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

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-202121

APRIL 20, 1981

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The Honorable Caspar W. Weinberger
The Secretary of Defense

Dear Mr. Secretary:

Subject: Potential Savings from Eliminating Unnecessary Central Air-Conditioning in Military Family Housing in Oahu, Hawaii (CED-81-91)

During our recent review of military family housing operations and maintenance, 1/ we learned that centrally air-conditioned family housing units in Hawaii were significantly affecting the military services' utility costs there. In a previous report 2/ we concluded that there was no need to centrally air-condition new and existing military family housing in Hawaii and that it would add millions of dollars annually to utility, repair and maintenance, and replacement costs.

This letter discusses the potential for eliminating many of these unnecessary air-conditioning units, which could result in substantial energy savings. Estimated net savings in utilities would total about $623,000 during the first year alone. Further savings would come from eliminating repair, maintenance, and replacement costs. The information on the number of potential units that could be removed and estimated dollar savings, unless otherwise stated, was provided by service personnel. The services' family housing managers with whom we spoke generally agreed with our findings.

Our objective was to determine the Department of Defense's (DOD's) present policy on air-conditioning military family housing in Hawaii. More specifically, we set out to determine (1) whether the services identify the need for central air-conditioning in

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1/"Differences in the Services' Military Family Housing Programs Hinder Good Management," (CED-81-71, Mar. 5, 1981).

2/"DOD's Requirement For Air-Conditioning Military Family Housing in Hawaii Is Unnecessary," (B-172376, May 20, 1974).

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their family housing in Hawaii and (2) whether savings were possible from eliminating unnecessary central air-conditioning in existing family housing units.

We visited one installation and its respective intermediate command for each service in Hawaii. (See enc. I for the specific locations.)

During this review we examined the applicable laws and DOD policy issuances for air-conditioning family housing in Hawaii. We interviewed service housing officials at the intermediate commands and installations and examined service documents relating to air-conditioning in their family housing. We referred to an Army study on air-conditioning and used part of its methodology in calculating potential utility savings. Estimates concerning the number of unnecessary air-conditioners and related cost information were based on the service housing managers' general knowledge of the housing inventory and, except in the Army's case, were prepared without detailed study.

UNNECESSARY CENTRAL AIR-CONDITIONING IN HAWAII IS NOT A NEW PROBLEM

Our 1974 report concluded that there was no need to centrally air-condition all new and existing military family housing in Hawaii. The report stated that DOD's requirements for across-the-board air-conditioning were unwarranted because:

--The military criterion used to authorize air-conditioning does not consider Hawaii's trade winds and moderate temperature and humidity conditions.

--The military services in Hawaii have gone on record as concluding that air-conditioning is not needed except at some locations having unusual weather and noise problems.

--The U.S. Coast Guard and the Federal Housing Administration do not believe that central air-conditioning is needed in Hawaii except in certain locations.

--Central air-conditioning is not common in Hawaiian townhouses and private homes, including those in the luxury category.

--Installing central air-conditioning in new and existing family houses could cost as much as $100 million.

--Central air-conditioning will add many millions of dollars annually to utility, repairs and maintenance, and replacement costs.

--Central air-conditioning will significantly increase power demand and consumption during a time of growing concern about energy shortages in the United States.

Our report recommended that the Secretary of Defense rescind the requirement for air-conditioning all family housing in Hawaii and develop new criteria for air-conditioning family housing in areas subject to cooling trade winds. DOD disagreed with the report recommendations and cited several reasons, primarily related to climate and humidity, why it believed air-conditioning was needed in Hawaii. Our report noted that DOD's response ignored the effect of trade winds, which make Hawaii's climate pleasant and attractive, and that DOD's characterization of Hawaii's climate as humid conflicted with the positions of the National Oceanic and Atmospheric Administration and the National Weather Service. In disputing the points in DOD's response, our report concluded that DOD's comments had questionable validity and that its position favoring across-the-board air-conditioning in Hawaii was unsupported.

From 1974 to the present, approximately 4,100 newly constructed family housing units were equipped with central air-conditioning in Oahu, Hawaii. Before that time, central air-conditioning was infrequent in military family housing in Hawaii. Some of these installations since 1974 apparently were made because a DOD directive (4270.1 M, Oct. 1972) required the services to install air-conditioning in all new and existing family housing in Hawaii. The Congress subsequently passed legislation (Public Law 93-552, sec. 509, as amended by Public Law 94-107, sec. 508) which prohibits air-conditioning in Hawaii except as authorized by the Secretary of Defense under certain conditions. Exceptions are allowed only for unusual circumstances resulting from excessive noise, adverse environmental conditions, or occupants' health.

Service housing managers told us that the DOD directive no longer applies to Hawaii. The services now have to justify the need for central air-conditioning in any newly constructed family housing units on a case-by-case basis.

