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Civil Engineer



ENERGY CONSERVATION PROGRAM

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This instruction establishes the MacDill Air Force Base Energy Conservation Program and Energy Steering Group (ESG). It defines the program scope, formulates basic energy policies, and assigns responsibilities for the effective management, utilization, and conservation of energy resources by all assigned, tenant, and attached units/staff agencies at MacDill Air Force Base and Avon Park Air Force Range. Maintain and dispose of records created as a result of prescribed processes according to the Air Force Records Disposition Schedule, accessible on-line at <https://afirms.amc.af.mil/>.

SUMMARY OF CHANGES

This publication has been substantially revised and should be reviewed in its entirety. Paragraph **1.** (References) was deleted, all references included in **Attachment 1**, and remaining paragraphs renumbered accordingly. Objectives (para **3.1.**) revised to eliminate the goals for FY2005; transfers responsibilities of the Commander, 6th Air Mobility Command (6 AMW/CC) to Deputy Commander (6 AMW/CV) (para **4.**); Engineering Flight Chief and other individuals added to the list of ESG members (para **4.4.**); adds requirement to set computers and monitors to energy save mode when not in use (para **7.3.**); and adds Energy Savings Performance Contracts (para **8.**).

1. Scope. Systems, facilities, equipment, and vehicles that consume electricity, natural gas, fuel oil, mogas, JP-4, diesel fuel, propane, or other forms of energy are within the scope of this regulation.

2. Background. The Department of Defense (DoD) Energy Management Program is based on compliance with public law and federal policy. There are several program goals and objectives. They are designed to complement each other, forming a synergy to improve operating efficiency, enhance mission capability, and improve personnel comfort and productivity. All DoD components are required to fully comply with the following executive directive which forms the basis for all other federal energy management programs and policies. The goals and objectives for each listed category include:

2.1. Existing Facilities:

2.1.1. Reduce facility energy consumption by 35 percent per square foot by FY2010 compared to FY1985.

2.2. Industrial Processes:

2.2.1. Improve industrial energy efficiency by 25 percent by FY2010 as compared to FY1990 benchmark.

2.3. Technology:

2.3.1. Implement all cost effective energy efficient, water conservation, and renewable energy technologies.

2.3.2. Increase use of solar and other renewable energy sources.

2.3.3. Reduce use of petroleum-based fuels in facilities by switching to clean fuels or renewable energy.

2.4. New Construction:

2.4.1. Meet or exceed the energy performance standards set forth in Title 10, Codes of Federal Regulations (CFR), Part 435 (10 CFR 435), *Energy Conservation Voluntary Performance Standards for Federal Buildings*.

2.4.2. Minimize the life-cycle cost of new facilities by using energy efficient, water conservation, or renewable energy technologies.

2.5. Innovative Financing and Contractual Mechanisms:

2.5.1. Utilize innovative financing and contractual mechanisms that may include:

2.5.1.1. Utility Energy Service Contracts (UESC)

2.5.1.2. Energy Savings Performance Contracts (ESPC)

2.6. Incentives and Awareness:

2.6.1. Assign energy program duties and responsibilities to pertinent personnel.

2.6.2. Appropriately reward exceptional performance of employees for implementing energy efficiency and water conservation.

2.7. Energy Efficient Products:

2.7.1. Purchase products that are in the upper 5 percent of energy efficiency for similar products or Energy Star labeled.

3. Objectives: The objectives of this program are to:

3.1. Reduce facility energy use and cost in accordance with AFD 23-3, *Energy Management*. Currently, Air Mobility Command goals are to reduce both energy consumption and cost by 35 percent by FY2010 compared to FY1985 baseline numbers. These are measured in terms of MBTU per square foot. The goals will be monitored each year at a rate of 1 percent per year through FY2010.

3.2. Reduce mobility and operations fuels.

4. Responsibilities for Key Personnel.

4.1. 6th Air Mobility Wing Commander (6 AMW/CC):

4.1.1. Approves major policy changes recommended by the ESG.

4.2. 6th Air Mobility Wing Vice Commander (6 AMW/CV):

4.2.1. Periodically holds meetings with unit commanders to emphasize program objectives.

4.2.2. Tasks unit commanders with program implementation and enforcement.

4.2.3. Directs energy conservation program.

4.2.4. Chairs quarterly ESG meetings.

4.2.5. Acts as point of contact for ESG matters to higher headquarters.

4.3. 6th Civil Engineer Squadron, Energy Manager (6 CES/CECB):

4.3.1. Develops and implements base energy conservation program in accordance with this instruction.

4.3.2. Enforces rules and regulations for efficient and economical utilization of energy resources.

4.3.3. Serves as recorder for ESG meetings.

4.3.4. Briefs building custodians on energy conservation responsibilities.

4.3.5. Monitors energy consumption.

4.3.6. Serves as engineering consultant on energy matters.

4.3.7. Conducts building audits to determine needed modifications and upgrades. Scope includes but is not limited to heating, ventilation, air conditioning and controls, lighting, and building envelopes.

