Inside

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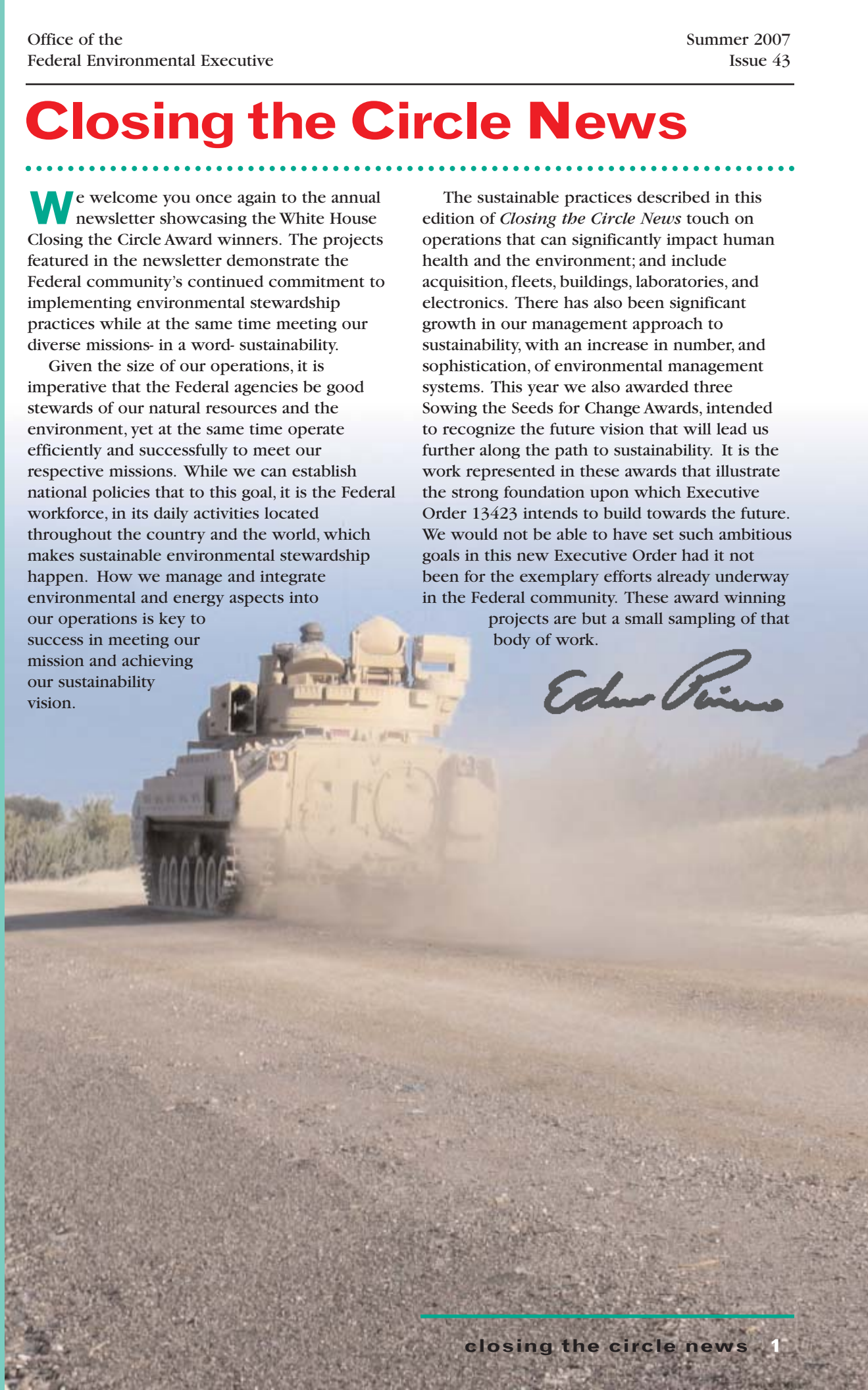
Closing the Circle News

We welcome you once again to the annual newsletter showcasing the White House Closing the Circle Award winners. The projects featured in the newsletter demonstrate the Federal community's continued commitment to implementing environmental stewardship practices while at the same time meeting our diverse missions- in a word- sustainability.

Given the size of our operations, it is imperative that the Federal agencies be good stewards of our natural resources and the environment, yet at the same time operate efficiently and successfully to meet our respective missions. While we can establish national policies that to this goal, it is the Federal workforce, in its daily activities located throughout the country and the world, which makes sustainable environmental stewardship happen. How we manage and integrate environmental and energy aspects into our operations is key to success in meeting our mission and achieving our sustainability vision.

The sustainable practices described in this edition of *Closing the Circle News* touch on operations that can significantly impact human health and the environment; and include acquisition, fleets, buildings, laboratories, and electronics. There has also been significant growth in our management approach to sustainability, with an increase in number, and sophistication, of environmental management systems. This year we also awarded three Sowing the Seeds for Change Awards, intended to recognize the future vision that will lead us further along the path to sustainability. It is the work represented in these awards that illustrate the strong foundation upon which Executive Order 13423 intends to build towards the future. We would not be able to have set such ambitious goals in this new Executive Order had it not been for the exemplary efforts already underway in the Federal community. These award winning projects are but a small sampling of that body of work.



Environmental Management Systems (EMS)

Environmental management systems (EMS) are a systematic approach to ensuring that an organization's environmental priorities and interests are incorporated into operational, planning, and management decisions. This category recognizes the most effective and innovative programs to implement EMSs at Federal facilities in accordance with E.O. 13148. Implementation of a facility-level EMS includes measurable environmental goals, objectives, and targets that are reviewed and updated as appropriate. The systems must also include a compliance component. This category also recognizes the use of quantitative or qualitative consideration of the full range (cradle to grave) of environmental costs and impacts of certain activities or procurement. ■

Waste/ Pollution Prevention

Waste prevention involves altering the design, manufacture, purchase, or use of products and materials to reduce the amount and toxicity of what gets disposed. It is sometimes called source reduction because it reduces or eliminates pollution at the source. This category recognizes waste and pollution prevention practices related to the generation of non-hazardous solid wastes or hazardous wastes or pollution from a Federal facility through any change in the design, manufacturing, or use/reuse of materials or products; and/or the amount of toxicity in waste materials before recycling, reuse, treatment or disposal. ■

Green Purchasing

The Federal green purchasing program gives preference to products which are made with recycled content, energy efficient, made with biobased content, or are environmentally preferable. It also includes the purchasing of alternative fuel vehicles and alternative fuels and products with no or lesser toxic or hazardous constituents. For the second year, the Green Purchasing category focuses on biobased products, the newest component of the Federal program. This is to reward trailblazers and leaders in biobased product use and purchasing. It recognizes how the agency, facility, or individual started to purchase biobased products through pilot projects, product testing, education and outreach to facility staff, or development of solicitation or contract language. ■

Sustainable Design/Green Building

Building sustainably is the practice of designing, constructing, operating, maintaining, and removing buildings in ways that conserve resources, reduce pollution, increase energy efficiency, and improve indoor air quality. Owning nearly 500,000 buildings, the Federal government has a tremendous opportunity to reduce energy and environmental impacts. This category recognizes the most innovative Federal government sustainable design and green building projects. It includes all facets of a project's life cycle, that is, project design and construction, energy efficiency, materials usage, building operations, and end of use issues. It also recognizes the cost effective use of innovative techniques and solutions that utilize sustainable design principles in the planning, construction, and operation of Federal facilities. ■

Alternative Fuel/Fuel Conservation in Transportation

With a very large fleet of automobiles, SUVs, and heavy trucks and buses, the Federal government can lead the way in increasing the use of alternative fuel vehicles and alternative fuels and reducing petroleum consumption. This is the third year this category recognizes programs, practices and procedures implemented in a Federal fleet that result in significant alternative fuel use and fuel conservation measures in transportation. This includes establishment of new alternative fuel infrastructure; methods for encouraging the use of alternative fuels; ride sharing programs; increased vehicle usage efficiency programs; hybrid vehicle or NEV acquisition and use; or any other methods a fleet uses to decrease its petroleum consumption. ■

Recycling

It is Federal policy to recycle to reduce waste and conserve resources. This category recognizes recycling activities – including collection, separation, and processing – by which products or other materials are recovered from the waste stream for use in the manufacture of new products. It also recognizes programs that have an internal education component and/or a public outreach component designed to promote recycling at the site, facility, or operation or to promote partnerships with the surrounding community. ■

Electronics Stewardship

New this year, this category recognizes Federal facilities that promote sustainable environmental stewardship of their Federal electronic assets in all three lifecycle phases: acquisition and procurement, operation and maintenance, and end-of-life management practices in accordance with the Federal Electronics Challenge (FEC) guidance for Gold Level partners or an equivalent program. ■

Sowing the Seeds for Change

Creating High Performance Buildings Through Innovative Policy

Washington, DC

Sustainable design/green building efforts among Federal agencies benefit from the interagency information-sharing facilitated by the Interagency Sustainability Working Group (ISWG). Created by DOE's Federal Energy Management Program in September 2001, the ISWG has more than 300 members from 19 agencies, of which 50 are active participants.

The ISWG laid the foundation for Federal sustainable design/green building efforts by identifying policy and technical issues; developing tools, guidance, and technical information; and developing the Memorandum of Understanding (MOU) for Federal Leadership in High-Performance and Sustainable Buildings. The notable contributions of the ISWG was illustrated by the MOU being elevated to a requirement for all agencies in E.O. 13423.

The ISWG recognized that in order for the Federal sector to fully embrace sustainability in the built environment, a coordinated policy among agencies was crucial. By acting as a forum for information exchange and policy development with Federal agencies that support sustainable building design practices, the ISWG successfully developed the Guiding Principles that serve as the foundation of the MOU for Federal Leadership in High-Performance and Sustainable Buildings.