POTENTIAL FOR REMOVING UNNEEDED AIR-CONDITIONING UNITS

Our analysis of 4,100 centrally air-conditioned military family housing units constructed since 1974 in Oahu, Hawaii, identified about 1,474 central air-conditioners which service representatives said were unneeded. Removal would result in significant savings in future utility consumption (first-year savings were estimated at about $623,000). Air-conditioning may be justified in many of the remaining units because of unusual weather conditions (over 2,000 Army units are located in a crater, away

from cooling trade winds) or excessive noise (many Air Force units were subjected to aircraft noise).

The services provided us the following estimates of unneeded units and estimated first-year savings.

Army

An April 1980 local Army energy conservation study concluded that 598 central air-conditioners installed in Army family housing could be eliminated. The project proposal for disconnecting and removing the air-conditioners noted that the family housing units were so designed and constructed that air-conditioning was not required. Eliminating the air-conditioners would reduce energy consumption and produce savings that would offset the project's costs in 5 months or less. The proposal was submitted to the Department of the Army headquarters; however, a decision is yet to be made.

Marine Corps

A Marine Corps installation housing manager told us that 670 central air-conditioners at Kaneohe Bay Marine Corps Air Station were not needed and could be removed--citing the high cost of energy as the major savings. He said that the central air-conditioners had been installed when the housing was constructed, in accordance with the October 1972 DOD directive requiring air-conditioning in new facilities.

Navy

Navy housing managers in Hawaii were reluctant to say how many air-conditioners they could eliminate without first studying the situation. However, one installation housing manager said that 200 units were good possibilities because the housing was located in an area with good trade winds.

Air Force

A Hickam Air Force Base official told us that a potential exists for the removal of only 6 units. About 99 percent of Hickam's air-conditioned family housing units are located close to either airline terminals, hangars, or a flightline. Accordingly, air-conditioning is justified at such locations due to excessive aircraft noise.

ESTIMATED FIRST-YEAR SAVINGS

The following table shows the estimated first-year savings in utility costs if unneeded central air-conditioners were removed.

Savings were computed using estimated per-unit electricity savings multiplied by the potential number of unneeded central air-conditioners which could be removed. The cost of disconnecting and removing the air-conditioners has been subtracted from the estimated savings.

	Number of units	First-year savings
Army	598	$184,598.46
Marine Corps	670	328,837.83
Navy	200	107,175.71
Air Force	6	2,628.61
Total	1,474	$623,240.61

Future annual savings should increase each year along with utility rate increases.

The Army estimated a cost of $209.92 to disconnect and remove each central air-conditioning unit. We used this cost factor to compute net potential savings for the Army, Navy, and Air Force (although the Navy and Air Force estimated the number of unneeded units, they had not developed estimated removal cost.) The Marine Corps estimated that it could disconnect and remove each unit for $150, so we used this figure to calculate its estimated net savings.

In our calculations we applied an average kilowatt-hour per-unit factor for annual electricity consumption to the various kilowatt-hour rates charged the services. This per-unit factor for annual electricity consumption and the method for calculating savings were patterned on the Army's air-conditioning study. We did not include estimated savings from eliminating repair, maintenance, or unit replacement costs. However, in our opinion, it is reasonable to assume that such savings would also be significant--especially projected over several years.

In discussing the number of unnecessary air-conditioners and related costs, service housing managers based their estimates on general knowledge of their housing inventory and, except in the Army's case, their estimates were prepared without detailed study. Although this method provides a good initial estimate of potential savings, more detailed study and analysis is needed to identify the total number of unnecessary units and potential costs and savings from disconnecting and removing the units.

DOD has several energy conservation programs underway with the overall goal to reduce energy consumption in its existing facilities. Eliminating the unneeded central air-conditioners in Hawaii would contribute toward meeting that goal.

CONCLUSION

While DOD has changed its requirement to consider the need for air-conditioning on a case-by-case basis, we found that unnecessary central air-conditioning is still used in some family housing in Hawaii. Disconnecting and removing these unneeded air-conditioners could produce substantial long-term savings.

Initial estimated net savings of $623,000 could be realized in the first year by removing unneeded units. Future year savings will rapidly approach $1 million annually. It is likely that the cost of energy will continue to rapidly escalate over the next several years--the Hawaiian Electric Company told us that a 4.1-percent increase is scheduled in July 1981. By eliminating unnecessary air-conditioning, DOD can reduce its military family housing budget and contribute toward meeting its energy conservation goals.

RECOMMENDATION TO THE SECRETARY OF DEFENSE

We recommend that you direct each of the services in Hawaii to identify what air-conditioning in their family housing inventories is unneeded and the number of units that could be disconnected and removed. Each service should submit an engineering study of first-year savings and projected annual future dollar savings from reduced utility consumption and from reduced maintenance and replacement costs. The decision to eliminate air-conditioning should be based on these studies; where appropriate, the Secretary should direct that unnecessary units be disconnected and removed.

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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of the Army, the Air Force and the Navy; the Commandant of the Marine Corps; and to interested congressional committees.

Sincerely yours,

Henry Eschwege

Henry Eschwege
Director