4.3.8. Expands energy management and control system (EMCS) to include new facilities and systems and upgrade existing EMCS's to further improve operating efficiency and reduce maintenance costs.

4.3.9. Constantly examines new technologies for suitability at MacDill Air Force Base.

4.3.10. Develops projects specifically intended to reduce energy. Funding will be through the Energy Conservation Investment Program or other special funding source, or Operations Program.

4.3.11. Conducts design reviews of all projects involving buildings, systems, equipment installation, and utility systems to ensure compliance with national energy policy.

4.4. ESG:

4.4.1. Consists of the following individuals or their representatives as a minimum:

4.4.1.1. 6 AMW/CV.

4.4.1.2. Headquarters Commandant, United States Central Command.

4.4.1.3. Headquarters Commandant, United States Special Operations Command.

4.4.1.4. Headquarters Commandant, United States Marine Central Command.

- 4.4.1.5. Public Affairs (6 AMW/PA).
- 4.4.1.6. Judge Advocate (6 AMW/JA).
- 4.4.1.7. Commander, 6th Comptroller Squadron (6 CPTS/CC).
- 4.4.1.8. Commander, 6th Medical Group (6 MDG/CC).
- 4.4.1.9. Commander, 6th Operations Group (6 OG/CC).
- 4.4.1.10. Commander, 6th Mission Support Group (6 MSG/CC).
- 4.4.1.11. Commander, 6th Maintenance Group (6 MXG/CC).
- 4.4.1.12. Commander, 6th Civil Engineer Squadron (6 CES/CC).
- 4.4.1.13. Commander, 6th Logistics Readiness Squadron (6 LRS/CC).
- 4.4.1.14. Commander, Joint Communications Support Element (JCSE/CC).
- 4.4.1.15. Base Energy Manager (6 CES/CECB).
- 4.4.1.16. Engineering Flight Chief (6 CES/CEC).
- 4.4.1.17. Base Exchange Manager.
- 4.4.1.18. Commissary Manager.
- 4.4.2. Reviews and establishes energy conservation guidelines and policies for all base organizations.
- 4.4.3. Provides command level interest and awareness to the base energy conservation program and gives the command conservation measures and practices.
- 4.5. Squadron commanders:
 - 4.5.1. Implement and enforce base energy policies within their units.
 - 4.5.2. Communicate requirements to their facility managers.
- 4.6. Facility Managers:
 - 4.6.1. Continuously inspect facility for energy waste.
 - 4.6.2. Take corrective action to eliminate energy waste by either:
 - 4.6.2.1. Turning device off manually.
 - 4.6.2.2. Calling the Civil Engineer construction service.
 - 4.6.2.3. Informing unit commander.
 - 4.6.3. Disseminate policies to building occupants.
- 4.7. 6 AMW/PA.
 - 4.7.1. Provides an information program to educate energy consumers in conservation practices.
 - 4.7.2. Releases information on conservation accomplishments into public domain after coordination with 6 CES/CECB.
 - 4.7.3. Publishes utilities conservation news.

4.7.4. Coordinates photography for publicity.

4.8. 6 LRS/CC (Fuels Monitor):

4.8.1. Monitors fuels consumption and reports status to the ESG.

4.8.2. Makes recommendations to the ESG on fuels consumption and cost reduction.

4.8.3. Attends ESG meetings.

4.9. Senior leadership support is required for the success of our energy conservation efforts. Many of the actions described in this policy concern areas traditionally considered the responsibility of real property building managers. However, no one person can accomplish all of these actions, and many lie outside the realm of a building manager. Facility managers should be considered expert facilitators in this effort, but it will require a total team effort to meet the energy reduction goals. True leadership at all levels is required to change our habits and get every individual and organization on the right track towards saving energy.

5. Policies. The energy conservation program is intended to reduce the amount of energy consumed on MacDill Air Force Base to meet federally mandated requirements. Commanders will emphasize to assigned personnel the importance of energy conservation, raise the priority for energy conservation initiatives, and aggressively implement this energy conservation program.

5.1. The 6th Mission Support Group Commander will provide policy oversight and monitor the energy conservation programs.

5.2. The 6th Civil Engineer Squadron will report component energy consumption through Headquarters, Air Mobility Command (HQ AMC/CE).

5.3. Commanders at all levels will ensure implementation of this program in their respective commands by providing command emphasis through all possible avenues.

5.4. The Public Affairs Office will publish activities and information submitted by 6th Civil Engineer Squadron and other staff sections and appropriate agencies on the energy conservation program.