During ISWG meetings, members go over specific topics including sustainable design techniques, updated reports, and any future plans, meetings, or conferences that pertain to green buildings. In addition to this, the group has developed a website that organizes information about sustainable design which gives members the ability to comment and make reviews about the new and different techniques for the creation and implementation of these buildings. The ISWG Intranet web site (http://www.eere.energy.gov/femp/technologies/sustainable_workinggroup.cfm) allows Federal agencies to post sensitive agency-sponsored sustainable design information for member review and comment. Through this and other means, the ISWG initiates and participates in the review and evaluation of Federal reports and programs dealing with sustainable design.

In FY 2006 alone, the ISWG successfully supported the implementation of sustainable design practices in Federal facilities by:

- Serving as a forum for the exchange of information within the Federal government on individual agency sustainable design activities.
- Supporting 19 agencies in sending high-level representatives to the "White House Summit on Federal Sustainable Buildings" that took place on January 24-25, 2006 and at which the agencies signed the MOU on Federal Leadership in High-Performance and Sustainable Buildings. The ISWG drafted and submitted the MOU to OFEE in the winter of 2005-2006.
- Developing the Technical Guidance for Implementing the MOU on Federal Leadership in High-Performance and Sustainable Buildings.
- Developing the Model Program Implementation Plan for the MOU on Federal Leadership in High-Performance and Sustainable Buildings.

The ISWG's Technical Guidance Task Group developed technical guidance for implementing the MOU guiding principles. In June 2006, the completed and posted technical guidance document on the Whole Building Design Guide (http://www.wbdg.org/sustainablemou/). The technical guidance is a compilation of resources that offer practical advice for designing, operating, commissioning, and monitoring sustainable new buildings and major renovations in the Federal sector. The guidance has been instrumental in assisting Federal representatives to fulfill the MOU guiding principles.

The model plan is a sample process or checklist that Federal agencies can use as a starting point in the development of their agency's High Performance and Sustainable Buildings Program. The plan has been successful in helping agencies meet the objectives of the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings.

ISWG plays an educational, analytical, and networking resource role in leading and guiding Federal partners to incorporate sustainable building design practices into their Federal facilities. Please contact Matt Gray, (202) 586-0067. ■

Sowing the Seeds for Change

The Army Strategy for the Environment: Sustain the Mission, Secure the Future

Washington, DC

Recognizing that simply complying with environmental regulations will not assure that it will be able to sustain its mission, the Army has moved from a compliance-based environmental program to a mission-oriented approach based on the principles of sustainability. Building on the lessons learned from sustainability pilot programs conducted at several Army installations, such as Fort Bragg, Fort Lewis, Fort Hood, Fort Carson, and Fort Campbell, the new Army strategy institutionalizes those efforts. The strategy is designed to build stronger relationships with local communities in order to find common solutions to environmental issues, while protecting training lands for Soldiers. For example, several of the Army installations arranged for land conservation easements, which both conserve land from development and ensure that development will not encroach on the areas needed for mission training operations.

The new Army strategy establishes a long-range vision that enables it to meet its mission today and into the future. Sustainability is the foundation for this strategy and a paradigm that focuses the Army's thinking to address both present and future needs while strengthening community partnerships that improve its ability to organize, equip, train, and deploy its soldiers as part of the joint force.

The Army Strategy for the Environment: Sustain the Mission, Secure the Future outlines the Army's long-term vision and its sustainability goals. The goals are as follows:

- ***Foster a Sustainability Ethic:*** Foster an ethic within the Army that takes us beyond environmental compliance to sustainability.
- ***Strengthen Army Operations:*** Strengthen Army operational capability by reducing our environmental footprint through more sustainable practices.
- ***Meet Test, Training and Mission Requirements:*** Meet current and future training and testing and other mission requirements by sustaining land, air, and water resources.
- ***Minimize Impacts and Total Ownership Costs:*** Minimize impacts and total ownership costs of Army systems, materiel, facilities, and operations by integrating the principles and practices of sustainability.
- ***Enhance Well-Being:*** Enhance the well-being of our soldiers, civilians, families, neighbors, and communities through leadership in sustainability.
- ***Drive Innovation:*** Use innovative technology and the principles of sustainability to meet user needs and anticipate future Army challenges.

For more information please contact John Fittipaldi at john.fittipaldi@hqda.army.mil or (703) 604-2307. ■

Army Sustainability Examples

Fort Bragg - Protecting Training Lands

To relieve pressure on training and readiness caused by encroachment and increased endangered species management requirements, Ft. Bragg, the U.S. Army Environmental Center, and The Nature Conservancy started the Private Lands Initiative (PLI) in 1995. Through the PLI, the Army and non-government organizations cost-share the purchase of land titles or conservation easements from landowners to minimize incompatible land use. The PLI has become a model for regional sustainability planning by ensuring that the land and resources of Ft. Bragg will be fully able to support military operational readiness and training. It also ensures that Ft. Bragg operates within its fair share of Earth's resources and strengthens community relationships. ■

Fort Campbell - Conserving Resources

Deconstruction provides an alternative to typical demolition and disposal. In deconstruction, buildings are demolished by hand in the reverse order of their construction to carefully remove materials for reuse and recycling. The process reduces disposal of materials into the landfill, and provides material for renovation and other small-scale construction projects. In 2002, Ft. Campbell partnered with Habitat for Humanity to demonstrate deconstruction of five WWII military barracks. The project demonstrates how to minimize the cost of excess building demolition while maximizing the value of recovered materials. ■

Fort Lewis - Improving Management Practices

Fort Lewis won the FY2002 Army Environmental Award for its installation sustainability undertakings. Fort Lewis was touted for conducting a Sustainability Executive Conference during development of its Installation Sustainability Plan (ISP), establishing an ISO 14001-compliant EMS and being the first Army installation to achieve third party registration, establishing the Model Motor Pool program, and purchasing 14 neighborhood electric vehicles to help reduce air emissions and petroleum-based fuel consumption.

The sustainability conference established Fort Lewis as a leader in the regional sustainability movement, and resulted in an invitation to participate in the Governor's sustainability task force. This has improved an already excellent relationship with the local community and will help pave the way for future partnering opportunities. ■

Sowing the Seeds for Change

Successful Launch of EPEAT

Washington, DC

The successful launch of the Electronic Products Environmental Assessment Tool (EPEAT) on July 21, 2006 has made the purchasing of environmentally preferable electronics a reality. Seeing the need for criteria for environmentally preferable office electronic equipment, EPA provided seed funding and staff to work with stakeholders to develop the standard, assist Federal agencies seeking to purchase environmentally preferable office electronics, and develop other tools for Federal purchasers. The EPEAT tool was developed out of a three year process funded and staffed by EPA, with the assistance of more than 100 stakeholders.

In 2004, 12 Federal agencies representing 84 percent of the Federal government's annual information technology (IT) budget signed a Memorandum of Understanding with OFEE and EPA committing them to reduce the environmental impacts of their procurement, use, and disposal of electronics. At the time, there was no commonly agreed upon system for identifying environmentally preferable computer products. In order to meet their commitments, Federal agencies needed to expend tremendous effort to identify and evaluate environmental attributes in computer procurements. EPA launched EPEAT to meet the agencies' needs and save them innumerable hours and dollars in the process.

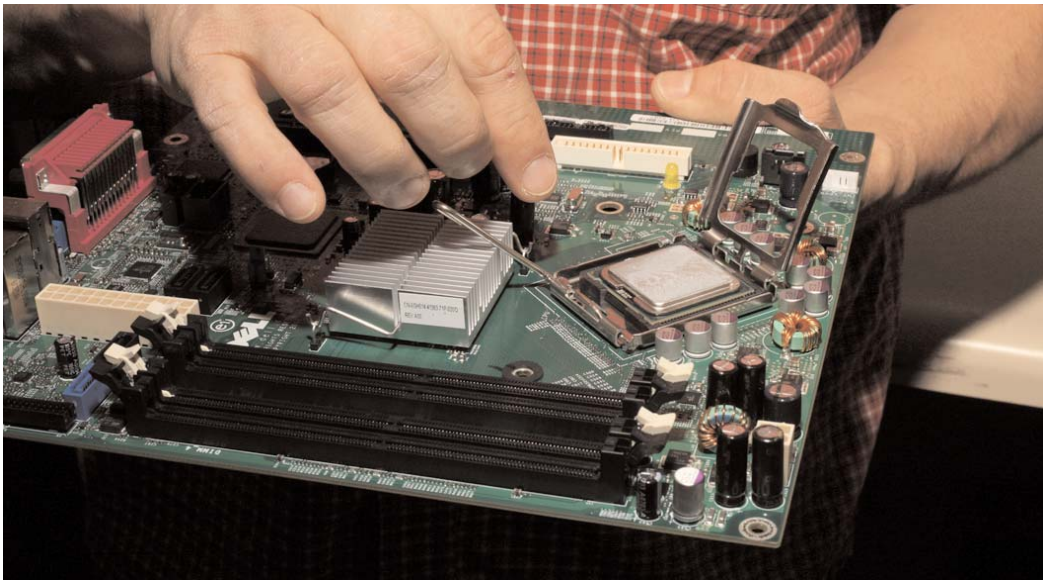
The result is the Institute of Electrical and Electronics Engineers (IEEE) 1680 American National Standard for the Environmental Assessment of Personal Computer Products, which defines environmental performance criteria for computer desktops, laptops, and monitors. The standard identifies mandatory and optional criteria. Products meeting the mandatory criteria are eligible to be registered as EPEAT-bronze, while those meeting 50 percent or 75 percent of the optional criteria can be registered as EPEAT-Silver or Gold, respectively. Within the first year after the standard was launched, more than 500 products have been registered, including 6 at the Gold level. At least 13 manufacturers, including Apple, CTL Corporation, Dell, Gateway, Hewlett Packard, Lenovo, Mind Computer Products, NEC, Northern Micro, Panasonic, Sona Computer, Sony Corporation, and Toshiba, have registered products.

