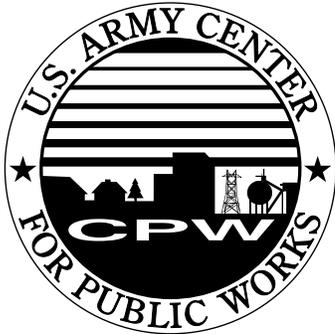
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In This Issue...

**You Have
the
POWER...**



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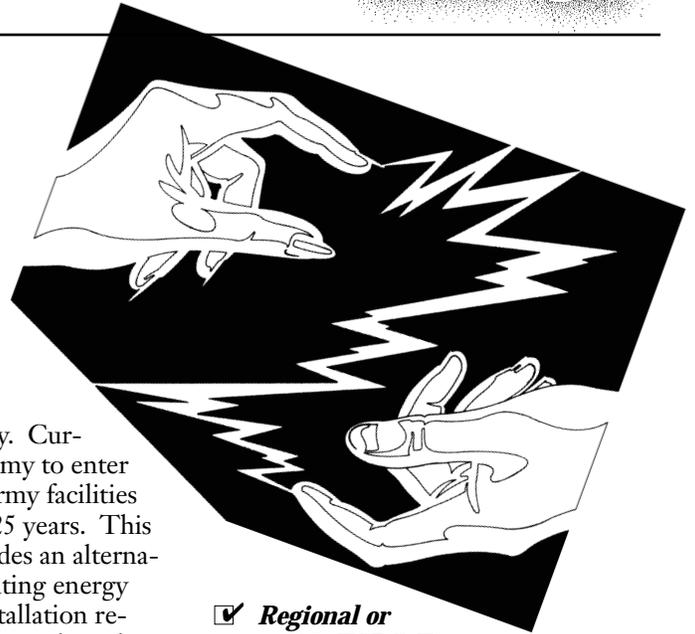
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Energy Savings Performance Contracts Partnerships for savings and profit ...

by Penelope Schmitt



One of the commonest laments on military installations today is, "we can't spend a nickel to save five dollars!" Now the Army is offering a method installations can use to save thousands of dollars—without spending a cent. A shell game? Not at all. Through Energy Savings Performance Contracts (ESPCs), both the Army and its business partners can share in the payback for greater energy efficiency.

Energy Savings Performance Contracting (ESPC) is a contracting procedure in which the contractor implements energy conservation and cost saving measures in exchange for a share of the dollar savings that result from those measures.

- The contractor evaluates, designs, finances, acquires, installs, operates, and maintains energy saving equipment.
- The Army gets new, energy efficient equipment without any up-front capital investments. Capital costs are financed by the contractor.
- The contractor is repaid out of savings.
- The savings generated and claimed by the contractor are audited monthly or at a minimum annually.
- If the savings are lower than guaranteed by the contractor, then the payments to the contractor are lower.
- Aggregate annual payments to the contractor cannot exceed the amount that the government would have paid for utilities (including all operations, maintenance, repair, and other ancillary costs) without the ESPC.

The technologies, type of energy saving measures, financing and other conditions of the contract determine the level of compensation to the contractor, with the remainder of the sav-

ings retained by the Army. Current statute allows the Army to enter into such contracts for Army facilities for up to a maximum of 25 years. This type of contracting provides an alternative method of implementing energy saving projects, when installation resources such as manpower, technical expertise or funding are limited or not available.

Detailed procedures for performing ESPCs are provided in Army Policy Guidance for Army-wide Implementation of Energy Savings Performance Contracting (DAIM-FDF-U memorandum, 6 September 1995).

How can your installation implement an ESPC?

✓ **Single or multiple Energy Conservation Opportunities (ECOs) at a single base:** This is the method used for most of the early ESPC contracts. The Army invests in the up-front energy audits and feasibility studies, develops solicitation packages, requests proposals, and awards the contract.

✓ **Base-wide contract:** Base-wide contracts reduce the cost and time of implementing ESPC contracts. In a base-wide contract, the installation invites contractors to submit proposals. Proposals are evaluated on their technical qualifications, proposed mark-up, and financing costs. The selected contractor is then allowed to survey the installation, or parts of the installation, to perform audits, feasibility studies, and propose ECOs. The installation can accept ECOs for further development and award delivery orders, or reject the ECO(s). Each delivery order under this type of contract specifies the terms and conditions of any government payment and performance guarantees.

✓ **Regional or area-wide ESPC:** These contracts further reduce the cost and time of implementing ESPC contracts and make it easier for installations to implement ECOs. This concept is similar to the base-wide contract except that contractors are selected for a region or area. The regional ESPC is an indefinite delivery, indefinite quantity (IDIQ) contract awarded to multiple contractors to investigate, develop, and submit proposals for energy cost saving measures and award task orders to contractors at various Army facilities. An installation in the region or area can choose one of the preselected contractors and then have one or more ECOs performed as task orders.

The first regional ESPC, called ESPC I, was developed by the U.S. Army Corps of Engineers, Huntsville Engineering and Support Center for the states of Virginia, Georgia, North Carolina and South Carolina. Any installations in those four states can use this contract.

A second regional ESPC, called ESPC II, has also been developed by Huntsville Center and was awarded in August 1997. Installations interested in ESPC I or II should contact the Huntsville POC: **Bobby Starling, (205) 895-1531.**

✓ **Unsolicited Proposals:** The Energy Policy Act of 1992 also permits installations to receive unsolicited proposals for ESPC services from firms that are qualified to provide such



Fort Bragg/Honeywell ESPC: Corps of Engineers provides partnership, support

by Penelope Schmitt

On a mid-June morning, the Corps of Engineers Resident Office at Fort Bragg filled with people from Honeywell Corporation, Minneapolis; the U. S. Army Corps of Engineers Engineering and Support Center, Huntsville; U.S. Army Center for Public Works, Fort Belvoir; the Corps' Savannah District; and Fort Bragg. All were partners in the Army's Energy Savings Performance Contracting Effort.

The day's business?: To learn the basic hows and whys of operating the ESPC recently signed between Fort Bragg and the Honeywell Corporation. The session's facilitators were all members of the staff at the U.S. Army Engineering and Support Center, Huntsville, which supports the contract with training and contract management assistance.

First order of the day was to identify installation staff who would manage the Fort Bragg aspect of the contract. Energy manager George Dib led the team with assistance from the DPW engineering division, a contract specialist, contracting officer, legal counsel and a resource management specialist.

Bobby Starling, ESPC Program Manager, explained the nature of the contract and the methods for determining savings and payments. Among the suggested measurements were:

- One-time metering and stipulated savings for lighting.
- Bill comparison for multiple types of work done in a building.
- Monthly metering of a complex system like a new chiller or boiler.

In most cases, Starling explained, a simple, standard work flow process can be used to manage task orders under the contract. Lighting retrofits and motor replacements, for example, often yield big savings. Yet the project work and monitoring is simple.

An expanded work flow process is needed when expensive, complex project proposals are under consideration. Central cooling and heating plants or cogeneration projects would need a tailored, structured procedure to ensure successful implementation.

Standard Work Flow. Through an eight-step process, most projects can be

brought to completion. In many cases, the work can be further streamlined, but it is important that both partners stay informed in order to avoid misunderstandings. "Flexibility is the key to making this work," Starling said. The Expanded Work Flow process is much more complex, including a structured 19-step process.

The first step, Team meetings between installation and contractor participants, is the most important. "Team as much as possible," Starling emphasized. "The goal is to take you from a contractor proposal to notice to proceed within 45 to 50 days."

Both government and contractor responsibilities and requirements are carefully outlined in the supporting documentation for the ESPC. With the help of a facilitator like the Huntsville Center, it should be possible for every participant to walk a reasonably clear path to success.

The contractor takes the second step, when he puts forward a proposed Energy Conservation Savings Measure, it should include a site survey, feasibility study, and design. "A site survey could take five minutes or five days," Starling said. "Installation staff should make every effort to guide the contractor to places where you think the savings are."

(continued from previous page)

services. If the installation is interested in the proposal, then it must place a notice in the Commerce Business Daily announcing the proposal, and inviting other similarly qualified firms to submit competing proposals. The proposals are then evaluated against written criteria that the installation has established. The contractor with the best proposal that meets the installation needs and criteria is selected for further negotiation and award of the contract.

The Army has eight ESPCs in place. The first five were developed as single project contracts, two were base-wide contracts, and the last two, ESPC I and ESPC II, are regional contracts.

CONUS Installations can take advantage of the Huntsville regional con-

tracts ESPC I or ESPC II, or do it on their own by issuing a solicitation on a single or multiple technology basis or on a base-wide basis. Installations can also use the unsolicited proposal route to get ESPCs.

Following, you will find articles that describe some of the options and explain in detail how they have been applied at installations.

In this era of declining resources, ESPCs are an innovative tool to accomplish energy saving projects, to acquire new equipment, operation and maintenance assistance, and achieve utility cost reductions. **PWD**

Penelope Schmitt is the chief of CPW's DPW Liaison Office.

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“Provide good information!” Starling said. “Let the contractor know things like a building’s occupancy and use schedule, the mission done there, what equipment is in the building, its age, what utility rate charges are.” Of course if a facility is scheduled to be demolished or otherwise removed from the base inventory, don’t let the contractor waste time and money on it.

Starling advised Honeywell that contractors can only recover the costs of a site survey through the Percent Increase of Amortized Cost (PAIC) which is already established as part of Honeywell’s bid. The contractor is thus encouraged to be effective—but not to linger over site surveys.

Feasibility studies are intended to make sure each project is doable, and worth the contractor’s investment. The contractor may cancel a project during the study if it is found to be uneconomic. Practicality is the other major concern. It may “look good on paper, but can it be installed?” is the question Starling urged contractors to ask themselves—and their customers. The feasibility report is a key item evaluated by the installation team.

Third, the contractor undertakes Design at his own risk. The design must include all the necessary technical information to evaluate the feasibility of the ECSM. Obviously, the contractor’s best interest is to proceed to design only when his survey and consultation with the installation team show that the project is likely to fly.

The installation, Major Command and the Corps support agency—in this case Fort Bragg, FORSCOM, and Huntsville Center, all have the right to review the proposal. The information

they will have to examine will include the proposal and feasibility study, shored up by data like engineering calculations, catalog cuts, Life Cycle Cost Analysis, Savings to Investment Ratios, termination schedules and any other needed information.

The contracting officer can reject the project if he decides it is not feasible for any reason, including (but not limited to) financial, technical, contractual,

“If you can’t measure with a good method and know what you did, you won’t be happy with the results of your project.”

—Bobby Starling, ESPC Program Manager

savings, or facility mission. The government is not subject to any costs for the feasibility study or design unless the government decides to buy the submitted documentation. Cost recovery is built into the task order if the government chooses to implement it.

Fourth, the parties Negotiate a shared savings agreement. An independent government estimate for the cost of the project is also submitted to ensure the contractor’s proposed price is reasonable. The government may go to another contractor if the price is determined to be unreasonable, and the contractor would be paid for any data used. “We have never had such an impasse so far,” both Honeywell and Huntsville said.

For the first two years of the Bragg/Honeywell Contract, Huntsville will provide these estimates. After two years, Fort Bragg may choose to take over this responsibility.

Fifth, the contracting officer then accepts the proposal and issues a Task Order together with any necessary contract changes. After the contractor has submitted and received approval for shop drawings, a site safety and health plan, and a work schedule, Huntsville issues a Notice to Proceed.

Sixth, the installation is responsible for Quality Assurance

during Construction. “Be timely!” Starling said. “That’s your part in letting the contractor move ahead. Use industry standards and avoid Corps guide specs. The contractor owns all installed equipment. Your goal is to ensure that it will perform and be safe at the end of the contract period, not to know whether there are 15 bolts on the flange rather than 14! The real question is, ‘Is your commander going to be happy with this project?’”

The seventh step, Operations and Maintenance, is normally the responsibility of the contractor. Each proposal does have a maintenance clause, and government personnel can perform operations and maintenance on government-owned systems which the contractor has upgraded. “Right now, you will probably ask the contractor to do maintenance wherever possible,” Starling advised. Why?

Because the contractor can ask for remedies if government staff don’t perform properly. This opens the flood gates for a lot of muddy water!

Measurement and Verification. The parties must agree on a practical technique that gives an accurate measure of the actual savings from a project. “Take trouble to agree on a good method up front,” Starling said. “If you can’t measure with a good method and know what you did, you won’t be happy with the results of your project.”