6. Procedures. Commanders at all levels will:

6.1. Require staff duty to inspect unit areas for energy waste and report those not in compliance to unit commanders.

6.2. Appoint and train energy coordinators/managers and establish energy audit teams. Energy audit teams are to be the facilitators of the energy conservation effort. The mission of the energy team is to identify and facilitate action on energy conservation initiatives. This effort includes such things as unit reduction initiatives, initiating work requests, obtaining funding for larger energy conservation projects, and keeping personnel informed of its actions and actions that everyone can accomplish in energy conservation.

6.3. Initiate public awareness campaigns. Energy conservation is the responsibility of everyone. These goals will require both a concerted conservation effort by the base populace and extensive energy saving facility projects. All organizations must evaluate how they accomplish their mission and how it can be made more efficient. The goal is to accomplish energy conservation milestones without impacting the base mission. The result will be reducing energy consumption and establishing a more efficient work force. Steps must be taken to reduce the amount of energy used by the base, and

many of the actions taken have an impact on employee quality of life. This impact is usually very small, and can be further alleviated through a comprehensive public awareness effort, which explains the reasons behind the necessary actions and shows the results of our efforts. Once these actions become habit, the impact on quality of life diminishes greatly and these habits will continue benefiting everyone both at work and in their personal lives. Change is rarely easy, but can benefit everyone. Seek and publish activities and information on the energy conservation program.

6.4. Reduce the Peak. Unnecessary lights and equipment left on during business hours cost twice as much to run as lights and equipment left on overnight. Everyone should make an effort to keep the peak low.

7. Energy Conservation Actions. The following energy conservation efforts are those that can be focused on by everyone. These conservation measures will provide immediate energy cost and usage reduction.

7.1. Lighting Policy. The general concept of the lighting policy is to make sure that the proper quantity and style of the most efficient lighting are being used for the task being done in all areas. This, along with minor maintenance such as lamp replacement and cleaning, can save precious base resources.

7.1.1. Lighting Levels. Many work areas on posts and bases are lit far more brightly than is required for the tasks performed. The following are appropriate lighting levels for various work areas as identified in the Illuminating Engineering Society (IES) Handbook: Lighting Level (foot-candles) example of activities: 5-Outdoor walkways; 5-10-Restaurant/dining areas; 10-20-Reception areas/lightly used office areas; 20-50-Typical office work; 50-100-Demanding visual tasks (accounting or detailed shop work); 100-200-Very difficult visual tasks/low contrast and small size.

7.1.2. Relamping. Older, tube-type T12 fluorescent lamps are rated at 40 watts each. Newer fluorescent lamps require only 32 watts to supply the same amount of lighting. It is actually cost effective to remove existing 40-watt and 34-watt lamps in bulk and replace them with new 32-watt T8 lamps, and also replacing the magnetic ballast with the new electronic ballast, thereby realizing a 20 percent energy savings. The 32-watt lamps and ballast are available through base supply. Replace both the lamps and ballast when using the T8 lamps. Be sure to collect the old 40-watt lamps and turn them in for recycling at the Transfer Station, Building 885. In addition to tube-type lamps, compact fluorescent lamps (CFL) exist for regular incandescent light bulbs (divide the incandescent lamp wattage by 4 to determine the correct wattage of the new CFL). Many of these lamps can result in savings of 50 to 75 percent.

7.1.3. Light Fixture Cleaning. Lamps and fixtures get dusty over time, thus reducing their lighting output. An increase in lighting output of up to 30 percent can be realized by simply dusting off lamps, reflectors, and light covers or diffusers. Keep this in mind when determining whether current lighting levels are adequate in your work area. Also make sure that your light fixtures have the proper lens on them for your application. There are primarily two types, prismatic and parabolic. The prismatic lens has the typical white, rough textured finish and should be used wherever light should be distributed uniformly in the area. The parabolic lens is typically silver and comes in a variety of "egg crate" sizes. These lenses are primarily used in areas of computer monitors to reduce the potential glaring effect of the lights on the screens.

7.1.4. Exit Lights. For safety reasons, exit lights run 24 hours a day, 365 days a year. Old exit lights typically use 40 watts an hour and require at least one hour of maintenance every year. New exit lights using Light Emitting Diodes (LED) use only 1.8 watts and last for over 20 years **WITHOUT EVER REPLACING THE LAMP!** For this reason, whenever exit signs are to be replaced or added, they will be LED.

7.1.5. Exterior/Parking Lot Lights Deactivation/Reduction. This process calls for the evaluation of all parking lot and streetlights for excessive illumination. These lights will be reduced in areas where it has been determined that no safety or security degradation will be realized. This effort will primarily be done so in areas that will only be affected during non-duty hours. If the facility has 24-hour operation, illumination will be provided in the vicinity of the facility itself, with the remote or outer parking lot lights deactivated. This means that if personnel will be in the facility after dark, they should be instructed to move their vehicle during night duty hours to a closer location.