As of January of 2007, Federal purchasers have integrated EPEAT requirements as a component into IT Requests for Proposal (RFPs) or contracts. Considering that these IT RFPs and contracts total $42 billion, the Federal government is sending a strong message to the marketplace that there is demand for greener computers on the part of large purchasers. To help make this happen, EPA provided technical assistance by educating agency IT departments about the EPEAT tool, assisting in bid evaluation, and providing sample solicitation language.

EPA is also funding the development of an Environmental Benefits Calculator which can calculate the environmental benefits achieved by procuring EPEAT registered products. This tool will be used in two ways:

- Individual purchasers can input the number of EPEAT-registered products they have procured to get the specific amount of resulting environmental benefits.
- The Green Electronics Council will provide aggregate data from EPEAT manufacturers on the total number of EPEAT-registered products shipped annually to determine annual total environmental benefits achieved by the standard.

The creation of the program has been a marvelous success that has already saved the Federal government time and money. EPEAT is also a testimonial to the effective way that the government and marketplace can work together, through the use of voluntary, consensus standards, to realize environmental and economic benefit. For more information about the program please contact Holly Elwood at elwood.holly@epa.gov or (202) 564-8854. ■



Environmental Management Systems-Military

Continual Environmental Improvement for Sustainability at Fleet Readiness Center Southwest

San Diego, CA

Fleet Readiness Center Southwest (FRC SW) is a manufacturing, maintenance and repair facility for F/A-18 Hornets, E-2C Hawkeyes, C-2A Greyhounds, S-3 Vikings, H-53 Sea Stallions, SH-60 Seahawks, EA-6B Prowlers, UH-1N Hueys, and AH-1 Super-Cobras. The installation repairs thousands of aircraft component line items representing a volume in excess of 30,000 units annually. It also repairs and overhauls the LM2500 engine that powers Navy ships, replenishes the Navy's Supply System with repaired aviation parts, and performs inter-Service work for the Army, Air Force and Coast Guard. Its Field Service Strategic Business Team (SBT) sends cross-functional teams to support deployed squadrons worldwide. FRC SW occupies 63 buildings including more than 2 million square feet of workspace on 358 acres and employs approximately 3,300 civilian and military personnel. A wide variety of industrial processes are deployed, generating a range of environmental impacts.

FRC SW successfully uses its environmental management system (EMS) to coordinate a multitude of command functional groups and shop areas to meet its mission, while addressing Federal and State of California environmental regulations. The EMS approach enables the installation to coordinate a multitude of command functional groups and shop areas within the FRC SW to agree on solutions that improve the environment (reduce pollution) while ensuring that all other command criteria for projects are satisfied for mission success.

Key initiatives are incorporated at FRC SW to accomplish positive results for the environment despite a time of shrinking budgets. The key initiatives include teaming energy conservation with pollution prevention for leveraging resources, using existing budgets for green procurement and recycling, using the ISO 14001 EMS plan-do-check-act process, using a process improvement team, and a table providing zero discharge focus points for sustainability. The result has been continued success for environmental improvement.

Under FRC SW's EMS, the Strategic Business Units (SBUs) participate in identifying their own objectives and targets, considering the associated environmental impacts and identifying them in a standardized project plan. These objectives and targets are reviewed and screened by the Environmental Improvement Team (EIT), a multi-disciplinary team of subject matter experts that provide their input and recommendations to management. The process ensures that all necessary approvals are documented, including the Executive Steering Committee (ESC or top management) if necessary. In addition, the Environmental Program Offices uses the EIT as an integrated process action team to identify and implement pollution prevention initiatives. The various stakeholder considerations are addressed throughout the process.

After targets have been identified and the EIT has given their input, the process to implement the action is initiated. Each project is entered into a shared database which allows all interested parties to keep tabs on the process. A second key part to the FRC SW's EMS is that it has an internal audit component which offers management oversight into the project and ensures it is moving forward.

FRC SW developed a "Zero Discharge" Pollution Prevention (P2) table of focus points for sustainability applicable to any process, equipment, building, governmental or commercial organization. It may be applied to any or all components to life cycle assessment, including materials acquisition, manufacturing, post-manufacturing or use and disposal. These focus points are:

- Raw materials
- Energy
- Water
- Ozone depleting substances
- Vehicles
- Historical pollution
- External compliance requirements

The EIT ranks all P2 projects via the EMS system to achieve zero discharge for sustainability. Key metrics tracking results are used for measuring actual progress. Selected projects are implemented via the EMS. This is an established process assisting the entire command for improvement through a standard management process registered to the ISO 14001 Standard.

In implementing the zero discharge P2 approach, FRC SW integrated its P2 and energy conservation programs. During the past three years (2004 through 2006), FRC SW has applied for and received energy grants to implement projects that save energy and reduce pollution. For example, by switching to Turbo-cor Chillers and direct digital control – magnetic bearings used with an electrical centrifugal motor – FRC SW will eliminate the use of lubricating oils and the associated waste, as well as ozone depleting substances used in this type of > > >

> > > equipment. While costing $1 million, this first-of-its-kind purchase with the Department of Defense will avoid $125,000 in costs, reduce energy usage by 1,042 kilowatt hours annually, and pay back within 8 years.

The facility recycles significant volumes of hazardous and non-hazardous wastes, including 209,000 pounds of abrasive blast media, nearly one ton of batteries, 84,000 pounds of mixed oils, 15,000 pounds of solvents, 143,000 pounds of paper, and 829,500 pounds of metals.

In working toward its zero discharge goal, from FY 2004 to FY 2006, FRC SW has achieved an amazing reduction of 68 percent of containerized waste, nearly 100 percent of industrialized waste, 97 percent of extremely hazardous waste, 92 percent of priority highly toxic air emissions, and 90 percent of ozone depleting substances, with significant reductions in other air pollutants and energy and water usage as well.

For more information about environmental improvement at FRC SW, please contact Raymond Paulson at raymond.paulson@navy.mil, and for questions about the EMS, contact Richard Pfeiffer at richard.pfeiffer@navy.mil. Environmental Program Office – (619) 545-2907. ■

Environmental Management Systems-Civilian

Expanding the Envelope of BNL's EMS

Upton, NY

The Department of Energy's (DOE) Brookhaven National Laboratory (BNL) is the first Office of Science laboratory to achieve site-wide third party certification of its environmental management system (EMS) to the ISO 14001 EMS standard. BNL began its EMS with certification of its Relativistic Heavy Ion Collider (RHIC) project. The project was soon followed by EMS certification at eight facilities and then the entire site. BNL's EMS model has been used by many other DOE facilities as a template for development of their own EMSs.

Each year, the EMS participants develop targets and objectives, reflecting BLN's focus for improvement for the year, DOE expectations, and commitments to other BNL stakeholders.

Furthering improvements through its EMS and commitments to environmental stewardship, BNL has participated in or gained membership to several voluntary environmental programs including the EPA National Performance Track Program, the National Partnership for Environmental Priorities, the Federal Electronics Reuse and Recycling Program, the EPA Mercury Challenge, and the FY 2007 Federal Electronics Challenge. From 2003 through 2006, BNL has recognized significant benefits through participation in these programs, including:

- 40 percent reduction in the site-wide inventory of mercury
- 90 percent reduction in the onsite inventory of PCBs
- 35 ton reduction in Class I ozone depleting substances
- 34 percent reduction in atmospheric emission of radionuclides
- Recovery of 42 acres for restoration as viable forest
- Recycling of 50 tons of electronics during 2006 alone

BLM shares its knowledge not just within DOE but with others through presentations at EPA-sponsored workshops and the New York State (NYS) Business Council.

In recognition of the Lab's strong EMS and membership in PTrack in late 2005, BNL was requested by the NYS Department of Environmental Conservation to participate in the development of the NYS Environmental Leaders program, the NYS corollary to the EPA PTrack program. This program will be accessible to organizations with proven compliance programs, a strong EMS, and continuing commitments toward environmental stewardship. In addition, BNL routinely presents its EMS status and successes at local Community Advisory Council meetings, Brookhaven Executive Round-Table meetings (an organization comprised of DOE and local, state, and county regulators), and DOE-wide routine meetings.

For more information, please contact Robert Lee at blee@bnl.gov or (631) 344-3148. ■

Waste/Pollution Prevention — Military

Every Waste a Reuse Opportunity

Fort Hood, TX

Flort Hood, located in central Texas, operates many diverse programs aimed at minimizing the large volume of solid waste generated on-site. The 218,000 acre installation supports a daily population of 374,416, which is large enough to be considered a medium-sized city in Texas. With such a large population on-site, solid waste generation was determined to be the number one significant aspect under Fort Hood's EMS. Since solid waste emerged as the base's most significant aspect, waste prevention and recycling are viewed as the most viable options to improve the base's environmental performance.

Using waste prevention and recycling, Fort Hood takes a materials management approach to reducing the amount of solid waste requiring disposal. Its innovative material substitution efforts have a huge impact on the installation. The inert material management program diverted more than 90,000 tons from the landfill during 2006. The reuse of waste asphalt shingles and asphalt roadway for surface road improvements reduce dependency on exterior purchases of asphalt, while diverting more than 1,000 tons of waste material from the landfill, saving the installation almost $30,000. Partnering with Texas A&M University, Fort Hood developed a process that reuses asphalt and masonry material generated around the installation, while diverting more than 9,900 tons of waste from the landfill and saving the installation more than $285,000 in disposal costs. The process creates a new trail surface by takes a mixture of asphalt concrete and masonry and adds fly ash, calcium chloride, and cement to form a surface that is stronger and less expensive than current maintenance practices.

On another project, Fort Hood's inert material management program provided more than 4,000 tons of processed asphalt used for roads to installation stables, saving the installation more than $18,000 in new material purchases, along with a disposal cost avoidance of more $100,000. These inert material management and compost programs, exemplify long-term sustainability initiatives used in waste prevention, erosion control, air and water quality challenges, and land reclamation.

