UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

February 3, 1978

The Honorable John White
Assistant Secretary of Defense
(Manpower, Reserve Affairs and
Logistics)

Dear Mr. White:

The General Accounting Office has surveyed the energy conservation efforts at sixteen selected overseas military installations in Hawaii, Guam, and four foreign countries (See Attachment I). The primary objectives of our survey were to evaluate the management of the energy conservation programs and to determine if the installations complied with established Federal energy conservation regulations. Overseas military installations are almost totally dependent on foreign energy sources and therefore could be vulnerable to cutbacks or embargoes. A successful program to save energy at overseas installations is important because it can reduce this vulnerability while fostering an energy conservation ethic throughout the Department of Defense (DOD).

A number of the installations we visited have demonstrated that saving energy is possible through sound programs and practices. Conversely, there were certain areas where improvements could be made by DOD and the military services in their continuing efforts to Save Defense Energy. The factors which our survey indicated contributed to positive energy conservation programs at the installations we visited and the areas in which we believe improvements can be made are summarized below.

FACTORS CONTRIBUTING TO POSITIVE ENERGY CONSERVATION PROGRAMS

Although we identified potential for conserving energy at all of the installations visited, positive

energy conservation programs were observed at those locations where top management emphasized conservation. For example, at the U.S. Army Support Command in Hawaii, a senior officer was designated to organize and direct the energy conservation program. The program subsequently reversed a growth trend even though the number of personnel and facilities was increasing.

Another factor contributing to positive conservation programs involved the exchange of information. The most extensive energy information exchange system involved Naval Facilities Engineering Command field personnel who make scheduled visits to naval installations worldwide. Using a prescribed format, these multi-disciplinary engineering teams survey energy conservation activities and provide technical assistance. As part of the technical assistance, the teams identify a project's potential for conserving energy and help installation staff write up proposals for funding.

There were other examples of effective systems and though not as in-depth as the system just described, each had interesting features such as multi-service coverage or easy implementation.

AREAS WHERE IMPROVEMENTS CAN BE MADE

While DOD encourages conservation and installations have achieved significant energy savings, DOD has not issued overall energy conservation program regulations and guidelines. Our survey indicated that without such guidelines, conservation goals between the military services are inconsistent and diverse service regulations do not all comply with prescribed Federal regulations.

Conservation goals should be more consistent and equitable

Conservation goals for the installations visited were not always equitably set and the methods used to determine them varied considerably within each service. Navy installations' goals were still based on 1973 adjusted energy use less 15 percent, while the Army and Air Force set zero growth from a 1975 base.

Some installations had been allowed to adjust their goal while others had not, even with evidence of mission increases. Where adjustments were allowed, we found no uniform criteria being used. For example, in fiscal year 1975, goal adjustments were commonly made without evidence of mission increases, simply to allow for additional air-conditioning or other improvements to existing facilities. Further, goal adjustments were usually increases, even though personnel levels often remained static or decreased. In one case, the transfer of a communications facility to another geographic area was treated as a recurring energy saving, rather than a reduction to the installation's goal.

Federal energy conservation regulations should be used

The key regulations dealing with energy conservation in the Federal government are set forth by the General Services Administration in Federal Management Circular 74-1, Appendix C, "Heating, Cooling, and Lighting of Buildings." Although DOD has not yet issued overall energy program regulations, DOD officials told us that each military service had been advised that Federal regulations apply. However, except for the Marine Corps, military service regulations omitted one or more key Federal requirements.

In comparing actual energy usage to the Federal regulations, we identified many areas where there was potential for immediate energy savings. A few examples follow:

--Federal regulations require heating temperatures no greater than 68 degrees Fahrenheit during working hours, and 55 degrees during non-working hours. Use of portable space heaters is generally prohibited. Nonetheless, space heaters were observed in use at several locations, even in air-conditioned space.

--The general standard is that cooling in office space shall be no lower than 78 to 80 degrees. However, we observed that two centrally air-conditioned bachelor enlisted quarters at one base had floor by floor temperatures ranging from 68 to 72 degrees and a three-story administrative building was uniformly cooled to 73 degrees.