7.1.6. Light Switches and Occupancy Sensors. Every facility on base should have a nightly security checklist which includes shutting off lights that are not in use. Some office areas may not have light switches currently installed or the switches may turn off lights over large areas rather than specific work zones. Also, some lights may not be the responsibility of anyone in particular such as bathrooms, vestibule, and hallway lights. These areas should be identified to the building manager so a plan can be instituted to ensure these lights get turned off at the end of the day. Turn off all non-essential lighting in a space. Occupancy sensors are smart alternatives to simple light switches. These sensors monitor movement, body heat, or sound to determine whether a room is occupied, and shut off the lights when the room is empty. Many of these sensors have variable sensitivities and time delays that allow them to adapt to different uses. Offices, conference rooms, and restrooms are all good locations for occupancy sensors.

7.2. Heating, Ventilating, and Air Conditioning (HVAC). The heating, ventilating, and air conditioning systems are primarily the responsibility of the HVAC Shop. Base personnel can give assistance in the area of problem identification.

7.2.1. Thermostat Settings. Standards for thermostat settings are 68 degrees Fahrenheit in winter and 76 degrees Fahrenheit in summer. It must be stressed that these temperatures require appropriate dress to ensure personal comfort. The savings possible through maintaining these standards are significant.

7.2.2. Programmable Thermostats and Energy Control Systems. Programmable thermostats or energy control systems cut back on heating, ventilation, and air conditioning systems at night, on weekends, and during the day when they are not needed. The number of these systems will increase over the next few years as large facility improvement projects get under way. These systems can also reduce energy costs by a control method known as "peak shaving". This strategy turns off heating and cooling systems during periods of peak energy use in order to reduce the peak demand charge the base pays each month. These control systems may cause buildings to feel stuffy during after duty hours. This is a normal consequence of their energy saving function.

7.2.3. Space Heaters. The use of space heaters for employee comfort is prohibited in office spaces. These units are a safety hazard and extremely expensive to run. Space heaters may be approved for use in extenuating or extreme circumstances by BCE.

7.2.4. Personal Fans. The use of personal fans for employee comfort is encouraged provided that proper summer thermostat settings of no lower than 76° F are maintained. If proper thermostat settings are maintained, the quality of life benefit provided by these fans outweighs the minor increase in electrical consumption.

7.2.5. Doors and Windows. Gaps around door and window frames can have a large impact on the efficiency of heating and cooling systems. Door and window frames should be inspected to ensure a tight seal. Caulk or weather stripping should be used when possible to seal gaps and cracks. Doors and windows should be closed when building heating and cooling systems are running. An open door or window may provide comfort to those near it while forcing the heating or cooling system to run harder and making other parts of the building far less comfortable. Fans are the best answer, as they provide local comfort by keeping the air moving without causing discomfort in other parts of the building. Many older buildings on the base have poorly insulated windows. The energy efficiency of these windows can be greatly improved by placing mini-blinds over the windows, especially if the windows are on a side of a building that is often exposed to the wind and sun.

7.3. Computers and computer equipment, including laser printers, should have the systems operations software set to energy power conservation mode if they will be unused for more than fifteen minutes, unless this is an excessive inconvenience, i.e., the printer serves more than two people. Utilize energy star mode if it is an option on your laser printer. Designate 24-hour network printers and turn off all other printers and copiers after duty hours.

7.4. Office and Personal Equipment: Fax machines should be turned off after duty hours if possible. If incoming faxes are likely during off-duty hours and more than one fax is available, designate one fax as a 24-hour fax and turn all other fax machines off after duty hours. Copy machines should also be turned off after duty hours. Many newer machines have automatic timers that cycle the copier on and off automatically. All personal equipment such as fans and radios should be turned off when not in use. All unnecessary equipment should be removed.

7.5. After Hours Work. Past experience has shown that after hours staffs often turn on lights while working and then fail to turn them off when leaving an area. It should be stressed to staffs that energy use should be kept to the minimum required to accomplish their tasks. Lights should be turned off when not in use, including hallway lighting. Staff can also act as secondary energy checkers, ensuring lights, copy machines, and computer monitors are turned off overnight.

8. Utility Energy Service Contracts (UESC) and Energy Saving Performance Contracts (ESPC) and Energy Conservation Investment Program (ECIP). UESC, ESPC, and ECIP offer an excellent opportunity to save energy. Base Civil Engineer shall review all opportunities for cutting energy consumption through the use of UESC, ECIP, Federal Energy Management Program, and ESPC.

TIMOTHY S. SMITH, Colonel, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 23-3, *Energy Management*

Title 10 CFR, Subpart A, Part 435, *Energy Conservation Voluntary Performance Standards for Federal Buildings*