# Department of Defense

# Annual Energy Management Report

# Fiscal Year 2005

*Meeting the Requirements of Executive Order 13123*

*Greening the Government through Efficient Energy Management*

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# EXECUTIVE SUMMARY

The Department of Defense (DoD) continues to make significant progress toward achieving the goals of the Energy Policy Act and Executive Order (EO) 13123 *Greening the Government Through Efficient Energy Management.* The DoD Energy Program initiatives include facility equipment retrofits, energy awareness efforts, energy manager training, audit programs, procurement of energy efficient products, and the use of sustainable design in new construction. Other contributing factors include integrated energy planning, source energy considerations, taking maximum advantage of electrical market transformation, enhanced use of renewable energy, and demonstration of innovative technologies.

The Department has approximately 1.95 billion square feet of facilities and spends roughly $2.9 billion on facility energy consumption.

Through Fiscal Year 2005 (FY 2005), we achieved a 28.3 percent decrease in standard building and facility energy consumption (as measured on a British Thermal Units (Btu) per gross square foot (GSF) basis) as compared to a FY 1985 baseline. The goals are a 30 percent decrease by 2005 and a 35 percent decrease by 2010.

In last year's report, DoD predicted that with the absence of Energy Savings Performance Contract (ESPC) authority for FY 2004, it would have some difficulty in meeting the reduction goal for standard buildings. While the Department in fact did fall just short, it was not without effort and an impressive 3.3 percent reduction from last year. Having reinvigorated awareness campaigns and increased the focus on renewable energy, DoD is well on track to meet the new Energy Policy Act goals.

DoD achieved a 21.6 percent reduction in industrial and laboratory facilities since the FY 1990 baseline year. The goals are a 20 percent decrease by 2005 (compared to 1990) and a 25 percent decrease by 2010.

DoD achieved a significant reduction in water usage by implementing water management plans and conservation technologies. In FY 2005, DoD consumed 124.3 billion gallons of potable water. This represents a 28.3 percent decrease from FY 2000 base year.

DoD made remarkable progress in installing renewable energy technologies and purchasing electricity generated from renewable sources (solar, wind, geothermal, and biomass) when life cycle cost-effective. The total renewable energy usage amounted to 8.35 trillion Btus in FY 2005. This was a significant increase from last year and accounts for 8.3 percent of all electricity consumption. The Department continues to emphasize the use of passive solar designs, such as building orientation and window placement and sizing in a variety of building types and new facility construction. Examples of projects completed this year are detailed in Section II.B. DoD just recently established a long range renewable energy goal of 25 percent by 2025.

The Department continues to emphasize the use of passive solar designs, such as building orientation and window placement and sizing in a variety of building types and new facility construction. Examples of projects completed this year are detailed in Section II.B. DoD just recently established a long range renewable energy goal of 25 percent by 2025.

The Department of Defense published a revised facility energy instruction on November 22, 2005 that accounts for the provisions of the Energy Policy Act of 2005, as well as various recent Government Accountability Office reports and recommendations.

# I. MANAGEMENT AND ADMINISTRATION

Energy management at DoD installations is focused on improving efficiency, reducing demand, eliminating waste, and enhancing the quality of life while meeting mission requirements. Accomplishing these objectives reduces utility costs and achieves the energy program goals established in a DoD memorandum dated November 18, 2005.

The facilities energy program is decentralized, with Defense Component Headquarters providing guidance and funding, and installations managing site-specific energy and water conservation programs. Energy project funding comes from a combination of government and alternative financing initiatives. Military installations are responsible for maintaining awareness, developing and implementing projects, and ensuring that new construction meets sustainable design criteria.

Of significance this year is the Department of the Army's efforts in the area of installation energy management. Some highlights from their efforts include:

Energy management at Army installations is focused on improving efficiency and eliminating waste. Accomplishing these objectives will reduce costs and ensure program goals are achieved. The facilities energy program is primarily decentralized with Army installations managing site-specific energy and water conservation programs. The Army has a centrally funded Energy Awareness and Conservation Assessment Program, however installations are responsible for maintaining awareness, developing and implementing projects, and ensuring new construction meets sustainable design and energy efficiency criteria. Army headquarters provided guidance and funding through Headquarters, Installation Management Agency (HQ IMA). Responsibilities and functions of Army elements implementing the program are outlined in AR 11-27, Army Energy Program, and in the DoD Energy Manager's Handbook. On 8 July 2005, Chief of Staff of the Army, Peter J. Schoomaker and Secretary of the Army, Francis J. Harvey signed the Army Energy Strategy for Installations, thereby authorizing the plan that the Army will use to reduce energy for the next 20 years. The Army Energy Strategy introduces 5 major initiatives, which will be supported by specific actions, that not only focus the Army on definitive areas where energy inefficiency must be eliminated, but also provides a framework detailing processes, programs, procedures, resources, etc. that will be used to meet the goals of EPACT 2005.

## *A.* Energy Management Infrastructure

### 1. Senior Agency Official

The Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics) is the DoD Senior Agency Official responsible for meeting the goals of EO 13123.

## 2. Agency Energy Team

The DoD Installations Capabilities Council (ICC), chaired by the Deputy Under Secretary of Defense (Installations & Environment) and chartered to address a broad spectrum of installation issues, is designated as the DoD Agency Energy Team. The membership of the ICC contains the cross-section of DoD senior leadership necessary to make decisions needed to remove obstacles hindering compliance with EO 13123.

## B. Management Tools

## 1. Awards (Employee Incentive Programs)

To increase energy conservation awareness and to recognize energy-saving efforts, DoD rewards individuals and organizations that demonstrate excellence in the field. These rewards serve to highlight and share the best practices among DoD agencies and to motivate employees.

**Air Force**

- The Air Force participated in the 2005 Federal Energy and Water Management Awards; 17 award candidates were submitted, with one individual award and one Presidential award received.
- The Air Force received the 2005 Green Power Purchase Award as the largest federal purchaser of green power with over 41% of the federal governments purchase.
- HQ AFCESA has developed a rewards program called "Reduced Energy Appreciation Program (REAP)" which rewards the top three installations for the best overall reduction in energy use based on their previous year. The winners were Little Rock AFB AR, Nellis AFB, NV and LaJes AFB Azores. Along with the award the base energy manager and their BCE received a trip to Energy 2005 to speak on their successes to the other commands and bases.
- Several commands have developed energy award programs that distribute funds to their base winners each year. They include:
  - PACAF has a $225K annual award program recognizing long-term and short energy reduction projects at their installations.
  - ACC has a base energy award program that awards up to a total of $1.0 million to ACC bases that exceeded the FY05 30% milestone goal and/or improved over last year's performance.

**Department of the Navy**

The Department annually holds a Secretary of the Navy energy awards ceremony to recognize outstanding achievement in the efficient use of energy. Mr. B.J. Penn, the Assistant Secretary of the Navy for Installations and Environment, was the keynote speaker at this year's awards ceremony and he presented the awards to the winning activities. Five awards were provided to Navy and Marine Corps winners in the categories of facilities and industrial installations. In addition to the SECNAV awards, installations with an aggressive and successful program were recognized as achieving Platinum (highest) or Gold (second highest) level rankings for their energy programs.

The Navy Region Southwest energy team received a Presidential Energy award for reducing energy costs by 10%, saving over $4M in FY04 and another $1M in FY05. The Marine Corps Base Camp Pendleton California energy team also received a Presidential Energy award for replacing inefficient HVAC and lighting systems, saving $1.9M. DON installations and individuals received six of 20 awards for Federal Energy and Water Management. In addition, two DON installations were featured in the DOE Federal Energy Management Program "You Have the Power" campaign posters and are designated as DON Showcases.

**The Army**

Energy conservation awards are presented to individuals, organizations, and installations in recognition of their energy/water-saving efforts. In addition to recognition, these awards provide motivation for continued energy-reduction achievements. The installations and regions participated in three energy awards programs--*the Secretary of the Army Energy and Water Management Awards, the Presidential Energy Awards, and the Department of Energy Federal Energy and Water Management Awards.* Each program recognizes individuals and organizations for exceptional performance in implementing energy efficiency achievements as set forth under E.O. 13123.

The *Secretary of the Army Energy and Water Management Awards* were presented on August 28, 2005 for accomplishments in energy and water management during FY 2004. Award winners were:

Energy Efficiency / Energy Management Installation

- Installations: Fort Lewis, Washington and Fort Knox, Kentucky
- Individual: Mr. Bobby Lynn – Fort Hood, Texas
- Small Group: 414th Base Support Battalion, Hanau, Germany (Mr. Karl-Heinz Schneider, Mr. Walter Rausch, Mr. Peter Adrian); Fort Buchanan, Puerto Rico, (Mr. Victor Quinonez, Mr. Ramon Figueroa, Mr. Edgardo Garced, Mr. Ferdinand Torres, Mr. Jesus R. Gimenez; Fort Bliss, Texas -- (Mr. Juan Morales, Mr. Danny Villareal, Mr. Ricardo Berumen)

Individual Achievement

- Mr. Steve Jackson – Southeast Region Energy Office

Alternative Financing

- Individual: Mr. Tommy Baldwin – Fort Rucker, Alabama

Renewable Energy

- Small Group: Rock Island, Arsenal, Illinois (Mr. David Osborn, Mr. Kim Johnson, Mr. Dave Degan, Mr. Allen Thompson, Mr. Dick Brown

Innovative/New Technology

- Yuma Proving Ground, Arizona

The *Presidential Energy Awards* were presented October 27, 2005 for Leadership in Federal Energy Management in FY 2004 --

- Team -- U.S. Army Installation Management Agency Southeast Region (IMA-SER).

The ***Federal Energy and Water Management Awards*** were presented October 27, 2005 for accomplishments in energy and water management during FY 2004 --

- Energy Efficiency / Energy Program Management Award to Organization -- U.S. Department of the Army, Fort Lewis, Washington

**Defense Commissary Agency**

- DeCA currently uses its existing performance awards procedures and on-the-spot awards.
- DeCA normally participates in the Federal Energy and Water Management Awards program.
- The DeCA Energy Management Program Policy Directive incorporates provisions for incentive awards through our existing "IDEAS" suggestion program and on-the-spot awards.
- Our DeCA East and DeCA Europe regional offices established a separate energy awards program to encourage energy savings and innovation at store and employee level.

**Washington Headquarters Service**

The Defense Facilities Directorate in the Pentagon designed a web based Pentagon energy information site, which contains a link to an employee suggestion program, which will be launched in FY 2006. There is an incentive award for personnel to operate the Pentagon Heating and Refrigeration Plant (H&RP) in an energy efficient manner for meeting the goals outlined in E.O. 13148. The H&RP has an Award Fee in their contract as a Most Efficient Organization (MEO) resulting from a previous A-76 Competition. The H&RP personnel must maintain performance requirements of the equipment through proper staffing, maintenance, repairs, etc. Each person may get up to $6000.00. In FY05, they received 95%.

**National Security Agency**

Although there are no specific energy award programs at NSA, rewards are offered to employees for outstanding performance and innovative suggestions. Facilities Services also presents a financial incentive award known as "The Employee of the Quarter" award. This award is presented to an employee for outstanding accomplishments on facilities projects and programs. Monetary awards were also given to individuals or teams where unique initiatives and exceptional performance proved to be deserving of special recognition. These awards frequently involve cost and energy savings ideas that are beneficial to the Agency.

**Other DoD Agencies**

- DCMA will use DOE FEMP Annual Federal Energy and Water Management Awards Program to nomina individuals, facilities or teams that perform exceptional work in implementing Executive Order 13123. D representative attended the DOE 2005 combined Presidential and Federal awards ceremony held at the U Department of State Headquarters.
- The DFAS Agency Energy Management Program Manager was given two Special Act awards for his eff promote the Agency Energy Management program during this fiscal year.

## 2. Performance Evaluations

Energy and water management provisions are included in performance plans of the DoD Energy Chain of Command, including major command, base and site energy managers. Below are examples of specific approaches that various DoD components are taking.

**Air Force**

- All base energy managers and each major command energy manager have performance statements that include ratings on implementing energy conservation measures to meet federal goals and Executive Orders for their installations and commands.
- HQ PACAF is using the Resource Efficiency Manager (REM) concept command wide. All major installations now have a REM assigned at those locations. PACAF is the first command-wide REM program in the AF.
- HQ AETC is developing a REM program and has two REM's in place.

**Department of the Navy**

The Navy created an agency-wide standard description of the roles and responsibilities of its energy managers. This description defined all the elements of the energy management function at the installation level and the regional level. These roles and responsibilities will be used in existing job series to set the performance expectations for energy managers. The Navy is also developing an agency wide contract to place Resource Efficiency Managers at its installations. REMs are expected to produce savings equal to twice their cost, providing at least a 2:1 return on investment.

**The Army**

- Army Regulation (AR) 11-27, Army Energy Program, requires inclusion of energy and water conservation responsibilities in the position descriptions of members of The Army's energy team, principal program managers, heads of field offices, facility managers, designers, energy managers, and their superiors. Energy and water is managed intensively to ensure efficient and effective use of energy products.

- The Army's regional offices conduct scheduled assistance visits to their respective installations and verify that installations are in compliance with the provisions of E.O. 13123 and AR 11-27. These visits include verification of Energy Manager position descriptions and evaluations of personnel responsible for the energy program. In addition, the Army centrally funds Energy Awareness and Conservation Assessments to assist in the identification of Energy Conservation Measures. During FY 2005, these seminars identified low cost-no cost energy conservation opportunities in excess of $5 million.

**Defense Commissary Agency**

- Energy management provisions are in the performance evaluations of the DeCA Chief Executive Officer and Acting Director by virtue of their requirement to execute the Agency's Strategic Plan and Key Objectives for fiscal years 2005-2011. Key goals of this plan are: preserve and deliver a premier quality-of-life benefit for our customers; be the employer of choice for our workforce; and implement business process improvements to enhance corporate performance with our business partners. Reducing facility and industrial building (commissary) energy use is instrumental in reducing our unit cost. DeCA has accomplished this by improving the infrastructure through reduction of maintenance backlog, executing new construction, modernization, maintenance and repair, and store equipment requirements that incorporate state-of-the art efficiencies.

- Energy management provisions are in performance evaluations of the Chief, Facilities Planning & Sustainment; Facilities Program Manager; Agency Energy and Environmental Manager, region engineers and field engineers. Sustainable design practices are included as duties and responsibilities in the position description of the DeCA West Region Engineer. DeCA region chief of operations, zone managers, and store directors have a critical element in their performance plan for unit cost management and control. Store level utilities costs are a significant part of store level costs of operations. Utilities cost management, control, and awareness include quarterly reporting of energy use and costs from each store.

- Energy conservation design practices are included as duties and responsibilities in the position description of DeCA region and field engineers. The DeCA West Lead Engineer and DeCA Europe Region Engineer are also identified as the Region Energy Conservation Officer in one of the duties and responsibilities. Their responsibilities include review of Region Headquarters managed projects to ensure energy conservation and sustainable design practices are being implemented. Other critical elements include review of energy use to ensure timely reporting. A critical element in their work performance includes Headquarters DeCA energy program policies and guidance implementation and reporting.

**Washington Headquarters Service**

Some job descriptions and critical elements include energy conservation principles for appropriate management and operation personnel and are updated on an annual basis. For example, the H&RP's performance work statements developed as a part of the A-76 cost comparison study has requirements to operate the plant equipment and systems in an efficient manner as well as to maintain an optimal efficiency level for of the boilers and chillers. Also included in this study was an incentive award for personnel to operate the H&RP in an energy efficient manner for meeting the goals outlined in E.O.13148.

**Other DoD Agencies**

- The NSA management staff is committed to cost effective energy saving projects and programs designed to benefit the Agency in numerous areas. The Deputy Associate Director for Installations and Logistics has a provision included within his annual employee performance appraisal directed at the goals of Executive Order 13123.
- DFAS has added appropriate statements to include successful implementation of conservation actions in the position descriptions and performance evaluations of members of the agency energy team.

## 3. Training and Education

In FY 2005, DoD provided energy management training for 3481 of the 7174 appropriate personnel. The DUSD (I&E) staff is encouraging DoD energy personnel to attend the World Energy Engineering Congress & FEMworks™, September 13-15, 2006, at the Washington Convention Center, Washington, DC.

The following summarizes provides specific examples of activities associated with DoD training and education programs.

**Air Force**

- The Air Force Institute of Technology (AFIT) Civil Engineer and Services School at Wright-Patterson AFB OH conducts an Energy Management Training (EMT) course. AFIT has also included the energy course material in an on-line computer-training program. Additionally, a one-hour energy briefing is provided in the CE programmer's course.

- The Air Force Civil Engineer Support Agency (AFCESA) developed a web based ESPC training program providing training for 35 personnel (from engineering, contracting, legal and comptroller areas) from 9 locations.

- The ANG at base level promotes energy conservation awareness through the following methods: building manager training/meetings, semiannual state employee awareness training, drill weekend assemblies and base newspaper articles. 180 members were trained this year.

- ACC and PACAF funded the costs for all their base energy managers (26) to attend the 2005 DOE/DOD Energy Workshop held in Long Beach CA.

- HQ AFCESA held its annual command energy managers meeting in conjunction with the 2005 energy conference. 78 personnel attended.

- HQ AFCESA developed and fielded a web based Facility Managers Energy awareness course to assist our base energy managers in training new building managers.

**Department of the Navy**

- In FY05, 234 personnel received training in areas specified in the Energy Policy Act. These personnel consist of: Energy Managers, Energy Conservation Officers, Maintenance Mechanics, Planners, Equipment Mechanics, Facilities Supervisors, Accountants, Admin. Officers, Project Managers, APWO's, Architects, Environmental Engineers, Electrical Engineers, Division Directors, Controls Mechanics, Civil Engineers, Budget Analysts, Boiler Plant Personnel, ROICC, Zone Managers, and Utility Engineers. This brings total training classes attended to 2258.

- The training consisted of specific training opportunities under the specified areas of the Energy Policy Act, namely: Operations and Maintenance, Controls, Design, Lighting, Electric Codes, LEEDs Training, Natural Gas Seminars, Water Resource Management, Steam Plant Improvement, Renewable Energy, Energy Accounting, Energy Savings Performance Contracting, Measurement and Verification, Training on Equipment found in Federal facilities and Certified Energy Managers (CEM) Training. The Navy has 141 registered "Certified Energy Managers" since the program inception.

- The sources of training include in house and commercially available sources such as: North Carolina University, Dept. of Energy, Association of Energy Engineers, Johnson Controls, Redvector Online Courses, Utility Companies, Tempcon, Allen Bradley, Northwest Energy Efficiency Council, Sandia Nat'l Labs, IEEC, American Institute of Architecture, National Technology Transfer, Inc, Navy Civil Engineer Corps Officer School, American Solar Energy Society, University of Wisconsin, Federal Energy Management Program, The U.S. Green Building Council, American Water Works Assoc., Florida Solar Center, and GSA.

- DON continued and expanded its energy awareness program to train all personnel to be aware of and influence energy consumption. The program includes compact disks that provide policy, publications and program execution tips for energy managers, as well as, materials targeted to educate and involve military youth. Distribution of a monthly newsletter titled *Energized,* and weekly flash emails to energy managers, regions and HQ quickly disseminates key information. Promotional materials are distributed to personnel to involve all in energy management practices without impacting productivity.

