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ADDENDUM



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TO

U.S. GENERAL ACCOUNTING OFFICE

STAFF STUDY

[THE SAM-D PROGRAM]

DEPARTMENT OF THE ARMY

MARCH 1975

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ADDENDUM
TO
THE SAM-D PROGRAM
STAFF STUDY

The purpose of this addendum is to report SAM-D program changes which occurred after our review work on the basic Staff Study was completed. The basic Staff Study on the SAM-D program was issued in February 1975.

SAM-D PROGRAM SCHEDULE SLIP

As reported in the basic Staff Study, the SAM-D program was extended one year due to the January 1974 program redirection. The Army is now projecting an additional 1-year slip in the SAM-D program at an increase in estimated cost of \$282.1 million.

Army officials attribute the latest 1-year schedule extension to a reduction of the fiscal year 1976 budget request by OSD from \$165.3 million to \$130.0 million. According to these officials, procurement of sufficient Phase III hardware and services must be initiated in fiscal year 1976 to complete a balanced engineering development and testing program on schedule. They said that the budget reduction prevents the necessary commitment to Phase III in fiscal year 1976.

FISCAL YEAR 1976 SAM-D BUDGET REQUEST

The planned distribution of the fiscal year 1976 funds requested for the SAM-D program is shown in the following table.

<u>Budget item</u>	<u>Cost (in millions)</u>
Prime contract	\$ 87.6
Government	24.7
Cost reduction	12.0
Small contracts	3.0
Anti-radiation missile countermeasures and software verification/validation	2.7
	<u>\$130.0</u>

The \$87.6 million programmed for the prime contract is to fund Phases I and II during fiscal year 1976. Of this amount, \$75.9 million is already included in the contract. The Army estimates an additional \$11.7 million will be required to (1) correct design deficiencies that may occur during TVM testing, (2) fund design efforts to permit final determination of the SAM-D configuration, and (3) efficiently resume full-scale engineering development upon successful completion of the TVM tests.

The \$24.7 million for Government includes \$4.5 million for salaries and other expenses of the SAM-D Project Office. The balance of these funds is for the procurement of hardware and services from other Government agencies in support of the TVM tests and Phase II. A breakout of this support is contained in Appendix I.

The \$12 million request for cost reduction consists of cost reduction items to be initiated in fiscal year 1976.

Our review of the planned efforts which are to be funded from fiscal year 1976 funds did not disclose any instances which were unrelated to the proof-of-principle or austere development tasks.

DEFINITIZATION OF THE RESTRUCTURED
SAM-D CONTRACT

The restructured contract, definitized January 31, 1975, provides for a target cost of \$548 million for Phases I and II. This new target cost is about \$40 million more than the previous target cost of \$508 million for all three phases. The following table shows the cost adjustments made by the Army in arriving at the new target cost.

<u>CONTRACT ITEM</u>	<u>ESTIMATED COST</u> (in millions)
Contract target cost prior to restructuring	\$508
Deletion of Phase III costs included in the contract	- 85
Transfer of Phase III costs to Phase II ^{1/}	+ 22
Contractor cost overrun	+ 39
Program stretchout and escalation costs	+ 49
Scope added to the contract	+ 15
New contract target cost	<u>\$548</u>

The Army estimates that the cost of Phase III effort excluded from the current contract will be about \$150.8 million. This estimate consists of \$85 million previously included in the contract for Phase III, \$10.4 million for Phase III startup, and \$55.4 million for program stretchout and escalation.

Under the restructured contract the contractor's target fee was reduced from \$50.8 million to \$39 million. This \$11.8 million reduction, in accordance with the incentive provisions of the contract, is the contractor's 30 percent share of the negotiated cost overrun of \$39 million.

^{1/} This consists of \$9 million for effort formerly included in Phase III and \$13 million for cost increases and economic loss resulting from the delay of Phase III. These costs are attributable to (1) effort common to Phases II and III for which the cost would have been borne partially or completely by Phase III, (2) consolidation of facilities, and (3) learning curve penalties.

Of the \$15 million identified with added scope to the contract, \$6 million is for cost reduction activities. The balance of \$9 million in tasks consists of proposal effort and design changes. According to Army officials, the costs of proposal preparation was significant since it spanned approximately 9 months and involved three separate proposals by the prime contractor to include the numerous changes. Army officials stated that there were significant redesign effort and software changes needed as a result of the reconfigured SAM-D II.

STATUS OF PROOF-OF-PRINCIPLE TESTING

The restructured contract provides for the completion of the track-via-missile (TVM) proof-of-principle testing in January 1976, a slip of 3 months from the previously scheduled completion date of October 1975. The scheduled date for the first TVM flight test under this revised schedule was January 1975 but a subsequent delay caused this flight to be rescheduled to February 27, 1975. Army officials told us that this latest 1-month slip in the initial flight will not impact the scheduled completion of the TVM test series.

Army officials stated that this first flight in the proof-of-principle test series was a success and the basic primary and secondary objectives of the flight appear to have been achieved according to the initial data obtained.

MATTER FOR CONSIDERATION BY THE CONGRESS

In its discussions with the Army, the Congress may wish it to provide an analysis of the estimated cost increase of \$282.1 million as a result of the additional 1-year program slip.