The installation uses composting to reduce a significant volume of its solid waste stream. In 2006, the compost program diverted 2,874 tons of waste material from its landfill and saved more than $83,000 in disposal costs. This compost program is the first of its kind in the Army that sells compost and mulch through an installation qualified recycling program. The compost meets Texas Department of Transportation and U.S. Composting Council requirements for unrestricted use, which allows Fort Hood to use the compost and mulch in a wide variety of applications for land reclamation and erosion control, supporting the installation's training mission through measures to maintain critical maneuverability training using waste diverted from the landfill.

Fort Hood partnered with the Commission on Environmental Quality and EPA to develop a unique erosion control compost method for improving land reclamation and erosion control application methods across the installation. This method assists three counties to use compost in erosion control and to reduce contamination in local watersheds. It has become critical to the three counties' water quality. The Army Corps of Engineers recognizes erosion control compost as a best management practice that positively impacts both land reclamation and waste minimization.

Fort Hood also has a growing deconstruction program that identifies the deconstruction potential in all structures, and then works with installation agencies like Fort Hood Family Housing (RCI) and the Corps of Engineers to find "win-win" deconstruction process in lieu of demolition. Current Habitat for Humanity efforts have diverted more than 700 tons of material from the landfill, while providing more than $45,000 in revenue for Habitat for Humanity and saving more than $28,000 in landfill cost.

In the State of Texas, soil contaminated with petroleum, oil, and lubricants (POL) is classified a special waste. Fort Hood's POL-contaminated soil remediation program, the Army's first, remediated more than 2,000 tons of contaminated soil, saving the installation more than $200,000 during the award period. Fort Hood remains on the forefront of new process development through the implementation of a "natural" remediation process and the windrow composting of POL contaminated soils, both Army firsts. These two projects significantly reduced current processing times, saving more than $75,000 in disposal cost.

Exemplifying the Army's sustainability program, Fort Hood is demonstrating that mission and training ability are enhanced by integrating environmental concerns into daily activities using innovative techniques. Fort Hood has improved cost-avoidance and efficiency while spreading environmental stewardship across the installation's divisions and agencies. All installation > > >

> > > personnel excel in solid waste reduction and recycling. With a strong commitment to environmental management, mission enhancement, community involvement and outreach, Fort Hood continues to build a sustainable installation to be "The Great Place".

To learn more about Fort Hood's efforts in waste prevention, please contact Jeff Salmon at jeff.salmon@us.army.mil or (254) 287-9184. ■

Waste/Pollution Prevention — Military

Awni M. Almasri: Waste Minimization at Commander Navy Region, Southwest Asia

Bahrain

Awni Almasri is the Regional Environmental Program Director for the Commander Navy Region, Southwest Asia (CNRSWA) and its 79 tenant commands. The primary mission of CNRSWA, Naval Support Activity (NSA) Bahrain, and the tenant commands is to provide critical logistical support to US forces operating in the Arabian Gulf Region.

In 1999, Mr. Almasri received a Closing the Circle Award for used oil recycling and a program to clean and reuse dirty shop towels. These programs were created as a partnership with the Bahrain Ministry of Environmental Affairs. Since then, he has continued to implement rigorous waste prevention and recycling programs that divert both solid and hazardous waste from disposal, saving hundreds of thousands of dollars in disposal fees. On a daily basis, he helps in the reduction of anything from regular recyclable materials (paper, glass, wood, etc.) to hazardous waste that is produced on site or delivered from ships for disposal.

CNRSWA's program was able to recycle more than 760 tons of solid waste, which reduced disposal costs by 30 percent, avoided $45,000 in disposal costs, and earned $15,000 in revenue. Mr. Almasri used the revenue to purchase more recycling equipment and provide pollution prevention and recycling training for both military and civilian personnel. In addition, Mr. Almasri began collecting reusable and gently used clothing to be donated to locals that needed it the most. Through the generosity of Mr. Almasri, the program has been able to help clothe several hundred community members.

The shop rag and used oil programs expanded to 97 tons of rags and 98 tons oil, a significance increase from the 24 tons of rags and 370 55-gallon drums of oil recycled in the 1990s. The rag washing program alone saved $160,000 on disposal costs.

Mr. Almasri created a program to reuse empty drums that otherwise require specific cleaning or disposal. The used drums are provided to ships free of charge instead of disposing of them through the Defense Reutilization and Marketing Service (DRMS). This practice not only reuses drums, it saves more than $40 per drum on disposal charges and the cost of purchasing new drums, which can run $75 – 100 for a new United Nation (UN)-certified hazardous waste drum.

He also created a hazardous materials reuse program to find users of materials otherwise destined for disposal. Materials are made available to customers free of charge, saving them the cost of purchasing new materials. Material typically reused in this program include paint, detergents, solvents, lead acid batteries, fire extinguishers, anti-fire fighting foam, dessicants, and compressed gas cylinders. This program has reduced disposal costs by more than $125,000 and saved more than $60,000 of hazardous materials procurement funds. For additional information, please contact, Awni Almasri at awni.almasri@me.navy.mil or 011-973-1-785-4630. ■

Waste/Pollution Prevention — Civilian

Thomas Jefferson National Accelerator Facility Cryogenic Refrigeration System Improvements

Newport News, VA

Thomas Jefferson National Accelerator Facility (Jefferson Lab) is funded by the Department of Energy (DOE), with strong support from the City of Newport News, VA, the Commonwealth of Virginia, and the United States Congress. As a user facility for scientists worldwide, its primary mission is to conduct basic research of the atom's nucleus at the quark level. With industry and university partners, it also has a mission in applied research for using the Free-Electron Lasers based on technology the laboratory developed to conduct its physics experiments. As a center for both basic and applied research, Jefferson Lab also reaches out to help educate the next generation in science and technology.

The Cryogenics Group in the Accelerator Engineering Department is tasked with providing refrigeration for a variety of Jefferson Lab research activities. Three refrigerators provide -452 and -456 degrees Fahrenheit refrigeration for the operation of the Continuous Electron Beam Accelerator Facility and its three experimental halls, the Free- Electron Laser Facility, and the Superconducting Radio Frequency Test Facility.

Using their extensive experience in the industrial design of cryogenic systems, group members designed a new process that revolutionizes the way cryogenic plants work. As a result, the plants use less electricity and the time between maintenance periods is extended, thereby reducing waste from the maintenance process — providing both energy and environmental benefits.

Jefferson Lab uses liquid helium at sub-frigid temperatures to cool instruments and superconducting accelerator cavities. Before any cooling takes place, the helium must be compressed, which heats it up. Cryogenics Group Deputy Leader Venkatarao Ganni stated that of all the components in the system, the compressors use the largest amount of electricity. "We use very large helium compressors, which compress helium from about one atmosphere up to 21 atmospheres. These compressors use a lot of electrical power," Mr. Ganni states.

Ganni further states that helium refrigerator manufacturers did not always consider the daily variations in a client's needs when designing a plant. Instead, refrigerators were made to operate at maximum efficiency when at the full refrigeration design capacity or, at best, a few intermediate operating points. "In industry, we were asked by our customers to guarantee this maximum capacity, although that operating point is normally higher than the daily operating needs," Ganni said.

For instance, when less refrigeration was needed in the past, the same amount of helium was sent through the compressors at full operating pressures; therefore, the compressors were using the same amount of electricity, even when full refrigeration capacity was not needed.

By making changes to the process, the Cyrogenics Group was able to significantly reduce energy use. They reconfigured the refrigeration system controls to efficiently scale back the compressor energy consumption by reducing the operating pressures when full capacity is not needed. When more refrigeration is required, the system controls then ramp the system pressures back up. This different mode of operation, dubbed the Ganni Cycle, has made the refrigeration plant much more efficient. The "Ganni Cycle" required very few or no new components. Rather, how the system is controlled and configured provides the results.

The portions of the Ganni Cycle which can be used for existing plants have slashed the power requirements of the Jefferson Lab's refrigeration system, while still meeting the Lab's needs. The cycle has dropped the electricity required for Jefferson Lab cryogenics from 6 Megawatts (MW) to 4.2 MW, resulting in a direct savings of $33,000 each month in electricity costs.