**The Army**

- This year's expenditure for energy management training was $402,000. A total of 29 Army energy managers took the Certified Energy Managers training course. An additional 862 personnel were trained under the Energy Awareness and Conservation Assessments program and various other installation training initiatives.

- Awareness and training programs are important for the Army to achieve and sustain energy-efficient operations at the installation level. The U.S. Army Assistant Chief of Staff for Installation Management (ACSIM) provided assistance to installation staffs by providing Energy Awareness and Conservations Assessments at 6 of its installations. These assessments identified low cost/no cost opportunities, helped to heighten the awareness of installation personnel, and assisted the installation in identifying new and improved technologies and energy-saving projects.

- The Army's Installation Management Agency's (IMA) Regions also provide training to their respective installations. For example, in April 2005, the Southeast Region (SERO) held an Energy Manager's Forum in Atlanta, GA. SERO brought together installation staff, HQ Army staff, Department of Energy (DOE) Staff, and various other energy consultants and personnel to discuss strategies, approaches, programs, processes, and procedures to improve energy operations and assist in meeting the goals of Executive Order (E.O.) 13123. Other IMA regions participated in DOE Federal Energy Management Program training via webcast and teleconferencing. Europe Region conducts annual energy manager training, with a curriculum that's consistent with the proficiency requirements of the Energy Policy Act.

- The Army uses energy management training courses available from commercial sources, such as Association of Energy Engineers, to meet the requirements of E.O. 13123. The DoD Energy Manager's Handbook is distributed on the Construction Criteria Base CD. The Army's Energy website has been revised and is accessible by going to http://hqda-energypolicy.pnl.gov and provides current information and reference materials applicable to the energy program.

**Defense Commissary Agency**

- The DeCA Center for Learning hosted four Facility Energy Supervisor/Quality Surveillance Representative (FES/QSR) courses, one Quality Surveillance Representative (QSR) and three Facility Energy Supervisor Executive Courses (FESEC) during FY 2005. The FES/QSR training course is a 2-day, commissary specific course for the commissary FES/QSR. The QSR Course places emphasis on managing the refrigeration and HVAC maintenance contract to bring efficiencies to quality of maintenance and repair and equipment operation at the most energy efficient level possible. The FESEC is a 1-day executive training course for commissary store directors and zone managers. Our Department Operations courses address energy usage and conservation in the store director, meat management, produce management, grocery and quality assurance courses. These courses are taught throughout DeCA's worldwide operations. Instruction includes formal classroom training for energy awareness and conservation practices, quality assurance, reporting and monitoring. Also, a site visit to a nearby commissary facility is conducted to acquire "hands-on" experience and serve as a vehicle for student evaluation.

- We continue to pursue our continuing goal of two trained FESs per store. We trained 136 commissary store employees, store directors and zone managers by region in FY 2005. This represents 96 percent (136/140) of our training goal. Training and travel costs were $168,500. Students represented facilities in Europe, Far East and CONUS. The FES/QSR students are normally department managers, quality assurance or store supply personnel. The FESEC students are normally store directors, store administrators or facility managers.

- All DeCA employees are required to view our 12-minute, commissary energy awareness video, "Put Yourself in the DeCA Energy Efficiency Picture," within 30 days of hire which is also incorporated in our FES/QSR Representative and Executive

Courses. This commissary specific, energy awareness training video is provided to all of the commissaries; central distribution centers (CDC) and office facilities. The topic is also presented to store directors and managers as a part of our Commissary Operations Basic and Advanced Courses. These courses are in a formal classroom form.

- Each commissary, CDC, and office facility has an energy management supervisor whose title is "Facility Energy Supervisor" (FES) identified and assigned. Commissaries and CDCs have a requirement to maintain two FES/QSR trained personnel on staff at all times. This person attends formal training minimally every 2 to 3 years.

- Training aids, including videos, are available at each DeCA store and office for initial and refresher energy awareness training.

- In FY 2005, ENERGY STAR® products continued to receive utmost consideration when developing specifications and issuing acquisitions for energy using products.

- Information technology hardware and computer and copying equipment are acquired under the ENERGY STAR® Program using GSA Schedules and either government-wide or service contracts.

**Washington Headquarters Service**

An outline for a website was developed. This website is designed to provide information on energy efficient strategies and a repository for an employee suggestion program. Two (2) DFD personnel and two (2) PENREN personnel participated in the Energy 2005 Conference in August 05 in Long Beach, CA. Intermediate LEED training was held in May 05. Attendees included 22 PENREN personnel and 1 contractor. Another LEED workshop was held in August 2005, which included attendees from DFD, PENREN, and contractors. There were also two rounds of commissioning training in July 05. These sessions included 10 attendees from the Pentagon (PENREN and DFD) and 19 attendees (RRMC, DFD, and PENREN)

**National Security Agency**

NSA employees attend training for their respective disciplines. This training often includes energy conservation measures. Additionally, NSA has an internal website that provides information on saving energy for both commercial and personal use. This site also contains material pertaining to energy policies and regulations throughout the federal government and the Agency.

The DCMA Energy Manager attended the AEE 2005 World Energy Engineering Congress (WEEC) to learn how the new Energy Policy Act of 2005 will affect all types of facilities and how to comply with its requirements. HQ DCMA Energy Management Administrator attended AEE's Comprehensive 5-Day Training Program for Energy Managers to stay abreast of all new technology in order to implement the provisions of Executive Order 13123.

Two members of the DFAS Energy Management Team attended Energy 2005 held at Long Beach, CA in August. The seminars and displays provided many ideas and useful tools for the future of energy management. DFAS also had one attendee complete the Green Purchasing class and the Introduction to Distributed Energy provided on the internet. Pertinent energy information has been posted to the DFAS ePortal site for employee access.

All DLA Energy Managers were asked to attend the Energy 2005 Workshop and Exposition to stay abreast of all new technology in order to implement the provisions of Executive Order 13123. They are also advised to attend DOE and AEE formal, interactive computer and correspondence courses.

## 4 Showcase Facilities

DoD continues to participate in DOE-designated Showcase Facilities to demonstrate new and innovative energy saving technologies. Facilities that are designated Showcase Facilities may incorporate energy and water saving designs, energy conservation improvements, and renewable energy use. Below are examples of Showcase-related activities in the DoD.

**Air Force**

Air Combat Command was recognized by DOE/FEMP as the Air Force's Special Project Poster for 2005 which was distributed for October's Energy Awareness Month. The winner is Langley HQ campus complex, converting the HVAC to a water source heat pump system and improved lighting. The result is energy savings of 57,813 MMBtus and 3,824 Kgals of water annually.

**Department of the Navy**

- DON established two new showcases in FY05. Naval Station Guantanamo Bay brought the world's largest wind farm diesel hybrid system on line. The 3.8 MW plant is improving the installation's grid reliability, producing 25% of the station's power and saving the Navy $1.2m annually.
- Marine Corps Base Camp Pendleton, CA awarded over $6M in Utility Energy Services Contracts, de-centralizing a steam plant, and installing high efficiency lighting systems, day-lighting for warehouses, and solar powered lighting systems for bus stops, street signs and street lights.
- Naval Base Ventura County, Port Hueneme, CA and the U.S Naval Academy, Annapolis, MD continue as on-going DON showcase installations due to the large numbers of Academy midshipmen, Civil Engineer Corps officers and Navy facilities managers who receive operations and facilities training there. Other continuing showcase projects are: The Naval Base San Diego Admiral Prout Field House and Pool, the DDC system at NSWC Dahlgren, the 7MW cogeneration system at MCAGCC Twenty-Nine Palms, the 750 kW photovoltaic system at Naval Base Coronado, CA, the ground source heat pumps and EMCS at MCAS Beaufort, SC, the BOQ at NTC Great Lakes and various projects at Naval Medical Center San Diego, CA.

**Defense Commissary Agency**

The designated "showcase facility" for the FY 2006 construction program is the Barksdale AFB, LA, Commissary. Energy efficiency features include heat reclaim from the refrigeration systems for space and water heating and refrigeration compressor systems comprised of several compressor sizes to ensure the most efficient combination of compressors is running at any one time to meet the load. The Refrigeration Monitoring and Control System (RMCS) for control of the Refrigeration System and Heating Ventilation and Air Conditioning (HVAC) System ensures efficient equipment operation. We maximized use of energy efficient glass door refrigerated display cases, installed automatic scheduling of sales area and display case lighting, anti-sweat heater controls, temperature-terminated defrost and energy efficient lighting systems. Additional energy efficiency features of this facility are occupancy sensors, automatic water control on restroom fixtures, dual path HVAC systems for the sales area, maximum use of wall and roof insulation, energy efficient doors and windows, and utility metering.

**Washington Headquarters Service**

- The Pentagon building has been designated, as the "Energy Showcase Building" for DOD and the goal of the Pentagon Renovation program is to provide an exemplary sustainable DOD Facility. The Pentagon Renovation and Construction Program has incorporated sustainable design requirements into all projects and used the USGBC LEED rating tool to measure success. In FY05, PENREN's active, major projects included the following: 1) Wedge 2: Construction was winding down and is scheduled to be completed in December 2005. This project is in the LEED-EB pilot program and is currently tracking well for earning a "silver" rating. 2) Wedge 3: The design was started and completed in FY05 and the demolition and abatement of W3, Phase 1 started in FY05. We are expecting a "Certified" rating. 3) The Pentagon Library and Conference Center (PLC2) was awarded in July 2004. However, most of the design was accomplished in FY05. This design-build contract included a requirement that a "Certified" rating be earned under LEED for New Construction (LEED-NC). The contractor set the bar higher at "Silver" and is currently tracking well to earn this rating.

- ETSD developed codes and standards for the Pentagon Reservation, which included the International Code Council (ICC) International Energy Conservation Code. This code regulates the design and construction of buildings for the effective use of energy. The intent of this code is to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy. The energy team developed a draft Comprehensive Energy Management Plan, a Recalibration of the Baseline, and a Forecasting Tool.

# II. Energy Efficiency Performance.

## A. Energy Reduction Performance.

### 1. Standard Buildings.

EO 13123 set a goal to achieve a 30 percent reduction in energy consumption (measured in Btu/ft2) by 2005 and a 35 percent improvement by 2010, relative to a 1985 baseline. In FY 2005, after applying renewable energy purchase credits, the Department's standard building energy consumption was 98,204 Btu/ft2. This represents a total reduction in energy consumption per gross square foot of 28.3 percent relative to a FY 1985 baseline. More aggressive energy reduction was expected; however, the lapse in ESPC authority for FY 2004 had a major impact. Many planned ESPC projects were delayed, suspended, or cancelled, resulting in disruption of government and contractor teams. DoD is focused on reinvigorating its ESPC program and is well on track to meeting the new goals of the new Energy Policy Act of 2005.

### 2. Industrial and Laboratory Facilities

The industrial, laboratory, research and energy intensive facilities consumption in FY 2005, after applying renewable energy purchase credits was 167,221 Btu/ft2. This equates to a 21.6 percent reduction when compared to the 1990 baseline of 213,349 Btu/ft2. EO 13123 goal is to reduce energy consumption by 20 percent by 2005 and by 25 percent by 2010 (considering 1990 as the base year).

### 3. Exempt Facilities

- DON exempts mission critical, concentrated energy use transmitters, simulators, cold iron support to ships, and some private party facilities. A list of exempt facilities is provided in Section IV.
- The Army and Air Force have no exempt facilities. However the Air Force is exempting the energy consumed by streetlights and airfield lighting. This amounts to 5,747 MWH.
- All exemptions are consistent with DOE's current exemption policy.

### 4. Tactical Vehicle and Equipment Fuel Use

In FY 2005, DoD consumed approximately 5.17 billion gallons of mobility fuels – down from 5.35 billion gallons in FY 2004. Spending on mobility fuels increased 47 percent from $5.39 billion in FY 2004 to $7.95 billion in FY 2005. This increase in cost is attributed to the rise in fuel prices. For example, the price of jet fuel increased from $1.11 per gallon in FY 2004 to $1.70 per gallon in FY 2005.

The Air Force (AF) made significant positive improvements in our processes for the procurement/lease of alternative fueled vehicles and utilization of alternative fuels. For the third year in a row, the AF estimates it will surpass the Energy Policy Act (EPAct) Alternative Fuel

Vehicle (AFV) acquisition mandate of 75 percent by 23 percent. If the AF's current strategies and assumptions remain unchanged, the AF will continue to exceed the AFV acquisition mandate in FY 2006 & FY 2007 and increase the amount of alternative fuels consumed by AF vehicles. The AF's success is largely due to AF major commands and local commanders placing special emphasis on obtaining AFVs within their owned and GSA leased fleets. Additionally, the AF Petroleum Office (AFPET) has made great strides working with the Defense Energy Supply Center (DESC) in obtaining more alternative fuel infrastructure and alternative fuels. One significant factor for AF's success towards the AFV acquisitions mandate is the increased use of Biodiesel or B20; 7K Gasoline Gallons Equivalents (GGE) in FY 2001, 603K GGE in FY 2002, 714K GGE in FY 2003, 3.3M GGE in FY 2004 to approximately 3.8M GGE in FY 2005. While the AF was able to meet the AFV acquisition mandate for FY 2005, we expect to fall short of compliance with the E.O. 13149 fossil fuel consumption reduction goal of 20 percent for FY05. We are increasing the use of alternative fuels and estimate a 14% fossil fuel reduction for FY05. We will continue to utilize CNG, but the availability of CNG vehicles will cause us to shift our focus to the more available E85 fuel. Note: Data to determine the total amount of alternative fuels consumed in our AFVs will not be complete until December 15th due to GSA not being able to provide fuel consumption figures until mid November 05. The following depicts actual alternative fuels and B20 consumption data to date;

| Alternative Fuel | FY05 Air Force Sales | % Increase over FY04 Sales |
|---|---|---|
| B20 (54 Locations) | 3,800,000 GGEs | 20% |
| E85 (15 Locations) | 215,000 GGEs | 100% |
| CNG (23 Locations) | 115,500 Natural Units | Same as last year |

Thirteen alternate fuel projects (installations to include McGuire AFB, Little Rock AFB, Warfield ANG, Randolph AFB, Sheppard AFB, Niagara Falls ANG, Kirtland AFB, Hill AFB and Forbes Field ANG) are underway (active construction or active design) which will continue to improve our progress to satisfy the mandates and utilizations of alternative fuels. Six of the thirteen projects have an E-85 scope/goal, Four of the thirteen have a Bio-diesel scope/goal, and the rest is overall maintenance (piping or tank maintenance) of facilities to provide alternative fuels. Additionally, per AFPET approximately 45 additional alternative fuel infrastructure projects have been submitted to DESC. Unfortunately, despite our aggressive AFV acquisitions, increased use of B20, E85, CNG and increased MPG for light duty non AFVs, we don't anticipate achieving the 20 percent reduction for FY05. Due to the current Global War on Terror and sustained security threat levels at stateside Air Force bases, we expect our covered fleet's overall petroleum fuel consumption will remain constant. Infrastructure will continue to be an impediment and our operations tempo will continue to exacerbate the problem by causing thousands of additional miles traveled. We are confident that the AF will continue to be successful in obtaining alternative fuel infrastructure at many of our installations. We further expect them to work diligently at improving the availability of alternative fuels at locations that already have alternative fuel infrastructure in place. HQ USAF/ILGM will continue to provide guidance on obtaining and utilizing alternative fuel vehicles and alternative fuels to the maximum extent possible and make positive/aggressive efforts towards meeting the EPAct and EO13149 mandates.

## B. Renewable Energy

The Department of Defense remains dedicated to fulfilling the goals of the Executive Order 13123 by purchasing and generating electricity from renewable sources. In FY 2005, the Department used 8.35 Trillion Btu of renewable energy from self-generation and through purchases. This translates to over 8 percent of DoD's electricity consumption, well exceeding the EO 13123 goal of 2.5% by 2005. DoD emphasizes the use of solar and other renewable energy sources where it is cost-effective and has just recently established a long range goal of 25% by 2025. Passive solar designs, such as building orientation and window placement and sizing have been implemented in a variety of existing buildings and new facility construction. Following are examples of renewable energy activities in various DoD components.

**Department of the Navy**

DON generated and purchased renewable electricity and thermal energy, equivalent to 10.6% of annual electricity consumption. These sources include geothermal energy, biomass from municipal waste, wind energy, solar energy, ground source heat pumps and thermal energy from cogeneration systems. This exceeded the FY05 renewable energy goal of 2.5%.

**The Army**

Army policy is to purchase Green Power - electricity generated from renewable energy sources when it is available. The Army continues to emphasize the use of passive solar designs, such as building orientation and window placement and sizing in a variety of building types and new facility construction. The Army anticipates more growth in the implementation of renewable energy and active solar technologies due to the recently implemented Sustainable Design and Development guidance.

### 1. Self-Generated Renewable Energy

DoD has integrated photovoltaic power systems, solar water heating systems, and transpired solar collectors (solar walls) into its facilities. Active solar heating applications have included maintenance facility solar walls, swimming pool heating, and hot water heating. Below are illustrative examples of self-generated renewable energy projects:

**Air Force**

- Luke AFB AZ awarded an ESPC to install a 122Kw PV system that will be operational in FY06
- F.E. Warren AFB WY installed two on-grid wind generation units with a capacity of 1.2MW.
- USAF Academy generated and captured over 870K CF of digester gas in lieu of natural gas for use in the process of hot water boiler at the WWTP.
- Eielson AFB AK has a refuse derived fuel (RDF) program and processed over 890 tons, generating 12,289 MMBtus saving over 840 tons of coal.

**Department of the Navy**

- DON is increasing generation of renewable energy, operating the largest wind/diesel hybrid plant in the world and the two largest Federal photovoltaic systems in the United States. DON is generating "free" thermal energy from the waste heat of five cogeneration systems, and a sixth plant will add to this generation in early FY06. The eastern flank of a geothermal well at NAWC China Lake, CA has been producing 345,000 MWH of electricity per year, since 1990. DON generated 353,000 MWH of renewable electricity and over 1.2 million Mbtu of renewable thermal energy.

- The Navy is negotiating award of a geothermal electrical generating plant at NAS Fallon, NV. Once constructed, the plant will produce power for the electric grid.

Projects made operational in FY05 include a 3.8 MW wind/diesel hybrid system, at Naval Station Guantanamo Bay, Cuba, and a 10MW cogeneration plant at Naval Training Center Great Lakes, Chicago, IL. Other new renewable projects generating in FY05 include:

| **Solar Hot Water** | |
|---|---|
| **State** | **Application** |
| CA | NAF El Centro |
| HI | Naval Base Pearl Harbor |
| | |
| **Photovoltaic** | |
| **State** | **Application** |
| HI | Naval Base Pearl Harbor |
| HI | PMRF Kauai |
| N/A | NSF Diego Garcia |
| CA | Naval Base Coronado |
| CA | Naval Base Point Loma |
| CA | MCAS Yuma |
| CA | MCB Camp Pendleton |
| CA | NAF El Centro |
| | |
| **Daylighting** | |
| **State** | **Application** |
| CA | DLA San Diego |
| PA | NSWCCD Philadelphia |
| | |

**The Army**

- As technologies have become more cost-effective, The Army has installed self-generating technologies such as solar, wind, geothermal, and biomass, and continues to make significant

progress in promoting the use of these and other renewable technologies at our installations. The Army is developing portable Photovoltaic (PV) technology to serve as the primary power source of a Battalion size Tactical Operations Center (TOC). The current units under field test will meet 80 percent of the TOC's power requirements. The units are tactically quiet, reduce the logistic footprint, and prevent pollution.