Will your energy bill go down right away? Yes, but. . . . For the duration of the contract, you will be sharing savings with the contractor. So you will be continuing to budget at close to the same level. The delta between your actual energy costs and your budgeted level will be used to pay the contractor’s share of energy savings and to amortize the cost of projects installed by the contractor. Some savings may accrue to your installation as well. During this period, you will be enjoying improved efficiency, upgraded systems, and contractor provided operation and maintenance of newly installed equipment.

At the end of each task order, when the capital investment is paid back and the contractor turns the project over to the installation, you may expect to realize further savings. **PWD**

Are you on the *Digest* distribution list?

If not, give Linda Holbert a call at (703) 428-7931 DSN 328.





\$1.1 Billion Corps contract will save Army energy, money

by Robert E. DiMichele

It just got a lot easier for the government to save energy dollars. On August 11th, 1997, the U.S. Army Engineering and Support Center, Huntsville, awarded a \$1.1 billion contract to a dozen commercial firms across the country in an innovative effort to save energy dollars and increase energy efficiency.

This energy savings performance contract can provide energy conserving efforts to any government facility in 46 of the 50 states, plus the District of Columbia and Puerto Rico. It is the largest energy savings contract ever of its type.

The other four states (Virginia, North Carolina, South Carolina, and Georgia) are covered under a previous \$355 million contract known as ESPC I.

The new contract sets up an innovative partnership among a government facility, the Huntsville Center, and private industry. The contractor provides the design, capital investment, construction, operation, and usually the maintenance for energy-efficient equipment, products, or services.

An Army installation or other government facility no longer has to come up with tax dollars to repair, replace, and maintain resources needed to reduce energy consumption. The contractor provides the investment needed for the resources, then receives a profit from the energy savings the project generates. The resulting savings is shared between the government and the contractor.

The only cost to the installation under the contract is a "bank account deposit" of \$50,000 up front per installation or activity. This covers Huntsville Center's costs for facilitating the contract. "We charge an hour's worth of labor at the GS rate plus an overhead rate to each customer for each hour we provide service," Starling explained. That service, he emphasized, is directly in support of the installation's ESPC.

The cost of developing the contract itself is not imposed on the customer. Area-wide contracts have already been developed and awarded with the help of funding from Forces Command, the Assistant Chief of Staff for Installation Management, and the U.S. Army Reserves. "In the past, we would have had to charge a customer as much as \$140,000 to develop a contract for them," Starling explained. "Now all that work has been done, and customers are only asked to provide an account that can be drawn down to pay for the costs of administering their contract. We begin to charge against it when we develop a Memorandum of Agreement with the customer. But even these charges are minimal, since the economies of scale of the big regional contract let us do a lot of 'generic' work. The fact is, that \$50,000 is usually saved on the very first task order issued under a contract. And the expertise we can offer installations would probably save them much more in training time, manpower time, and the time they would spend waiting to put their own contract in place."

"It's a win-win situation," said Bobby Starling, Huntsville Center's energy program manager. "This is an example of the government working a lot smarter and more efficiently."

This contract makes an innovative, cost-avoidance energy program reachable for any government facility. There is a 25-year contract term with a maximum 10-year ordering period for a potential \$1.1 billion. That means it is a stable contract that will allow private industry the opportunity to come into a government building and make major energy conservation efforts over the long term.

The contract works under a very simple plan, according to Starling. "We're talking real savings. No savings, no payment." Annual payments to the contractor will not exceed the actual

energy and ancillary cost savings. In fact, an energy audit is conducted to verify savings and ensure all payments are accurate based on the energy baseline, projected energy use, and savings measurement method identified in the Energy Team's task orders.

From a single solicitation, the Huntsville Center's Energy Team made 11 awards overall, 10 unrestricted plus one for small business. Since the contract includes any government facility in 46 states, several contractors are needed to maintain responsiveness.

The awardees are: CES/Way International Inc., of Houston, Texas; Duke Engineering and Services of Charlotte, North Carolina; ERI Services Division of Bridgeport, Connecticut; HEC Inc. Of Natick, Massachusetts; Honeywell Inc., of Phoenix, Arizona; Johnson Controls Inc., of San Diego, California; Northeast Energy Services Inc. (NORESKO) of Framingham, Massachusetts; Viron Corporation of Kansas City, Missouri; and Xenergy, Incorporated, of Burlington, Massachusetts.

In addition, an award went to a joint venture of Centerprise of Overland Park, Kansas, with Energy Performance Services of King of Prussia, Pennsylvania. The small business award winner was Abacus Engineered Systems of Seattle, Washington.

"This is an opportunity for installations and government agencies to save money for other programs that substantially affect their missions," Starling said.

The contract development costs were shared among Forces Command, the Army Reserve, The Assistant Chief of Staff for Installation Management, and The U.S. Army Corps of Engineers Field operating agency, Army Center for Public Works. **PWD**

Robert E. DiMichele is the public affairs officer at Huntsville Engineering and Support Center, U.S. Army Corps of Engineers.



ESPC—You CAN do it yourself!

Yes, the Energy Savings Performance Contracting business is complex.

But according to Scott Bly, Energy Manager for DPW Hawaii, it's far from impossible. Bly believes there are some significant advantages to charting your installation's own course.

"Money is a major consideration," he said. "We did talk to Huntsville about getting their help. However, the price tag for their assistance was \$200,000 just to get started. I knew that my DPW could not get our Garrison Commander to approve that expenditure."

*(Note: USAG Hawaii was negotiating with Huntsville before the New CONUS-wide ESPC was awarded. Now **contract development costs have dropped to \$0 for installations, and up-front charges are only \$50,000 per installation as a bank account that can be drawn on to pay for costs associated with facilitating the installation's in-place contract. See article on page 10 for more details.**)*

The tradeoff, of course, is that to go it alone with any chance of success, the energy manager must persuade several elements on the installation to contribute manhours and training time and money. In a resource-scarce Army, that may be the best way for some installations to pursue an ESPC.

"If you and your supporting DOC and JAG are willing to do the work, I think that you can benefit by getting a contract that will fit your needs better," Bly said. "For example, the greatest need some installations have is to upgrade and update equipment. Energy savings are important—at the installation and Armywide, but the truth is that these savings will be more beneficial in the big picture than in the individual DPW's budget. On the other hand, the overall Operations and Maintenance savings and investment in major systems may be extremely attractive for the installation."

If you make sure your ESPC meets your goals, Bly explained, everyone wins—the contractor makes money, the Army and DoD save on energy consumption, and the installation gets both local energy savings and modernized equipment and less expensive operations.

"We learned a lot of lessons in going through this process," Bly said. "At this moment, we have decided not to award a contract, because the facilities that were our primary targets for the ESPC have recently been funded and scheduled for complete renovation by our MACOM. In a way, that's proof that our process has worked. We didn't buy into an unworkable instrument because we did our homework right. We have a lot of data and better approaches that we will use the next time. And there will probably be a next time!"

"If you make sure your ESPC meets your goals, everyone wins."

—Scott Bly, Energy Manager for DPW Hawaii

Here are some suggestions Bly has for Energy Managers who want to try the do-it-yourself method.

- **Establish your goals first.** Do you want new equipment? This will govern your scope-of-work process. Do you want a lot of energy savings quickly? If so, simpler lighting and motor retrofits may be a better way to go. Do you want to save money? Ensure that you seek proposals that will cut your O&M costs as well as save energy.
- **Get your MACOM's approval.** They should understand what your basic concept is, and know the scope you contemplate. They can tell you if your plans and projected funding or building plans are on a collision course.
- **Organize your team.** "You, your Directorate of Contracting, legal counsel, the engineers, and especially the person who will do the economic analysis, all need to work together from the start." The ability to gather a local expert is the only practical way for the installation to

replace up front investment in help from Huntsville with "sweat equity."

- **Go to training.** "Take every kind of training you can. We attended training sessions with the Department of Energy under FEMP (Federal Energy Management Program) and also the Air Force training. The whole team came along. That's vital too."

- **Establish a firm scope of work.** "This is an area where I personally differ from the Huntsville concept," Bly explained. "Under their process, the contract is awarded before the contractor identifies any task orders. You really don't know what they will

plan or offer to do until after they go to work for you and you are committed. From my point of view, that does not allow us to tailor the process enough to suit the installation's needs.

Yes, Huntsville does see

that you save energy. But your collateral goals might not get met as well."

"For example, at this time, with the Capital Venture Initiative out there on family housing, we would ensure that no Army family housing projects were in our scope of work. Those facilities could soon be in the hands of a private contractor. We would also draw a line around facilities where we'd have major security problems about having a contractor enter and do work there."

"Most important to us, we'd establish the highest maintenance cost buildings and facilities that we would like the contractor to include in the bid. For example, we have a big cold-storage warehouse that is a really high-cost facility for us. We have breakdowns, emergency repairs, high labor costs, problems getting staff with the right expertise. Of course, we want all the competitors to bid on modernizing that building's equipment and doing operations and maintenance. Imagine



getting that headache off your books and into the contractor's hands for 25 years! Any contract that didn't specifically address such facilities in the scope of work would not satisfy me. And we had no trouble at all getting five qualified contractors to make reasonable bids that included this facility. The profit is still there for them."

- **Design your evaluation process carefully.** Bly recommends that installations consider a two step process. In order to submit a proposal, contractors must supply documentation that gives the installation a good basis for evaluation. "We think it would be best to prepare historical data, drawings, documentation, and base line information to give to all potential contractors," he said. "Hold a meeting and invite them to come. Give the same presentation and documentation to everyone. Make sure that you give weight to the facilities and systems you want addressed."

Why does Bly suggest this step? "We didn't make our desires clear and specific enough at the outset. We got proposals that were so different from one another that they were very difficult to compare. If you take the time to give your bidders a good scope of what you want them to do, you have a better chance of being able to sort out which contractors are going to do the best job for you."

Bly suggested that an initial winnowing be done to identify three to five final competitors. "When you get to the second stage, and start supplying detailed information and doing walk-throughs, you don't want to be working with 20 different people. At this point, you want the contractor to develop a fully-detailed technical plan, with a clause that the contract will be awarded as written."

"At this stage, give the contractor as much information as possible: data, drawings and plans and specs, maintenance costs. Also, when you do the walk through, supply all the

data on the mechanical rooms and walk the contractors through as a group. Our final list was seven contractors. I repeated this step seven times. I didn't have to!" This will save a lot of time and act as yet another guarantee that all have been given a level playing field.

- **Exercise control over the financial process.** "This is extremely important," Bly said. "Every company that bids is going to come at you with a different twist on inflation and discount factors and professional engineering costs. The contract we were looking at was 25 years long. A fraction of a percentage point here or there could make a huge difference. The ability of bidders to manipulate data is almost infinite. I recommend that you work with your team to produce a consistent set of economic factors that they must use to create their financials—I'd even suggest you give them a read-only disc format and require them all to submit proposals that way. You have to exercise control here in order to get information you can really evaluate."

- **Study other ESPCs.** Do your homework and get good ideas by getting copies of contracts other installations have written.

- **Scrutinize your bidders carefully.** "The term 'prequalified' does not mean that your bidders are all super-qualified," Bly warned. What it does mean is that the bidders have submitted information to the government and met certain minimum conditions. However, it does not constitute an automatic blue-ribbon stamp of approval. The installation has to do research to make sure the bidder is able to follow through.

"Be sure you get detailed references from their previous customers," Bly suggested. "We had one company submit a bid whose references responded that they had never heard of them. Some were not in stable financial condition and couldn't be expected to survive for the 25-year life of the contract."

- **Get help from your utility company.** "Of course your utility may be a bidder, and this will mean you have to be careful how you call on them. But they can help you with special metering, help you evaluate technical details, establish what types of rebates you might earn."

- **Get smart on measurement and evaluation.** "This is also a major issue," Bly said. "Your contract will last for 25 years. You don't want to have it be 25 years of monthly wrangling over what really is happening in your energy accounts. You don't want to have a constant, adversarial relationship to deal with over that long a time.

"I preferred the method that the Department of Energy suggests, which is to establish a guaranteed maximum amount the contract will pay to the contractor to amortize his equipment and supply his profit. This does limit the amount of profit the contractor will make to an agreed level. The contracts Huntsville offers have the advantage of permitting the government and the contractor to split the difference in savings *above* the guaranteed level. But this required much more frequent meetings on measurement and evaluation, and it appeared to me that there was too much incentive for debating savings month after month. Under the DOE method, the contractor knows that he's going to make a profit. We had five contractors willing and eager to bid on that basis."