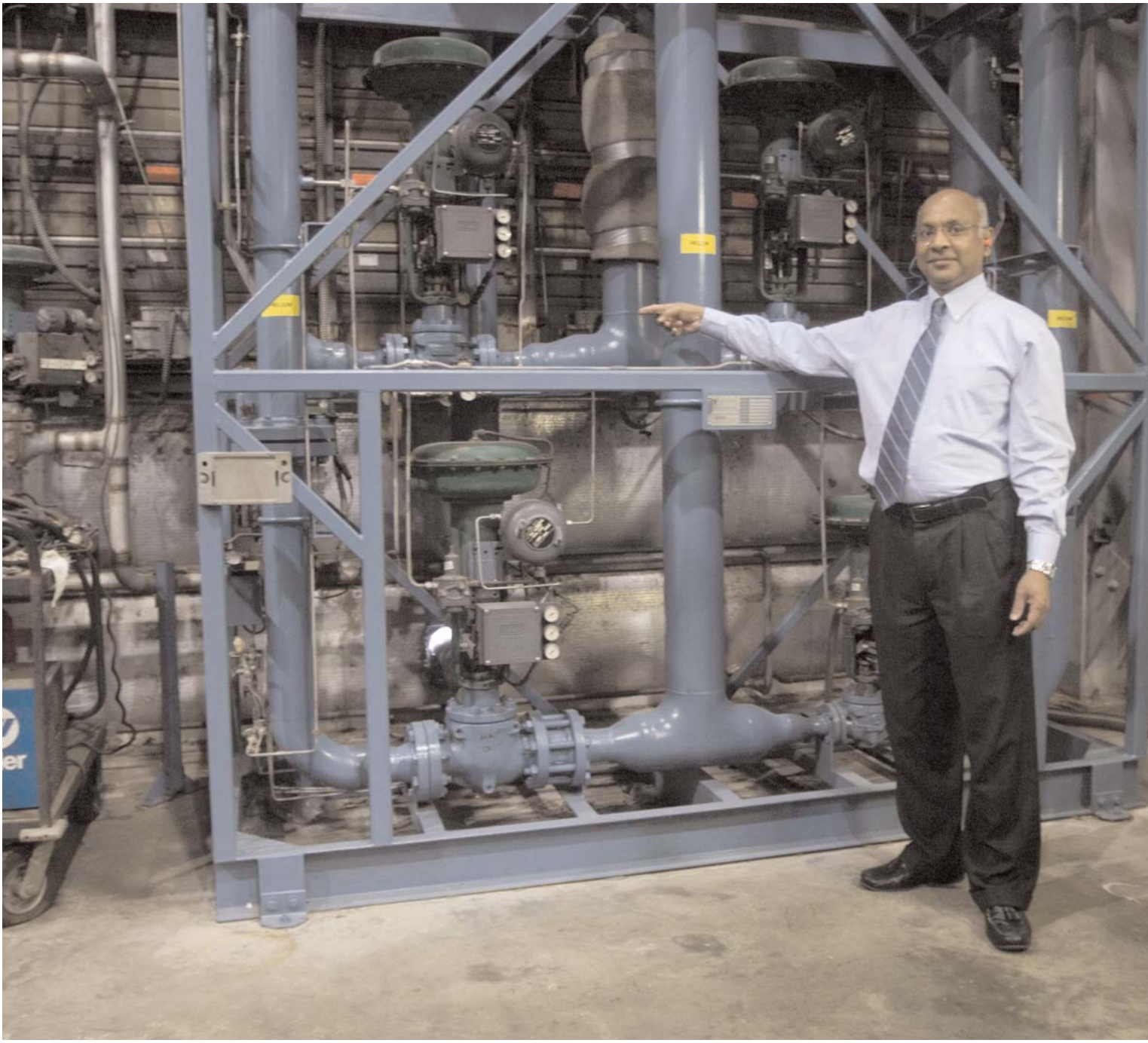
The Ganni Cycle also nearly doubles the lifetime of some refrigerator components, increasing the time between necessary maintenance periods. This reduces both labor costs and waste generated annually from maintenance.

The Cryo Group used some of the money saved to revitalize the refrigeration plant's charcoal beds – used to purify the helium — and to conduct other cost-saving maintenance and efficiency improvements.

Other DOE facilities are now using portions of the Ganni Cycle at existing plants. Brookhaven National Laboratory upgraded the Relativistic Heavy Ion Collider (RHIC) cryogenic system, applying portions of the Ganni Cycle to help increase the efficiency of the helium liquefier. The collaboration between Jefferson Lab and BNL reduced the refrigerator electric power consumption by 35 percent, from 9.2 MW to 6 MW. The RHIC staff also reported an increase in system stability and reliability. At the Spallation Neutron Source at Oak Ridge National Lab, a similar collaboration centering on > > >

> > > optimizing the 2K (Kelvin) helium cryogenic plant operation led to a 32 percent electric power reduction, from 3.8 MW to 2.6 MW.

This ingenious process has not only saved at Jefferson National Accelerator Facility but across other DOE facilities and is now in the review process for a patent. For more information please contact Dana Arenius at arenius@jlab.org or (757) 269-7276. ■



Green Purchasing — Civilian

NOAA GLERL Green Ship Initiative

Muskegon, MI

Reprinted from Fall 2006 Edition of "Closing the Circle News"

The Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), Great Lakes Environmental Research Laboratory (GLERL) conducts ecosystem research throughout the Great Lakes region. GLERL research vessels also provide platforms for other NOAA entities and Federal agencies with interests in the Great Lakes.

GLERL's Ship Operations Group, based in Muskegon, MI, created a "Green Ship Initiative" in 1999 to explore innovative ways to reduce the environmental impact of its ships and boats on the nation's greatest fresh water resource. During the past two years, this initiative has transitioned from a series of pilot projects to full implementation. The current emphasis is on outreach and technology transfer as interest grows for environmentally friendly shipboard practices.

An element of the "Green Ship Initiative" is to explore shipboard systems and materials that have the greatest potential to reduce environmental impact, yet may not have extensive field trials. One example is the exclusive use of B100 biodiesel, as opposed to the B20 that is now widely used, particularly in Federal fleet vehicles. Total emissions from B100 are four times lower than B20, and the fuel is significantly less toxic than petroleum diesel, making B100 a better choice for marine applications. Most importantly, B100 eliminates the high sulfur emissions of marine #2 diesel fuel. GLERL's six-year successful experience with B100 has answered many questions about long-term effects on engine performance, life cycle costs, material compatibility, and cold weather operation.

In order to convert to biodiesel, operators of older vessels might need to replace non-compatible materials such as natural rubber, certain elastomers, or yellow metals. Due to the detergent effect of most biobased oils, GLERL anticipates an increase in the removal of contaminants and dirt with the installation of larger or secondary filters until the initial peak in particulates removal.

During fiscal year 2006, GLERL vessels consumed more than 16,000 gallons of B100 in a diverse list of diesel engine types onboard three vessels. GLERL has assisted other NOAA operating groups and universities with the conversion to B100 fuel onboard six additional research vessels, accounting for another 8,000 gallons this year. Increasingly, institutions with an environmental mission are converting to this cleaner, renewable fuel.

Biobased products are now used exclusively for all GLERL shipboard systems, including fuel, hydraulic, transmission, and engine crankcase systems, and for maintenance products. Canola based motor oil is performing well in the diesel engines and is being analyzed to determine ultimate service life. This canola motor oil/B100 soy biodiesel combination is unique and could yield further emission reductions. > > >

> > > Preference has been given to products with the highest biobased content for shaft seal oils and deck hydraulics, where there is a risk of overboard discharge. These products have been tested under the rigors of the marine environment in both warm and cold climates and have been found to be equivalent to petroleum product performance.

There have been a number of operational benefits to the Green Ship Initiative. Technology reviews, pre-trial risk analysis, and product evaluations have improved staff expertise and refocused attention on all mechanical systems. Calculation of life cycle costs has highlighted the complexity of systems and offered some creative solutions. For example, GLERL addressed the high cost of fueling small boats at remote sites by using 275-gallon tote containers as temporary storage and shuttles to dockside. This provides the economy of tanker truck shipments with fueling flexibility not available through commercial marinas, and the cost of the totes was recouped within two years based on the savings from delivery costs. The less hazardous nature of B100, as compared to #2 diesel, allows greater logistic options. The strong detergency of B100, often viewed as a negative, is being effectively used to overhaul old fuel systems without manual disassembly and cleaning.

One concern raised about biobased oils is shelf stability. Through the use of inventory controls, GLERL keeps minimal amounts of material on hand, which avoids shelf stability problems. GLERL has not encountered any operational problems with age or stability.

Another concern is the impact of cold temperatures on the oils. The B100 fuel is somewhat insulated by the water, so its temperature rarely drops below 50 degrees even when the surface is ice covered. Under extreme conditions, or if a smaller boat is removed from the water, a B20 mix is used instead of B100.

GLERL has participated in a number of public outreach events, including the Michigan Energy Fair, focused on the importance of renewable and environmentally friendly energy sources. The presence of a federal research ship at these events has been a significant public attraction and provides a real world demonstration of a petroleum free alternative. GLERL involvement with biobased industry groups, such as the Michigan Soybean Promotion Committee, has helped promote biodiesel and other biobased oils in marine recreational and commercial markets.

To better communicate lessons learned and share technical resources, GLERL established a Green Ship working group with participants from NOAA and university and commercial vessel operators. Initially focused on science research ships, this network is growing in its scope and diversity. For more information, please contact Dennis Donahue at dennis.donahue@noaa.gov. ■

Green Purchasing — Civilian

Timothy Trittschuh: Biobased Fluids Pilot Project at Fort Custer National Cemetery

Augusta, MI

In time of war and in time of peace, maintenance of our national cemeteries is a sacred charge. Timothy Trittschuh, a mechanic at Fort Custer National Cemetery (FCNC), takes his responsibility caring for both the final resting places of our nation's veterans and the environment very seriously. Demonstrating that mission can be accomplished in a sustainable way, Mr. Trittschuh led FCNC's effort to test and use biobased products in cemetery grounds maintenance equipment.

FCNC is a 770 acre facility with more than 20,000 graves located in Augusta, MI. The FCNC maintenance crew use more than 90 pieces of equipment in their work, including lawnmowers and backhoes. Seeking ways to conserve oil in the cemetery operations and to try alternatives to petroleum-based products, Mr. Trittschuh was eager to try biobased products that were homegrown and less damaging to the environment.

In June 2005, FCNC began using B20 biodiesel fuel for all diesel equipment. The cemetery staff found that B20 performed as well as conventional diesel, provided improved engine performance, and reduced engine emissions. Mr. Trittschuh then partnered with the United Soybean Board (USB) to conduct a pilot test of additional biobased products. In November 2005, discussions began in earnest with USB for a 6-month pilot project, and soy-based fluids and lubricants were added to FCNC's equipment in 2006. These materials meet government "greening" objectives, are safer for employee handling, and are biodegradable if spilled. Biobased fluids are now used in two-cycle grounds maintenance equipment and heavy equipment hydraulic/transmission systems at the cemetery.

As part of the pilot project, USB donated biobased products to FCNC for their use and evaluation. The products were tested in a variety of equipment. FCNC found that all of the products tested have worked as well as, or better than, their non-biobased counterparts. The equipment in which the biobased products are used is performing normally in all weather conditions. Backhoe operators have noticed that controls used to maneuver hydraulic equipment feel tighter and smoother, providing safer operation.

The task of the project was to > > >

Soy-based Products Used at Fort Custer National Cemetery

- Bar and chain oil
- Two-cycle engine oil
- Hydraulic (universal tractor) fluid
- Hydrostatic fluid
- Winter diesel fuel conditioner

> > > identify the performance characteristics for biobased products in cemetery operations. The goal was to show that there would be no negative effect from using biobased products, and hopefully show that there were instead positive effects. The project conclusions were that there were indeed positive effects, including cost savings on biodiesel fuels such as B20.