- The Army has integrated photovoltaic power systems, solar water heating systems, and transpired solar collectors (solar walls) into facilities and generated an estimated 210 Billion British Thermal Units (BBtu) of self generated electrical power during FY2004. This self-generated power is coupled with projects such as ground-source heat pumps, solar water heating systems, and photovoltaic systems to generate electricity for isolated loads such as range targets, airfield landing strip lighting, and remote water pumping stations. Active solar heating applications have included maintenance facility solar walls, swimming pool heating, and hot water heating.
- The Army was also successful in funding the installation of 10 kW wind turbines at Fort Huachuca, Arizona and at the Headquarters for the Arizona National Guard. The following are self-generating renewable energy projects implemented and operating on Army Installations:

  - Fort Stewart, GA generates high-pressure steam using wood chips at the central energy plant. In FY 2005 Fort Stewart used about 359 BBtu (39,901 short tons) of wood chips to generate steam.
  - Fort Carson, CO generates 1-2% of its energy from renewable sources such as solar heat (indoor pool), photovoltaics (traffic signals, noise monitors, pumps, other equipment, and a solar wall at a hangar.
  - Fort Riley, KS generated 2500 MMBtus of thermal energy from geothermal heat pumps in FY05.
  - Fort Buchanan, PR has 32 photovoltaic street lighting systems with an estimated daily savings of 69,750 KWh in FY05.
  - Fort Irwin, CA, Fort Sam Houston, Fort Huachuca, and Fort Polk, LA generated a portion of their thermal energy with the total renewable thermal energy generated in FY05 of 128,360 MMBtu.
  - Rock Island Arsenal, IL generated approximately 20,571 MWHs of electricity from its hydroelectric plant in FY05
  - Red River Army Depot, TX generated 52,853 MMBtu of renewable energy through burning wood scrap.
  - McAlester Army Depot, OK; Fort Sam Houston, TX; Fort Irwin, CA, Fort Huachuca, AZ, White Sands Missile Range, NM, and Yuma Proving Grounds, AZ generated 629.0 MWH of solar electric power.
  - Fort Huachuca, AZ generated 2.5 MWH of wind power.

**Defense Commissary Agency**

Many commissary designs incorporate passive solar features. Examples include:

- Heat reclaim is always considered and normally used. Daylighting is also considered in design development.

- Geothermal heat pump systems are now analyzed when considering design alternatives since larger capacities have become available.

- DeCA was working with First Solar Electric (FSE), Parker, CO and the energy manager of Los Angeles AFB, CA to install a roof mounted, photovoltaic solar array capable of producing 152 kW at the Los Angeles AFB Commissary, CA. FSE left the US market in late FY 2005. We are now working with PowerLight Corporation, Berkeley, CA to accomplish this project in FY 2006.

**Washington Headquarters Service**

- The Pentagon has three photovoltaic arrays with a combined capacity of 96 kW and smaller photovoltaic systems (solar lights) at 48 various locations bring the total Pentagon Reservation photovoltaic capacity to 110.4-kW.
- A solar thermal system exists in the Wedge 1 portion of the building to supplement the domestic hot water system and has the capacity to produce 375 Mbtu/yr and two solar thermal systems located at the incinerator have a combined capacity of 5.8 Mbtu/yr.
- The solar thermal system at the H&RP guard booth consists of 400 sf of tiles with a total capacity of 11.7 kW to provide lighting, heat and air conditioning for the H&RP guard booth.

## 2. Purchase of Renewable Energy

DoD continued to purchase energy from renewable sources. In FY 2005, total DoD renewable energy purchases amounted to 834,449 MMbtu. The following provides a brief summary of other DoD agency achievements in this area:

**Air Force**

The amount of the renewable energy reported in Table 1.6 of the Energy Management Data Report is not applied to Standard Buildings for the renewable energy credit, but is applied in the energy scorecard reduction figures. Total for FY05 is 1,047,766 MWH. Dyess AFB and Fairchild AFB purchase 100% renewable power for their installations.

| Installation | MWH | State |
|---|---|---|
| USAFA | 60 | CO |
| RAF Lakenheath | 11,178 | England |
| Edwards AFB | 132,780 | CA |
| Grand Forks AFB | 2,520 | ND |
| Fairchild AFB | 67,278 | WA |
| Altus AFB | 3,000 | OK |
| Columbus AFB | 42,610 | AR |
| Goodfellow, TX | 17,884 | TX |
| Gunter | 45,906 | AL |
| Keesler, MS | 42,000 | MS |

| Installation | MWH | State |
|---|---|---|
| Lackland, TX | 70,800 | TX |
| Laughlin, TX | 16,842 | TX |
| Little Rock, AR | 39,000 | AR |
| Luke, AZ | 3,000 | AZ |
| Maxwell, AL | 3,000 | AL |
| Randolph,TX | 36,000 | TX |
| Sheppard, TX | 48,586 | TX |
| Tyndall, FL | 50,400 | FL |
| Vance, OK | 12,000 | OK |
| WHMC | 5,084 | TX |
| F.E.Warren, WY | 4,547 | WY |
| Barksdale | 15,817 | LO |
| Beale | 14,579 | CA |
| Cannon | 9,357 | NM |
| Davis-Monthan | 13,146 | AZ |
| Dyess | 72,885 | TX |
| Dyess Commissary | 1,788 | TX |
| Dyess - Off base sites | 602 | TX |
| Ellsworth | 23,866 | SD |
| Holloman | 13,150 | NM |
| Langley | 21,891 | VA |
| Minot AFB | 103,202 | ND |
| Mountain Home | 9,282 | ID |
| Nellis | 23,749 | NV |
| Offutt | 23,587 | NE |
| Seymour Johnson | 12,520 | NC |
| Shaw | 15,869 | SC |
| Whiteman | 18,000 | MI |
| Total | 1,047,766 | |

## Department of the Navy

DON purchased 114,588 MWH of renewable electricity and 601,321 MBtu of renewable thermal energy. Norfolk Naval Shipyard, Portsmouth, VA (industrial consumption), purchases electricity and steam from a privatized waste to energy plant. NAS Keflavik, Iceland purchases electricity and steam generated from geothermal energy.

## The Army

Redstone Arsenal purchases steam from the City of Huntsville that is produced from municipal solid waste. In FY 2005, Redstone purchased 609,800 MBtu. This renewable energy source was developed prior to 1990 and is therefore not included in the Renewable Energy/Renewable Energy Credit Purchases on the DoD Scorecard. Fort Carson is purchasing 6,650 MWH of electrical power generated from renewable sources from Colorado Springs Utility. The Army is

making a special effort to purchase renewable energy generated from solar, wind, geothermal, and biomass.

The Presidio of Monterey purchased 14,495 MWHs of solar energy in FY 2005 and Fort Sill purchased 116,383 MWH of solar energy in FY 2005. Fort Lewis purchased 12,000 MWH of Solar and Wind energy and Aberdeen Proving Ground purchased 469,300 MBtu of thermal energy in FY 2005.

**Defense Commissary Agency**

DeCA purchased 8.688 Million Btus of thermal energy generated by geothermal energy and 1,842 Million Btus of electricity generated by hydroelectric sources for the Keflavik commissary in FY 2005.

## C. Petroleum

DoD continues to make significant progress in reducing the consumption of petroleum-based fuels. Please see the component-submitted examples below for examples.

**Air Force**

Fuel oil (#2 and #6) and LPG/propane were used in Air Force facilities in both FY85 and FY04. The petroleum reduction from FY85 to FY05 was 72%. (FY05 = 7,683,327 MBTU; FY85 = 27,453,556 MMBtus).

**Department of the Navy**

Fuel Oil use in facilities decreased 1.8 million gallons or 2.6% from last year. Several installations optimized central steam plant start-up/shut-down based on weather forecasts. Some installations installed boiler control systems to monitor and adjust efficiency and optimizing performance. Others upgraded heating systems to more efficient units.

**The Army**

The Army's baseline consumption of fuel oil was 101 TBtus in FY 1985 and has been reduced to 6.5 TBtus in FY 2005. Since FY 1985, The Army has reduced petroleum-based fuel use at its facilities by 94.8 percent. Army Installations have been encouraged to investigate alternative fuels such as natural gas and renewable energy that produce less carbon emissions. Installations have also been encouraged to use more natural gas with fuel oil as back up.

**Defense Commissary Agency**

| | | Annual Consumption | Annual Consumption | Percent | Denominator & |
|---|---|---|---|---|---|
| **Buildings/Facilities** | | **FY 1995** | **FY 2005** | **Change** | ***Numerator*** |
| Fuel Oil | Thou Gal | 1.0 | 121.1 | 11,948% | (121.1-1.0)/1.0 |

| | | | | | |
|---|---|---|---|---|---|
| Natural Gas | Thou Cu Ft | 7,799.0 | 7,121.7 | -8.7% | (7,121.7-7,799)/7,799 |
| LPG/Propane | Thou Gal | 0.0 | 0.0 | 0.0% | |

**Excluded Buildings/Industrial (Commissaries)**

| | | | | | |
|---|---|---|---|---|---|
| Fuel Oil | Thou Gal | 558.7 | 371.2 | -33.6% | (371.2-558.7)/558.7 |
| Natural Gas | Thou Cu Ft | 379,337.0 | 375,512.9 | -1.0% | (375,512.9-379,337)/379,337 |
| LPG/Propane | Thou Gal | 45.3 | 84.9 | 87.4% | (84.9-45.3)/45.3 |

- The large increase in fuel oil from DeCA's FY 1995 Base Year is due to DeCA Europe Central Distribution Centers (CDCs) not reporting on this commodity until FY 2003.

- No DeCA FY 2005 commissary designs used fuel oil (except for that used in emergency generators) and no design used LPG/propane.

- We estimate an annual reduction of 14.8 thousand gallons in fuel oil usage at the Kaiserslautern Central Distribution Center (Cold Storage), Germany, as the result of the boiler system replacement accomplished through an Energy-Savings Performance Contract in FY 2005.

**Washington Headquarters Service**

- Every effort is made to minimize the use of #2 fuel oil (FO2) as a back-up supply in the production of steam and only use it when cost-effective, compared with natural gas, or when curtailments are ordered. Only a minimal amount of oil was used during FY05.
- The compressed natural gas (CNG) and ethanol 85% (E85) fueling station at the Navy Exchange Gas Station continues to serve alternative fuel vehicles that are in use throughout the Pentagon Reservation. The total usage of alternative fuels is as follows: 1) ethanol – 38,673 gallons, 2) compressed natural gas – 43,905 gallons, and 3) bio diesel – 57,092 gallons. In addition, electric charging stations are located in the Pentagon's Remote Delivery Facility (RDF) for charging an estimated 500 electric special purpose vehicles (SPVs) used throughout the Pentagon Reservation.
- The percentages of petroleum-based fuels used by DLA in FY 85 were 0.9 percent propane and 16.3 percent fuel oil. The percentages of petroleum based fuels used by DLA in FY 05 was 0.1 percent propane and 0.3 percent fuel oil. The change in propane was a -88 percent decrease from FY 85 baseline to FY 05. The change in fuel oil was a 98 percent decrease from FY85 baseline to FY 05.

## D. Water Conservation

While there is no specific water reduction goal outlined in EO 13123, DoD remains committed to reducing over all consumption of natural resources by recording annual water consumption data from The Services. In FY 2005, 195 DoD facilities developed water management plans and implemented best management practices (BMPs). This year, DoD consumed 124.3 billion

gallons of potable water. This represents a 28.3 percent decrease in consumption when compared to a FY 2000 base year.

DoD is striving to increase water conservation awareness and reduce water use—particularly where tight water supplies may potentially impact mission accomplishment and personnel morale. Water conservation measures not only reduce water use and cost, but also reduce energy consumption (for pumping) and sewage treatment costs. Additionally, water conservation helps to reduce the quantities of wastewater treatment chemicals (most notably chlorine) being released into the environment, and reduces the risk of drawing down aquifers or saltwater intrusion into aquifers. Thus, water conservation efforts, in addition to being environmentally responsible, can help installations stretch dwindling Operation and Maintenance (O&M) dollars. For specifics, please see below:

**Air Force**

The Air Force consumed 38,112.7 MGal of water in FY05 at a cost of $74,854.9. This is a reduction of 7.3% from last year's consumption.

**Department of the Navy**

Thirty-nine installations have water management plans and have implemented at least 4 best management practices in water efficiency. This represents over 20% of DON installations and is a significant increase over FY04. In FY2005:

- Navy Region Southwest installed water efficient washing machines and waterless urinals, and implemented a wastewater recycling system at Naval Auxiliary Landing Field San Clemente Island. Naval Base Ventura County implemented xeriscaping at Point Mugu, converting 1.5 acres from watered turf to drought-tolerant xeriscaping. Naval Air Weapons Station China Lake is using a SCADA system to measure and alert maintenance personnel when abnormal flow rates from reservoirs occur. Alarms were successfully used this year to alert personnel to a 14" water distribution line break. Quick repair reduced the amount of water lost. Naval Weapons Station Seal Beach reduced irrigation water by 50% by not watering non-prestige areas.

- Naval Surface Warfare Center Carderock Division, West Bethesda, MD utilities personnel have replaced several potable water mains minimizing distribution system leaks. Utilities personnel installed a low profile condensate tank so steam condensate would not have to be drained to waste before opening the main to a building after outages.

- Naval Surface Warfare Center Cardedrock Division Ship Systems Engineering Station Philadelphia reduced potable water usage by 9% compared to FY04 usage. Keys to success included diligent monitoring of metered consumption data and close oversight of HVAC cooling tower systems and condensing water loops.

- Naval Air Engineering Center Lakehurst, NJ inspected and repaired the water distribution system. They replaced or repaired condensate return lines for Power Plant 2 and Building 194. Both systems support large capacity boilers.

- Norfolk Naval Shipyard, Portsmouth, VA was pumping water from utility tunnels approximately 18 hours per day. A water survey was performed in utility tunnels in industrial buildings to determine the source of water leaks. Repairs have reduced water use and pumping requirements to approximately 6 hrs per week.

- Naval Surface Warfare Center Carderock Division Memphis Detachment uses a 350,000-gallon storage tank. When the water level in the test site must be reduced, it is pumped to the storage tank until it is needed again. This allows the site to reuse the water instead of dumping it to the sewer and refilling with new water.

- Naval Station Great Lakes, Chicago, IL replaced 6,626 ft of condensate return piping which is saving 33.6 million gallons of water per year.

- Naval Base San Diego, CA installed rinse and save water valves in the galley and restaurants to cut water usage. 66 energy star washers were installed at the Single Sailor Laundry facilities.

- NAS Fallon, NV replaced the galley food refrigeration system that had a once through heat rejection system. Replacement saved in excess of 1 million gallons of water annually.

- Naval Base Coronado, CA Naval Base San Diego, CA and Naval Base Point Loma installed 529 water-efficient washers and 13 water free urinals. Naval Base Coronado developed an efficient leak reporting and response system. Excessive water use meter reads are automatically flagged; REMs are promptly notified to investigate to determine root cause and resolve. REMs also began use of innovative leak detection equipment to aid the program.

- Naval Support Activity Monterey, CA installed water free urinals and used 90% non-potable water for irrigation.

- Navy Region Hawaii implemented a leak detection project at Makalapa Housing. Meters were installed on about 30 irrigation systems reducing over-irrigation by 500 Kgal/day.

- Fleet Activities Sasebo experienced a brief drought in June 2004, and implemented water conservation measures, resulting in using 14% less water than in the previous month.

The Army

In FY 2005, the Army used 45,933.6 million gallons of potable water, a 30.5 percent decrease from FY 2004. The Army's total water use has steadily declined - water use dropped by almost 45 percent between FY 1992 and FY 1999. During the same time period, water disposal volume dropped by 43.7 percent. Greater treatment and testing requirements imposed on water suppliers by the Safe Drinking Water Act and amendments have increased the cost of providing potable

drinking water. Water conservation efforts, in addition to being environmentally responsible, can help installations stretch dwindling Operation & Maintenance (O&M) dollars. Also, those water conservation measures that reduce wastewater quantities provide an additional opportunity for savings. All Army installations have a water management plan.

**Defense Commissary Agency**

- DeCA potable water usage for FY 2005 is 405.1 MGY, which is a 16.1 percent increase from its FY 2000 baseline of 349.1 MGY (405.1-349.1)/ 349.1)*100). The increase occurred due because most DeCA Europe facilities did not begin reporting data until FY 2003. This is a 4.1 percent (405.1-422.6)/422.6)*100) reduction from the 366.7 MGY use in FY 2004.

- The DeCA design criterion requires low consumption toilets and urinals with electronic flush sensors for new and renovated commissaries. Electronic sensor control valves are specified on hand wash lavatories. At locations where host installations maintain "waterless" urinals, the projects may include the "waterless" urinals.

- DeCA construction projects implemented are required to include low flow devices for flush valves and lavatory faucets. The use of electronic valves was included in projects to reduce water use. The DeCA East regional office is located in a General Services Administration (GSA) negotiated leased building. The regional office contracted for the space and requested that the building owner incorporate current commercial energy efficient design with set back thermostats and state of the art equipment efficiently ratings. The plumbing fixtures in the office are all of the low flow type and meet commercial plumbing criteria. The energy and utility costs are included in the lease agreement so the rent includes these costs. This makes it beneficial for the owner to use the most energy efficient equipment to maximize their energy savings.

- DeCA West continues to upgrade restroom facilities, by fitting them with low-flow type fixtures and where applicable, sensor activated faucets and flush valves. This is an on-going process.

- More emphasis has been placed on the immediate necessity to repair leaky and/or faulty plumbing fixtures as they are identified. If the installation/base maintenance work force is not available to resolve the problem, outside (off-base) maintenance will be sought to acquire immediate correction of the problem.

- Closer monitoring and improved quality checking of commissary store quarterly water use and cost reports (DeCA Form 20-1) has been implemented. Store directors continue to stress the importance of conserving water in their daily operations.

- The DeCA East San Antonio office implemented local city water conservation rules for lawn watering schedules and has a booster pump in the lawn sprinkler supply line for optimum use of available water pressure.

- The DeCA East Utilities Task Force directed that all locations conduct a comparative reading of water meters each month to validate consumption as reported by host installation.

- Local city water conservation rules for lawn watering schedules were implemented at the DeCA East San Antonio office.

- Landscape irrigation, at times, has been substantially reduced at the DeCA Headquarters facility, Fort Lee, VA.

**Washington Headquarters Service**

- During FY05, efforts were focused on identifying locations of main water supplies to the reservation as well as existing water meters. These efforts consisted of reviewing existing condition drawings, reviewing as-builds from recently completed (within last 5 years) projects and field surveys to verify meter existence and locations.

- The Wedge 2 measurement & verification program was not sufficiently installed by the end of FY05 to evaluate the performance of the design to exceed the EPACT requirements.

- The water metering information gathered and verified in FY05 will support the development of a comprehensive water-metering plan in FY06, which will allow for the more detailed investigation of the source of the increases in water consumption.