All in all, the process is demanding, but worthwhile, Bly said. "We know a lot about our consumption baselines and costs that we didn't know as clearly before we started," he said. "We will be able to move through this process confidently if and when we decide to invite proposals again. A lot of installations out there could really get help from an ESPC. I hope these pointers will encourage some of them to give it a try."

👤 POC is Scott Bly, Energy Manager, DPW Hawaii, (808) 655-6383. **PWD**



Hats off to Army energy programs

On July 30, 1997, Mr. Orsini, Deputy Assistant Secretary of the Army for Logistics presented the 19th Annual Secretary of the Army Energy Conservation Award to the following installations:

Active Army:

- U.S. Army Aberdeen Proving Ground, MD
- United States Army Headquarters, National Training Center & Fort Irwin, Fort Irwin, CA
- U.S. Army Fort AP Hill, VA
- U.S. Army War College, Carlisle Barracks, PA
- U.S. Army 411th Base Support Battalion, Heidelberg, Germany
- Headquarters, 25th Infantry Division (Light) and U.S. Army, HI

Army National Guard:

- State of Nebraska Army National Guard
- State of Minnesota Army National Guard

U.S. Army Reserve:

- Headquarters, 88th US Army Reserve Regional Support Command, Fort Snelling, MN
- Headquarters, 90th US Army Reserve Regional Support Command, Little Rock, AR

In addition, the following energy managers received a check for \$1,500 for their outstanding contribution to the energy program at their installation.

- Terry Banks**, Fort AP Hill, VA
- Scott Bly**, Schofield Barracks, Hawaii
- Holger Grab**, 411th BSB, Germany
- Robert E. Jefferies**, State of Minnesota Army National Guard



Winners and presenters at the 19th Annual Secretary of the Army Energy Conservation Award ceremony.

- Barnard S. Kemter**, 88th U.S. Army Reserve Regional Support Command
- Hays Kinslow**, 90th U.S. Army Reserve Regional Support Command
- Rene Quinones**, Fort Irwin, CA
- Petra Sauer**, 411th BSB, Germany
- Sergio Sergi**, Fort AP Hill, VA
- Gary Testerman**, Aberdeen Proving Ground, MD
- Samuel J. Truax**, Nebraska Army National Guard
- Raymond Uerbish**, Carlisle Barracks, PA
- Steven L. Weber**, State of Nebraska Army National Guard

The ceremony started on the evening of July 29 with a reception for the winners and their guests, continued through July 30 with the awards ceremony, and concluded with an awards luncheon at Fort Meyer.

The Army's goal is to cut energy consumption by 30 percent by the year 2005, said Mr. Eric A. Orsini, Deputy Assistant Secretary of the Army (Logistics). So far, conservation efforts have saved the Army over \$1.5 billion in energy costs.

"By 2005, we'll have saved \$3 billion. We know we will make it," Orsini said.

Attendees at the awards ceremony included Mr. Orsini; Mr. O'Konski, Director, U.S. Army Logistics Integration Agency; Mr. Kowalczyk, Deputy Direc-

tor, Transportation, Energy, and Troop Support; Mr. Watling, Director, U.S. Army Center for Public Works; MG Genetti, Deputy Commander, HQ U.S. Army Corps of Engineers; and COL Osgood, Director, Facilities and Housing, Office of the Assistant Chief of Staff for Installation Management.

Major commands nominate installations for the Secretary of the Army Energy Awards based on their conservation accomplishments during the previous fiscal year. To select the best programs, the Army Energy Steering Committee conducts on-site assessments of each nominee.

The Army also garnered many wins at the 1997 Federal Energy and Water Management Awards when it was selected for the following awards.

Individual - Energy Efficiency/Management

John Scott Bly
U.S. Army Garrison, Hawaii

Joseph Chup
Scranton Army Ammunition Plant, PA

Vincent P. Moreau
Fort Huachuca, AZ

James B. Paton
U.S. Army Center for Public Works, VA



Individual - Energy Savings Performance Contracting

Brett Langolis, PE
Fort Lewis, WA

Individual - Special

C.A. Kowalczyk
Assistant Director for Energy and Troop Support
DCSLOG, Washington, D.C.

Small Group - Energy Efficiency/Management

USAMC - Lima Army Tank Plant,
OH

Small Group - Renewable Energy

Fort Carson, CO

Small Group - Energy Savings Performance Contracting

Barnes and Sage Building (Boston and Syracuse)
Fort Drum, NY
Fort Dix, NJ
Engineering and Support Center, Huntsville, AL
U.S. Military Academy, West Point
U.S. Military Academy, NY
Engineering and Support Center, Huntsville, AL

Organization - Energy Efficiency/Management

Fort Carson, CO
Fort Irwin, CA
Holston Army Ammunition Plant, TN
Fort Huachuca, AZ
Aberdeen Proving Ground, MD

Organization - Renewable Energy

Fort Huachuca, AZ

Organization - Water Conservation

Fort Eustis, VA **PWD**

Fort A.P. Hill wins Secretary of the Army Energy Conservation Award

by Ken Perrotte

A lighting project that will save Fort A.P. Hill more than \$50,000 annually is the top reason the installation won the 19th Annual Secretary of the Army Energy Conservation Award, beating out finalists worldwide.

The awards program recognizes and rewards Army installations that have achieved significant reduction in energy use and energy dollars.

Fort A.P. Hill's nomination package focused on lighting upgrades at the installation's Wilcox Camp Site. Wilcox, the most heavily used of the Fort A.P. Hill camp sites, can house several thousand troops at one time.

Nearly a quarter of a million troops annually have been training in recent years on Fort A.P. Hill's 76,000 acres of maneuver areas and live fire ranges.

More than 3,600 lighting fixtures in 58 buildings were upgraded or replaced during the 3-month project, which concluded in February 1997. Incandescent fixtures were replaced with energy-efficient fluorescent lamps, existing fluorescent lamps were retrofitted with newer technology, and incandescent exit signs were changed using light emitting diode kits.

The changes will save Fort A.P. Hill an estimated 835,089 kilowatt hours per year, which equates to about \$55,802. Additional savings of about \$66,000 annually will come from decreased maintenance costs associated with the new long-life bulbs.

Incandescent bulbs that previously had an average life span of 3 months have been upgraded to fluorescent bulbs with life spans ranging from 3.5 to 7 years. An incandescent exit sign that used to burn out in 8 months will now last 25 years.

Beyond energy savings, soldiers using the Wilcox Camp will notice improved light levels. Lighting levels inside the barracks increased from 20 foot candles to almost 50 foot candles, and exterior lighting has also improved.

The total cost of the lighting project was \$224,474, which was funded using Federal Energy Management Program dollars. John Roeder, Fort A.P. Hill energy coordinator, said the project was readily funded given the very rapid investment payback in terms of energy savings.

POC is John Roeder, Fort A.P. Hill energy coordinator, (804) 633-8409. **PWD**

Ken Perrotte is the public affairs officer at Fort A.P. Hill, VA.





Nebraska National Guard wins National Energy Conservation contest for third straight year

by Leonard Krenk

Champions, Champions, Champions. The Nebraska Army National Guard stepped into an area few organizations ever tread when they won the Secretary of the Army's Energy and Conservation award for the third straight year.

Officials from the Nebraska Army National Guard traveled to Washington, D.C., to accept the award on behalf of the state during a ceremony held at the Pentagon. Accepting the award for Nebraska were area Chief Warrant Officer Harold Bingham, supply systems analyst, Chief Warrant Officer Steve Weber, former supply systems analyst, and Sam Traux, chief of the Construction and Facilities Maintenance Office Engineer Branch.

In winning the rare three-peat, Nebraska registered a 7.1 percent reduction in energy usage in comparison to 1985, the year established as the baseline for the competition.

Vehicle and aircraft usage were down 23.9 percent, while fuel usage climbed 44.7 percent over 1985. However, Bingham said, considering that the Nebraska Army National Guard has more than tripled the square footage of facilities since 1985, the energy savings is remarkable.

“Considering that the Nebraska Army National Guard has more than tripled the square footage of facilities since 1985, the energy savings is remarkable.”

—Chief Warrant Officer Harold Bingham

National Guard facilities include armories, maintenance repair shops, offices, and hangars. New construction in 1996, totaling a whopping 262,936 square feet, included the U.S. Property and Fiscal Office and the Combined Services Maintenance Shop Lincoln. “We really did a great job,” said Bingham. “That’s the full-time people and the

part-time people of the Nebraska Army National Guard doing a good job of turning off lights when they don’t need them, closing doors and keeping windows shut like they should and running their air conditioners at the right level.”

Bingham also credited the savings in facility costs to recent energy-saving measures including the installation of drop ceilings, more energy efficient lighting and new windows and doors.

According to Traux, the Nebraska Army Guard has taken a systematic process toward cutting the state’s energy costs. For example, Traux said, replacing the old incandescent lighting with new “green lighting” has actually cut lighting costs by two-thirds.

Another thing the FMO has looked at has been an effort to reduce electrical loads during peak hours. To cut this, Traux said his office has directed that facilities stagger their peak loads over a period of time. For example, at the Adjutant General’s office complex, heaters and air conditioners go on at a certain time, lights go on at another, and finally people turn on their computers and other office equipment at a third.

“This really cut our electricity costs tremendously,” Traux said.

Other improvements include moving supply offices into existing offices, allowing the Guard to keep supply rooms at temperatures 20 degrees cooler than others in the building, as well as working toward developing “smart buildings” in which computer sensors outside a building measure weather conditions and set the environment within the facility accordingly.

POC is Chief Warrant Officer Harold Bingham, supply systems analyst, (402) 471-7542. PWD

Leonard Krenk is the public affairs officer for the Nebraska National Guard.

Iowa Army Ammunition Plant earns award for fuel conversion

Iowa Army Ammunition Plant recently earned the U.S. Army Materiel Command Energy and Water Conservation Award in the Mobility Energy Category.

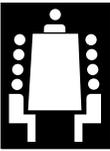
The plant picked up the honor for converting to E-85, a fuel that is 85 percent ethanol, in a third of the vehicles supplied to the plant by the General Services Administration.

The conversion reduced the plant’s dependence on fossil fuel by about 85 percent, and staff members at the ammunition plant estimate they will avoid using 26,400 gallons of petrole-

um-based gasoline a year. The plant avoided the use of 7,516 gallons of petroleum-based gasoline in 1996.

Ethanol burns cleaner than gasoline, and use of the fuel cuts ozone-forming pollutant emissions by 30 percent. According to some estimates, the use of ethanol versus gasoline reduces the amount of carbon monoxide by 32 percent, nitrous oxide by 96 percent and hydrocarbons by 96 percent. PWD

(Based on an Iowa Army Ammunition Plant news release.)



From \$140k to \$0—How Huntsville shrinks ESPC contracting costs

by Bobby Starling

It used to take Huntsville Engineering and Support Center up to 24 months and \$140,000 to award a technology specific, site specific Energy Savings Performance Contract. Later, we moved to a base-wide concept that allowed contractors to present energy savings ideas anywhere on the entire military installation. That process took five months. It was better, but still took too long.

Now the cost to get a contract in place is exactly \$0! We have wiped out that \$140,000 cost to the installation entirely. Better yet, the Area ESPC contracting vehicle we have in place lets us place a contractor on the customer's facility literally within days. That's not just improvement, it's what our customers want most—faster, better, cheaper service from the U.S. Army Corps of Engineers.

With the help of funding from Forces Command, the Assistant Chief of Staff for Installation Management, and the United States Army Reserves, we established an ESPC contract that serves government facilities in all 50 states. It costs our customers nothing to take part in the contract.

There's no such thing as a free lunch? Well, it's true that we do ask installations and other major activities to place \$50,000 on account to reimburse us for the services Huntsville staff provides directly to them in support of their contract Memorandum of Agreement and task orders. This amount is usually saved on the very first task order issued under their contract.

Forces Command has seen this method of ESPC contracting as such a benefit that the command centrally funds that reimbursement account. Fort Bragg, North Carolina, for example, pays us not one red cent for the work we are doing to support their partnership with Honeywell and the Corps to save energy. FORSCOM has funded our costs, and Honeywell makes all the investment for energy saving equipment, installation, maintenance and operation. If there is a better investment out there, I don't know of it!

If your MACOM has not funded your ESPC effort, you probably want to know what your \$50,000 pays for. We at the Huntsville Engineering and Support Center understand that even \$5,000 is not peanuts to today's hard-

pressed installation Directorates of Public Works. That's why we make sure that every dollar we spend is in direct service to your installation or activity.

Huntsville Center, like most Army Corps of Engineers activities, is fully reimbursable. We do not receive any appropriated funds to support you or ourselves. Thus, all our costs are paid for by our customers. Under the ESPC, what you pay for is an hour's worth of labor at the GS rate, plus an overhead rate to each customer for each hour of service we give to support their contract.

