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

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION



General Billy M. Minter
Commander in Chief
U.S. Air Forces in Europe
APO New York 09012

Subject: Improvements Needed In The Air Force's Design Process For Military Construction Projects In Europe (GAO/NSIAD-83-21)

Dear General Minter:

We have reviewed the design process for military construction projects in Europe. The review was made primarily at each of the services' design agents that are responsible for the design and construction of all Department of Defense projects within their designated geographic areas of Europe--Army Corps of Engineers' Engineering Division, Frankfurt, Germany; Naval Facilities Engineering Command's Office in Charge of Construction, Madrid, Spain; and U.S. Air Force 7502 Civil Engineering Squadron, Ruislip, England.

During our review, we identified certain problems that we believe warrant your attention and corrective action:

--The lack of emphasis given to the use of value engineering in the design of Air Force military construction projects in Europe.

--Design agencies were not assuring that proposed Air Force construction projects meet the congressional goal for projects to be at the 35 percent design stage when submitted to the Congress for authorization and funding.

## VALUE ENGINEERING STUDIES ON PROJECTS

The goal of value engineering is to assure that a project's required function is met at the lowest cost consistent with performance, reliability, and maintainability. To

accomplish this goal, a team of architects/engineers focuses attention on the essential function in a chosen design or construction objective. Value engineering encourages immediate design improvement, improved specifications and guidelines for later construction, evaluation of new systems and materials, and designers to be innovative.

Air Force Regulation 89-1, dated June 20, 1978, emphasizes the use of value engineering in the design of military construction projects by stating that regional civil engineers, major commands, and design agents will ensure that a continuing value engineering effort is applied on projects. An Air Force implementing design instruction requires design agents to obtain Air Force clearance for value engineering on a case-by-case basis.

We found that the Air Force authorized a value engineering study for only one project in its fiscal years 1982 and 1983 military construction programs in Europe. The Naval Office in Charge of Construction in Madrid made the study on the Air Force's second increment of facilities and utilities at Comiso Air Base, Sicily. The approved proposals will save about $1.5 million, or 43 times more than the study cost.

Officials from the Army Corps of Engineers' Engineering Division in Frankfurt and the Naval Office in Charge of Construction in Madrid which use value engineering on Army and Navy projects said that they had identified Air Force projects with value engineering potential. However, the Air Force has not authorized value engineering studies on these projects. The two Air Force organizations in Europe that provide this clearance generally do not approve the use of value engineering studies on their European projects. Officials from these two organizations--the U.S. Air Forces Headquarters in Europe and the 7502 Civil Engineering Squadron--said that, although they recognize the benefits of value engineering, staff shortages and past unsuccessful studies prevented them from either having value engineering programs or permitting individual project studies.

In regard to the staff shortages, the Navy and Army in Europe use only 1 and 2 staff years, respectively, to administer their value engineering programs. Further, in an August 11, 1982, report (House Report No. 97-726, 97th Congress, 2nd Session), the House Committee on Appropriations expressed concern over the inconsistent levels of value engineering efforts on construction projects among the various districts, divisions, and services. The Committee stated that all services should take full advantage of the potential cost savings implicit in the value engineering process and devote the resources necessary to implement a meaningful program.

We believe that the savings possible by using value engineering would more than offset the cost of staff to administer a meaningful program for the Air Force in Europe. Therefore, we believe that you should consider establishing a value engineering program in Europe.

## CONGRESSIONAL DESIGN GOAL

The Congress has emphasized to the Department of Defense the importance of having the design of military construction projects at the 35 percent design stage when construction projects are submitted for congressional authorization and funding. This goal is intended to provide the Congress more accurate project cost estimates and to facilitate the start of construction soon after congressional approval.

Using December 31, 1981, as the cutoff date for determining project design status, we found that approximately 25 percent of the projects we sampled in the Air Force's fiscal year 1983 military construction budget for Europe did not meet the congressional design goal. Our analysis excluded ground launched cruise missile projects because they were atypical late program inserts. The following shows the result of our analysis.

| | Number |
|---|---|
| Projects submitted for funding | 87 |
| Projects sampled (note a) | 65 |
| Projects not 35 percent design complete | 16 |
| Percent of projects sampled that did not meet design goal | 25 |

a/We did not analyze all projects submitted because the 35 percent design completion dates were not available on all projects.

We compared the budget estimates for the 16 projects not meeting the 35 percent design goal with the cost estimates that were prepared later when the projects were at the 35 percent design stage. The budget estimates submitted to the Congress were about $2.2 million more than justified based on the later cost estimates. We also noted that the predominant cause for the Air Force submitting cost estimates for projects that were less than 35 percent complete was that Air Force headquarters was late in authorizing the designs. According to an Air Force headquarters official, the refining of the Air Force's planning and programing process for the fiscal year 1983 military construction program delayed the issuance of design authorizations on many projects.

Documentation on these 16 projects indicated that the 35 percent design stages were completed an average of 6 months after the December 31, 1981, cutoff date. The range to complete the 35 percent designs for the 16 projects was from 3 to 12 months after the budget submission date.

While the predominate cause for late project designs was the delayed issuance of design authorizations by Air Force headquarters, we believe that when projects are not at the 35 percent design stage at the time of budget submission to the Congress, the appropriate committees should be informed of those projects as well as when the projects are expected to reach the 35 percent stage. Another alternative would be to defer those projects until the next budget submission. This latter alternative appears appropriate for those projects not meeting the 35 percent design stage until a significant time after the budget submission.

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We would appreciate your comments and notification of any actions you plan on the matters discussed in this letter. Copies of this letter are also being sent to the Secretary of the Air Force and the Air Force Deputy Chief of Staff, Logistics and Engineering.

Sincerely yours,

James G. Mitchell

James G. Mitchell
Associate Director