- The Wedge 2 Renovation design shows a 30% reduction in water use over the EPACT requirements, which was achieved by using water efficient fixtures and infrared controllers in the renovation.

**National Security Agency**

- In FY-05 NSA paid $1.9M for 443 million gallons of water to accommodate 8.80 million sq/ft of space. This is a 15% reduction from the 1985 base year, even though space increased by 107%.
- NSA continues to implement water-conservation measures, and uses water saving fixtures in lavatories during renovation or repair projects. Reports of water leaks receive immediate attention, particularly for the underground steam distribution system.
- There are several buildings on Fort Meade Post that are included as part of the NSA's total water usage. These buildings are tied into the NSA water distribution system but do not have separate metering to determine water use. Future plans include installing separate water meters on each building to determine actual water consumption.

## Other DoD Agencies

- **DCMA** water usage in FY 2005 was 3.4 million gallons at a cost of $7.4K. Compared to the previous ye which was 4.6 million gallons at a cost of $9.1K. This represents a 26% reduction in actual water utiliza
- **NGA** established a Water Management Program in FY 2003 and continues to implement at least one Bes Management Practice (BMP) at each site in FY 06. All water supplied to NGA in FY-2006 will be mete The Bethesda Site requested the Washington Water and Sewage Authority, to install new water meters. T was initiated in July 2003. Two meters were added in 2004. An additional seven meters are scheduled for installation during 2005 that will bring the total to 10 meters. NGA will carefully monitor the new water consumption figures, measure and report the results of the (BMPs) that are implemented.
- **DLA** estimated water consumption usage for the baseline FY 00 was 100 million gallon. DLA water consumption use for FY 05 usage is 182.6 million gallons used. DLA is currently working on a Water Conservation Management Plan expected to be completed in FY 06.

# III. Implementation Strategies.

DoD's philosophy is to give the Defense Components the flexibility to manage their own energy programs to meet the goals of Energy Policy Act (EPAct) and EO 13123. DoD's primary objectives in implementing strategies are to improve energy efficiency, eliminate energy waste and reduce costs. To achieve these two objectives, the Services use the following common strategies:

1. Invest in energy efficient technologies, such as high efficiency lighting and ballasts, energy efficient motors, and packaged heating and cooling equipment with energy efficiency ratios (EER) that meet or exceed Federal criteria for retrofitting existing buildings.
2. Utilize Energy Savings Performance Contracts (ESPC) and Utility Energy Savings Contracts (UESC).
3. Investing in Energy Monitoring and Control Systems (EMCS).
4. Re-energizing of Energy Awareness Campaigns
5. Providing training to energy coordinators at both the region and installation level.

For example, the Army program objectives provide execution flexibility to regions and installations in meeting the goals of E.O. 13123 and the new Energy Policy Act of 2005 (EPACT 2005). The primary objective was to develop an overall Army Energy Strategy. The Army Energy Strategy was developed and approved on August 8, 2005 by Secretary of the Army, Frances J. Harvey and Chief of Staff of the Army, Peter J. Schoomaker. The Army Energy Strategy has five initiatives. They are to eliminate waste in existing facilities, increase energy efficiency in renovation and new construction, reduce dependency on fossil fuels, conserve water resources and improve energy security. To achieve the objectives of the Army Energy Strategy, the Army is developing a campaign plan, which will provide a systematic approach for accomplishing:

1. Investing in energy efficient technologies, such as high efficiency lighting and ballasts, energy efficient motors, and packaged heating and cooling equipment with energy efficiency ratios (EER) that meet or exceed Federal criteria for retrofitting existing buildings. The Army is using the Energy Conservation Investment Program (ECIP) program and private sector funding from Energy Savings Performance Contracts, Utility Energy Services Contracts, and Demand Side Management (ESPC/ UESC/ DSM) to make these investments on our installations.

2. Utility Energy Savings Contracts. The Army awarded 7 UESC agreements in FY 2005 with an annual savings of 344,797 MMBtu. These contracts included projects such as HVAC improvements at the Fort Knox Directorate of Information Management facility (Bldg. 1227, Decentralization of the Fort Campbell Boiler Plant (Bldg 7008) and Lighting Upgrades in 38 buildings and on 4 ball fields at Fort Gordon,

3. Investing in Energy Monitoring and Control Systems (EMCS). The Army is using the ECIP program and ESPC projects to install EMCS on several installations, as well as upgrade and expand existing systems at installations. In FY 2005, the Army invested $5.4 million in a Utility

Monitoring and Control System (UMCS) at Fort Drum and $2.35 million in an Energy Management Control System (EMCS) at Anniston Army Depot.

4. Providing training to region and installation level energy coordinators. During FY 2005, the Army funded Certified Energy Manager's (CEM) training courses available through the Association of Energy Engineers. Twenty-nine Army energy managers completed the Certified Energy Manager's (CEM) training course.

## A. Life Cycle Cost Analysis

The Department's Facilities and Energy managers utilize life-cycle cost analysis in making decisions about their investment in products, services, construction, and other projects to lower costs and to reduce energy and water consumption. DoD considers the life-cycle costs of combining projects, and encourages bundling of energy efficiency projects with renewable energy projects, where appropriate. Projects are prioritized for capital funding and execution is based upon the greatest life-cycle savings to investment ratio. The use of passive solar design and active solar technologies are recommended where cost-effective over the life of the project. Sustainable development projects use life-cycle costing methodology and follow the Whole Building Design Guide. For examples, pleas see below:

**Air Force**

Life Cycle Cost Analysis was used on all new construction projects and retrofit projects, including ESPC, UESC, and ECIP programs. Examples include:

- Dormitory construction at Barksdale AFB LA (MILCON $15.6M).
- Dining hall/Airmen's Center at Cannon AFB NM (MILCON $9.5M).
- Infrared heating systems (11) replaced an old forced air heating system at Altus AFB OK.
- CFL lighting retrofit at Yokota AB JN using FASCAP funding.

**Department of the Navy**

All DON energy projects (centrally funded and financed) are required to evaluate savings on a life cycle basis. Projects submitted utilize the NIST publication handbook 135 and DOE energy discount factors as guidance. In FY03, the DON energy projects team adopted use of DOE's Building Life Cycle Costing software as a standard for determining project economics. Sustainable development projects use life cycle costing methodology and follow the whole building design guide. GSA and DLA guidance on purchasing energy efficient products continues to be distributed in order to educate purchasers of the life cycle costing requirement and provide them assistance making purchasing decisions.

**The Army**

Army facilities utilize life-cycle cost analysis in making decisions about their investment in products, services, construction, and other projects to lower the costs and to reduce energy and water consumption. The Army is required to use building systems and/or equipment that meets

or exceeds the energy performance standards set forth in 10 Code of Federal Regulations 435, local building standards, etc, and that result in the lowest life-cycle cost. The Army considers the life cycle costs of combining projects, and encourages bundling of energy efficiency projects with renewable energy projects, where appropriate. Utilizing energy efficiency, water conservation, solar and other renewable energy technologies can minimize life-cycle cost. The use of passive solar design and active solar technologies are required, where cost effective over the life of a project.

**Defense Commissary Agency**

- DeCA Handbook (DeCAH) 20-1, emphasizes use of life cycle cost requirements in design of commissaries. The handbook was revised in FY 2005 and is pending issue to in-house staff and contractors.
- DeCA Handbook (DeCAH) 20-1 emphasizes life cycle cost evaluation of HVAC systems for alternate fuel sources and other energy reduction strategies including direct expansion and gas-fired systems. Designs include other items such as: occupancy sensors, energy efficient lamps and ballasts, LED exit signs, high efficiency motors on air handling units and display cases, maximized use of glass door refrigerated cases instead of open cases, use of refrigeration monitoring and control systems for the most efficient operation of refrigeration systems and HVAC, automatic water controls for restroom fixtures for efficient use of water, use of Dual Path and desiccant air handling units for the most economical means of cooling and dehumidification, maximized use of wall and roof insulation, implementation of energy efficient doors and windows, and plastic curtains on refrigerated cooler doors.
- Plastic or metal swing air curtain doors are replacing the strip curtains on walk-in refrigeration equipment in the freezers, meat, dairy and produce rooms in new and renovation projects.
- DeCA Europe assures that existing procedures in the DeCA Design Criteria that require life cycle cost analysis be performed for major mechanical components prior to start of design and selection of the type of HVAC to be installed. The boiler replacement project at Grafenwoehr Commissary, GE used the Life Cycle Analysis method to determine the benefit for various system components. Other requirements stated in the DeCA Design Criteria require the design firms to provide life cycle cost analysis on construction materials and methods.
- The projects that are normally a regional office responsibility are replacement type projects that required a quick turnaround. Life-cycle cost procedures are used where alternatives are available.
- The use of life-cycle cost alternatives is a primary focus in the design determination required during major and sustainment project development.
- In FY 2005, an analysis was conducted relative to fax machine repairs at the Agency Headquarters. Machines with the lowest life cycle costs were selected for procurement.

**Washington Headquarters Service**

LCCA is a requirement of the Wedge 2- 5 contract and is being overseen by Pentagon Renovation and Construction Office. For example, an LCCA was done in FY04 on the major HVAC system in the renovation as well as the drinking water system as part of the effort of the

renovation program to capture the total cost of ownership of the systems. However, there were no LCCA's done in FY05.

## B. Facility Energy Audits

DoD demonstrates the department's commitment to energy conservation and the goals of Executive Order 13123 by conducting energy audits of facilities and installations. In FY 2005, DoD completed an audit of 225,129 thousand square feet (ksf) or 10.7 percent of total facility square footage in FY 2005. For specifics, please see below:

**Air Force**

- The Air Force has performed facility audits of 63,734ksf or 10.2% of 626,453ksf of the total facility space for FY05.
- The Air Force has performed facility audits of 670,304 ksf or 107% of 626,453ksf the total facility space since FY92.

**Department of the Navy**

Energy audits were conducted on 12% of facility square footage. Since 1992, audits were completed on a total of 128% equivalent of DON facility square footage. Some audits were repeat audits, several years apart, to investigate additional conservation measures not cost effective previously, or to investigate measures that were not identified the during the first audit. DON strives to fund audits on a reimbursable basis (funds provided by individual installations) or by adding the cost of audits into alternatively financed projects.

**The Army**

The ESPC and UESC contractors as part of their proposals primarily conduct energy audits. The Army audited 85,802,000 square feet (out of a total 852,630,000 square feet) in FY 2005, or 10.1 percent of the total square footage.

**Defense Commissary Agency**

- DeCA audited 6.3 percent or (1,102,978 SF /17,643,949 SF) of its reporting facilities in FY 2005 due to Energy and Environmental Manager manpower constraints. Additional manpower recourses are planned in FY 2006 to increase the number of facilities audited.
- DeCA is partnering with the DOE for a retro-commissioning plan to audit commissaries with the objective of providing a baseline for a detailed retro-commissioning plan that will be applied to all commissaries system-wide.
- Energy audits are accomplished from the DeCA HQ level through the Agency Energy and Environmental Manager (EEM).
- The DeCA East and DeCA Europe have Utility Energy Task Forces (UTF) that investigates high energy using facilities and make recommendations for remediation of the problems that are found. The UTFs required energy audits to be accomplished through the DeCA EEM or for existing audits to be revisited to better identify problems. DeCA plans formation of a UTF in January 2006.

- Additionally, 25 commissaries were audited electronically, through analysis of refrigeration monitoring and control data. These audits resulted in a potential annual savings of $380,000 once recommended corrections are completed.

**Washington Headquarters Service**

The Pentagon has partnered with an energy service company (ESCO) to advance the EO 13123 audit goals. A representative from DOE is facilitating this partnership. The ESPC Acquisition / Selection Team consisted of members from ETSD, FFD, and PENREN. This team selected one of the four competing ESCOs. The kickoff meeting was held 4thQtr FY05 and they are starting to evaluate the Reservation.

**Other DoD Agencies**

- In FY 2005, **DCMA** procured a SAVEnergy Audit through the DOE for DCMA District West HQ, Carson, CA.
- **DLA** performed its final site audit at the Defense Depot Susquehanna Pennsylvania (DDSP). All DLA sites have been audited.

## C. Financing Mechanisms

Utility Energy Service Contracts (UESC) and Energy Savings Performance Contracts (ESPC) are crucial tools for financing energy efficiency measures that allow installations to improve their infrastructure and pay for the energy efficiency measures through the savings generated by the project over time (10-25 years). ESPCs are partnerships with private sector companies, known as Energy Savings Companies (or ESCOs). UESCs are similar to ESPCs, with the most notable difference being that the projects are financed and implemented through utility companies

In FY 2005, Defense Components through a decentralized approach awarded 22 UESC and 15 ESPC task orders/contracts producing an estimated annual energy savings of 1,058 Trillion Btu and a total life-cycle savings of $282 million. For specific examples, please see below:

**Air Force**

The Air Force awarded 8 new ESPC and 3 new UESC task orders for this FY. These task orders include energy infrastructure upgrades and new equipment to help the installations reduce energy and water consumption. Examples include new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices.

**ESPC Table of Air Force Awarded Projects**

| BASE | Award Date | Awarded Task Order Total Contractor Investment | Contracting Agent |
|---|---|---|---|
| Altus AFB | 31 Mar 05 | $3,948,534 | AF |

| | | | |
|---|---|---|---|
| Minot AFB | 8 Jul 05 | $1,937,927 | AF |
| Nellis AFB | 25 Aug 05 | $3,169,649 | AF |
| Hill AFB | Jul 05 | $3,670,000 | DOE |
| Charleston AFB | 21 Sep 05 | $23,924,000 | DOE |
| Luke AFB | 26 Sep 05 | $7,536,089 | AF |
| Cannon AFB | 5 May 05 | $1,986,860 | AF |
| Goodfellow AFB | 28 Jun 05 | $2,692,246 | AF |
| Total | | $49,909,532 | |

**UESC Table of Air Force Awarded Projects**

| BASE | Award Date | Awarded Task Order Total Contractor Investment | Contracting Agent |
|---|---|---|---|
| Hurlburt AFB | Dec 04 | $2,721,871 | AF |
| Andrews AFB | Dec 04 | $978,129 | AF |
| Ellsworth AFB | Oct 04 | $4,280,000 | AF |
| Total | | $7,980,000 | |

## Department of the Navy

- Based on past projects, DON estimates it needs to invest $140-$170M/yr in energy efficient equipment (financed + appropriated) in order to meet EPAct 2005 energy reduction goals. Utility Energy Service Contracts (UESC) and Energy Savings Performance Contracts (ESPC) are invaluable financial mechanisms to fund energy efficiency measures. Naval Facilities Engineering Command (NAVFAC) utilizing Utility, Department of Energy, Department of Army and Department of Navy contracts, executes both contract vehicles, and makes full use of appropriated project funds.
- In FY04, Congress allowed ESPC authority to expire, and although authority was re-instated in FY05, projects had to be started from the beginning because utility rates and interest rates changed. This severely limited DON's ability to award ESPC. Several projects are projected for award in FY06. $28.5M (first capital cost) worth of financed UESC projects were executed. The following is a list of delivery orders awarded this fiscal year:

**UESC**

| Location | Contract Vehicle | #Of Delivery Orders |
|---|---|---|
| NAS Brunswick, ME | NAVFACENGCOM, Atlantic Division | 1 |
| NAVFAC MIDLANT, Norfolk, VA | NAVFACENGCOM, Atlantic Division | 1 |
| NAS & PWC Jacksonville, FL | NAVFACENGCOM, PWC Jacksonville | 3 |
| MCLB Blount Island, FL | NAVFACENGCOM, PWC Jacksonville | 1 |

| | | |
|---|---|---|
| NSWC Corona, CA | NAVFACENGCOM, Southwest Division | 1 |
| NAS Whidbey Island, WA | NAVFACENGCOM, Southwest Division | 1 |
| MCB Camp Pendleton, CA | NAVFACENGCOM, Southwest Division | 1 |
| MCAS Yuma, AZ | NAVFACENGCOM, Southwest Division | 1 |
| NUWC Keyport, WA | NAVFACENGCOM, Southwest Division | 1 |
| NCCOSC San Diego, CA | NAVFACENGCOM, Southwest Division | 1 |

**The Army**

- Army installations access all of the financing mechanisms available to them, including ESPC, UESC, and various forms of appropriated funds. Some Army installations have used the Army's Utility Modernization Program to supplement its ESPC projects.
- In FY05, the Army awarded 7 ESPC contracts with an annual savings of 34,325 Million British Thermal Units (MBTU).
- In FY 2005, The Army awarded 7 UESCs, with utility company investment of approximately $29 million. Most of the anticipated $54.6 million in total life cycle cost savings will be returned to the utility company to pay for improvement measures. The following UESC contracts were awarded in FY 2005.

| Location | Project Scope |
|---|---|
| Fort Knox, KY | HVAC Improvements DOIM 1227 |
| Fort Knox, KY | HVAC 12 Bldgs 2300 Block |
| Fort Campbell | Decentralization of 7008 Boiler Plant |
| Fort Campbell | Boiler Plant, Chilled Water System, and Distribution System Improvements |
| Fort McPherson | Chiller and HVAC Upgrades, and water conservation |
| Fort McPherson | Infrared Heating, Lighting, Controls, and Water Conservation |
| Fort Gordon | Lighting Upgrade in 38 Bldgs and 4 Ball Fields |

**Defense Commissary Agency**

- DeCA is considering giving Huntsville District authority to make another attempt to pursue an ESPC. We are also working with DOE Northeast Region for ESPC services.
- An ESPC initiated by the Ramstein AB energy manager, with coordination and input from DeCA Europe, replaced all the lighting in Kaiserslautern Germany Military Community Commissaries at Sembach Military Community, Ramstein AFB, Vogelweh AB and our Kaiserslautern Central CDC.

## D. Energy-Star ® and Other Energy-Efficient Products

When life cycle cost-effective, DoD organizations select Energy Star® and other energy-efficient products when acquiring energy-consuming products. Guidance generated by DOE, GSA and DLA for energy–efficient products are incorporated into the sustainable design and development of new and renovated facilities. The components are procuring energy-consuming products that are in the upper 25 percent of energy efficiency. Energy efficient technologies include high-efficiency lighting and ballasts, exit signs, energy efficient motors, low-voltage distribution transformers, and the use of packaged heating and cooling equipment with energy efficiency ratios that meet or exceed Federal criteria for retrofitting existing buildings. Information technology hardware, computers and copying equipment are acquired under the Energy Star® program using GSA Schedules and either Government-wide or Service contracts. For specifics of some of the actions taken by DoD components, please see below:

**Air Force**

- The AF continues to pursue a policy that all purchases of computers, printers and copiers will be specified as Energy Star compliant.
- Design specifications for new and retrofitted equipment are reviewed to ensure they are in the upper 25% or Energy Star compliant.