We provide reports to customers quarterly, or more frequently if required, to tell our customers exactly how much contracting, legal, engineering, training to the customer and contractors and other and program management support we are providing. Because federal law requires it, we must ask for that \$50,000 account to draw against—we can't work first and bill later, as in the private sector.

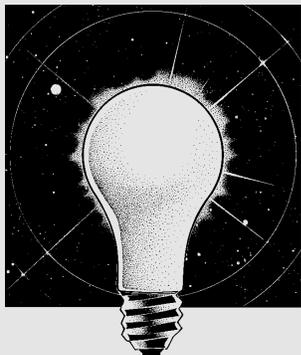
Our services give excellent value, since our ESPC team is experienced in working closely with customers and contractors to make sure your energy savings task orders are technically the best they can be. We also help your installation team negotiate with the contractor, review economic calculations that will be used to bring you and your private sector partner the benefits of energy savings.

Huntsville Center isn't shy about it—we think that we have the best, cheapest, fastest way to get you on the road to saving energy and improving your installation's operating infrastructure. We hope you'll be in touch with us soon!

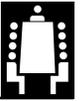
POC is Bobby Starling, Huntsville Center's Energy Program Manager, (205) 895-1531. **PWD**

Dial 1-800-DLA-BULB Energy Efficient Lighting Catalog

The Defense General Supply Center produces an excellent catalog for procuring energy efficient lighting systems. The catalog includes the latest technology in energy efficient bulbs, ballasts, fixtures, occupancy sensors and



solar lighting systems. It has been especially designed so that customers can determine with a minimum of effort what to order. To obtain a copy of the Energy Efficient Lighting Catalog, just dial 1-800-DLA-BULB. **PWD**



PROFILE

by Linda S. James

Bobby Starling

Huntsville's Energy Program Manager

Engage Bobby Starling in a conversation for more than a few minutes and you discover what he considers the most important thing in life — people.

“If you care to be successful, surround yourself with people smarter than yourself —and *listen* to them,” he said.

A philosophy that has worked magic on what is arguably the fastest growing installation support program at Huntsville Center — the Energy Program. In the six short years since Starling began as program manager at Huntsville Center, this entirely reimbursable program has grown from \$700,000 to \$44 million.

Invite Starling to tell more about the program and you’ll hear about how it began with the installation of a chiller unit at a single installation in Texas; you’ll hear how the team changed the way they did business saving the customer hundreds of thousands of dollars and reducing response time from 24 months to one week; you’ll hear how the phones are ringing off the hook as installations have heard how the program can work for them; you’ll hear how the team has changed business processes to keep up with growing demands on time and to ensure the customer gets value back for every dollar they pay.

But, what is most notably missing in Starling’s conversation is the word “I.” His unbridled enthusiasm for the program is contagious; his belief that the people at Huntsville Center are critical ingredients to success is undeniable.

“Teamwork makes this work,” insists Starling. “Teamwork, accountability to each other, and *trust*.” He adds with



conviction that the team includes people outside of Huntsville Center — the contractors and the customers. A concept that receives far more than just lip service from Starling. He knows all about “customers.” Before he worked for Huntsville Center, he was a Corps customer.

For much of Starling’s 26-year Army career, he was on the receiving end of Corps support. An industrial engineer graduate of North Carolina State, he began at the installation level - “where the rubber meets the road -” experience he considers “invaluable” and something he looks for when selecting people to join the Energy Team.

Starling came to Huntsville from Department of the Army, Deputy Chief of Staff for Operations, where he was the lead engineer on the Army ranges program. In that position, he worked closely with Huntsville Center specialists and he liked what he saw. According to Starling, the business focus at the Huntsville Center creates an environment that not only allows but nurtures the growth of programs like the Energy Program.

“From day one, I’ve been given the opportunity to develop my full potential as the manager of a business— a business that relies on a customer base,” said Starling.

“Huntsville Center gives my team the freedom to make the changes necessary to meet customer needs. And that’s the bottom line - it all goes back to people.” **PWD**

Linda S. James is a public affairs officer at the Huntsville Center; (205) 895-1694.

New laws make DSM easier

Recent legislation provides greater flexibility for entering into electrical, gas and water demand side management (DSM) programs with public utility companies. Installations can now:

- Accept any financial incentive, goods, or services generally available to the public from the utilities to adopt cost effective technologies and practices offered by the utilities.

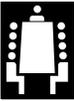
- Take advantage of published DSM rebates.
- Enter into comprehensive agreements with utilities to design and implement a cost-effective demand and conservation incentive program to meet the unique needs of the installation.

The new legislation also allows utilities to advance financing costs to the installation, under terms no less favorable

than those applicable to its most favored customer, to be repaid from funds available for the purchase of utilities services.

Installations should contact the local public utility companies about available DSM programs and opportunities.

POC is Roger E. Cundiff, U.S. Army Center for Public Works, (703) 806-6102 DSN 656, e-mail: cundiff@belvoir-cpw1.army.mil. **PWD**



Prime Power supports troops in Bosnia

by Nancy Gould and Alicia Gregory

In December 1995, more than 20,000 U.S. troops and equipment were deployed to Bosnia to support Operation "Joint Endeavor," a peacekeeping mission led by the North Atlantic Treaty Organization (NATO).

In a joint effort to house these troops, Navy Seabees, an Air Force Rapid Deployable Heavy Operations Repair (RED HORSE) squadron, and Army engineering units built permanent base camps to protect the troops and their environment from severe weather conditions. More than just protection from the elements, these troops also needed a place where they could live and work efficiently and have some comfort.

That's when the 249th Engineer Battalion (Prime Power) was called into action. Company B's 4th Platoon, stationed in Germany, deployed to the Tulsa Valley. Two months later, they were joined by the Headquarters Company and 2nd Platoon from Fort Bragg, North Carolina. The battalion Tactical Operations Center also deployed from Fort Belvoir.

"Because the local power grid was not stable, there were many power outages and spikes to power voltage (under and over voltage conditions)," said SGT 1st Class Bradley Galloway, B Company operations sergeant of the 249th Battalion (Prime Power). The power quality in the area did not allow things to run smoothly."

Equipped with four 750-kilowatt generators, enough energy to run a small town, these engineers set off for the Baltic Peninsula. Their mission was to install a power plant to provide electricity to Camp Steel Castle and create a distribution system for 13 other camps in the area.

Camp Steel Castle was a permanent base camp where soldiers from the 1st Armored Division worked and lived during their mission in Bosnia. Built by the Air Force RED HORSE squadron, the camp consists of two Force Provider modules (prefabricated buildings), hard-backed general purpose tents, and frame tents. The camp

"We are there to support any power need that our units have."

—SGT 1st Class Bradley Galloway

housed approximately 1,600 soldiers.

The 13 other base camps are existing facilities (used by United Nations forces) and new camps built by the joint forces engineering units. The structures are a combination of hard back tents and existing war-damaged buildings.

Some Prime Power engineers are still in Bosnia, supporting the Base

Camp Coordinating Agency (BCCA) at Tuzla. The engineers evaluate electrical projects and provide quality assurance for local, national, and Brown & Root Inc. construction projects. (Brown & Root is a Houston-based contracting company providing laundry services, fuel points for tent heaters, garbage pick-up and disposal, and other caretaker services in the area.)

"We service the troops (stationed in Bosnia) with power for anything from their coffee pots to their computers," said Galloway. "We are there to support any power need that our units have." **PWD**

Nancy Gould and Alicia Gregory are public affairs specialists at the Savannah District.

Energy Audit and Retrofit Program succeeds

In February 1995, the Army awarded a contract for lighting audit and retrofit services at CONUS Army installations. Since that time, the Army has done lighting audits in over 25 million square feet of buildings, surveyed motors and steam traps at 20 installations, and implemented over \$6 million in lighting retrofit projects under that and subsequent contracts. Those projects have a combined projected lifetime savings of \$15 million. The current contract offers a wide range of conservation technologies such as fixture retrofit, fixture replacement, delamping, installation of reflectors, and installation of motion sensors.

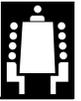
The program's success results from conducting multiple projects at different locations under one contract. This requires less time than to establish individual contracts for each project and establishes competitive prices due to the large volume of work done under a single contract. The process is streamlined by focusing on standard

retrofit technologies for specific applications, avoiding conservation measures that require lengthy analysis or design.

When first established, the program was centrally funded with DoD Federal Energy Management Program funds. Installation DPWs identified requirements and MACOM energy managers prioritized them. Now, most work done under the contract is at sites as requested and funded by customers. Installation DPWs may use the contract to execute audit and retrofit projects at their facilities.

Installations interested in executing lighting retrofit projects are encouraged to contact CPW for using such contracts as a cost-effective and time-saving alternative to developing their own local contracts.

For more information, please contact Jim Paton, Mechanical and Energy Division, (703) 806-6091 DSN 656, or e-mail: jim.b.paton@cpw01.usace.army.mil **PWD**



Saving with performance-based contracting

by Bob Hohenberg

Performance-based service contracting (PBSC) is exactly what it sounds like. It focuses on getting the work done, not on the way it's done, as in the old days. In fact, a key element is to write work statements so that contractors are free to decide for themselves how they will meet the government's objective. That way, they can use their ingenuity.

Why implement PBSC? That's easy. It's a proven tool for improved contractor performance, and it has already demonstrated cost savings of 15 percent or more. Good contractors like it, because if they perform well, they have an edge in solicitations where past performance is a selection factor.

PBSC is also as brief and as specific as possible about the objective. This makes it easier to objectively assess contractor performance and pay only for

satisfactory performance.

Here are the five essential elements of PBSC, straight from the Office of Federal Procurement Policy (OFPP):

1 PERFORMANCE WORK STATEMENTS. What exactly is needed? Requirements should be stated in clear, concise, commonly used, easily understood, measurable terms.

2 PERFORMANCE STANDARDS. What performance level does the government require? The minimum acceptable performance standard should rarely be 100 percent, since the standard directly affects the cost of the service. However, too low a standard may discourage good contract performance. Standards may be accepted industry standards, or they may be developed by the agency based on past

workloads or best practices. Either way, they should have industry input.

3 MEASUREMENT TECHNIQUES. How will the contractor's performance be judged? Include a surveillance schedule and methods.

4 INCENTIVES. How will the government reward outstanding performance and discourage poor performance? Set positive incentives at challenging but attainable levels. Define standard performance, maximum positive and negative performance incentives, and units of measurement in the solicitation. Negative incentives, if used, should represent the value of the service lost. Create a balance between cost, performance, and schedule incentives.

5 EVALUATION CRITERIA. How will the government assess the contractor's proposal and select the contractor? Select the best combination of price, technical, and past performance. Keep it simple to ensure that selection is based on significant factors.

PBSC requires discipline, teamwork, and fundamental knowledge of the process. Answering the necessary questions requires the involvement and commitment of the entire organization. This fosters internal communication, a nice fringe benefit.

For more information on performance-based service contracting, visit the OFPP website at <http://www-far.npr.gov/OFPP.html>. A Best Practices guide is available at <http://www.arnet.gov/BestP/BestPPBSC.html>.

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Bob Hohenberg works on contracting issues in CPW's Facilities Management Directorate.

New guidelines for swimming pool safety

by Robert W. Fenlason, III

Operations and maintenance personnel, responsible for operating gas chlorinators that disinfect swimming pool water, now have new guidelines available. Pamphlet 97, entitled "Safety Guidelines for Swimming Pool Applicators," provides recommendations for filling, reconditioning, storing, transporting, and dispensing chlorine from compressed gas cylinders. Related descriptive information, published in other Chlorine Institute pamphlets, is referenced.

This pamphlet can be obtained by writing to the Chlorine Institute, Inc., 2001 L Street, NW, Suite 56, Washington, D.C., or requested by telephone, (703) 775-2790, or FAX: (202) 223-7225.

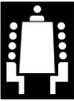
The Chlorine Institute exists to foster safety, human health, and the environment in connection with the production, distribution, and use of

chlorine and chlorine-containing compounds. The Chlorine Institute meets this obligation by providing scientific and technical material for those who handle chlorine chemicals.

Organizations such as the Compressed Gas Association, the U.S. Department of Transportation, the U.S. Environmental Protection Agency, and the U.S. Occupational Safety and Health Administration promulgate standards and regulations for chlorine use and handling. This new pamphlet concisely compiles applicable handling procedures from these other authoritative sources.

POC is Robert W. Fenlason, III, CECPW-ES, (703) 806-5201 DSN 656.