--The Federal energy conservation lighting standard for office space is 50 footcandles at work stations, 30 in work areas, and 10 in non-work areas. While lighting surveys at one installation resulted in removal of some lights, work station and area readings were still commonly over 100 footcandles.

Additional potential for saving energy arose from institutional inertia; the organizations had been doing it that way and thought it was required. This was particularly true of air-conditioning provided to communications and other electronic equipment areas. At three bases where communications or switching equipment was in a selected facility, users told us the lower cooling levels being maintained were needed for the equipment. Equipment manuals, however, showed that higher temperatures were acceptable.

Another problem noted during our survey was that DOD policies governing energy use were not consistently applied to all ranks. At one installation all family housing was limited to a maximum of two window air-conditioners, but senior officers were allowed up to eight units. At another installation, family homes were limited to 4 tons of air-conditioning, but three senior officers' homes had 16, 16, and 22 tons of air-conditioning respectively.

Inconsistent implementation of successful conservation techniques and enforcement of Federal regulations overseas

appeared related to a lack of information flow between the installations. Ten of the 16 installations visited had no formal system to exchange information and data with other installations in that geographic area. At three bases where local regulations did not comply with Federal standards, officials told us they had no record of the Federal standards.

Better measurement of energy use can foster conservation

DOD's efforts to control energy use are hampered by limited means to measure consumption other than in total for an entire installation. The Navy, at the locations we visited, meters electrical use by major users and thus is in a position to identify excessive use and take corrective action. The Army, Air Force, and Marine Corps use metering devices at a central access point, but usually cannot measure energy use by specific organizations. These services rely on estimates to distribute costs to tenants or to identify consumption by housing areas. Where consumers are charged for actual use the reduction in use can be dramatic. Navy data for Guam showed that consumption in individually metered and billed homes averaged about 40 percent less than comparable unmetered homes.

CONCLUSIONS AND SUGGESTIONS

Overseas military installations can achieve energy conservation through sound programs and practices. There are a number of such installations making successful efforts to conserve energy and these programs should serve DOD well as models for other overseas installations.

Top management emphasis was a key factor in successful programs, but the lack of a strong central program has resulted in inconsistent and inequitable goals. DOD's conservation efforts have been hampered by gaps in its system to disseminate energy information. The need for good information systems is particularly important at overseas bases, which are far removed from commands and other bases, making frequent contacts difficult.

We believe that DOD's efforts to Save Defense Energy could be improved by setting up a Department-wide program which provides uniform basic guidelines and standards for each military service. Additionally, we suggest that DOD:

--Strengthen overseas energy conservation information dissemination by obtaining and distributing information and data already available within the Federal government.

--Provide guidance on goal adjustments with specific reference to mission increases and decreases, what changes qualify for adjustments, and how adjustments are to be computed.

--Issue regulations to assure that the Federal standards for energy usage, such as heating, cooling, and lighting levels, are used in all DOD facilities.

--Emphasize and encourage the use of metering as a mechanism for controlling energy use.

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The results of our survey were discussed with responsible officials in the Office of the Director of Energy and the Defense Audit Service. They expressed general agreement with the facts presented to them.

As you know, the Defense Audit Service, in conjuction with the audit services of the Army, Navy, and Air Force, performed a review last year of the DOD energy conservation program. Their reports, which were issued during the period April-July 1977, contained findings essentially the same as those disclosed in our survey. The reports also indicate

that DOD management was responsive to the audit services' findings and that corrective actions were or are planned to be undertaken. In view of management's positive response, we are closing out this assignment with the issuance of this report. We would appreciate, however, being informed of any action you take or plan to take on our suggestions on page 6 for improving DOD's energy management program.

Copies of this report are being sent to the Deputy Assistant Secretary, Energy, Environment, and Safety; the Director of Energy, OSD(MRA&L); and the Director, Defense Audit Service. We appreciate the cooperation extended to our representatives during the course of the survey.

Sincerely yours,

William C. Oelkers

William C. Oelkers
Assistant Director