As part of the pilot, FCNC evaluated environmental impacts, including air emissions, wastewater discharge, waste disposal, spill impacts, environmental regulatory requirements, and worker health and safety effects. In addition, equipment performance in all weather conditions were evaluated for both conventional petroleum and biobased products. Mr. Trittschuh researched suppliers and USB information and compared Material Safety Data Sheets (MSDS). Equipment tests were conducted under extreme weather conditions. The maintenance staff also examined adverse wear on rubber parts (o-rings, seals, boots, etc), metal-to-metal wear, and consumption reports. All tests of biobased oils and fuel indicated no negative adverse reactions, and product performance comparisons were somewhat better than petroleum based products.

What about cost? There was no cost related to the initial pilot project due to the donation of the products, but lubricating oil and fluids are substantially more expensive than petroleum based products; their use would be two to six times greater than petroleum based products in the future. Biodiesel (B20), however, is currently five cents a gallon cheaper than regular diesel. FCNC uses approximately 4,000 gallons of diesel fuel per year, resulting in a $200 per year savings. Based on the B20 cost savings and the favorable performance of the other biobased products, FCNC plans to continue using them.

The pilot program at Ft. Custer will be used as the basis for use of B20, as well as other biobased fluids and lubricants, at the other 122 national cemeteries. The experience gained could enable biobased product use at other Department of Veterans Affairs (VA) facilities, such as B20 biodiesel for diesel powered emergency generators at VA hospitals, as well as the other biobased fluids and lubricants tested. In addition, the information will be provided to state veterans cemeteries through the state-grants program. It will also be available to the US Cemetery Association.

For further information about the use of biobased products at FCNC, contact Kenneth Haines at Kenneth.Haines@va.gov or (269) 731-2337. ■

Recycling-Military

Kadena AB Recycling Team

Okinawa, Japan

Kadena Air Base (KAB), Japan, is the largest U.S. installation in the Asia-Pacific region and home to the Air Force's largest combat wing. KAB is located on Okinawa, south of mainland Japan. Okinawa is only 67 miles long and up to 17 miles wide and covers a total area of 454 square miles. The small size of the island drastically limits the amount of landfill space for all inhabitants of Okinawa, and high transportation costs to off-island recycling facilities affect recycling costs. Despite these limitations, the base has an > > >

> > > impressive recycling program. KAB promotes protection of the pristine waters and natural resources of the Ryukyu Islands by making recycling easy. KAB combines executive order, statutory, and Air Force requirements by collecting, separating, and processing materials.

Despite increased costs of transporting recycled materials off-island, KAB maintains a relentless drive to accomplish a first rate recycling program and overcome the challenges of limited space and marketable items. Due to overseas disposal costs of $260 per ton, KAB has significantly reduced its solid waste disposal costs through recycling, composting, and mulching. Skyrocketing costs of solid waste and hazardous waste disposal provides KAB with a strong incentive to continue developing creative approaches to recycling and composting programs. KAB reduced the solid waste disposal rate from more than 25,000 tons to approximately 14,080 tons per year. This effectively decreased disposal costs by more than $2.8 million dollars in 2006. Commodities commonly recycled in the U.S. are not common overseas which is why KAB is so proud of its success.

The base's recycling program is comprehensive and innovative. It goes beyond traditional recyclable commodities to include vehicle and range wastes, as well as organics. The program is available not just to base personnel and families but to more than 4,000 Japanese employees and contractors which in all total up to more than 22,000 people. Located on the base are 1,018 industrial facilities, 1,555 housing related structures, and more than 8,180 homes. Each house must participate in the recycling program. Just from the houses alone, MFH recycled 440 tons of material in 2006.

Anything from metals to plastics are recycled on the base. Metals are purposely separated by type, which increases their revenue from recycling. Last year alone, the base recycled titanium, aluminum, stainless steel, copper, and other metals totaling 380 tons. KAB also generates a sizable stream of range residue or "scrap waste" consisting of spent munitions, small-arms casings, large practice projectiles, inert practice bombs, target remnants, scrap steel, and other operational waste. The spent munitions are demilitarized with a deformer and recycled to produce an impressive 10 tons of brass in 2006, saving $10,000.

Plastics are sent to off-island markets, diverting more than four tons of plastics from the large waste stream. Glass is crushed and used to fill sandbags for flood control, for construction (mixed with sand), or for military uses.

KAB also has expanded its recycling program to hazardous materials and hard to handle wastes as well, including lead acid batteries, spent antifreeze, used tires, and spent fluorescent bulbs. The base recycled 4 tons of lead acid batteries. Recycling of 495 gallons of spent antifreeze saved $15,000, and the base plans to expand antifreeze recycling to the aircraft ground support equipment, generators, and refueling vehicle shops. Similarly, the base is reusing and retreading tires, saving $10,000 and keeping these tires out of the landfills.

One of the more creative recycling techniques is collection of used cooking oil for conversion to biodiesel fuel. Oil drums were placed throughout the base for residents to dispose of their used cooking oil. The base accumulated more than 350 gallons since the programs inception in November 2006. A contractor converts the used oil to biodiesel for use in facility diesel engine vehicles.

KAB composts organic waste generated from base housing, grounds maintenance, and contractor projects; 750 tons were made available to residents in the Okinawa DoD community saving $185,000. Residents transport organic waste (branches, grass, yard debris etc) to the chipping area for mulching and composting. In 2006, there was more than 3,800 tons of organic waste, including typhoon debris. In addition, almost three tons of untreated wooden pallets were chipped at the recycling center — saving money and landfill space.

The base uses an on-going education program to ensure the success of its program. Those that are newly assigned to KAB must attend a recycling newcomer's class. Each year, 3,700 people are trained on how to separate and package recyclables and dispose of them. Along with that, the base holds fieldtrips and waste segregation games with participating Department of Defense schools because it believes learning about recycling needs to start at an early age.

KAB saved $2.8 million in waste disposal costs and cut its waste from 25,000 to slightly more than 14,000 tons in 2006.To learn more about the program, please contact Huan Nguyen at huan.nguyen@kadena.af.mil or 81-611-734-5336. ■

Recycling-Civilian

USPS Total Solid Waste Management Program

Memphis, TN

The Total Solid Waste Management (TSWM) program is an integrated, large-scale environmental program that diverts recyclables from U.S. Postal Service (USPS) waste stream. It differs from conventional single-location recycling efforts by providing a comprehensive program for a large geographic area that involves all major types of recyclables. It uses the power of the USPS transportation network to increase the volume, recovery rate and sale price of recyclables, and, by removing recyclables from the trash, it reduces landfill volume and trash disposal costs. As of December 15, 2006, TSWM was operational in 229 USPS locations in Pennsylvania and Mississippi. Since its inception in April 2005, TSWM has recycled more than 10.4 million pounds of recyclables and generated more than $245,000 of incremental revenue for the USPS.

TSWM combines environmental stewardship and increased profitability. It was established by the USPS Eastern Services Category Management Center to reduce the solid waste stream at USPS locations by significantly increasing recycling efforts. Selling more recyclables and reducing trash volume has enabled this program to create a new revenue stream for the USPS.

TSWM primarily recovers Undeliverable Standard Mail (USM), plastic film, and corrugated. Wooden pallets, metals, and confidential paper are included in the program where applicable.

The program uses otherwise unused USPS transportation vehicles to transport recyclables from individual post offices to a Processing and Distribution Center. The recyclables are then consolidated and sold to processors and manufacturers as raw materials, generating revenue for the USPS. In at least two instances, the recyclables are turned into new products for USPS use, closing the recycling loop.

For example, corrugated containers are recycled back into linerboard for boxes. A portion of the corrugated recycled by USPS facilities are used by the TSWM supplier's recycled linerboard mill. The linerboard is used by the supplier to manufacture double wall bulk boxes used by Bulk and Priority Mail Centers in the Eastern U.S.

TSWM also engages in closed loop recycling of plastic stretch wrap and shrink wrap. These materials are recycled into composite wood > > >

> > > products that are used to build decks and fences in the commercial marketplace. The composite wood also can be used to create railings at USPS facilities.

TSWM has a significant internal education component that promotes recycling at USPS facilities. TSWM recycling experts visit each location that joins the TSWM program to explain the procedures and benefits of recycling to USPS employees. To further enhance internal education, TSWM created an educational brochure that folds out into a poster that explains what is recyclable in USPS facilities, how to recycle various items, and how the TSWM program benefits our environment. USPS employees have been enthusiastic supporters of recycling and are often excited to learn how each person can help our environment by recycling instead of throwing recyclables in the trash.

TSWM also encourages USPS customers to support and participate in recycling efforts in their communities. A number of USPS locations have posters in their lobbies supporting recycling. The poster proclaims that the USPS location is a participant in the TSWM program, provides statistics on the positive environmental impact of TSWM, and encourages USPS customers to recycle in their own homes and offices.

The TSWM program has significantly increased the amount of recycled materials and revenue at each facility. At one participating facility, Southeastern (PA) Processing and Distribution Center, the trash bill before TSWM was $153,279. In the comparable period after TSWM, the bill was $78,113, a reduction of 49 percent. But what is more incredible is that Southeastern diverted from the waste stream and sold 3.5 million pounds of recyclables, generating $113,471 in revenue and creating a credit of $35,358.