Robert W. Fenlason works on water and wastewater issues at CPW.



Cyberspace biosolids information

by Robert W. Fenlason, III

The World Wide Web has become an excellent resource for current technical and regulatory information. The following organizations operate a Web site that contains some biosolids technical and regulatory information that wastewater treatment plant operators and managers may find helpful:

The Water Environment Federation (WEF) provides a comprehensive Web site for technical biosolids information. Users accessing the Federation's home page can click on "biosolids" to gain access to the main biosolids page, which lists internal and external links. Users then can connect with a page on regulatory guidance for beneficially using biosolids that includes a summary of the goal of 40 ORB Part 503 standards for land-application projects. Web surfers also have access to the WEF biosolids technical discussion group, which invites comments on topics related to wastewater residuals, Part 503, conditioning, thickening, dewatering, stabilization, and beneficial use. Users can also link to other biosolids organizations and events. The URL for the Water Environment Federation is: (<http://www.wef.org/biosolids.html>).

The U.S. Environmental Protection Agency (USEPA), Office of Water, provides summaries of some of the regulations it has issued since October 1994, including surface water regulations for biosolids, National Pollutant Discharge Elimination System (NPDES) Permitting, water quality standards, and wetlands and dredging. This site includes a summary of a final rule, promulgated on Oct. 25, 1995, that amends Part 503. This is the amendment that deleted land-application pollutant limits for chromium and changed the land-application pollutant concentration limit for selenium. It also provided the complete text of a rule proposed on Oct 25, 1995, to amend Part 503 by modifying various land application, surface disposal, pathogen and vector attraction reduction and incineration provisions. The URL for the USEPA Office of Water

is: (<http://www.epa.gov/watrhome/regs/sum.html>).

The Ecosystem Science and Conservation Division in the University of Washington, College of Forest Resources, uses their site to announce future conferences on biosolid related issues and provides access to the abstracts and complete texts of technical forest soils publications written by faculty members and graduate students.

One of the technical papers available discusses liming effects on cadmium, copper, nickel, and zinc concentrations in soil that had been amended with biosolids 16 years ago. Another paper addresses long-term organic changes in biosolids-amended soil. The URL for the University of Washington, College of Forest Resources is: (<http://weber.u.washington.edu/~robh/>).

POC is Robert W. Fenlason, III, CECPW-ES, (703) 806-5201 DSN 656 (e-mail: bob.w.fenlason@cpw01.usace.army.mil)

Role of past performance

You are a Program Manager. You want to award a service contract

to a vendor who performed well in the past. He offers a good price, but it isn't the lowest offer. Your Contracting Officer insists on going with the lowest price. The winner lets you down, and six months later everyone is sorry.

Thanks to the growing emphasis on past performance information (PPI), that kind of story may soon be found only in history books. Today, the FAR requires that PPI **must** be considered in awarding contracts worth more than \$1 million.

"When we meet with (government) end users to assess their needs, there is a much greater focus on the value of a solution as opposed to finding the cheapest product," Phil McGovern, marketing staff manager of Lucent Technologies, told Government Executive.

Naturally, this means more work for the Program Manager and Contracting Officers. The added value of this process, however, is that the contractor receives timely feedback on ongoing as well as completed performance.

PPI can include the contractor's record of timeliness of performance,

technical quality, cost control, program management, resources, integrity and ethics, and recognition of best practices. The assessment is done by the Contracting Officer.

Some warnings:

- PPI must be reliable, unbiased and relevant.
- An offeror with no history cannot be penalized for that, but in a tie-breaker situation, a manager may award to a vendor with a good record over one with no record.

In addition to resource selection, PPI may be used to establish competitive ranges, discuss progress with contractor, decide whether to exercise contract options, and choose among vendors on multiple award contract. It is useful in market research and the development of acquisition strategies.

POC is Bob Hohenberg CECPW-FM, (703) 428-6227 DSN 328, FAX: (703) 428-7590 or e-mail: bob.e.hohenberg@cpw01.usace.army.mil.

(Reprinted from **Acquisition Reform Today.**)



Prepare heating boilers for winter

by John Lanzarone

As the nights begin to cool and autumn comes upon us, most people think of football, deer hunting or if they've stacked enough firewood. While DPW heating shop people are no different than the rest of us, they're also thinking of the coming heating season. This is a very busy time for them, getting all the heating equipment started for the coming cold weather.

To get your heating boilers ready for the winter season, follow these steps to prepare your systems for cold weather operation and avoid unexpected equipment failure:

1 Have a qualified person disassemble the low-water cutout and makeup-water feeding device. Clean, recondition, and test before the boiler is put into service.

2 Clean burner assembly and adjust combustion controls for maximum efficiency.

3 Test the safety/relief valve for freedom of operation. After the boiler is operating, check that the valve reseats properly.

4 Check all pressure and temperature controls and gauges, and clean the water-level gauge glass so that it indicates proper water level at all times.

5 Repair or replace any leaking pipes or fittings on the boiler or anywhere in the heating plant.

6 Insulate water lines exposed to freezing temperatures. Steam and condensate lines should also be insulated to reduce energy losses and for safety concerns. Some steam traps are sub-

ject to freezing, so be careful when selecting trap types.

7 Check all mechanical equipment, such as fans and pumps, for smooth operation and proper lubrication.

8 Establish and maintain a record of boiler operation.

9 Clean boiler heating surfaces of all deposits to avoid waste of fuel and problems with the boiler. Inspect refractory.

10 Clean the boiler water surfaces if the boiler design allows; otherwise, consider using a suitable chemical to minimize buildup of scale and prevent corrosion.

In addition to the above steps, the following should be performed, depending on whether a boiler is producing steam or hot water:

FOR STEAM BOILERS:

- ✓ Check condensate float valve.
- ✓ Check pressure controls.
- ✓ Check condensate return pump(s).
- ✓ Check condensate tank.
- ✓ Check feed and transfer pumps.
- ✓ Check draft fans/switches.
- ✓ Check gas safety switches.

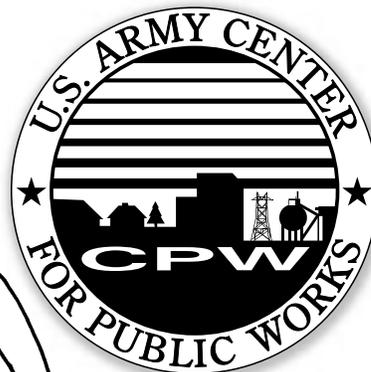
FOR HOT WATER BOILERS:

- ✓ Check circulating pump system.
- ✓ Check water cutoff.
- ✓ Check water feeder.
- ✓ Check shutoff valves.
- ✓ Check temperature controls.
- ✓ Check draft system.

For more tips and information about heating systems, call John Lanzarone at (703) 806-6067. **PWD**

John Lanzarone is a mechanical engineer with the Mechanical & Energy Division, Directorate of Engineering, CPW.

Public Works problem?



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Boiler operator errors and poor maintenance leading cause of injuries

by John Lanzarone

A report released by the National Board of Boiler and Pressure Vessel Inspectors for 1996 boiler accidents in North America shows that the leading cause of injuries for various types of boiler accidents is operator error or poor maintenance.

The report addresses power boilers, heating boilers (both steam and hot water) and unfired pressure vessels. In 1996, 2,087 boiler and unfired pressure vessel accidents led to 78 injuries and 10 fatalities in North America. While the Army was fortunate in that no known boiler related fatalities occurred in 1996, we did have our share of accidents.

The data (not Army specific) presented in the report shows that power boilers experienced 557 accidents and 125 of those were because of operator error or poor maintenance. Faulty low water cut off devices accounted for 356 accidents. Steam heating boilers had 741 accidents, with 490 related to faulty low water cut off devices and 125 blamed on operator error or poor maintenance. Unfired pressure vessels experienced 319 accidents, with 252 of those attributed to operator error or poor maintenance. Water heating boilers had 470 accidents with 112 being attributed to the low water cut off device and 221 to operator error or poor maintenance.

Clearly, the major sources of accidents for boilers and unfired pressure vessels are a lack of proper maintenance, operator error, or faulty low water cut off devices. What can we in the Army do to address these potential problem areas?

First, ensure that your high pressure (power) boilers are receiving the annual boiler inspection required by AR 420-49. This inspection may expose problems with the low water cut off device, and may indicate whether the proper level of maintenance is being provided. This inspection can expose improper chemical treatment, equipment deficiencies, and non-conformance to the ASME (American Society of Mechanical Engineers) code.

Secondly, ensure that your boiler operators are properly trained. While boiler operator certification is one

method of ensuring a minimum level of proficiency, without refresher training your operators may no longer be as proficient as they once were. Available on a reimbursable basis, CPW has a training and certification contract that can lead to operator certification, or can be used as refresher training.

 For more information on the

National Board of Boiler and Pressure Vessel Inspectors report, contact the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, Ohio. If you'd like more information about what CPW can do for

you to address operator training or boiler inspections, please call either John Lanzarone at (703) 806-6067 or DSN 656-6067, or Phil Conner at (703) 806-6068 or DSN 656-6068. E-mail them at john.r.lanzarone@cpw01.usace.army.mil or phil.j.conner@cpw01.usace.army.mil **PWD**

Assessing condition of buried heat distribution systems

by Dennis Vevang

It has been known for some time that infrared thermography could find problem areas on buried heat distribution systems, just as it has done for roofs and electrical distribution systems. While such information is useful for locating areas of major failures, for planning purposes, some quantification of the results from an infrared survey of major portions of a heat distribution system would be advantageous.

Some recent progress has been made towards this end by two International Energy Agency (IEA) District Heating projects in which the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) has participated. The objective of these projects was to develop a method which would allow quantification of heat losses from the temperature profile of the ground's surface above the buried heat distribution pipeline. Basically, the method uses the integral of the temperature distribution at the ground's surface along with climatological and system data to get an empirical estimate of the heat loss.

Although the method has some limitations, the project investigators felt that its accuracy could be expect-

ed to be within 20 percent. The primary limitation is the difficulty in measuring the ground surface temperature in areas with heavy grass.

Using this method, CRREL has conducted infrared surveys of two facilities: a NASA installation and an Air Force base. Results have been good and the facilities will be provided with both heat loss estimates and prioritized replacement lists. The ultimate goal of this work is a method that could either be commercially available or conducted by government teams.

While the method is still being developed and improvements are being made, the CRREL team is available to conduct surveys of other facilities on a reimbursable basis. If you are interested in having such a study done at your facility, please contact the CRREL principal investigator, Gary Phetteplace, (603) 646-4248; FAX: (603) 646-4380/4640; or email: gephete@crrel.usace.army.mil.

 CPW POC is Dennis Vevang, CECPW-EM, (703) 806-6071 DSN 656. **PWD**

Dennis Vevang is a mechanical engineer in CPW's Engineering Division.



FORSCOM tests high-performance clothes washers

by Greg Sullivan

The Pacific Northwest National Laboratory (PNNL), in conjunction with U.S. Army Forces Command (FORSCOM) and major U.S. clothes washer manufacturers, has initiated a demonstration of high-performance clothes washers in Army barracks. The intent of this demonstration is to measure, analyze, and report the energy and water efficiency of currently available high-performance clothes washers in military barracks applications.

The clothes washers in the study are commercial quality horizontal axis (H-

axis) designs. With the H-axis design, the washer drum rotates about a horizontal, rather than a vertical, axis. The benefit to the H-axis washer is that the drum only partially fills with water during the wash and rinse cycles. As the drum turns about its horizontal axis, the clothes are tumbled into and out of the

water. In contrast, a standard vertical axis (V-axis) washer requires the clothes to be fully immersed in water and moving about a central agitator for proper washing. Because most of a clothes washer's energy use is tied to hot water use, any savings in hot water translates to energy savings.

Additional energy savings are reported due to the high spin speeds achieved in the horizontal axis designs. These higher spin speeds mean less water remaining in the clothes at the end of the wash cycle, thus saving dryer energy.

The clothes washers used in barracks applications are typically designated as on-premise laundry (OPL) type and are close to the durability and construction of full commercial type clothes washers; however, they do not have coin boxes. The U.S. Department of Energy does not require testing and certification of these clothes washers, as it requires of residential clothes washers.

While many claims have been made regarding energy and water savings of the H-axis designs, very little independently generated data are available. Manufacturer claims of energy savings from H-axis clothes washers range from 30 to 70 percent and water savings range from 30 to 50 percent over the standard V-axis designs.

The goal of this program is to provide FORSCOM and the Department of Army with a greater understanding of the potential energy and water savings from using high-performance OPL clothes washers in its many barracks applications.