**Department of the Navy**

- The DON eBusiness Office, Card Management Group, agreed to incorporate into the curriculum relevant information about federal buyers being directed by FAR Part 23 and E.O13123 and EO 13122 to purchase products that are Energy Star labeled or products that are designated to be in the upper 25% of energy efficiency in their class as well as products with low standby power. This training is normally dispersed through the Naval Supply Corps School and developed through the Card Management Group. Government Services Administration (GSA) is a regular instructor at the Navy in-house energy manager's course. The GSA has partnered with the Department of Energy (DOE) and the Environmental Protection Agency (EPA) to offer the federal community a broad range of energy efficient products. They have identified energy efficient products in catalogs and on the GSA Advantage, an online shopping and ordering system that provides access to thousands of contractors and millions of products and services.
- A survey was conducted of energy efficient products policy and products use. Of 88 installations responding, the following table indicates strong use of available information and incorporation of energy efficient products.

| Energy Efficient Products Issue | Number of Installations Responding |
|---|---|
| Recommendations Distributed and Use is Encouraged | 59 |
| Advertised During Awareness Activities | 61 |

| | |
|---|---|
| Instructions Address FEMP Recommendations | 42 |
| Designers and Equipment Specifiers use FEMP product recommendations | 73 |
| Procurement Officials use FEMP Recommendations | 64 |
| Nothing Formal is Being Done to Implement FEMP Recommendations | 11 |

- Energy Star ® performance criteria are included in acquisition requirements for systems and appliances in privatized family housing units. Energy efficient operations are included in some Base Operating Support contracts.

- The Navy/Marine Corps Intranet (NMCI) contractor operates desk top and servers for most DON employees around the world. The contractor requires that all computers remain continuously on to enable remote operations and maintenance activities such as pushing software upgrades. Though the computers are set to go into "sleep mode", consumption in this mode is higher than 1 watt as required by E.O 13221. DON is requiring the contractor to develop an alternative that will allow computers, monitors and printers to be shut down on nights and weekends.

**The Army**

When life cycle cost-effective, The Army requires **ENERGY STAR** *Energy Star* ® and other energy-efficient products when acquiring energy-consuming products. Army procurement specifications were updated in FY 2000 and Army regulations are currently under revision. Army procurement regulations are now in compliance with President's directive of 3 May 2001 and will ensure Army installations are procuring only energy-consuming products which are in the upper 25 percent of energy efficiency as designated by the Federal Energy and Management Program. These revisions enable installations to factor energy-effectiveness into the purchase cost of the item and to factor in both the operating and purchase costs of the item into the purchase price to determine "best value."

**Defense Commissary Agency**

- DeCA's Contracting Directorate (AM) procures energy efficient products, such as paper and plastic grocery bags made up of a minimum of 35 percent pre-consumer or post-consumer recycled products. New or replacement balers are purchased for our commissaries in consideration of efficient disposal of cardboard and plastic products.

- The AM includes information on ENERGY STAR® products in the formal CARE Training presented to all Government Purchase Card (GPC) Holders and approving officials. This training is also posted in DeCA's public folders for access and reference. In accordance with EO 13123, GPC holders are made aware of their responsibility to purchase energy efficient products.

- In FY 2005, ENERGY STAR® products continued to receive utmost consideration when developing specifications and issuing acquisitions for energy using products.

- Information Technology hardware and computer and copying equipment are acquired under the ENERGY STAR® Program using GSA Schedules and either government-wide or service contracts.

- DeCA continues to review and pursue opportunities to utilize electronic communication and data transfer, which conserves the use of such things as paper, postage, and personal resources.

- ENERGY STAR® compliance is a requirement for vendors to participate. 100 percent of the Directorate of Information Technology (CII) acquisitions are energy efficient. DeCA CII has published a hardware (HW) standards document, which is based on HW available from these contracts.

- DeCA design criteria requires premium efficiency fan motors for HVAC systems, electronically commuted fan motors on the refrigeration display cases, T- 8 fluorescent light fixtures with electronic ballasts in display cases and in new and renovated facilities.

**Washington Headquarters Service**

A web based energy information site for the Pentagon was developed in FY05 and will be implemented in FY06. This includes energy education and energy links including Energy Star. A plug load management program was outlined and will be implemented in FY 06.

## E. Energy Star ® Buildings

Energy Star Buildings is a program developed by the U.S. Environmental Protection Agency (EPA) to promote energy efficiency in buildings. Energy Star Building criteria are based on a five-stage implementation strategy consists of lighting upgrades, building tune-up, load reductions, fan system upgrades, and heating and cooling system upgrades. For specifics, please see below:

**Air Force**

- Two AF hospital clinics at Eielson AFB AS and Nellis AFB NV have been designated Energy Star Buildings.
- Facilities #35, 316, 351 and 1030 have all been designated Energy Star at Buckley AFB CO.
- All new MFH units must be designed to meet the Energy Star criteria.

**Department of the Navy**

- The Naval Medical Center, San Diego, CA (2001) and the Naval Base Ventura County, Port Hueneme, CA, Welcome Center (2003) were awarded the EPA Energy Star® Label. The Energy Star® Label means the building is in the top 25 percent of the most energy efficient buildings of similar type in the nation. The Medical Center is also an energy showcase. The welcome center employs an efficient HVAC system and energy efficient lighting.

- The EPA certification program was briefed at the energy projects team meeting and regional energy managers were encouraged to apply for EPA certification. Energy efficient O&M practices will be distributed to enable low cost, high payback energy savings.

**The Army**

Army installations have assessed their buildings and leasing activities and are working to insure compliance with ENERGY STAR Building criteria. The Army's new Sustainable Design and Development Criteria will ensure that it's facilities when constructed or upgraded meet or exceed ENERGY STAR criteria.

**Defense Commissary Agency**

DeCA has no buildings designated as ENERGY STAR® Buildings. We expect to self-certify up to 85 CONUS commissaries in FY 2006. This represents 32 percent (85/268) of our commissary facilities.

**Washington Headquarters Service**

WHS established protocols to baseline the energy consumptions of the following facilities using the Portfolio Manager: Wedge 1, PAC, RDF and MEF. Energy Star targets were established for each new facility (i.e. Wedge 3 and PLC) using the Energy Star Target Finder program. This helps the Pentagon Reservation because setting an energy use goal and seeing its resulting costs and emissions is one of the best ways to produce high performance buildings. This energy use goal is measured by an energy performance rating on a scale of 1 to 100. This rating is acquired through the use of two online tools: Target Finder for building designs and Portfolio Manager for existing buildings. Portfolio Manager requires twelve months of actual energy data, while Target Finder requires annual energy consumption estimates for design projects. Target Finder helps designers compare simulations from their design to data from similar operating buildings. A rating of 90 indicates that a design ranks in the top 10 percent for energy performance.

## F. Sustainable Building Design

Sustainability initiatives require an integrated design approach to the life cycle of buildings and infrastructure. The concepts of sustainable development as applied to DoD installations have been incorporated into the master planning process of each of the Services. Installations are encouraged to approach land use planning and urban design in a holistic manner and integrate it with energy planning. In FY 2005, DoD adopted and applied sustainable design principles in 867 new building projects. Of these, 254 projects can or will be certified under LEED. The following provides examples of Defense Component sustainable building design and construction efforts.

**Air Force**

The Air Force Civil Engineer established an AF Sustainable Development Policy on 19 Dec 01. All facility and infrastructure MILCON projects must apply sustainability development concepts in the planning, design, construction, environmental management, operation, maintenance and

disposal process by FY09. The Air Force sustainable target for FY05 was 35%. The Air Force did 44 out of 260 projects or 17% (MILCON and major renovation). The following are examples of using sustainable design concepts:

- Air Combat Command had 4 facilities obtain LEED certification to include a Library at Shaw AFB SC and an ADAL Intelligence production complex at Wright-Patterson AFB OH
- Laughlin AFB TX is designing a hybrid water source GSHP dormitory project.
- The NORTHCOM Addition and Mission Support facility Addition is in construction at Peterson AFB CO.
- Consolidated Support Facility at Edwards AFB was rated at a Silver level under LEEDs and was awarded the AF design for sustainability in FY05.

**Department of the Navy**

- NAVFAC Instruction 9830.1, Sustainable Development Policy, was promulgated 09 June 2003. Implementing sustainable development concepts and principles will reduce the total cost of ownership of facilities. The policy requires all new construction projects be LEED certifiable unless conditions exist that limit the pursuit and accomplishments of the LEED credits necessary for achieving the LEED Certified level. In FY05, 25 of 50 MILCON projects were constructed to be LEED certifiable. There were an additional 23 MILCON projects that data was not available due to staff limitations resulting from hurricane assessment/CONCAP work. A program metrics template has been developed to collect sustainable design data for NAVFAC projects and a method of data collection using the template is being assessed.
- DON continues to provide sustainable development training for all business lines. In FY05, the Design Strategies for Low-Energy, Sustainable, Secure Buildings Workshop was provided in Norfolk, VA and Naval Station Newport, RI. Two workshops are planned for the west coast in FY06. In addition to this classroom training, NAVFAC is developing online sustainable development training for all business lines to provide a sustainable primer and identify the changes in their processes to implement sustainable development in the acquisition process. This online training is scheduled for completion mid-FY06. This investment in training will lead us to be more efficient and effective in implementing NAVFACINST 9830.1.
- To date, the results of the investment in sustainable development are being determined through design and manufacturer estimates and modeling. DON awarded a task order contract to determine which design options offer the greatest sustainable solution and the greatest return on investment (ROI), through measurement of the actual performance of buildings. The measurement of the design's effectiveness will also support the business case for further implementation of sustainable development across DON. The information on building performance will be used to: Adapt/Improve equipment to operate more efficiently and as designed; determine actual whole building return on investment for sustainable development; and develop design guidance on best sustainable design options.
- Other DON sustainable program initiatives include: revising and developing new Unified Facilities Guide Specifications for sustainable design, assessing and determining the impacts of the Energy Policy Act of 2005 to the DON, and developing a business case for sustainable

design in DON facilities supporting the commitment and requirement for an integrated, whole building, life-cycle approach to reduce the total ownership costs of DON facilities.

**The Army**

- The Army has embraced this concept and has identified projects in FY 2002 and beyond as Army SDD Showcase Facilities. The U.S. Army Corps of Engineers (USACE) has been tasked to incorporate sustainability principles into its design and construction process. USACE has developed a 3-day sustainable design and development workshop to train Army and DoD personnel. Workshops conducted trained approximately 450 design engineers and installation personnel.
- Sustainability initiatives require an integrated design approach to the life cycle of buildings and infrastructure. During FY 2002, the Department of the Army issued a policy requiring all projects to be scored against the Sustainable Project Rating Tool (SpiRiT) and require all project designs to achieve the Bronze level. The Army hopes to engage the perspectives and expertise of its personnel throughout the plan, design, build and commissioning process and to establish sustainable goals. It helps in deciding current and future resource priorities, materials, mission needs and building performance; and ensuring contract documents are written to support sustainable design, construction and performance objectives. It also facilitates The Army's awareness of how facility systems and materials affect initial project and life-cycle costs, operations and maintenance practices, and ultimate facility performance over the facilities lifetime. All Army installations have been encouraged to designate their own SDD Showcase Projects and strive for higher sustainable rating levels (Silver, Gold, and Platinum). In accordance with Army policy, in FY 2005, Rock Island Arsenal and Tooele Army Depot designated themselves as Army showcase facilities. In FY 2005, the Army design/constructed 612 new buildings. Of those 612 new buildings, 163 can or will be LEED certified or 26.6 percent.

**Defense Commissary Agency**

- Four new projects were initiated in FY 2005. They were evaluated in accordance with DeCA's new Sustainable Design Rating Guide, which is based on the US Green Building Council's Green Building Rating System ™ for New Construction and Major Renovations (LEED ® - NC); LEED ® - NC for Retail, Pilot Version, March 2005. Commissary project locations are Barksdale AFB, LA; Dyess AFB, TX, Ft Drum, NY; and, Ft McCoy, WI. LEED certifiable projects are at Barksdale AFB, LA; Dyess AFB, TX; and Ft Drum, NY.
- Projects initiated in FY 2005 used sustainable development and design principles (or equivalent) as a standard for DeCA commissary construction. Standard design principles used are as follows:

- Storm Water Management

  - During site selections, sensitivity to habitat of endangered species and wetlands, preference to urban areas with existing infrastructure
  - Advocate alternative transportation by providing bicycle racks and size automobile parking to meet, but not exceed, what is needed

- Maximize water efficiency by using automatic water controls for restroom fixtures
- Implementation of a building commissioning plan
- Maximize use of energy saving techniques to include implementing heat reclaim from the refrigeration systems to provide space heating and water heating, using refrigeration compressor systems comprised of several compressor sizes to ensure that the most efficient combination of compressors are running at any one time to meet the load, implementing a Refrigeration Monitoring and Control System (RMCS) for control of the Refrigeration System and Heating Ventilation and Air Conditioning (HVAC) System to ensure efficient operation, maximized use of more efficient glass door refrigerated display cases rather that open cases, maximized use of the most energy efficient lighting systems implementing the most advanced lighting equipment available, use of lighting occupancy sensors to insure lighting is off when rooms are not in use, use of a dual path HVAC unit for the sales area which allows for a more efficient method of cooling, maximum use of wall and roof insulation, implementation of the most energy efficient doors and windows, and maximum use of utility metering
- CFC reduction in HVAC&R equipment
- Use of fire suppression systems that use no HCFCs or Halons
- Use of cardboard balers
- Maximum use of existing building structures, rather than replacing, through our major Add/Alt projects
- During building demolitions recyclable materials are saved
- Use of materials with recycled content
- Meet minimum indoor air quality standards
- DeCA's goal is to design and construct to make our buildings certifiable under LEED although actual certification by the US Green Building Council.

- Beginning with the FY 2005 major construction program, all project designs track metrics associated with SPIRIT/LEEDS certification with a goal of bronze level certification.
- DeCAH 20-1 documents sustainable design requirements as stated above. The handbook emphasizes use of life-cycle costs, pollution prevention, other environmental and energy costs associated with the construction and life cycle operation of the facility. Detailed requirements are incorporated for items such as energy efficient lighting, dual-path HVAC, premium efficiency fan motors, refrigeration monitoring and control systems, lighting controls, and roof membrane materials. DeCA design criteria are reviewed and updated annually.

**Washington Headquarters Service**

The Pentagon Renovation Office (PENREN) incorporates sustainability requirements and goals in each of their design-build Requests for Proposal. Also, in all PENREN design-build contracts, they use the LEED rating system as their primary "green building" metric. Design-build projects awarded between 1999 and mid 2002 did not require that contractors use the LEED rating system, but they volunteered to use it as a metric. PENREN's newer contracts included a requirement for earning a LEED "Certified" as a minimum. The following projects started in FY05: 1) The Pentagon Library and Conference Center (PLC2) was awarded in July 2004 (4th Qtr FY04). However, most of the design was accomplished in FY05. This design-build contract

included a requirement that a "Certified "rating be earned under LEED for New Construction (LEED-NC). The contractor set the bar higher at "Silver" and is currently tracking well to earn this rating. 2) Wedge 3 started in FY05 and is following the LEED for Existing Buildings (LEED-EB) rating system. Although this project is still in the early stages, it is on track to earn a "Certified" rating.

**National Geospatial Intelligence Agency (NGA)**

NGA added no new buildings during FY 05 but has planned to add one in FY06. There were many construction and renovation projects conducted during FY 05 that resulted in the installation of energy and water efficiency equipment and technology upgrades. For example, Roberdeau Hall was gutted and renovated, as was the Freemont Building, Erskine Hall 4th Floor, the EH 3rd floor is scheduled for FY05. Maury Hall renovations also occurred during FY 05 and will contribute reductions in energy consumption well into the future. The Bethesda Campus has site wide energy management systems (EMCS) installed. Since the base year (1985) major changes in energy consumption can be attributed to energy technology upgrades being key elements of renovation projects and shifting to digital production systems. NGA facilities are slowly evolving towards sustainable building designs by integrating energy upgrades will all renovations.

## G. Energy Efficiency in Lease Provisions

DoD emphasizes energy and water conservation in leased facilities and each of the Services has issued guidance directing that all leased spaces comply with the energy and water efficiency requirements of the Energy Policy Act of 1992. It is DoD's intent to continue to have the landlord make appropriate investments in energy efficiency, which can be amortized in the lease, provided the new total cost (energy costs plus lease cost) does not exceed total costs without improvements. These leases should amortize the investments over the economic life of the improvements. Build-to-lease solicitations for DoD facilities will contain criteria encouraging sustainable design and development, energy efficiency, and verification of building performance. DoD relies upon the General Services Administration (GSA) to ensure the above provisions are included in buildings that they lease for DoD. Below are some examples of actions taken by DoD components:

**Air Force**

The Air Force evaluates all leased properties for location, cost/SF, and availability and energy efficiency. All these factors are reviewed before accepting a lease.

**Department of the Navy**

Leased space must also comply with the energy and water efficiency requirements of the Energy Policy Act of 1992. The Navy must rely upon GSA to ensure the above provisions are included in buildings that they lease for the Navy. The Department of Navy currently leases 57.5 million square feet of building facilities.

## The Army

The Army emphasizes that energy and water conservation be included in all facility leases and requires these leased facilities to meet energy and water goals. The intent is to have the landlord make appropriate investments in energy efficiency, which can be amortized in the lease, provided the new total cost (energy costs plus lease cost) does not exceed total costs without improvements. Leases should amortize the investments over the economic life of the improvements. Build-to-lease solicitations for Army facilities contain criteria encouraging sustainable design and development, energy efficiency, and verification of building performance.

## Defense Commissary Agency

- DeCA uses GSA as a leasing agent for its few leased facilities.
- Lease-back facilities include the DeCA East regional office; San Antonio, TX, office B/3030 and Harrison Village Commissary, IN, DeCA West r office facilities, Sacramento, CA and the McClellan Commissary, Sacramento, CA.
- The DeCA East, Virginia Beach, VA, office incorporates the requirement to use current commercial energy efficient design standards. Consideration is given on all procurements to include high efficiency systems for HVAC and water use. Devices that meet or reduce current flow rates for water use are used. This office space is located in a GSA negotiated leased building. The regional office contracted for the space and requested that the building owner incorporate current commercial energy efficient design with set back thermostats and state of the art equipment SEER ratings. The plumbing fixtures in the office are all of the low flow type and meet commercial plumbing criteria. The energy and utility costs are included in the lease agreement so the rent includes these costs. This makes it beneficial to the owner to use the most cost effective energy using equipment to maximize their energy savings.
- No new DeCA West office facility leases were negotiated or started in FY 2005. Our regional office facilities and the McClellan Commissary are being occupied under a lease-back through the Air Force Base Closure Agency (AFBCA). These facilities were occupied in an "as-is" condition, and energy efficiency measures (i.e., occupancy sensors, low flow type fixtures, energy efficient lighting) have been installed at DeCA's expense to reduce energy costs.
- All DeCA East San Antonio leased facilities are required to be within energy and water conservation code compliance of the host municipality as written within each lease agreement.
- DeCA Europe works with the Base Installation Command or the Area Support Group (ASG) to negotiate with the leased property owner when leased facilities are required. They ensure that existing facilities meet energy efficiency and water conservation requirements, by requiring all plumbing fixtures to be water saver types, with energy efficient lighting, and insulated walls and roof. In new design-built-to-lease commissaries such as the facility under construction at Gricignano, Italy, we ensure that the design meets the energy saving provisions as outlined in our DeCA Design Criteria. We also try to ensure that our leased facilities are metered to allow actual utility usage to be charged.