GOVERNMENT SUPPORT TO SAM-D DEVELOPMENT
DURING FISCAL YEAR 1976

<u>SUPPORTING ACTIVITY</u>	<u>TYPE OF SUPPORT</u>	<u>COST (IN THOUSANDS)</u>
U.S. Army Electronics Command	Monitor the microwave tube and devices development, continue development and support of the IFF system, monitor and integrate GFE communications into the SAM-D System, monitor the Fire Section communications development and planning.	\$ 500
U.S. Army Tank and Automotive Command	Two Army standard M-818 tractors and two SAM-D developed XM-860 trailers to support the austere development program were delivered in late FY 75. Effort will include on-site maintenance support for vehicles, testing of trailer components, updating the design data package, and providing maintenance and product assurance data.	1,200
U.S. Army Troop Support Command (Mobility Equipment R&D Center (MERDC))	MERDC will deliver two Prime Power Groups, two Total Environment Control Systems, and spares as GFE to support the hardware integration of Weapon Control Group #2 and two Launcher Group 15 KW diesel generators. MERDC will continue to debug the power units, provide on-site maintenance support, update the design data package, provide maintenance and product assurance data, and continue development testing.	1,300
U.S. Army Missile Command (MICOM)	The R&D Laboratories provide technical support during all phases of the development program. During FY 76, assistance in evaluating the Proof-of-Principle (POP) test program and flight test data will be provided, along with technical assistance	5,400

CCST
(IN THOUSANDS)

SUPPORTING
ACTIVITY

TYPE OF SUPPORT

on development and component assembly/system test activities on ED Fire Control Groups (FCG) 1 and 2. The initiation of counter-ARM development tasks is planned. MICOM also provides the Project Office with base-operations type support.

U.S. Army Test Command

Support the Phase I and initiation of Phase II austere development testing in FY 76. This support includes utilities, documentary photography, captive carry and tracking missions in addition to efforts required on the day of the actual flight test.

Army Missile Test &
Evaluation Directorate

Effort includes coordination with Range activities in support of the POP Test Program; analysis of flight tests to be provided to the SAM-D Office, software evaluation, and contractor support.

1,800

7 National Range

Direct support of POP flight test which includes range instrumentation (radars, optics, cameras, cinetheodolite, etc.), missile recovery, range facility, and flight support aircraft (for radar tracking missions).

2,200

Harry Diamond Laboratories

Continue minimum analysis of hardware designs for the nuclear hardening (EMP) requirement. Conduct tests in selected areas to support analysis. Provide support for Phase II hardware design. (According to the Army officials EMP hardness is being done in this phase of the development program to determine those areas of the system that will require modification to meet requirements. FCG 3, 4, and 5 are to be nuclear hardened. If these modification requirements are discovered early enough in the development program, expensive retrofit costs will be avoided.)

160

COST
(IN THOUSANDS)

SUPPORTING
ACTIVITY

TYPE OF SUPPORT

Harry Diamond Laboratories

Deliver a total of 28 fuzes (in FY 76): 23 are for Phase II flight tests, 1 for ground test, and 4 for in-house qualification tests. Continue fuze development as indicated by ground and flight test results, support contractor testing, perform post flight analysis of fuze performance and continue development of the Fuze Test Set.

2,140

Edgewood Arsenal

Two Modular Collective Protective Equipment units will be delivered in FY 75. Edgewood will provide maintenance and product assurance data. This hardware is an integral part of the Phase II FCG #1 and #2.

5

Armament Command
(Picatinny Arsenal)

Design, develop and test the XM 248 Warhead and XM 131 Safety and Arming Device for the SAM-D missile destruct mechanism after EDM flight #6 as well as the tactical safety and arming device. The program includes lethality studies to determine the estimated SAM-D warhead lethality. In FY 76 warhead design/margin (D/M) testing will be accomplished. Twenty-four warheads will be assembled to support the in-house tests and the missile flights. Warhead Section D/M testing will be initiated. Hardware, including the S&A and warhead, will be fabricated to support the Phase I and Phase II efforts.

2,100

Human Engineering
Laboratory

Continue a minimum analysis of man-machine interfaces of SAM-D equipment. Conduct tests on SAM-D displays to evaluate operator interfaces. Provide support for Phase I procedures and Phase II hardware design.

50

<u>SUPPORTING ACTIVITY</u>	<u>TYPE OF SUPPORT</u>	<u>COST (IN THOUSANDS)</u>
Electronic Compatibility Analysis Center	Continue effort in support of frequency allocations. Provide support for Phase II hardware design.	50
Targets	Target costs include the cost of actual flight services for those targets flown in FY 76 for Phase I and Phase II tests and for long lead targets whose delivery schedule must be compatible with the contract for Phase II flights.	1,400
Project Office	Fund for civilian pay, military/civilian travel, train- ing support services not otherwise funded by separate tasks with MICOM.	4,500
Other Government	These funds provide for operation and maintenance of support aircraft, transportation, consulting services, GFE not otherwise provided by the above and study effort performed by other agencies. Supporting activities include: <ul style="list-style-type: none"> a. Hanscom Field support b. Repair parts, POL, etc. c. Army Research Office technical support d. Army Tactical Air Defense Systems project support of command and control planning e. Holloman Air Force Base support of flight services. 	1,900
Total		<u>\$ 24,705</u>