The demonstration is set to begin by December 1997. The schedule calls for five months of clothes washer metering with a final report expected by early summer, 1998. All performance results, along with life-cycle cost economics, will be presented in a follow-on article in a future Public Works Digest.

For more information, please contact Greg Sullivan, PNNL, (509) 372-6212, e-mail: gp_sullivan@pnl.gov.

PWD

Warning! Possible problem with Lennox pulse furnaces

by John Lanzarone

Although all furnaces should be checked before being placed into operation each heating season, the check is especially important this year for Lennox Pulse furnaces. Lennox Industries is warning of possible carbon monoxide leaks in its older pulse furnaces due to corrosion in the furnace heat exchanger. These units were generally manufactured between 1982-1988 and installed before 1990.

Lennox Industries is willing to schedule inspections and safety checks of the units and will replace faulty exchangers at no cost or give a \$400 credit towards a new furnace. The company is also providing free carbon monoxide detectors as part of the program.

It is essential that all installations with Lennox pulse furnaces verify that the units are safe before beginning operation this winter. All Lennox pulse furnaces should be suspect until proven otherwise. The problem only applies to Lennox pulse furnaces with model numbers beginning with G14 or GSR14. Please check the model number to be sure if the unit is included in the Lennox warning.

If your installation has Lennox pulse furnaces with model numbers

that begin with GSR14 or G14, please contact Lennox Industries at 1-800-537-4341 or 1-800-986-2162 to arrange for inspection and replacement. When calling the toll free numbers, a complete model and serial number is required to get beyond the automated voice system.

To locate the model and serial number, first remove the front door of the furnace and look for the product ID sticker. The sticker is usually on the inside left cabinet wall of the furnace. The model number of problem units will be G14 or GSR14 followed by a series of letters and numbers. The serial number, also located on the product ID sticker, consists of four numbers, followed by one letter, followed by five numbers.

Upon calling the toll free number and confirming that a furnace meets the model number criteria, the installation POC will be contacted by a Lennox representative within a few days. Installations may be able to get faster service by contacting the local Lennox Distributor.

POC is John Lanzarone, (703) 806-6067 DSN 656, or e-mail: john.r.lanzarone@cpw01.usace.army.mil

PWD



Emergency assistance for chlorine leaks

by Robert W. Fenlason, III

Chlorine is among the most useful and beneficial of all chemicals. Today's high standard of living and health can be attributed to chlorine. Some of its well-known uses include disinfecting water for drinking and swimming and bleaching. However, there are many other ways not universally recognized that chlorine and the related alkali chemicals benefit us. For example, chlorine is important in the production of pharmaceuticals, medical devices, safety equipment, computers, automobiles, aircraft parts and crop protection chemicals. Add to these uses personal care products, rubber processing, adhesives, fire retardants, paints, and perfumes. The list of chlor-alkali contributions to modern society is virtually endless.

Despite its many good uses, chlorine and chlorine-containing compounds have the potential to injure man or animals and damage the environment. The actual effects depend upon the concentrations of these substances in the air or water. The concentration is highest at the leak source; then it diminishes at various distances from the leak, depending on a number of variables.

When an accidental chlorine release occurs, prompt action is essential. Chlorine users should immediately contact their suppliers in the event of a chlorine emergency. Maintenance personnel should be familiar with suppliers' names and their emergency phone numbers should be posted near the point of use.

Chlorine suppliers can offer the user technical guidance and on-site support. With expert advice from the suppliers, most emergencies can be brought under control quickly and safely. When the supplier cannot be reached, in the case of an emergency, call the Chemical Transportation Emergency Center (CHEMTREC) at:

- (800) 424-9300 – 48 contiguous states
- (703) 527-3897 – Alaska, District of Columbia, and Hawaii

The CHEMTREC dispatchers contact the designated CHLORine Emergency Plan (CHLOREP) representative, who in turn contacts the local

CHLOREP team leader. The team leader then contacts the emergency caller to determine what expertise and aid are needed. CHLOREP is a mutual aid program between the United States and Canada; organized by the Chlorine Institute, to primarily advise and assist in resolving chlorine incidents that occur during transportation emergencies or at user locations. The program provides immediate emergency response from a local chlorine packager or manufacturer.

The CHLOREP divides the U.S. and Canada into regional sectors where more than 60 Chlorine Emergency Teams are usually dispatched through

the CHEMTREC at the Chemical Manufacturers Association in Rosslyn, Virginia, near Washington DC. If a local chlorine emergency cannot be resolved internally or with the help of a chlorine supplier, assistance can be obtained from a CHLOREP team by calling the number above. CHEMTREC operates on a 24-hour, 7-day-a-week basis to provide emergency telephone instructions to personnel at the scene of an incident or to provide actual assistance, if required, from numerous locations throughout the U.S. and Canada. Team members are all experts who have been trained through company programs and Chlorine Institute seminars.

POC is Robert W. Fenlason, III, CECPW-ES, (703) 806-5201 DSN 656.

PWD

Harmonic problems can be beat

by Richard Duong

Harmonics are generated by nonlinear loads. The nonlinear loads are the loads that generate voltages whose frequencies are multiples of an input voltage's frequency. For example, the power supplies of computer systems or the inverters of uninterruptible power systems (UPS) can generate harmonics.

The frequency of the input voltage is called the "fundamental frequency." Harmonics are normally characterized by the multiple number of the fundamental frequency. If the input voltage has a frequency of 60 Hz, then the third harmonic voltage will have a frequency of 180 Hz. The fifth harmonic voltage will have a frequency of 300 Hz.

Normally, three-phase balanced linear loads will result in zero neutral current. However, three-phase balanced harmonics will not cancel on the return conductor. The result is that a high current will flow on the neutral. If the neutral is not properly sized, overheating could occur. The neutral size is recommended at twice the phase conductor size for areas

where nonlinear loads are largely present.

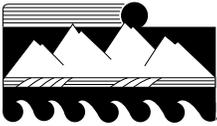
Electrical conductors consist of inductances and capacitances. The values of these inductances and capacitances vary with the frequencies of the currents flowing through the conductor. When the value of inductance is equal to the value of capacitance, a resonance will occur. If the harmonics have a frequency close to that of the resonance, serious damage can occur.

Harmonics can be detected by specialized instruments, and their harmfulness can be reduced by adding proper corrective devices such as harmonic filters, reactors, and so on. CPW can help your installation to reduce damage caused by unwanted harmonic voltages.

For more information, please call Richard Duong, CECPW-EE, at (703) 806-5179 DSN 656 or e-mail: richard.d.duong@cpw01.usace.army.mil

PWD

Richard Duong is an electrical engineer in CPW's Engineering Directorate.



Recycling a bright alternative to fluorescent lamp disposal

by Mark Ditmore

The Army, like private industry, relies heavily on fluorescent lighting to illuminate its offices and work areas. It also faces the same environmental challenges when disposing of the fluorescent lamp tubes, high density discharge lamps, and the ballasts that go with these lamps.

A more environmentally sound alternative to disposal is available, as several companies throughout the United States recycle the lamp tubes and properly dispose of the ballasts. The tubes contain mercury, a toxic metal that for disposal purposes may be classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). The Environmental Protection Agency regulates the disposal of wastes containing mercury.

Waste containing mercury is considered hazardous if the mercury content from leachate of a representative waste sample obtained from the EPA's Toxicity Characteristic Leaching Procedure (TCLP) is found to equal or exceed 0.2 milligrams per liter. The EPA neither lists nor exempts fluorescent lamp tubes as hazardous waste unless they fail the TCLP, in which case the tubes must be handled as hazardous waste.

The TCLP costs about \$140 per lamp. The lamps typically fail, so the test is not cost-effective. Installations should therefore assume that fluorescent lamp tubes are hazardous waste and manage them as such.

The lamp ballasts may contain polychlorinated biphenyls, or PCBs, which are banned carcinogens. Fluorescent lamp tube ballasts made before 1979 containing PCBs; those manufactured after 1979 do not and should be labeled "No PCBs."

The EPA has proposed a rule to modify the waste management of lamps contain mercury. This proposal — published in the Federal Register July

27, 1994, as 59 FR 38288 — would either include fluorescent lamp tubes in the Universal Waste Rule or exclude them from regulation as a hazardous waste if they are disposed of in permitted facilities.

The Universal Waste Rule includes batteries, pesticides and other "non-industry specific" wastes generated by small businesses, home owners, etc. If fluorescent lamp tubes are included in the Universal Waste Rule, up to 35,000 tubes could be stored for up to a year before shipment to a collection facility. A permit would be required for longer storage. Each state has a regulation for the disposal of these materials, so Army installations need to check the regulations in their state.

An Alternative

As an alternative to disposal, fluorescent lamp tubes and high density discharge lamps can be recycled. The mercury is recovered, aluminum is recycled, phosphor powder is reused, and the glass is used as a filler in asphalt.

Installations can contact their state environmental department or regional office for a list of companies that recycle fluorescent and high density discharge lamp tubes. When selecting a recycling company, find out if the company recycles all of the lamp materials and has all the necessary permits.

Recycling costs vary, depending on the quantity to be recycled. Prices are often determined on a per-linear-foot basis. Fluorescent tube recycling costs range from 6 cents to 15 cents per foot, with an average cost of 10 cents per foot. High density discharge lamp recycling costs range from \$1.25 to \$4.50 per lamp, with the average cost about \$2.50 per lamp.

Disposal costs average about 25 cents to 50 cents per 4-foot lamp, not including costs for packing and trans-

portation, or fees charged by landfill owners to test and evaluate a waste sample.

'Green' Lighting

A company under contract to the Department of Energy (DoE) developed an alternative to fluorescent, high density discharge or incandescent lighting. Using a mixture of sulfur and argon bombarded by microwaves, the units produce a light that significantly reduces ultraviolet radiation and closely matches the spectrum of sunlight. This product contains no hazardous materials and can be disposed of without any environmental considerations.

DoE installed a prototype lighting system at the exterior plaza of its Forrestal Building WHERE. The building was previously illuminated by 280 175-watt high-density discharge lamps containing mercury. DoE's contractor replaced all of these lamps by installing a light guide the full length of the plaza at its center, and placing one 5,900-watt sulfur lamp at each end of the light guide.

The total system power dropped from 49,000 watts to 11,800 watts, saving about \$9,000 per year in energy costs. The new system carries four times the illuminating power of its predecessor, and was installed at about 25 percent of the estimated cost of upgrading the conventional lighting system.

For more information about disposal requirements and recycling of fluorescent and high density discharge lamps, please contact the U.S. Army Environmental Center's Mike Eck at (410) 671-1227 DSN 584 or e-mail: mkeck@aec.apgea.army.mil. 

Mark Ditmore works in the Environmental Quality Division at the Army Environmental Center.



Fuel cells present an effective solution to pollution

by Mitch Bryman

Since 1974, Congress has established several complementary energy-saving programs to address concerns about economic stability and the nation's dependence on foreign oil. Recent initiatives such as the Climate Change Fuel Cell Program are driven by national interests, including industrial competition, dwindling energy resources and requirements to improve environmental quality.

Begun in 1994, the fuel cell program provides grants to private entities, usually local or regional utilities, willing to purchase early versions of market-ready fuel-cell systems that generate heat and electricity.

What Are Fuel Cells?

Fuel cells differ from batteries in that they consume fuel (oxygen and hydrogen) to maintain an electrochemical reaction, and they do not require recharging. Fuel cells produce electricity as long as fuel and air are supplied to the cell. The oxygen usually comes from the surrounding air, while the hydrogen

is obtained from a fossil fuel, most commonly natural gas. Both batteries and fuel cells produce electricity without combustion, rotating parts or noise.

The electrochemical reaction also produces heat, which can be used for space heating or to heat domestic water, swimming pools, hospitals, laundries, and boiler feed water. Reportedly, this raises the system's overall efficiency to about 85 percent. In contrast, the efficiency of the electricity purchased from local utilities represents only 30 percent of the original energy input.

Because of their high fuel-to-energy efficiency, fuel cells release up to 50-percent less carbon dioxide (a gas believed to contribute to global warming) than conventional technologies. Fuel cells emit reduced levels of pollutants than do conventional power plants because they utilize natural gas as the primary fuel.

Funding Availability

Cost remains a major obstacle to the program's success. Currently available fuel cell systems are expensive, but program managers intend to invigorate the fledgling U.S. fuel cell market by stimulating production demand, lowering costs and making them competitive with traditional energy sources.