## Washington Headquarters Service

Most of the space leased for WHS uses GSA leases. There are however three DFD leases, which use the same GSA lease provisions. The typical solicitation for offerors (SFO) tells the lessors to comply with the government's energy conservation guidelines and the Leased Facilities Directorate supports that in their day-to-day lease administration. When the Leased Facilities Directorate adds equipment for special requirements, they try to influence the lessors to use energy efficient applications.

## H. Industrial Facility Efficiency Improvements

DoD continues to make progress toward energy reduction goals. The following highlights several FY 2004 DoD Industrial Facility Improvement Projects:

**Air Force**

Hanscom, Hill, Robins, and Wright-Patterson are focusing on steam system improvements through replacing traps and repairing / replacing leaking steam lines.

**Department of the Navy**

- Naval Air Depot North Island, Coronado, CA installed several industrial facility efficiency improvements including: retrofit of 3 existing chillers with a new Turbocor Compressor and connecting the chillers to a DDC system, high bay lighting for the southwest hangar with programmable circuit breaker panel connected to EMS/DDC, demonstration tank cover on clean processing tank to provide ventilation control, compressed air reduction devices and meters with scheduled operation valves (repair leaks, replace disconnects, filters, & hoses), and lighting, ballast and occupancy sensor upgrades in office spaces.
- Naval Support Activity Panama City, FL replaced an oversized central compressor that had leak-prone feeder lines with a decentralized system, reducing compressed air usage by 50%.
- Naval Surface Warfare Center Carderock Division, Philadelphia, PA site installed cooling tower automation, and motor control center upgrades on the cooling water circulation pumps.
- Naval Surface Warfare Center Carderock Division, West Bethesda, MD site participated in the Technology Validation Demonstration Project to install de-stratification fans in a high bay. Preliminary results indicate the project is a success.
- Portsmouth Naval Shipyard, Kittery, ME consolidated shredding operations from two buildings to one.
- Naval Air Engineering Center Lakehurst, NJ installed anti-Resonance Power Factor Correction equipment in two of their largest industrial buildings.
- Naval Undersea Warfare Center Newport, RI installed demand controlled ventilation and DDC systems.
- Naval Air Station, Mayport, FL installed a small boiler in their boiler plant to handle low load conditions, improving overall plant efficiency.
- Marine Corps Air Station Camp Pendleton installed new compressed air equipment at three aircraft hangars and one engine repair shop.

**The Army**

Industrial and laboratory facilities are required to meet energy goals of a 20 percent reduction by 2005 and a 25 percent reduction by 2010 without exception. Many of The Army's industrial facilities have been in various stages of reduced production and the transferring of services from governmental to private sector. The Army uses energy consumption per square foot as the basis of evaluation for both industrial and laboratory facilities. The baseline year is 1990 in which The Army consumed 943,450 Btu per gross square foot. In FY 2005, The Army reduced energy consumption to 452,168 Btu per gross square foot, for a net reduction of 51.2 percent. Although we have met the 25 percent goal for 2010, we will continue to work to further reduce our energy usage at our industrial facilities. The reason for the significant decrease in FY 2004 compared to FY 2003 is a change in status of several industrial facilities.

**Defense Commissary Agency**

- DeCA installs dual-path air conditioning to control commissary store humidity as an alternative to natural gas or propane fired desiccant dehumidification systems.
- DeCA uses and plans to increase use of heat-pipe technology for dehumidification and heat reclaim. Domestic hot water and HVAC heat reclaim systems are standard in most large commissary store systems.
- A Quality Surveillance Representative (QSR) at each commissary monitors refrigeration and HVAC maintenance contract performance.
- DeCA conducts remote diagnostic monitoring of Refrigeration Monitoring and Control Systems (RMCS) at approximately 191 individual commissaries to ensure that refrigeration and lighting systems are being operated and maintained at their design specification. Discrepancies are forwarded to our maintenance contractors on a daily basis for correction. Lighting controls were monitored and adjusted by this same method in FY 2005. This surveillance resulted in improved contractor maintenance and improved equipment operation and less energy consumed. Web-based energy monitoring control systems are being evaluated for DeCA wide use.
- Energy efficient lighting and occupancy sensors are installed in all new construction and renovation projects. Computers are turned off at night and on weekends. Automatic lighting systems are installed in most refrigerated cases to turn off lights after business hours. Plastic or metal swing air curtain doors are installed where feasible.
- Regional Utilities Energy Efficiency Task Forces (UTF) is active in DeCA East and Europe Regions. This integrated approach to solving energy efficiency and billing problems has been successful in identifying actual and potential energy savings with the objective of reducing total operating costs.
- UTF evaluated high energy use facilities to determine causes and what should be done to correct problems. Each store's unit cost for utilities is monitored and all that are indicated as exceeding other stores in the same sales band are investigated for causes and recommended for correction. Identification of utility costs as a category of the unit cost program has intensified the store management's interest in the cost of water, electricity and other utilities that are billed to the store. Stores, where restroom facilities have been upgraded, have been fitted with the low flow type fixtures and where applicable, the sensor activated faucets and flush valves. The process is ongoing. Utility usage has been improved and monthly checks by management have been working on reducing costs.

- DeCA awarded lighting efficiency upgrades for DeCA commissaries at Fort Hood I, Fort Hood II, TX; NAS Whiting Field, FL; Camp Lejeune MCB, NC; Wright-Patterson AFB, OH; MCB Quantico, Fort Lee, Fort Eustis, VA; NSB New London, CT; and Taegu (Camp Walker), ROK. Lighting upgrades were also completed at DeCA's Kaiserslautern CDC Vogelweh AB, Ramstein AFB and Sembach Military Community through Kaiserslautern Military Community ESPC project.
- Commissary sales area designs include energy efficient ballasts and lamps, state-of-the-art HVAC systems, and lighting circuited and controlled by time-of-day schedules through the refrigeration monitoring and control system (RMCS).
- DeCA Europe continues to identify and replace refrigeration systems with newer more energy efficient refrigeration systems. Several small projects were initiated in FY 2005 to replace portions of aging refrigeration systems.
- During FY 2005, significant energy efficient replacement refrigeration systems projects were completed in DeCA East commissaries at Kirtland AFB, NM; Offutt AFB, NE; and Fort Rucker, AL.
- DeCA West completed five roofing projects in FY 2005, which incorporated a reflective coating that dramatically improved energy efficiency.
- All RMCS at locations which have lighting controlled through the RMCS were re-programmed to turn off major lighting circuits during holiday periods of November 25; December 24-25, and 31, 2004; and January 1, 2005. This action at 112 locations in FY 2005 representing 7,982,468 square feet resulted in an estimated energy savings of 574,700 kWh and an estimated cost savings of $34,484.

**National Security Agency**

- NSA's maintenance work force uses strategies to ensure that the most energy efficient products and procedures are used at all times on mechanical and electrical systems throughout the NSA campus. These systems include but are not limited to the following: compressed air systems, lighting, chilled water systems, pumping systems, hot water heating systems, etc.
- Most of the chiller plants at the NSA campus are fully automated. Chillers and associated equipment are programmed to operate automatically based on building load. We also have a MILCON project underway which, when completed, will interconnect all of the main campus chilled water systems, thereby allowing the most efficient chillers to provide chilled water for the buildings cooling requirements. We are also installing Variable Speed Drives on HVAC airside equipment in 3 large facilities.
- We are continuing the replacement of our legacy EMCS with a new state-of-the-art system. This new system is more flexible, will be monitoring more points, and running more energy efficient temperature control algorithms. We are also integrating a software package that will analyze system operation and determine where energy is being wasted.

## I. Highly Efficient Systems

DoD encourages the components to combine cooling, heating, and power systems in new construction and/or retrofit projects when cost effective. The following provides examples of

efforts to reduce energy consumption through the implementation of efficiency technologies and projects.

**Air Force**

- Elmendorf AFB AS the 611th ASG use waste heat from generators for heating facilities.
- Misawa AB will increase the use of Thermal Storage on the base in all new construction and renovation projects.
- Charleston AFB SC installed Ground Source Heat Pumps (GSHP) to eliminate chiller/heat plants throughout the base.

**Department of the Navy**

DON worked with OSD and DOE to develop appropriate credit for cogeneration systems on the annual report. DON cogeneration capacity is 44 MW. Plants at Portsmouth Naval Shipyard, Kittery, ME; Marine Corps Air-Ground Combat Center, Twenty-Nine Palms, CA; Marine Corps Recruit Depot, Parris Island, SC; Naval Submarine Base, New London, CT; Naval Medical Center San Diego, CA, Naval Base, San Diego, CA and Naval Surface Warfare Center, Indian Head, MD continue to operate and provided cogeneration credits contributing 2.8% of DON energy reduction. Naval Training Center Great Lakes, Chicago, IL 10 MW cogeneration project should be completed by December 2005. No local natural resources (biomass, geothermal, etc.) were available to utilize in these projects.

**The Army**

- The Army policy is to use high efficiency products in the operation and maintenance of central heating and cooling systems where large quantities of energy are used. FY 2002 was the final year of a 5-year, $300 million central heating systems modernization program. The goals of this program were to update the aging central heating systems infrastructure at select, large installations. Central heating systems at 14 major installations were modernized under this initiative in FY1998-2002.
- New facilities and major repair projects require the installation of energy efficient equipment. Some installations are also adding DDC controls and other automated equipment to better monitor energy use remotely.
- In addition to the centrally funded program, the installations also used their O&M funds to implement energy saving projects such as - upgrade boilers and distribution systems, improved high efficiency pumps and motors, and updated system controls, etc. Army regions and installations, along with the Army Corps of Engineers, evaluate the deployment of highly efficient energy systems for all new construction and major retrofit projects and incorporate these systems where cost-effective.

**Defense Commissary Agency**

- No combined CHP systems were designed or installed in FY 2005.
- Geothermal heat pump systems are considered as design alternatives when cost effective.

- Photovoltaic systems are surveyed and a PV project at Los Angeles AFB Commissary is planned for FY 2006.
- New refrigeration systems utilize electronic controls, heat reclaim, and refrigeration compressor "floating head" to reduce energy usage. Utilities are normally provided by host installations to DeCA. Designs include heat reclaim on refrigeration for HVAC and domestic hot water.
- All new and/or renovated facilities have a combined/integrated cooling, heating, and refrigeration monitoring system incorporated as a standard design.
- Utilities are normally provided by the host installation to DeCA.

**Washington Headquarters Service**

Wedge 2 energy requirements encouraged a holistic design strategy to meet the necessary target. The energy target is 120 kBTU/sq.ft. which has been met in the design and will be verified in FY06 after completion of the Wedge.

## J. Off-Grid Generation

DoD is pursuing distributed and off-grid generation where it is life cycle cost-effective to provide peak saving opportunities and energy security. Typical applications include micro-turbines, fuel cells, cogeneration plants, flywheels and back-up generators. The following provides examples of DoD's off-grid generation projects.

**Air Force**

- March AFB CA is installing a 300 Kw PV system above a carport structure.
- Eielson AFB will complete installation of small wind generators and improved solar controllers at 23 remote sites.

**Department of the Navy**

- DON utilizes off-grid generation for island installations, and remote applications.
- Naval Base Guantanamo Bay, Cuba installed four wind turbines totaling 3.8MW providing 25% of the power for this isolated facility. Diesel engine generators were overhauled and provide the remaining off-grid power.
- Naval Support Facility Diego Garcia, British Indian Ocean Territory installed solar street lighting fixtures in various areas of the base.
- Naval Base Coronado, CA installed Solar Powered LED Lights at the Naval Air Station North Island Fishing Pier.
- Navy Region Hawaii uses 1 kW photovoltaic systems to provide power to remote pumping and control stations.
- Marine Corps Air Station Yuma, AZ installed one mile of solar lighting along a perimeter fence & multi-use pathway.
- Marine Corps Base Camp Pendleton, CA installed more than 200 solar-powered street lights and caution lights over the past several years, and expanded the technology to provide solar-powered lighting at bus stops, carport electric vehicle charging stations, wastewater

overflow detection stations, and notification and communication systems. In FY06, the base will install 100 new streetlights at remote, off-grid locations.

- Other installations installed renewable power systems that are grid connected but reduce outside grid demand. These include a 30 kW PV system at Naval Base Point Loma, CA a 20 kW PV system at Naval Air Facility El Centro, CA and a 300 kW photovoltaic system at Navy Region Hawaii.
- DON continues to validate the performance and cost of Proton Exchange Membrane (PEM) fuel cells power plants in combined heat and power applications. Although PEM technology has made progress toward viable commercial products, there are still substantial durability, reliability, and availability issues that remain (e.g., due to hydrogen processing techniques, the PEM fuel stack becomes contaminated and can fail with as little as 6 months of continuous operation). The following installations are hosting the fuel cell demonstrations:

  - Naval Base Coronado, CA (5 power plants)
  - Submarine Base Point Loma, San Diego, CA (3 power plants)
  - Naval Base Ventura County, CA (2 power plants)
  - Naval Facilities Engineering Command Hawaii, Peal Harbor, HI (1 power plants)

- All the fuel cells extract hydrogen from natural gas except for the plant at Pearl Harbor, which processes propane. The intent of the demonstration is to assess the performance, operations, maintenance, and repair requirements of the PEM fuel cells. The fuel cell power plants will operate for one year under this program.
- In other fuel cell developments, 12 PEM fuel cell power plants, powered by an onboard supply of methanol, and incorporating a new design non-fluorinated Membrane Electrode Assembly (MEA), will be built and demonstrated at Naval Air Station, Pearl Harbor, HI. Commissioning of the test units is projected for July 2006. A separate contract has been awarded to validate an improved design for an interfacial seal system in PEM fuel stacks.
- A contract for a 500 kW Molten Carbonate Fuel Cell has been awarded for installation at Marine Corps Base Camp Pendleton, CA. The installation will validate performance and cost in a combined heat and power application.
- DON will redeploy a 20 kW wave power buoy at Marine Corps Air Station Kaneohe Bay, HI in Nov. 05 after upgrading it. The pilot project, a phase 3 Small Business Integrated Research (SBIR) project, is demonstrating the capability of harnessing wave power to drive an off shore generator and transmit the power on shore where it can be fed to the base grid. The buoy will be grid connected in Dec. 05. A second (40kW) buoy was constructed based on a more efficient design. The second buoy will be deployed in 2$^{nd}$ qtr FY06. Further design improvements are planned for a 3$^{rd}$ buoy to be deployed in FY07.
- A phase II SBIR project is gathering site-specific data to begin design of an Ocean Thermal Energy Conversion (OTEC) power plant at Naval Support Facility, Diego Garcia, British Indian Ocean Territory. The Navy will contract to purchase electricity, air conditioning and fresh water and the contractor will construct and own the OTEC system. Positive support was received from the British contingent during US/UK POLMIL talks in Washington, DC in Sept 05. The final preliminary design report is due from the contractor in March 06.

**Defense Commissary Agency**

If the installation cannot provide dependable power to the commissary, the programming and design team reviews what other sources are available to supplement the power for the commissary building. DeCA typically uses generators for backup power of Point of Sale (POS) and emergency lighting systems only.

**National Security Agency**

- NSA's maintenance work force uses strategies to ensure that the most energy efficient products and procedures are used at all times on mechanical and electrical systems throughout the NSA campus. These systems include but are not limited to the following: compressed air systems, lighting, chilled water systems, pumping systems, hot water heating systems, etc.
- Most of the chiller plants at the NSA campus are fully automated. Chillers and associated equipment are programmed to operate automatically based on building load. We also have a MILCON project underway which, when completed, will interconnect all of the main campus chilled water systems, thereby allowing the most efficient chillers to provide chilled water for the buildings cooling requirements. We are also installing Variable Speed Drives on HVAC airside equipment in 3 large facilities.
- We are continuing the replacement of our legacy EMCS with a new state-of-the-art system. This new system is more flexible, will be monitoring more points, and running more energy efficient temperature control algorithms. We are also integrating a software package that will analyze system operation and determine where energy is being wasted.

## K. Electrical Load Reduction Measures

Below are several examples of projects that are being pursued by the various DoD components:

**Air Force**

- Cheyenne Mountain AFS CO uses generators to their advantage by being on the "super peak" kilowatcher tariff and runs the generators when the local utility calls for load shedding.
- Beale AFB continues to operate a radio system to limit demand by controlling electric water heaters and air conditioning units. The system allows the base to curtail demand by over 1MW (about 10%) when electricity shortages are probable.
- FY05 marked the fourth year the USAF Academy participated in Demand Side Management efforts during "super peak" periods called by the local utility. The Academy's automated DSM program duty-cycled non-critical fan and pump motor loads to achieve approximately 4% reduction in peak power demand during the scheduled periods.
- Randolph AFB TX has the capacity to shed 2.4MW with emergency generators.

**Department of the Navy**

- DON is validating the performance of energy technologies such as cool roofs, heat pipes, air conditioning compressors with integrated variable speed drives, air conditioning duct sealants, high efficiency air conditioning systems, scotopic lighting and destratification fans.

The results of the demonstrations will be used to guide installations on the life cycle cost benefits of using these technologies to reduce electrical loads. Other electrical load reduction measures taken in FY05 are shown below:

- NAS Jacksonville lighting and HVAC upgrades
- National Naval Medical Center, Bethesda, MD chiller plant efficiency upgrade
- Naval Station, Great Lakes, Chicago, IL load shedding when requested by their electric utility provider.
- Naval Support Activity Orlando, FL replaced air handler units with more efficient models and installed variable frequency drives.
- Naval Base Guantanamo Bay, Cuba is replacing multiple window air conditioning units with central air conditioning systems.
- Naval Base San Diego Resource Efficiency Manager works directly with building monitors to reduce electrical loads in buildings. Data from time of use meters on each building help to identify load reduction opportunities.
- Naval Support Activity Panama City, FL implemented a 94-building energy-efficiency retrofit: lighting, ballasts, compact fluorescent bulbs, LED exit signs, air handler motors, cooling tower motors, supply pump motors, cogged V-belts. They also replaced an oversized central compressor and leak-prone feeder lines with a decentralized system.
- NSWCCD-SSES Philadelphia - modified DDC schedules on AC and lighting systems at multiple buildings.
- Naval Air Engineering Center Lakehurst installed Anti-Resonance Power Factor Correction Equipment in two of their largest industrial buildings to increase the electrical power usage efficiency.
- Naval Air Facility Atsugi, Japan de-lamped excessive lighting, shortened the A/C season by 4 weeks, encouraged people to turn off A/C 30min before the office closed, turned off lights during lunch, controlled lighting by using a card-key system in BEQ/BOQ, installed T-8 lamps, CFL, LED exit lights and photocells in all newly built or renovated spaces, and restricted room temperature controls.
- Naval Air Weapons Station, China Lake, CA replaced T-12 lamp and magnetic ballasts with T-8 and electronic ballasts, turned off all unused equipment and machinery, lowered thermostat settings on heaters in winter according to instruction. Energy awareness and energy-saving tips were published in the POW and on base TV channel.
- Naval Air Facility El Centro, CA shut down unoccupied bachelor quarters and hangars by turning the HVAC system off and unplugging all appliances. Adjusted HVAC systems throughout the base and used Direct Digital Controls to turn temperatures in occupied office buildings and hangars to 78 degrees during the cooling months and 65 degrees during the heating months. The two flight-line compressors were shut down on weekends and during holidays. Shut down HVAC systems in unoccupied buildings during government holidays. Applied HVAC scheduling to the Navy Exchange, various MWR buildings, and all office buildings using the Direct Digital Control system.
- Naval Base Coronado, CA programmed chiller and heat pump setbacks in several buildings; Removed and recycled 44 refrigerators; Installed 20 PlugMisers on video game machines and window air conditioners; Installed 11 VendMisers on Soda machines; replaced 850 incandescent bulbs with compact fluorescents.
- Naval Base Point Loma, CA reduced the number of Computer Room Air Conditioning units in ASW Center

- NAVSUPPDET Monterey, CA reduced lighting campus wide by removing fluorescent light bulbs. 50% of perimeter security lighting was turned off, and computers and office equipment were turned off when not in use.
- Norfolk Naval Shipyard, Portsmouth, VA replaced inefficient motors and controls with more efficient models in industrial shops.
- Naval Base Ventura County, CA replaced photocells and/or time controls to eliminate outdoor lights remaining on during daylight hours, instituted reimbursement program for vending machines (energy awareness), and shutdown non-essential galley refrigeration units.
- Naval Weapons Station Seal Beach, CA raised temperature setpoint and shortened hours of operation in air conditioned buildings, removed or disabled 15 window air conditioners, and removed 35 personal refrigerators.
- Fleet Activities Yokosuka, Japan replaced a 450kW constant speed motor for salt water pump with a variable speed motor.
- Fleet Activities Sasebo, Japan used an Energy Monitor Control System to monitor chilled water temp. and the internal temperatures of the high rise BEH. Based on the findings, the chilled water temp. was raised, reducing electrical loads.
- Naval Base Norfolk, VA installed 2000 automated, remotely readable electricity meters.