The TSWM program has seen tremendous growth. The program increased the number of participating facilities from 52 locations in November 2005 to more than 200 by December 2006. As a result, the volume of recyclables increased from 492,000 pounds recycled monthly to more than 1.3 million pounds monthly, while monthly revenue increased to $31,000. To learn more information about the program, please contact Mark Treese at mark.l.treese@usps.gov or (901) 747-7577. ■

Pentagon Library and Conference Center

Arlington, VA

Continuing its on-going efforts to renovate the Pentagon and associated buildings sustainably, the Pentagon Renovation & Construction Office (PENREN) recently converted the former Pentagon Officer Athletic Center to the Pentagon Library & Conference Center (PLC2). It is part of a multi-pronged effort that is a decade in the making to "green the Pentagon" and create a culture of sustainability. It encompasses 115,000 square feet of floor space. The facility is home to the Army library, 16 conference rooms operated by the Department of Defense Concessions Committee and several offices under the Pentagon Force Protection Agency. PENREN is submitting this project to the U.S. Green Building Council for LEED-Gold Certification.

The PLC2 project incorporated siting, materials, energy and water efficiency, and indoor air quality considerations.

Siting. PLC2 uses the existing building shell. A green roof covers 50 percent of the roof, providing thermal tempering, heat island reduction and stormwater runoff mitigation. Being part of the > > >

> > > Pentagon reservation, the building is near the Pentagon Metro station and the Pentagon's designated bicycle, carpool and vanpool parking areas, encouraging mass transit, carpooling, and other means to reduce transportation-related air pollution.

Materials. In addition to using the existing building structure, the PLC2 was constructed with recycled content materials, materials manufactured within a 500–mile radius, or environmentally preferable products. Based on the functional requirements of each particular space, environmentally preferable finish materials were emphasized. For example, flooring includes carpet tile, linoleum sheet or tile, ceramic tile, and terrazzo. In addition, more than 85 percent of the construction waste was diverted from the waste stream through recycling.

Energy Efficiency. The building takes advantage of daylighting to cut down on energy consumption. Skylights and a glass curtain wall at the center of the Grand Hall entrance supply the building with sunlight during daytime hours. The lighting and HVAC systems were designed so that the building is more than 30 percent more energy efficient than called for in the ASHRAE standard for new buildings. Lighting controls will modulate the public space lighting in response to the amount of light entering through the skylights. Overall the building is 20 percent more energy-efficient than a similar building following the ASHRAE 90.1-1999 standard.

Water Efficiency. To conserve water, the PLC2 contains ultra-low-flow showerheads, urinals, and lavatory aerators, as well as low-maintenance landscaping. In all, the building uses 32 percent less water without compromising on performance.

Indoor Environmental Quality. PENREN addressed both indoor air quality and the indoor environment while the PLC2 is in use. Urea-formaldehyde free wood products, low-emission paints, sealants, adhesives and carpeting were all used in construction. The mechanical system was designed for occupant comfort when there are large numbers of attendees at meetings and conferences. Using sensors, the mechanical design uses a demand-controlled ventilation system, which responds to the number of occupants in a space to ensure outstanding air quality while optimizing energy efficiency. This upgrade was extremely practical since the space has 16 conference rooms that vary in the number of occupants. In addition, prior to and during construction all indoor ventilation, heating and cooling, and components were protected from construction dust, moisture and mold.

Maintenance. The Pentagon itself is cleaned by service providers using green cleaning products. For PLC2, a green cleaning plan for purchasing and use has been outlined to minimize the use of toxic chemicals during building maintenance.

For more information please contact Walter Nielsen at walter.nielsen@whs.mil or (703) 962-5167. ■

Key Sustainable Design and Operation Elements

- Siting
- Materials
- Construction Waste Disposal Practices
- Energy Efficiency
- Water Conservation
- Indoor Air and Environmental Quality
- Green Cleaning

Sustainable Design/Green Buildings — Civilian

EPA's One and Two Potomac Yard: Raising the Bar for Sustainable Building Projects

Arlington, VA

The Environmental Protection Agency (EPA) continues to strive for excellence and create facility buildings that showcase the Agency's stewardship role in promoting energy and water efficiency and use of environmentally preferable materials. EPA's newest buildings, One and Two Potomac Yard, in Arlington, VA, achieved a LEED®-Gold for New Commercial Construction certification. It is anticipated that the project will receive EPA's Energy Star® building label in 2007. The two 12-story buildings total 650,000 gross square feet (GSF). They house mostly office and retail space, along with a fitness center, in order to accommodate the 1,650 employees working there.

Project Planning. Planning to build to the LEED-Silver level, EPA issued a Solicitation for Offers (SFO) specifying numerous environmental provisions, and selected Crescent Resources as the winning developer based in part on its ability to deliver those provisions. To make certain EPA's goals were met, the company hired an environmental building consultant and a building commissioning authority to guide and solicit suggestions in the construction of the building.

Siting. Located on a formerly abandoned railroad yard, the Potomac Yard site was chosen because of its central location in Northern Virginia and its proximity to transportation and local utilities. The site's location facilitates environmentally responsible commuting, as it is located close to Metrorail trains and Metro buses and is equipped with bicycle racks and shower facilities for cyclists.

Materials. In addition to specifying recycled content and > > >

Key Sustainable Design and Operation Elements

- Materials
- Construction Waste Disposal Practices
- Energy Efficiency
- Water Efficiency
- Indoor Air Quality
- Green Cleaning

> > > environmentally preferable materials, EPA specified that materials come from a specified geographic distance. More than 60 percent of the materials used to build the facility were extracted and manufactured within a 500-mile radius, thus supporting the local economy and reducing energy costs associated with materials fabrication and transport. Additionally, more than 80 percent of the facility's wood-based materials and products were certified by the Forest Stewardship Council. More than 70 percent of the construction waste was recycled, diverting 2,000 tons of wood and metal wastes from landfills.

Energy Efficiency. EPA obtains 100 percent of its electricity from renewable sources to power its buildings and laboratories. EPA purchases power both directly from renewable sources and via renewable energy certificates (RECs). For One and Two Potomac Yard, EPA signed a three-year green power contract for 4.2 million kWh, in the form of RECs, to offset 100 percent of the facility's annual electricity consumption. The purchase will support the generation of renewable energy at wind farms in Minnesota, Nebraska, Oklahoma, and Wyoming. The buildings are equipped with numerous features that help to reduce the amount of energy it consumes. Appliances such as energy-efficient task lamps and Energy Star® labeled refrigerators and microwaves contribute to energy savings as well.

The roofing materials used on the buildings are highly reflective, Energy Star® materials. The walkway joining the buildings has a vegetative roof planted with sedum in 4-inch depth trays, which will help to filter pollution and reduce sun heat loads.

Water Efficiency. One and Two Potomac Yard has achieved 41 percent water use reduction through water-saving technologies. The restrooms have low-flow faucets with electronic shutoff, low-flush urinals, and dual-flush toilets. Also designed with water conservation in mind, the exterior landscape is made up of drought-resistant and local plants so that no permanent irrigation system is required.

Indoor Environmental Quality. EPA has a long-standing policy of minimizing indoor air pollutants in its buildings. Low-volatile organic compound adhesives, paints, sealants, and caulks were used to ensure the indoor air quality of the Potomac Yard buildings.

Operation and Maintenance. A pollution filtering system is in place at the rear of the facility, which faces the Potomac River. Sand filters have been installed to intercept and treat stormwater runoff heading toward the river. The filters are expected to reduce total suspended solids in the runoff by more than 80 percent and total phosphorus by 40 percent.

EPA developed a Green Housekeeping Plan to ensure that the types of cleaning products used will be safe for the environment and its occupants. Also, a User Education Program informs occupants and visitors of the building's sustainable features. The building's performance is continually monitored using metering equipment that has been installed for various end-uses, including energy systems and equipment and water service systems. This will allow EPA to work with building operations and maintenance staff to optimize the energy and water consumption performance of the building.

For further information, please contact Cathy Berlow at berlow.cathy@epa.gov or (202) 564-3739. ■

Alternative Fuel / Fuel Conservation in Transportation – Military

USMC Garrison Mobile Equipment Fuel Conservation

Washington, DC

In 2005, OFEE added a new category to the Closing the Circle Awards to promote the goals and objectives of Executive Order 13149, "Greening the Government Through Federal Fleet and Transportation Efficiency." The U.S. Marine Corps (USMC) was the first DoD winner in this new category. This year, USMC once again is the DoD winner.

The U.S. Marine Corps takes great pride in its reputation for safeguarding the nation and its resources. Over the past seven years, safeguarding our resources has included reducing the consumption of petroleum used for transportation. Through leadership from Headquarters Marine Corps, forward-thinking base-level fleet managers, and dedicated staff, the Marine Corps has achieved a tremendous leadership position among Federal activities seeking to reduce petroleum consumption.

Continuing on the successes that led to the 2005 Closing the Circle Award, USMC exceeded Energy Policy Act of 1992 (EPAct) requirements for alternative fuel vehicle (AFV) purchases in both fiscal year (FY) 2005 and 2006. EPAct requires that 75 percent of Federal acquisitions of light duty vehicles be alternative fuel vehicles. USMC achieved 194 percent compliance in FY 2005 and 199 percent compliance in FY 2006!

In FY 2006, USMC achieved a 28.5 percent fuel reduction towards E.O. 13149 goals, used 1.5 million gallons of biodiesel, added 67 Neighborhood Electric Vehicles (NEVs) to its fleet of several hundred, and used alternative fuels in its AFVs 27.9 percent of the time.