Mark Williams, a product manager for the Department of Energy's Morgantown Federal Energy Technology Center (FETC), said grants available through the program are expected to double the number of fuel-cell power plants manufactured in the United States. FETC is the country's lead developer of fuel-cell technology and managed the Climate Change Fuel Cell Program during its first year.

In fiscal 1995, the fuel cell program acquired \$15 million in startup funding and awarded grants for 42

fuel cell power systems. Strong bipartisan congressional support has helped the program avoid sharp cutbacks. Congress appropriated an additional \$20 million, of which \$14 million was available, towards the combined fiscal 1996/97 program.

Beginning in fiscal 1996, management of the program was transferred to the Industrial Ecology Center (IEC) of the U.S. Army Tank-automotive and Armaments Command's Armament Research, Development and Engineering Center. The IEC is located at Picatinny Arsenal, New Jersey.

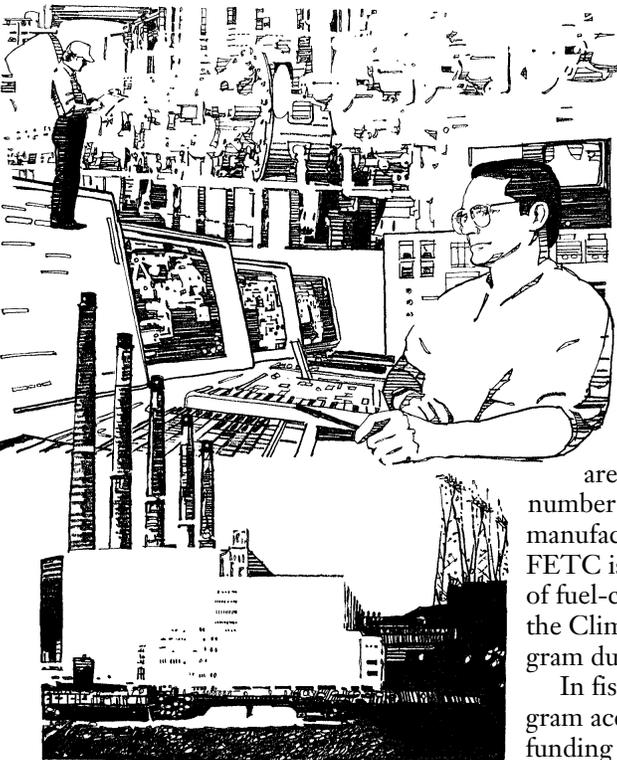
To encourage private-sector participation in the program, the fiscal 1995 and 1996/97 programs fund part of the total cost for producing fuel-cell power plants. The maximum amount of each grant is \$1,000 per kilowatt of power that the fuel cells can produce, or one third of the project costs, whichever is lower. The grant applicant picks up the balance of the costs.

Although Department of Defense installations are prohibited from applying for and receiving grants, they may participate in the program through partnership with an eligible utility, which submits an application and is accepted into the program. Daniel Tolliver, IEC project engineer, said DoD installations may independently work out ownership or lease agreements with their respective partners. Installations may also choose to purchase fuel, electricity or heat from the utility. Site selections for the fiscal 96/97 program were to be completed before the end of the summer by a selection board consisting of DoD and DoE personnel, Tolliver said.

Typically, gas utilities benefit from the program by increasing the demand for natural gas, while DoD installations benefit by reducing energy costs and fossil-fuel emissions.

Long-Term Energy Strategy

Obtaining reliable, cost-effective heat and electricity with minimal environmental impact is a major goal for





Battery Program supports pollution prevention

DoD installations. Because many of their central heating plants are nearing the end of their usable lives, fuel cells could present an opportunity to replace outdated equipment with state-of-the-art technologies.

Military installations also face increasingly stringent emission controls, rising fuel costs, and deteriorating system performance. Consequently, fuel cells installed through this program will be monitored for their efficiency in producing electrical energy, their thermal output, and system reliability. Results will be used to determine what role, if any, fuel cells should play in DoD's long-term energy strategy.

A Success Story

For some, the fuel cell concept is not new. NASA has used fuel-cell power sources since the 1960s for the Gemini, Apollo and Skylab spacecraft, and uses them in the space shuttle program. In January 1995, the Natick Army Research, Development, and Engineering Center (NARDEC) in Natick, Massachusetts, installed a 200-kilowatt phosphoric acid fuel cell, the only type of fuel cell available commercially in the U.S. This project was funded through the fiscal 1993 DoD Fuel Cell Demonstration Program, managed by the U.S. Army Construction Engineering Research Laboratories. NARDEC's fuel cell system generates about 1,576,800 kilowatt hours per year, saving the facility some \$85,887 in electricity costs and \$28,616 in demand costs annually.

The installation also recovers waste heat to preheat boiler feed water, reducing oil consumption by 29,705 gallons and saving an estimated \$21,548 per year. The fuel cell requires about 14,957.7 million BTUs per year in natural gas, at a cost of about \$78,228 per year. Net savings in utility costs are estimated to be \$57,823 yearly.

Pollution Solution

The costs associated with annual air emission permits or fines for noncompliance with air permit limits can be

The Defense Supply Center Richmond's (DSCR) Vehicular battery Consignment Program provides wet and charged type 6TL, 2HN and 4HN military specification batteries to Army activities for use in tactical and combat vehicles.

The program enables a contractor to stock batteries directly at Army facilities, making the batteries immediately available through normal requisitioning procedures. The contractor also enhances an installation's pollution prevention program by removing unserviceable batteries for disposal on a one-for-one basis.

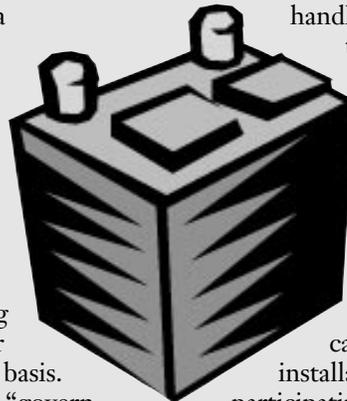
Customers designate a "government battery site manager" to account for the batteries. The contractor makes arrangements to meet with the site manager at least two weeks before the first delivery of batteries to determine how many, what kind, when, and where the batteries are to be delivered.

More than 165 Defense Department sites participate in the program, including Army, Marine Corps, Army National Guard and Army Reserve installations. The program offers a site, a manufacturer's warranty and the convenience of reduced handling of hazardous material, fewer disposal concerns and fewer shelf-life management problems.

The program is available throughout the continental United States, Hawaii and Alaska. DSCR reviews applications from sites and installations not currently participating in the program.

Once an application is approved, an initial stock of batteries can arrive at the installation within 30 days after the contracting officer issues a delivery order to the contractor. **PWD**

(Based on a DSCR news release.)



high. The potential for obtaining an exemption from air permitting requirements may provide an added economic incentive to install a fuel-cell power plant system as a replacement for outdated energy generation units.

In some states, reducing air emissions may allow the reduced pollutant to be cashed into an emission reduction credit that can be transferred to other facilities or sold to generate revenue. The potential market value of emission reduction credits can be significant.

Although proceeds from the sale of federally-generated emission reduction credits must revert to the U.S. Treasury, legislation has been introduced in Congress that would return the revenue to the federal installation or agency generating the credit.

According to FETC's Williams, the cost of a commercially available phos-

phoric acid fuel cell is \$3,000 per kilowatt capability, plus installation costs. If federal assistance initiatives such as the Climate Change Fuel Cell Program are successful in increasing commercial sales, analysts project that system costs of \$2,000 per kilowatt could be reached in two to three years and \$1,500 per kilowatt within the next five years. As more fuel cell types become commercially available, market competition is expected to drive prices even lower.

For more information, please call Daniel Tolliver, IEC, at (201) 724-4084, FAX: (201) 724-6759, or e-mail: dtoll@pica.army.mil or Mark Williams, FETC, at (304) 285-4747, FAX: (304) 285-4292, or e-mail: mwilli@metc.doe.gov. **PWD**

Mitch Bryman works in the U.S. Army Northern Regional Environmental Office.



Army Energy Awareness Seminar Program

The Energy Awareness seminar is designed to provide installations with information on no cost/low cost measures that will reduce the installation's energy consumption and energy costs (normally about 10 to 15 percent). The seminar is site specific to the installation and is presented at no cost to the installation, other than ensuring that personnel attend the sessions.

Prior to the seminar, our contractor, Systems Engineering and Management Corporation (SYSCorp), conducts a Pre-site Reconnaissance Visit (PSRV) of the installation. They will contact the installation to coordinate the date for the visit as well as the date for the seminar. They also request information from the installation engineer about energy consumption from the base year of 1985, usage profile, previous fiscal year's consumption, and the name of the local utility company that services the installation.

During the site visit, which is normally three to four days, they meet with the installation commander or his representative, the energy coordinator and base engineer. They visit a cross section of buildings and activities and look for energy conservation opportunities. During the visit, they test boilers, measure water temperature, check Heating, ventilation, and air conditioning (HVAC) units, look at refrigeration units, measure light levels in offices, and corridors.

Approximately four to six weeks after the site visit, they will return to present the seminar. Prior to making the seminar they will conduct an in-brief with the installation commander and brief him on what they found during the PSRV as well as what will be presented at the seminar so that there will be no "surprises." There are three sessions; an executive session, engineer session, and building energy monitor session.

The Executive session is intended for the commander, his staff, and other key players on the installation. It is de-

signed to highlight the potential savings which SYSCorp found during the PSRV. Typically the savings are between 10-25 percent of the installations energy bill. The savings are no cost/low cost to implement, as we realize that there is not a lot of money available these days. The goal of the Executive session is to get the support of the commander and key individuals for an energy conservation program.

The engineering session is designed for the installation engineering personnel at all levels, from the director to the individual responsible for maintaining/operating HVAC or boilers. It provides recommendations for specific systems which the contractor tested. It also provides information on energy efficient products which are available in the Defense Supply System. The goal of the engineer session is to provide information to the installation engineer in

order to assist him in the installation maintenance program and renovation program.

The building energy monitor session is intended for the individual who has been appointed within an organization to monitor the energy use in buildings. They are provided with information on areas to look at that indicate problems with the heating or cooling of a building, suggestions on how to improve the efficiency of the building, and how their efforts can help the installation achieve its energy goal. Much of the information provided can also be used to reduce energy consumption in their homes; if they reside off the installation, they can reduce their energy bill by about ten percent or more.

Each person who attends a seminar receives a book which contains information pertinent to the session they attended.

POC is Jeff Hager, (717) 770-6711 DSN 977, FAX: (717) 770-6702, e-mail: jeff.hager@hqda.army.mil **PWD**

PROSPECT course available for energy managers

The Energy Policy Act of 1992 (Public Law 102-486) established professional standards for federal energy managers, requiring they be proficient in six specific areas.

Those are:

- Fundamental of building energy systems.
- Building energy codes and applicable professional standards.
- Energy accounting and analysis.
- Life-cycle cost methodologies.
- Fuel supply and pricing.
- Instrumentation for energy surveys and audits.

Army PROSPECT Course 055, Energy Management in Existing Federal Facilities, provides the necessary instruction to fulfill those training requirements. Lessons are geared toward the technical side and give energy program managers, planners, and designers the background to select, analyze, evaluate and design energy conserving measures into existing facilities.

Each year, the Army centrally funds the tuition cost for one session. Installation energy managers interested in attending should contact their major command energy managers to forward nominations.