**The Army**

- Army installations use a variety of methods to reduce peak load and demand. In FY 2005, many Army installations in the Western part of the United States continued to take advantage of projects developed and initiated in FY 2004 based on the findings from the Western Power Grid Peak Demand and Energy Reduction Program. These studies provided a site-wide assessment of the energy-saving potential at the installation.
- Other installations use other energy consumption and cost savings measures. For example, Fort Gordon employs diesel generators to manage its peak load. Fort Gordon leases 13.5 megawatts of diesel generator assets from the 249th Prime Power Program. The generators allow Fort Gordon to peak shave the electrical load shape which amounts to at least $300K in annual savings or credits. Fort Lewis has various energy projects in which they do load shedding. Other installations use Energy Management Control Systems (EMCS) and Utility Monitoring Control Systems (UMCS) to do peak shaving

**Defense Commissary Agency**

- Lighting Measures-California stores turn off 50 percent of sales area lighting during load reduction warning periods. All stores with electronic Refrigeration Monitoring and Control Systems (RMCS) turn off 50 percent of sales area and all display case lighting during non-business hours.
- Personal Computers and Appliance Measures-Printers and personal computers not being used as servers are turned off at the end of each business day and on weekends. ENERGY STAR® power down features are activated on most electronic equipment. Personal appliances such as coffee pots and radios are turned off.
- DeCA's standard practice is to install motion sensors and separate lighting circuits to allow turning off unneeded lights.
- DeCA submits the Scorecard as a part of this Annual Energy Management Report.

**National Security Agency**

In the event that load reduction is required due to an emergency, the Agency will bring its generator plants on-line to provide power to the campus. This would provide a load reduction of approximately 40 MW. It should be noted that due to Agency operating conditions, and on-going maintenance work, this level of load reduction is not guaranteed.

**National Geospatial Intelligence Agency (NGA)**

**NGA**'s largest facility in St. Louis has an established electrical load shed plan consisting of using the EMCS to cycle or shed all non-essential loads, such as air handlers serving administrative areas, non-essential lighting and other non- production loads. A similar plan will be considered for NGA's remaining facilities and the ALERT study facilitates the bases for planned actions.

# IV. Data Tables and Inventories

**A. FY 2005 Annual Energy Management Data Report**

**B. Energy Scorecard for FY 2005**

**C. Goals of Executive Order 13123 and NECPA/EPACT**

**D. Industrial and Laboratory Facility Inventory**

**E. Exempt Facilities Inventory**

## A. FY 2005 Annual Energy Management Data Report

## B. Energy Scorecard for FY 2005

## C. Goals of Executive Order 13123 and NECPA/EPACT

| Goals of Executive Order 13123 and NECPA/EPACT | | |
|---|---|---|
| **Category** | **Goal** | **Comments** |
| Greenhouse Gas Emissions | 30% reduction by 2010 | Base year is 1990. DOE will calculate agencies' progress toward this goal and report it on agencies' annual energy scorecards |
| Energy Efficiency | | |
| Standard Buildings | 30% improvement by 2005 | Base year is 1985 |
| | 35% improvement by 2010 | |
| Industrial and Laboratory Facilities | 20% improvement by 2005 | Base year is 1990 |
| | 25% improvement by 2010 | |
| Exempt Facilities | N/A | Despite lack of quantitative goal, agencies should implement strategies to improve energy efficiency at these facilities. |
| Renewable Energy | Implement renewable energy projects | Installation of Federal solar energy systems will help support the Million Solar Roofs initiative |
| | Purchase electricity from renewable energy sources | |
| | Install 2,000 solar energy systems at Federal facilities by 2000 | |
| | Install 20,000 solar energy systems at Federal facilities by 2010 | |
| Petroleum | Reduce petroleum use | Switches to alternative energy sources should be life-cycle cost effective |
| Source Energy | Reduce use of source energy | Accomplish by undertaking projects that are life-cycle cost effective |
| Water Conservation | Reduce water consumption* | Accomplish via life-cycle cost effective measures, energy-savings performance contracts, or other financing mechanism |
| **NECPA/EPACT** | | |
| Energy Efficiency | 20% improvement by 2000 | Base year is 1985 |
| Financing | Undertake all energy efficiency improvement projects that have a simple payback period of 10 years or less by 2005 | E.O. 13123 expands this goal by mandating that any energy efficiency project that is life-cycle cost effective be undertaken |
| Audits | Conduct audits for energy efficiency on 10% of facilities annually | E.O. 13123 includes language supporting this goal |
| * FEMP has established water efficiency improvement goals as directed by the Executive Order. Agencies must implement Water Management Plans and Best Management Practices according to the following schedule: | | |
| | 05% of facilities by 2002 | |
| | 15% of facilities by 2004 | |
| | 30% of facilities by 2006 | |
| | 50% of facilities by 2008 | |
| | 80% of facilities by 2010 | |
| For more detail, see the FEMP guidance document Water Efficiency Improvement Goal for Federal Agencies. | | |

## D. Industrial and Laboratory Facility Inventory

**Army Industrial and Laboratory Facilities:**

**a. Anniston Army Ammunition Plant, TN**
ATTN: SIOHS-EN
4509 West Stone Dr.
Kingsport, TN 37660-9982

**b. Radford Army Ammunition Plant, VA**
ATTN: SIORF-OP-EN
Radford Army Ammunition Plant
Radford, VA 24141-0099
US Army

**c. AAFES Food Processing Plant**
Industriestrasse
67269 Grünstadt, Germany

**Air Force**

| Building Location | Building Classification |
|---|---|
| 1. Hill AFB UT | Industrial/Process |
| 2. Tinker AFB OK | Industrial/Process |
| 3. Robins AFB GA | Industrial/Process |
| 4. Arnold AFB TN | Industrial/Process/Laboratory |

**Department of the Navy**

DON's industrial inventory is based on the OSD approved definition that if 60% or more of the base-wide energy use is for industrial purposes, the entire installation can be designated industrial.

| | **Installation/Facility** |
|---|---|
| G91571 | WV ABL MINERAL CO |
| N00102 | NSY PORTSMOUTH NH |
| N00109 | LANTORDCOM YORKTOWN VA |
| N00164 | NSWC DIV CRANE IN |
| | NAVSURFWARCEN CARDEROCKDIV |
| N00167 | BETHESDA MD |
| N00174 | NSWC DIV INDIAN HEAD MD |
| N00178 | NSWC DIV DAHLGREN VA |

| | |
|---|---|
| N00181 | NSY NORFOLK VA |
| N00182 | NWS YORKTOWN SJC ANNEX |
| N00189 | FISC NORFOLK VA |
| N00193 | LANTORDCOM DET CHARLESTON SC |
| N00251 | NAVSHIPYD PUGET SOUND WA |
| N00253 | NAVUSEAWARCENDIV KEYPORT WA |
| N00311 | NSY PEARL HARBOR HI |
| N00396 | NAVWPNSTA SEAL BEACH DET FALLBROOK CA |
| N0431A | AFRADBIORSCHINST BETHESDA MD |
| N32013 | NAVMAG INDIAN ISLAND WA |
| N39353 | NSWC PT HUENEME DET SAN DIEGO |
| N44466 | TRIREFFAC KINGS BAY GA |
| N47318 | SIMA PASCAGOULA MS |
| N48381 | NAVSURFWARCEN DET MEMPHIS TN |
| N55632 | INACTSHIPFAC PHILA PA |
| N60478 | LANTORDCOM DET EARLE COLTS NECK NJ |
| N60701 | NAVWPNSTA SEAL BEACH CA |
| N61762 | NSWC DET WHITE SANDS NM |
| N62182 | NAVSURFWARCEN DET BAYVIEW ID |
| N62649 | FISC YOKOSUKA JA |
| N62701 | NAVSURFWARCEN DET DANIA FL |
| N62758 | NAVSHIPREPFAC YOKOSUKA JA |
| N63394 | NAVSURFWARCENDIV PORT HUENEME CA |
| N63402 | SWFPAC BANGOR WA |
| N64267 | NSWC DIV CORONA CA |
| N65886 | NAVAVNDEPOT JACKSONVILLE FL |
| N65888 | NAVAVNDEPOT NORTH ISLAND CA |
| N65923 | NAVAVNDEPOT CHERRY PT NC |
| N66079 | NAVSPASURFLDSTA CHULA VISTA CA |
| N66604 | NAVUNSEAWARCENDIV NEWPORT RI |
| N68336 | UNISERUOFHEASCN BETHESDA MD |
| N68733 | SWFLANT KINGS BAY GA |
| N68836 | FISC JACKSONVILLE FL |
| N70024 | NUWC NEWPORT NE DETS |
| M38450 | USMC BLCMD |
| M62204 | MCLB BARSTOW CA |
| M67004 | CG MCLB ALBANY GA |