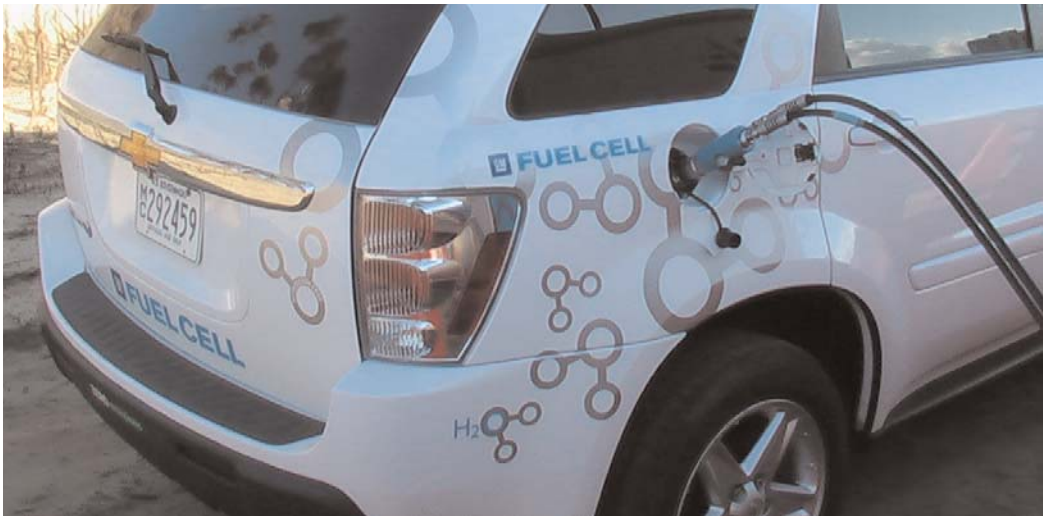
USMC expanded its E85 refueling capability by installing a fueling site at Marine Corps Air Station Cherry Point, NC; funding the construction of three E85 pumps to be operational this year at other Marine Corps Base Quantico, VA, Marine Corps Logistics Base Albany, GA and Marine Corps Air Station Beaufort SC; expanding ethanol use at Camp Lejeune, NC; fielding AFVs at locations with E85 pumps; and working with an E85 coalition to solve technical issues in order to clear the way for ethanol use in the State of California.

USMC also continued its use of compressed natural gas (CNG). It maximized the use of CNG fuel by working with the General Services Administration (GSA) to acquire dedicated CNG vehicles with useable life turned in by other agencies, partnered with GSA to acquire Honda Civic CNG sedans not normally offered by GSA Fleet, and refurbished and updated the CNG refueling site at MCB Quantico to ensure and encourage CNG use.

USMC also continued its efforts to "right size" its fleet by procuring additional hybrid electric vehicles for its recruiting stations, targeting the recruiters with high mileage hybrids for high mileage users

The Corps also is taking active steps toward future use of hydrogen-powered fuel cell vehicles (FCV). At Marine Corps Base Camp Pendleton, CA, the Marine Corps and the Naval Facilities Engineering Support Command are working to complete the installation of a hydrogen reformer and fueling station for dual government/civilian use. Camp Pendleton and Headquarters Marine Corps are working with automobile manufacturers and the Department of Energy to secure FCVs for use in Southern California.

A leader in DoD and the Federal government, the Marine Corps team of installation Fleet Managers and Headquarters staff has achieved remarkable results in petroleum reduction in 2006 building on a history of success. For 2007, the Marine Corps expects to again prove to be a leader in reducing fuel consumption. EPAct compliance will remain above 100%, ethanol, biodiesel and NEV usage will increase and ultimately the Marine Corps' fuel reduction rate will approach 30%. For more information, please contact James Gough at 703-695-7010, or james.gough@usmc.mil. ■



Alternative Fuel / Fuel Conservation in Transportation – Civilian

E85 Alternative Fuel Usage in the USPS Northland District

Minneapolis, MN

As an agency that drives more than 1 billion miles per year in more than 200,000 vehicles, the U.S. Postal Service (USPS) is in a unique position to demonstrate the viability of, and create markets for, alternative fuel vehicles and alternative fuels. USPS is a leader in the Federal community in the use of alternative fuels. The Northland District, which covers most of Minnesota and part of northwest Wisconsin, has emerged as USPS' leader in the use of E85 fuel. Through targeted vehicle deployment, senior management support, partnerships with local organizations, and employee commitment, the Northland District has significantly increased it use of E85 ethanol. Over the last three fiscal years, the Northland District has increased its use of E85 in its delivery fleet by 64.65 percent, an average increase of approximately 18 percent per fiscal year.

Two keys to the Northland District's success are (1) matching vehicles to areas where E85 is readily available and (2) partnering with the Minnesota Lung Association (MLA) to encourage the siting of additional E85 stations. For example, in 2001, when the District received 324 new ethanol-capable vehicles, it worked with MLA to identify existing E85 retail sites so that the new vehicles would be stationed at Post Offices where E85 was readily available. MLA also worked with the State of Minnesota and fueling stations to initiate more E85 retail sites by providing grants to convert a limited number of fuel pumps to E85. Although there were only 15 E85 retail sites in Minnesota at this time, the Northland District worked hard to place the AFVs in areas where they could re-fuel with E85 immediately.

Over the past six years, the Northland District continued to obtain additional AFV vehicles and locate them in areas with E85 stations. At the same time, the District encouraged existing gas stations to offer E85 near Post Offices with AFVs. At first, the District met with limited success, but in the past two years, it has been able to work with fueling stations to increase the availability of E85. The Duluth, MN, Post Office, for example, identified two nearby gas stations as potential E85 sources. One of the two stations agreed to add E85 if the Post Office first obtained AFVs. After negotiating who would act first, the Duluth Post Office obtained 45 carrier route vehicles capable of using E85, and the gas station converted to E85 at the end of FY 2006. The station is now set to pump an average of more than 1,200 gallons a month of E85 in place of regular gasoline. This one site alone should increase the Northland District's E85 usage by nearly 5 percent in FY 2007.

According to the Northland District, throughout the deployment of the AFV fleet, the following factors were crucial to success:

- The leadership role of the State of Minnesota and the Minnesota Lung Association to promote the proliferation of E85 fueling sites and USPS' partnership with these organizations.
- The support from the Senior Operating Managers and the local managers to use E85 when it was readily available and economically viable, or redeploy the vehicles to offices where it was readily available and economically viable.
- Creation of a tracking system to ensure that E85 is being used whenever economical. Non-use of the fuel resulted in movement of vehicles to a site where the fuel would be used.
- Creation of communication materials to educate Post Offices and District employees about how USPS was protecting the environment by leading the use of alternative fuels.

For more information about the Northland District's and USPS' use of alternate fuels, please contact Mike Fanning at 202-268-5073, or michael.j.fanning@usps.gov. ■

Electronics Stewardship — Civilian

DOE Headquarters Electronics Stewardship Green Team

Washington, DC

As one of the signatories to the *Federal Electronics Challenge (FEC) Memorandum of Understanding (MOU)*, the Department of Energy has been an active leader among Federal agencies in implementing electronics stewardship in all phases of the life cycle: acquisition, use, and end-of-life management. DOE Headquarters offices formed a "green team" to work together to implement the MOU both at headquarters and throughout DOE's offices and operations.

The Green Team Partners consist of four headquarter offices that have the responsibility of overseeing each individual lifecycle for electronics within DOE: the Office of Nuclear Safety and Environment (Green Team lead, environmental policies and assistance, including overseeing pollution prevention programs and data reporting), Office of the Chief Information Officer (CIO) (IT activities and policies, including maintenance), Property Management Division (end-of-life management and property disposition), and Office of Procurement and Assistance Policy Office (green purchasing).

Engaging the CIO's office is one of the keys to DOE's electronics stewardship success. The CIO and Agency Environmental Executive (AEE) issued a joint memorandum to all DOE programs and field elements on the Department's commitment to improving environmental > > >

> > > management of electronic assets, encouraging all sites and Headquarters to participate as FEC Partners (June 20, 2005) and join the FEC. Setting a national precedent for Federal agencies, the CIO adopted Electronics Product Environmental Assessment Tool (EPEAT) registration as a procurement requirement in its FY 2007 annual market survey for Headquarters desktop computers, notebook computers, and monitors). The CIO set an EPEAT-silver requirement for notebook computer procurements. The Green Team also promoted the EPEAT launch and advocates EPEAT training to all DOE elements. In addition, the DOE Procurement and Assistance Policy Office developed a draft Acquisition Letter (AL) for all DOE contractor purchasing of environmentally preferable electronics that specifies EPEAT-registered products in DOE acquisition contracts.

DOE revised its Environmental Protection Program DOE Order 450.1, to integrate environmental work into EMS programs across the entire agency. The new Order 450.1, Change 2, establishes Pollution Prevention and Sustainable Environmental Stewardship goals to be achieved Department-wide. The Order requires integration of pollution prevention into EMSs and specifies strategies for achieving the new goals, including: procurement, operation and maintenance, and end-of-life.

The CIO and FEMP have implemented best management practices to reduce energy consumption at Headquarters:

- After-hours shut down of non-critical electronics and electrical equipment in coordination with network security
- ENERGY STAR, power management features set as network default with permission required for modification on an as-needed basis
- Energy conservation instructional materials provided to Headquarters staff

The CIO and Property Management Division adopted a Headquarters policy for the universal reuse and life extension of cathode ray tube (CRT) computer monitors. CRT monitors are now replaced only when their functionality has expired. Under this policy, more than 800 CFT monitors were reused instead of recycled in 2006. DOE also recycled more than 200,000 pounds of electronics, about 40 percent of the Federal total volume.

In support of the Hurricane Katrina reconstruction efforts in Louisiana, the Green Team shipped 100 surplus DOE Headquarters computer workstations to the Belle Chase Middle Schools in Plaquemine Parish, LA, in cooperation with GSA and the Departments of Education and Transportation. The Team used teleconferences and DOE-wide bulletins to encourage other DOE elements to do the same. At least five other DOE sites sent surplus electronics to the Gulf Coast.

The Green Team promoted the electronics stewardship efforts through notices to senior managers, electronic stewardship teleconferences and presentations at workshops, as well as through the new policies. These efforts reached the major points-of-contact from 25 sites and 125 national DOE property management staff. The Green Team also developed multiple day training modules for on-site presentations on the integration of electronics stewardship into Environmental Management Systems (EMSs). The first such trainings were carried out in 2006 at the Idaho and Brookhaven National Laboratories.

Information about the DOE Green Team Partners can be obtained through Jeff Eagan, jeff.eagan@eh.doe.gov or (202) 586-4598.■

Office of the Federal Environmental Executive

White House Task Force on Waste Prevention and Recycling

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