POC is Jim Paton, CECPW-EM, (703) 806-6091 DSN 656. **PWD**



Stormwater management training video

by Robert W. Fenlason, III

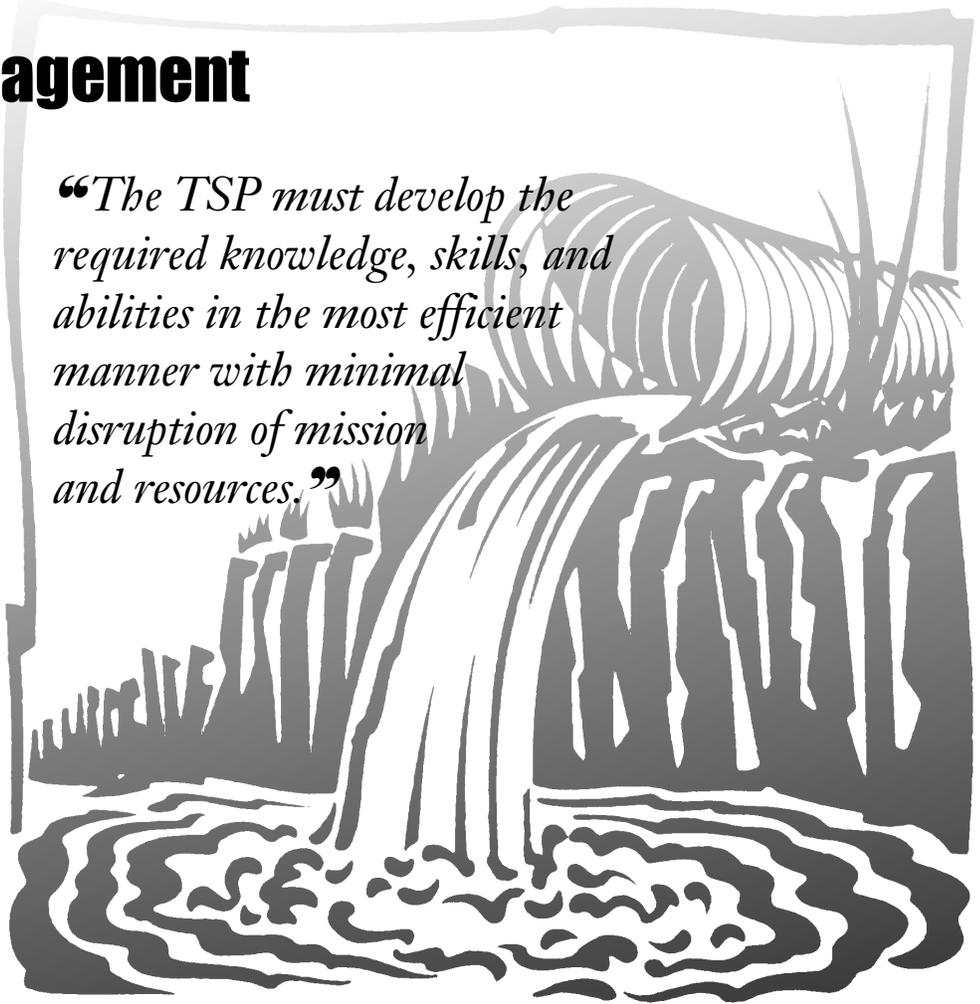
Most Army installations are currently maintaining and updating their Stormwater Pollution Prevention Plans (SWP³). The SWP³ establishes responsibilities and procedures for stormwater management. The plans also identify potential sources of pollution which may affect the quality of stormwater discharges associated with industrial activity from the installations.

In addition to identifying these sources, plans provide site specific pollution prevention measures or Best Management Practices (BMPs) to prevent or reduce pollution of waters of the United States resulting from these sources.

The SWP³ for each facility is a comprehensive document comprised of several sections: Planning and Organization, Assessment, BMP Identification, Implementation, Evaluation/monitoring, General Requirements, and Special Requirements. The US Army Environmental Center (USAEC), with assistance from the Army Environmental Training Support Center (ETSC), has developed the Stormwater Management Training Support Package (TSP) to accompany the SWP³, to assist the proper implementation of these comprehensive documents. It is essential that Army personnel (military and civilian) understand how to implement SWP³ at their installations.

The TSP provides an overview of regulatory requirements, introduces the SWP³ (to include requirements, purpose, and development), and addresses BMPs. While the TSP focuses on implementation of the SWP³, it also satisfies regulatory employee training requirements. Given the diversity of locations requiring training, range of available training facilities, and limited resources, the TSP must develop the

“The TSP must develop the required knowledge, skills, and abilities in the most efficient manner with minimal disruption of mission and resources.”



required knowledge, skills, and abilities in the most efficient manner with minimal disruption of mission and resources.

The purpose of the TSP is to meet the training requirements outlined in the stormwater permits. The overall objectives are:

- To ensure proper implementation of the Stormwater Pollution Prevention Plans (SWP³) at Army facilities, and
- To improve the quality of runoff while complying with facility stormwater permits.

This training is targeted for personnel employed in the following facilities: vehicle, marine and aviation maintenance. Although these target audiences share some common requirements, each has unique issues and responsibilities associated with stormwater. Consequently, three different baseline ver-

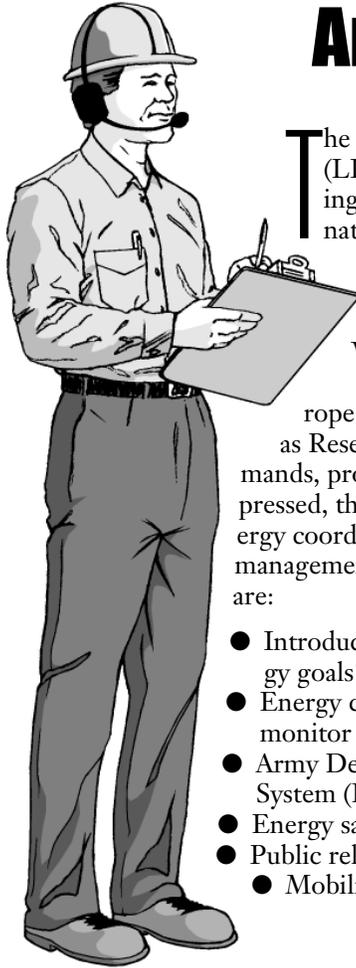
sions of the course were created, one for each target audience.

The ETSC has provided each Army installation Environmental Program Managers with a complimentary copy of the most current version of the “Stormwater Management” video-based training course. This course package is also available to military and civilian personnel from the Training Support Centers (TSCs) at Army installations. Additional copies may be obtained from ETSC in very limited quantities, as long as the supply lasts. Request your copy by contacting the ETSC distribution POC, Carol Brigance, at (205) 895-7409, FAX (205) 835-7466, or e-mail: brigancec@smtp.hnd.usace.army.mil.

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Army energy coordinator training



The Logistics Integration Agency (LIA) has developed a 34-hour training course for Army energy coordinators. This training is offered by the Army Logistics Management College (ALMC) and conducted semi-annually at Fort Lee, Virginia.

Offered on an area basis for Europe and the Pacific Command, as well as Reserve or National Guard Commands, provided sufficient interest is expressed, the course provides guidance to energy coordinators on all aspects of energy management. The major topics presented are:

- Introduction to the DoD and Army energy goals and programs.
- Energy coordinator and building energy monitor duties and responsibilities.
- Army Defense Utility Energy Reporting System (DUERS) Data System.
- Energy saving ideas.
- Public relations and awareness.
- Mobility energy management.

- Automated data and collection.
- Services and programs available through CPW.
- Utility energy management.

Here are the upcoming class dates:

Course Number	Size	Start date	End date	Registration Due Date
98-001	21	23 Mar 98	27 Mar 98	31 Jan 98
98-002	21	27 Apr 98	1 May 98	31 Jan 98

The Army Energy Coordinators Course is a no-fee course for DoD employees, civilian and military. ALMC will screen nominations to ensure course applicants are Energy Program Coordinators and meet minimum course requirements established by the ALMC course guidelines. Please submit your completed DD Form 1556 through your training office, so they can input the data into the ATAARS to get you registered, and make your own lodging arrangements at Fort Lee Billeting by dialing (804) 733-4100, ext: 5990, DSN 687-6700 ext 5990.

POC is Jeff Hager, (717) 770-6711 DSN 977, FAX: (717) 770-6702, e-mail: jeff.hager@hqda.army.mil **PWD**

New military handbook on petroleum fuel facilities

by Dennis Vevang

There is a new military handbook available. Petroleum Fuel Facilities, MIL-HDBK-1022, dated 30 June 1997, supersedes NAVFAC DM-22, dated August 1982. This new handbook applies to the Army, Navy/Marines, and the Air Force.

Petroleum Fuel Facilities contains general criteria and standard procedures for the design and construction of military land-based facilities which receive, store, distribute, or dispense liquid fuels. It is also applicable to the handling of liquefied petroleum gases (LPG) and compressed natural gas (CNG). It provides guidance on the rehabilitation, deactivation, or closure of fueling facilities. Support facilities are also included.

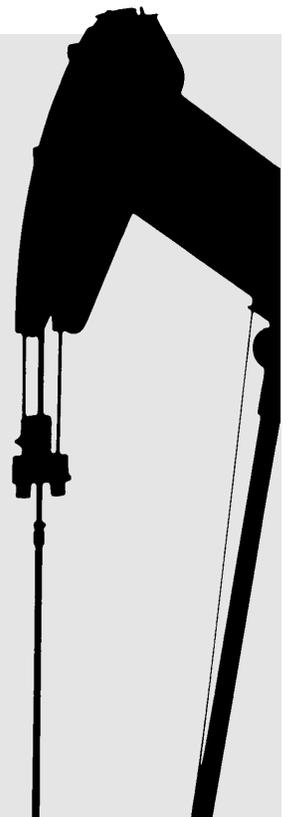
The guidance contained in this handbook is intended for use by facility planners, engineers, and

architects for individual project planning and for preparing engineering and construction documentation. In addition, it is intended for operations and maintenance personnel as a guidance document for facility design, modifications, and improvements.

This handbook is now available on the INTERNET at <http://web.infoave.net/~southdiv/criteria/index.htm#MHPF>

For more information, please contact Dennis Vevang, CECPW-EM (703) 806-6071 DSN 656. **PWD**

Dennis Vevang is a mechanical engineer in the Mechanical & Energy Division of the U.S. Army Center for Public Works.





All CP-18 (Engineers

and Scientists) and

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careerists are eligible

for CPW's Engineering

and Housing Advanced

Studies program

(EHASP), a long-term

training opportunity.

This is the second

article from Dan

Hitchings, who is

attending Harvard

University under the

1997-1998 EHASP

Program.

The summer session is over and we are about to start the "real" thing. Here are some notes and reflections on how the summer session went for me and what is going on now.

—Dan Hitchings

Shopping for classes at Harvard

The intensity of the courses in the summer varied and many things were optional. In reality, everything was optional because nothing was for a grade and it was really meant to prepare you. On the other hand, nothing was optional if you didn't already feel comfortable with it.

There was an incredibly large offering of things to do. Seminars, guest speakers, brown bag lunch speakers, tutorial sessions, professional interest group meetings, as well as the classes. The school offered basic computer tutorial sessions in all aspects of MS Office 97 and use of the internet.

It is incredible how many people have very little knowledge and experience with computers. Making choices and time management became a real challenge. There was no way to do every thing you are interested in, so setting priorities became very important.

The courses were very helpful. The microeconomics was great and analytics very useful. The case studies on specific issues and the issues briefing project were really experiments in group dynamics. In my opinion, they were carefully designed to demonstrate how interdependent we are and how tough it is to work in a group. Some real challenges. All in all, it was a great opportunity to assess where you are personally and help you make more informed choices on courses to take in the fall and spring semester.

A second, and large part of the summer session, was socializing. It gave everyone a chance to get to know their classmates, exchange ideas, and share viewpoints. With the tremendous diversity of students in the program, there is a lot to be learned from one another. Since nearly everyone lives in apartments in various directions, the socializing up front becomes very important. It is not likely we would have the time to get to know one another during the regular school year.

I can't imagine starting the program without the summer session. It would be extremely difficult to move from a work environment directly to school. The summer session has really increased what I will be able to get out of the regular program because now I am more ready, have tuned some

skills, have created some study habits, and have my mind set on learning. It was a good investment.

Now the tough part— selecting courses. We are allowed to take any graduate level courses offered at Harvard, including those at the Law School, Business School, School of Design, etc., and also cross register at MIT, or Tufts University (Fletcher School). There are more than 2,000 courses from which to select 8 to 10.

Harvard has a rather innovative way to let you preview classes at the Kennedy School. It is called "shopping days." Over the span of two days, each course is previewed two times. The professor gives a 30-minute overview of the course, provides a copy of the syllabus, and then answers questions. This gives you a great chance to get more detailed information about the class than a course description provides and to see the professor in action. You can "shop" for as many classes as you want, then start them on the following Monday.

"Shopping" also gives the professors a chance to tell you what is expected from class participants and to make an assignment for the first class.

Making the choices is not as easy I thought. I found that there are more courses I am interested in than I can fit in the schedule. So many questions...Do you work on skill based courses or knowledge based? Do you take things that are unique to the Kennedy School or things you really need? Do you select courses based on professors or on content? Well, the one good thing is that you can't go wrong. Nearly everything is a good course and you can't get everything in one year anyway.

Well, I'm off to start some assignments. One class has eight required texts along with other reading material they provide (at a cost). I will send you another update after a few weeks of classes.

Please keep in touch. I'd like to keep informed about the real world.

 You may reach Dan on the Internet at: Daniel_Hitchings/Student/KSG@ksg.harvard.edu **PWD**

Public Works

Digest