## Defense Commissary Agency

### Industrial and Laboratory Facilities Inventory.

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 1 | ABERDEEN PG | 93,384 | Baltimore | MD | U.S.A. |
| 2 | ALBANY MCLB | 33,155 | Albany | GA | U.S.A. |
| 3 | ALTUS AFB | 57,000 | Altus | OK | U.S.A. |
| 4 | ANCHORAGE | 105,000 | Anchorage | AK | U.S.A. |
| 5 | ANDERSEN AFB | 102,111 | Yigo | | Guam |
| 6 | ANDREWS AFB | 110,535 | Camp Springs | MD | U.S.A. |
| 7 | ANKARA* | 11,872 | Ankara | | Turkey |
| 8 | ANNAPOLIS | 25,794 | Annapolis | MD | U.S.A. |
| 9 | ANSBACH | 31,626 | Katterbach | | Germany |
| 10 | ARDEC | 23,084 | Patterson | NJ | U.S.A. |
| 11 | ARNOLD AFB | 23,194 | Tullahoma | TN | U.S.A. |
| 12 | NSCS ATHENS | 14,788 | Athens | GA | U.S.A. |
| 13 | ATSUGI | 31,747 | Yokohama | | Japan |
| 14 | AVIANO AB | 93,329 | Pordenone | | Italy |
| 15 | BABENHAUSEN | 7,243 | Babenhausen | | Germany |
| 16 | BAD AIBLING** | 18,406 | Bad Aibling | | Germany |
| 17 | BAD KISSINGEN | 11,388 | Bad Kissengen | | Germany |
| 18 | BAD NAUHEIM | 20,649 | Bad Nauheim | | Germany |
| 19 | BAMBERG | 46,792 | Bamberg | | Germany |
| 20 | BANGOR ANGB | 23,800 | Bangor | ME | U.S.A. |
| 21 | NSB BANGOR | 45,442 | Silverdale | WA | U.S.A. |
| 22 | BARBERS POINT | 37,847 | Pearl City | HI | U.S.A. |
| 23 | BARKSDALE AFB | 103,846 | Bossier City | LA | U.S.A. |
| 24 | BARSTOW MCLB | 17,000 | Barstow | CA | U.S.A. |
| 25 | BAUMHOLDER | 32,119 | Baumholder | | Germany |
| 26 | BEALE AFB | 77,237 | Marysville | CA | U.S.A. |
| 27 | BITBURG | 64,296 | Bitburg/Trier | | Germany |
| 28 | BOLLING AFB | 73,257 | Washington | DC | U.S.A. |
| 29 | BREMERTON | 39,866 | Bremerton | WA | U.S.A. |
| 30 | NAS BRUNSWICK | 35,466 | Portland | ME | U.S.A. |
| 31 | BUCKLEY AFB | 76,600 | Aurora | CO | U.S.A. |
| 32 | BUEDINGEN | 5,765 | Buedingen | | Germany |
| 33 | C. E. KELLY | 23,114 | Pittsburgh | PA | U.S.A. |
| 34 | CAIRO* | N/A | Cairo | | Egypt |
| 35 | CAMP CARROLL | 8,347 | Taegu | | South Korea |
| 36 | CAMP CASEY | 12,268 | Tongduchon | | South Korea |
| 37 | CAMP COURTNEY | 31,248 | Gushikawa | | Japan |
| 38 | CAMP FOSTER | 65,116 | Naha | | Japan |
| 39 | CAMP HOWZE** | 11,106 | Munson | | South Korea |
| 40 | CAMP HUMPHREYS | 8,421 | Pyongtaek | | South Korea |
| 41 | CAMP KINSER | 31,248 | Naha | | Japan |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 42 | CAMP KURE | 2,040 | Hiroshima | | Japan |
| 43 | CAMP LEJEUNE | 73,246 | Jacksonville | NC | U.S.A. |
| 44 | CAMP MERRILL | 2,592 | Dahlonega | GA | U.S.A. |
| 45 | CAMP PENDLETON | 121,286 | Oceanside | CA | U.S.A. |
| 46 | CAMP RED CLOUD | 11,040 | Uijonbu | | South Korea |
| 47 | CAMP STANLEY | 9,029 | Uijongbu | | South Korea |
| 48 | CAMP ZAMA | 7,130 | Tokyo | | Japan |
| 49 | CANNON AFB | 43,941 | Clovis | NM | U.S.A. |
| 50 | CARLISLE BARRACKS | 62,525 | Carlisle | PA | U.S.A. |
| 51 | CHARLESTON AFB | 89,083 | Charleston | SC | U.S.A. |
| 52 | NWS CHARLESTON | 62,000 | Charleston | SC | U.S.A. |
| 53 | CHERRY POINT | 55,300 | Havelock | NC | U.S.A. |
| 54 | CHIEVRES | 33,418 | Chievres | | Belgium |
| 55 | CHINA LAKE | 24,165 | Ridgecrest | CA | U.S.A. |
| 56 | NAS CHINHAE | 20,748 | Chinhae | | South Korea |
| 57 | COLUMBUS AFB | 48,951 | Columbus | MS | U.S.A. |
| 58 | CORPUS CHRISTI | 44,536 | Corpus Christi | TX | U.S.A. |
| 59 | NWSC CRANE | 9,381 | Crane | IN | U.S.A. |
| 60 | DAHLGREN | 15,399 | Fredericksburg | VA | U.S.A. |
| 61 | DARMSTADT | 56,600 | Darmstadt | | Germany |
| 62 | DAVIS-MONTHAN AFB | 106,000 | Tucson | AZ | U.S.A. |
| 63 | DEXHEIM | 44,296 | Dexheim | | Germany |
| 64 | DOVER AFB | 81,063 | Dover | DE | U.S.A. |
| 65 | DUGWAY | 15,000 | Dugway | UT | U.S.A. |
| 66 | DYESS AFB | 72,000 | Abilene | TX | U.S.A. |
| 67 | EDWARDS AFB | 57,628 | Rosamond | CA | U.S.A. |
| 68 | EGLIN AFB | 104,900 | Niceville | FL | U.S.A. |
| 69 | EIELSON AFB | 65,452 | Fairbanks | AK | U.S.A. |
| 70 | EL CENTRO | 8,699 | El Centro | CA | U.S.A. |
| 71 | ELLSWORTH AFB | 66,000 | Rapid City | SD | U.S.A. |
| 72 | F. E. WARREN AFB | 64,000 | Cheyenne | WY | U.S.A. |
| 73 | FAIRCHILD AFB | 76,473 | Spokane | WA | U.S.A. |
| 74 | FALLON AFB | 41,031 | Fallon | NV | U.S.A. |
| 75 | FORT BELVOIR | 121,582 | Alexandria | VA | U.S.A. |
| 76 | FORT BENNING | 99,792 | Columbus | GA | U.S.A. |
| 77 | FORT BLISS | 119,965 | El Paso | TX | U.S.A. |
| 78 | FORT BRAGG NORTH | 153,500 | Fayetteville | NC | U.S.A. |
| 79 | FORT BRAGG SOUTH | 118,251 | Fayetteville | NC | U.S.A. |
| 80 | FORT BUCHANAN | 100,763 | San Juan | | Puerto Rico |
| 81 | FORT CAMPBELL | 104,834 | Clarksville | TN | U.S.A. |
| 82 | FORT CARSON | 100,743 | Colorado Springs | CO | U.S.A. |
| 83 | FORT DETRICK | 20,588 | Frederick | MD | U.S.A. |
| 84 | FORT DRUM | 77,735 | Watertown | NY | U.S.A. |
| 85 | FORT EUSTIS | 96,809 | Newport News | VA | U.S.A. |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 86 | FORT GILLEM | 68,555 | Atlanta | GA | U.S.A. |
| 87 | FORT GORDON | 94,836 | Augusta | GA | U.S.A. |
| 88 | FORT GREELY | 24,742 | Delta Junction | AK | U.S.A. |
| 89 | FORT HAMILTON | 48,382 | New York | NY | U.S.A. |
| 90 | FORT HOOD I | 92,500 | Killeen | TX | U.S.A. |
| 91 | FORT HOOD II | 90,552 | Killeen | TX | U.S.A. |
| 92 | FORT HUACHUCA | 75,001 | Sierra Vista | AZ | U.S.A. |
| 93 | FORT HUNTER-LIGGETT | 7,800 | King City | CA | U.S.A. |
| 94 | FORT IRWIN | 50,752 | Fort Irwin | CA | U.S.A. |
| 95 | FORT JACKSON | 132,500 | Columbia | SC | U.S.A. |
| 96 | FORT KNOX | 125,513 | Louisville | KY | U.S.A. |
| 97 | FORT LEAVENWORTH | 69,470 | Leavenworth | KS | U.S.A. |
| 98 | FORT LEE | 71,088 | Petersburg | VA | U.S.A. |
| 99 | FORT LEONARD WOOD | 74,550 | Waynesville | MO | U.S.A. |
| 100 | FORT LEWIS | 109,384 | Tacoma | WA | U.S.A. |
| 101 | FORT MCCOY | 23,400 | La Crosse | WI | U.S.A. |
| 102 | FORT MCPHERSON | 25,096 | Atlanta | GA | U.S.A. |
| 103 | FORT MEADE | 111,549 | Laurel | MD | U.S.A. |
| 104 | FORT MONMOUTH | 53,700 | Eatontown | NJ | U.S.A. |
| 105 | FORT MYER | 66,432 | Arlington | VA | U.S.A. |
| 106 | FORT POLK | 79,200 | Leesville | LA | U.S.A. |
| 107 | FORT RILEY | 62,067 | Junction City | KS | U.S.A. |
| 108 | FORT RUCKER | 79,160 | Daleville | AL | U.S.A. |
| 109 | FORT SAM HOUSTON | 104,442 | San Antonio | TX | U.S.A. |
| 110 | FORT SILL | 105,000 | Lawton | OK | U.S.A. |
| 111 | FORT STEWART | 93,810 | Hinesville | GA | U.S.A. |
| 112 | FORT WAINWRIGHT | 97,244 | Fairbanks | AK | U.S.A. |
| 113 | GARMISCH | 27,700 | Garmisch | | Germany |
| 114 | GELNHAUSEN | 6,458 | Gelnhausen | | Germany |
| 115 | GIEBELSTADT | 4,422 | Giebelstadt | | Germany |
| 116 | GIESSEN | 30,109 | Giessen | | Germany |
| 117 | GOODFELLOW AFB | 49,639 | San Angelo | TX | U.S.A. |
| 118 | GRAFENWOEHR | 14,253 | Grafenwoehr | | Germany |
| 119 | GRAND FORKS AFB | 60,315 | Grand Forks | ND | U.S.A. |
| 120 | GREAT LAKES NTC | 54,375 | Waukegan | IL | U.S.A. |
| 121 | GRICIGNANO** | 3,659 | Grigignano | | Italy |
| 122 | NCBC GULFPORT | 30,752 | Gulfport | MS | U.S.A. |
| 123 | GUNTER AFB | 47,025 | Montgomery | AL | U.S.A. |
| 124 | HANAU | 125,860 | Hanau | | Germany |
| 125 | HANNAM VILLAGE | 8,210 | Seoul | | South Korea |
| 126 | HANSCOM AFB | 80,239 | Bedford | MA | U.S.A. |
| 127 | HARIO HOUSING | 23,290 | Hario | | Japan |
| 128 | HARRISON VILLAGE | 54,020 | Indianapolis | IN | U.S.A. |
| 129 | HEIDELBERG | 72,394 | Heidelberg | | Germany |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 130 | HICKAM AFB | 113,839 | Honolulu | HI | U.S.A. |
| 131 | HILL AFB | 73,702 | Ogden | UT | U.S.A. |
| 132 | HOHENFELS | 38,200 | Hohenfels | | Germany |
| 133 | HOLLOMAN AFB | 78,641 | Alamogordo | NM | U.S.A. |
| 134 | HUNTER AAF | 45,091 | Savannah | GA | U.S.A. |
| 135 | HURLBURT FIELD | 64,000 | Fort Walton Beach | FL | U.S.A. |
| 136 | IDAR OBERSTEIN | 10,824 | Idar Oberstein | | Germany |
| 137 | ILLESHEIM | 41,564 | Illesheim | | Germany |
| 138 | IMPERIAL BEACH | 76,171 | Imperial Beach | CA | U.S.A. |
| 139 | INCIRLIK | 61,485 | Incirlik | | Turkey |
| 140 | IWAKUNI MCAS | 32,353 | Iwakuni | | Japan |
| 141 | IZMIR | 17,320 | Izmir | | Turkey |
| 142 | NAS JACKSONVILLE | 88,143 | Jacksonville | FL | U.S.A. |
| 143 | KADENA AFB | 85,095 | Naha | | Japan |
| 144 | KANEOHE BAY | 57,232 | Kaneohe Bay | HI | U.S.A. |
| 145 | KEESLER AFB | 94,714 | Biloxi | MS | U.S.A. |
| 146 | KEFLAVIK | 50,296 | Keflavik | | Iceland |
| 147 | KELLEY BARRACKS | 16,799 | Stuttgart | | Germany |
| 148 | NAS KEY WEST | 22,140 | Key West | FL | U.S.A. |
| 149 | NSB KINGS BAY | 52,556 | St. Marys | GA | U.S.A. |
| 150 | KINGSVILLE | 14,160 | Kingsville | TX | U.S.A. |
| 151 | KIRTLAND AFB | 114,000 | Albuquerque | NM | U.S.A. |
| 152 | KITZINGEN | 29,213 | Kitzingen | | Germany |
| 153 | KODIAK* | 22,913 | Kodiak | AK | U.S.A. |
| 154 | KUNSAN AFB | 20,476 | Kunsan City | | South Korea |
| 155 | LACKLAND AFB | 117,410 | San Antonio | TX | U.S.A. |
| 156 | LAJES FIELD | 62,009 | Terceira Island | | Azores |
| 157 | LAKEHURST | 18,411 | Toms River | NJ | U.S.A. |
| 158 | LANGLEY AFB | 102,959 | Hampton | VA | U.S.A. |
| 159 | LAUGHLIN AFB | 36,591 | San Antonio | TX | U.S.A. |
| 160 | LEMOORE | 42,800 | Fresno | CA | U.S.A. |
| 161 | NAB LITTLE CREEK | 99,600 | Virginia Beach | VA | U.S.A. |
| 162 | LITTLE ROCK AFB | 100,065 | Jacksonville | AR | U.S.A. |
| 163 | LIVORNO | 35,275 | Pisa | | Italy |
| 164 | LOS ANGELES AFB | 71,822 | Los Angeles | CA | U.S.A. |
| 165 | LUKE AFB | 97,157 | Phoenix | AZ | U.S.A. |
| 166 | MACDILL AFB | 170,805 | Tampa | FL | U.S.A. |
| 167 | MALMSTROM AFB | 68,200 | Great Falls | MT | U.S.A. |
| 168 | MANNHEIM | 62,944 | Mannheim | | Germany |
| 169 | MARCH AFB | 109,000 | Riverside | CA | U.S.A. |
| 170 | MAXWELL AFB | 82,500 | Montgomery | AL | U.S.A. |
| 171 | MAYPORT NS | 51,232 | Atlantic Beach | FL | U.S.A. |
| 172 | MCCHORD AFB | 139,738 | Tacoma | WA | U.S.A. |
| 173 | MCCLELLAN AFB | 93,210 | North Highlands | CA | U.S.A. |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 174 | MCCONNELL AFB | 53,163 | Wichita | KS | U.S.A. |
| 175 | MCCULLY BARRACKS | 1,452 | Wackenheim | | Germany |
| 176 | MCGUIRE AFB | 109,230 | Wrighttown | NJ | U.S.A. |
| 177 | NAS MEMPHIS | 54,750 | Memphis | TN | U.S.A. |
| 178 | NAS MERIDIAN | 31,591 | Meridian | MS | U.S.A. |
| 179 | MINEO* | 6,835 | Mineo | | Italy |
| 180 | MINOT AFB | 55,000 | Minot | ND | U.S.A. |
| 181 | MIRAMAR NAS | 110,000 | San Diego | CA | U.S.A. |
| 182 | MISAWA AFB | 89,577 | Misawa | | Japan |
| 183 | MITCHEL FIELD | 33,884 | Garden City | NY | U.S.A. |
| 184 | MOFFETT FIELD | 40,000 | Mountain View | CA | U.S.A. |
| 185 | MOODY AFB | 43,400 | Valdosta | GA | U.S.A. |
| 186 | MOUNTAIN HOME AFB | 48,000 | Mountain Home | ID | U.S.A. |
| 187 | NAPLES | 99,400 | Naples | | Italy |
| 188 | NELLIS AFB | 91,192 | Las Vegas | NV | U.S.A. |
| 189 | NEUBRUECKE | 5,774 | Neubreucke | | Germany |
| 190 | NEW LONDON | 40,500 | Groton | CT | U.S.A. |
| 191 | NSA NEW ORLEANS | 70,588 | New Orleans | LA | U.S.A. |
| 192 | NEW RIVER MCAS | 49,239 | Jacksonville | NC | U.S.A. |
| 193 | NEWPORT | 45,900 | Newport | RI | U.S.A. |
| 194 | NB NORFOLK | 73,407 | Norfolk | VA | U.S.A. |
| 195 | NORTH ISLAND | 46,265 | San Diego | CA | U.S.A. |
| 196 | NAS OCEANA | 106,351 | Virginia Beach | VA | U.S.A. |
| 197 | OFFUTT AFB | 119,588 | Bellevue | NE | U.S.A. |
| 198 | ORD COMMUNITY | 111,991 | Monterey | CA | U.S.A. |
| 199 | OROTE | 56,500 | Agat | | Guam |
| 200 | OSAN AFB | 101,600 | Osan | | South Korea |
| 201 | PANZER BARRACKS | 5,985 | Boeblingen | | Germany |
| 202 | PARRIS ISLAND | 35,316 | Beaufort | SC | U.S.A. |
| 203 | PATCH BARRACKS | 63,827 | Stuttgart | | Germany |
| 204 | PATRICK AFB | 101,655 | Cocoa Beach | FL | U.S.A. |
| 205 | PATUXENT RIVER | 53,945 | Lexington Park | MD | U.S.A. |
| 206 | PEARL HARBOR | 92,439 | Honolulu | HI | U.S.A. |
| 207 | PENSACOLA | 75,200 | Pensacola | FL | U.S.A. |
| 208 | PETERSON AFB | 93,364 | Colorado Springs | CO | U.S.A. |
| 209 | PORT HUENEME | 60,655 | Port Hueneme | CA | U.S.A. |
| 210 | NNSY PORTSMOUTH | 49,917 | Portsmouth | VA | U.S.A. |
| 211 | NSY PORTSMOUTH | 28,253 | Portsmouth | NH | U.S.A. |
| 212 | PUSAN | 18,049 | Pusan | | South Korea |
| 213 | QUANTICO | 78,000 | Woodbridge | VA | U.S.A. |
| 214 | RAF ALCONBURY | 67,758 | Peterborough | | England |
| 215 | RAF CROUGHTON | 19,256 | Bichester | | England |
| 216 | RAF FAIRFORD | 33,012 | Fairford | | England |
| 217 | RAF LAKENHEATH | 68,384 | St. Edmunds | | England |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 218 | RAF MENWITH HILL | 30,722 | Harrogate | | England |
| 219 | RAF MILDENHALL | 10,571 | Newmarket | | England |
| 220 | RAMSTEIN AB | 72,990 | Ramstein | | Germany |
| 221 | RANDOLPH AFB | 88,253 | San Antonio | TX | U.S.A. |
| 222 | REDSTONE ARSENAL | 80,900 | Huntsville | AL | U.S.A. |
| 223 | RHEIN-MAIN AB** | 54,664 | Frankfurt | | Germany |
| 224 | RIYADH* | 24,040 | Riyadh | | Saudi Arabia |
| 225 | ROBINS AFB | 81,210 | Macon | GA | U.S.A. |
| 226 | ROCK ISLAND AR. | 33,260 | Rock Island | IL | U.S.A. |
| 227 | ROTA | 53,384 | Jerez | | Spain |
| 228 | SAGAMI DEPOT | 3,857 | Tokyo | | Japan |
| 229 | SAGAMIHARA | 67,535 | Tokyo | | Japan |
| 230 | NS SAN DIEGO | 93,349 | San Diego | CA | U.S.A. |
| 231 | SAN ONOFRE | 25,787 | San Clemente | CA | U.S.A. |
| 232 | SASEBO | 19,774 | Sasebo | | Japan |
| 233 | SCHINNEN | 24,005 | Heerlen | | Netherlands |
| 234 | SCHOFIELD BARRACKS | 86,971 | Wahiawa | HI | U.S.A. |
| 235 | SCHWEINFURT | 45,942 | Schweinfurt | | Germany |
| 236 | SCOTIA | 25,978 | Schenectady | NY | U.S.A. |
| 237 | SCOTT AFB | 105,234 | Belleville | IL | U.S.A. |
| 238 | SELFRIDGE ANG | 65,200 | Mt Clemens | MI | U.S.A. |
| 239 | SEMBACH | 52,884 | Kaiserslautern | | Germany |
| 240 | SEYMOUR-JOHNSON AFB | 64,000 | Goldsboro | NC | U.S.A. |
| 241 | SHAW AFB | 56,500 | Sumter | SC | U.S.A. |
| 242 | SHEPPARD AFB | 87,593 | Wichita Falls | TX | U.S.A. |
| 243 | SIGONELLA | 69,011 | Catania | | Italy |
| 244 | NS SMOKEY POINT | 60,367 | Marysville | WA | U.S.A. |
| 245 | SPANGDAHLEM AB | 23,532 | Bitburg | | Germany |
| 246 | SUGAR GROVE | 3,300 | Sugar Grove | WV | U.S.A. |
| 247 | TAEGU | 50,250 | Taegu | | South Korea |
| 248 | TINKER AFB | 99,607 | Oklahoma City | OK | U.S.A. |
| 249 | TOBYHANNA | 37,822 | Scranton | PA | U.S.A. |
| 250 | TRAVIS AFB | 91,243 | Fairfield | CA | U.S.A. |
| 251 | TWENTYNINE PALMS | 43,400 | Twentynine Palms | CA | U.S.A. |
| 252 | TYNDALL AFB | 79,425 | Panama City | FL | U.S.A. |
| 253 | USAF ACADEMY | 63,296 | Colorado Springs | CO | U.S.A. |
| 254 | VANCE AFB | 28,861 | Enid | OK | U.S.A. |
| 255 | VANDENBERG AFB | 72,816 | Lompoc | CA | U.S.A. |
| 256 | VICENZA | 69,200 | Vicenza | | Italy |
| 257 | VILSECK | 61,074 | Vilseck | | Germany |
| 258 | VOGELWEH AB | 62,777 | Kaiserslautern | | Germany |
| 259 | WALTER REED | 50,556 | Washington | DC | U.S.A. |
| 260 | WEST POINT | 78,000 | Highland Falls | NY | U.S.A. |
| 261 | WHIDBEY ISLAND NAS | 40,004 | Oak Harbor | WA | U.S.A. |

| # | Name | Area (sf) | City | State | Country |
|---|---|---|---|---|---|
| 262 | WHITE SANDS MR | 32,000 | Las Cruces | NM | U.S.A. |
| 263 | WHITEMAN AFB | 57,562 | Knob Noster | MO | U.S.A. |
| 264 | WHITING FIELD | 21,334 | Pensacola | FL | U.S.A. |
| 265 | WIESBADEN | 73,778 | Wiesbaden | | Germany |
| 266 | WRIGHT-PATTERSON AFB | 122,705 | Dayton | OH | U.S.A. |
| 267 | WUERZBURG | 73,750 | Wuerzburg | | Germany |
| 268 | YOKOSUKA NESC | 79,839 | Yokosuka | | Japan |
| 269 | YOKOTA AB | 49,235 | Tokyo | | Japan |
| 270 | YONGSAN | 181,145 | Seoul | | South Korea |
| 271 | YUMA MCAS | 23,682 | Yuma | AZ | U.S.A. |
| 272 | YUMA PG | 22,700 | Yuma | AZ | U.S.A. |

Notes:

* Six commissaries are not included in the DeCA Energy Use and Cost Database (EUCD) because they do not purchase utilities. These are Ankara, TR; Cairo, EG; Kodiak, AK; Mineo, IT; Riyadh, SA; and Sugar Grove, WV.

** Four commissaries closed during FY 2005 but are included in the list above because they reported throughout the year. They will be removed from the DeCA EUCD for FY 2006. These are Bad Aibling and Rhein-Main AB, DE, Camp Howze, KR, Gricignano, IT. When these are removed the total commissary count, as of October 1, 2005, is 268.

## E. Exempt Facilities Inventory

| Facility/Function | Location |
|---|---|
| Cold Iron | SUBASE NEW LONDON CT |
| Cold Iron | NSY NORFOLK VA |
| Cold Iron | PWC NORFOLK VA |
| Cold Iron | WPNSTA CHARLESTON SC |
| Cold Iron | NAS PENSACOLA FL |
| Cold Iron | NAS KEY WEST FL |
| Cold Iron | SUBASE KINGS BAY GA |
| Cold Iron | NAVSTA MAYPORT FL |
| Cold Iron | WPNSTA EARLE COLTS NECK NJ |
| Cold Iron | NAVSTA GUANTANAMO CUBA |
| Cold Iron | NSWC COASTSYSTA PANAMA CITY FL |
| Cold Iron | NAVPHIBASE LITTLE CREEK VA |
| Cold Iron | NETC NEWPORT RI |
| Cold Iron | NAVSTA ROTA SP |
| Cold Iron | NAVSTA PASCAGOULA |
| Cold Iron | NAVSTA INGLESIDE TX |
| Cold Iron | NUWC NEW LONDON |
| Cold Iron | NAVBASE SAN DIEGO CA |
| Cold Iron | NAVBASE CORONADO SAN DIEGO CA |
| Cold Iron | NSY PUGET SOUND BREMERTON WA |
| Cold Iron | NSY PEARL HARBOR HI |
| Cold Iron | FLEET ACTIVITIES CHINHAE SK |
| Cold Iron | COMFLEACT YOKOSUKA JA |
| Cold Iron | COMNAVMAR GUAM GQ |
| Cold Iron | NAVBASE VENTURA, PORT HUENEME CA |
| Cold Iron | COMFLEACT SASEBO JA |
| Cold Iron | NAVSTA PEARL HARBOR HI |
| Cold Iron | SUBASE SAN DIEGO CA |
| Cold Iron | SUBASE BANGOR WA |
| Cold Iron | NAVSTA EVERETT WA |
| Simulator | WPNSTA CHARLESTON SC |
| Simulator | NAS PENSACOLA FL |
| Simulator | NAS JACKSONVILLE FL |
| Simulator | NAS KINGSVILLE TX |
| Simulator | NAS LEMOORE CA |
| Simulator | NSWC DIV PT HUENEME CA |
| Simulator | MCAS MIRAMAR CA |
| Transmitter | NAS JACKSONVILLE FL |
| Transmitter | NAVSECGRUACT WINTER HARBOR ME |

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| Transmitter | RADTRANF ANNAPOLIS MD |
| Transmitter | NAVRADTRANFAC SADDLEBUNCH KEYS |
| Transmitter | NAVCOMMSTA JACKSONVILLE FL |
| Transmitter | NAVRADSTA /T/ JIM CREEK WA |
| Private Party | NAF EL CENTRO CA |
| Private Party | NSWC COASTSYSTA PANAMA CITY FL |
| Private Party | COMFLEACT YOKOSUKA JA |
| Private Party | NAVOBSY WASHINGTON DC |
| Private Party | NAF ATSUGI JA |
| Private Party | CBC PORT HUENEME CA |
| Private Party | CBC GULFPORT MS |
| Private Party | MCAS IWAKUNI JA |
| Private Party | NAVSTA ROTA SP |
| Private Party | NAS KEFLAVIK IC |
| Private Party | NAVCOMMSTA KEFLAVIK IC |
| Private Party | HDQTRS 4TH MARDIV NEW ORLEANS |
| Private Party | NAVSTA PASCAGOULA MS |

Air Force street and airfield lighting installed after 1985 are exempted in this report.