

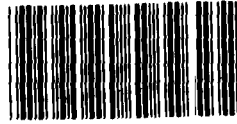


UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

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AUG 9 1984

Lieutenant General James A. Abrahamson, Jr., USAF
Director, Strategic Defense Initiative
Organization
Department of Defense

Subject: The Department of Defense's Space Laser Program
Plan--Status and Issues (GAO/NSIAD-84-132)

Dear General Abrahamson:

We reviewed the status of the Space Laser Program Plan and provided a draft report to the Secretary of Defense for his comment in January 1984. Our draft report stated that:

- completion of the plan was taking longer and costing more than estimated and
- certain high priority tasks within the plan were off to a slow and reduced start.

The draft report proposed that the Secretary assess the Department of Defense's (DOD's) progress in accomplishing the goals of the plan and determine what adjustments were needed to resolve uncertainties about the feasibility of space-based lasers. We also proposed that he consider the need to change the plan's management structure to assure timely completion of the plan.

Since we sent the draft, Secretary Weinberger has established your program office to manage the President's Strategic Defense Initiative (SDI). We understand that the SDI effort supersedes the Space Laser Program Plan and consolidates management of all strategic defense programs related to ballistic missile defense under you as a dedicated program manager. Funding authority for SDI is also centralized and is your responsibility.

Because it appears that the structure the Secretary has established for the SDI effort will resolve the program management and funding problems identified in our draft report, and because the activities covered in the Space Laser Program Plan have been subsumed in SDI, we have decided not to issue that report. We believe, however, that awareness of the problems experienced under the Space Laser Program Plan may prevent similar

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problems with the SDI program. Therefore, we take this opportunity to discuss the two concerns--cost growth and the program's diffused management structure.

OBJECTIVE, SCOPE, AND METHODOLOGY

We reviewed DOD's Space Laser Program Plan because of its interest to the Congress and DOD and because of its high costs. Our objective was to evaluate the progress and potential of DOD's Space Laser Program Plan, including an indepth review of the Defense Advanced Research Projects Agency's (DARPA) Triad program from its inception.

We performed fieldwork primarily between November 1982 and November 1983. Our review was performed in accordance with generally accepted government audit standards.

DEVELOPMENT OF THE SPACE LASER PROGRAM PLAN

In 1980 the Congress directed DOD to provide a detailed plan for the earliest deployment of a space-based laser. In May 1981 DOD told the Congress that a space-based laser could be deployed in the early 1990s but that some major uncertainties about the military use and technology should be resolved before beginning development. In June 1982 DOD issued its Space Laser Program Plan. The plan's major goal was to resolve these major uncertainties in order for DOD to make an informed decision by 1987 on whether to proceed with developing a space-based laser prototype. Another goal was to develop advanced laser technologies for space application to demonstrate whether a space laser system had the growth potential to meet more advanced threats.

In its plan, DOD consolidated the space laser efforts, which were previously shared by DARPA, the Air Force, and the Army, and increased the funding by about \$50 million a year starting in fiscal year 1982. The effort was to be under the central direction of the Office of the Secretary of Defense.

SUBSTANTIAL COST GROWTH CREATED PROGRAM INSTABILITY

When presented to the Congress in 1982, the Space Laser Program Plan was a 6-year, \$908.3 million effort. Necessary shuttle integration costs for Talon Gold of \$160.0 million--not included originally--raised the original estimate to \$1,068.3 million. By December 1983, the plan was estimated to take 7 years and cost \$1,558.3 million. Enclosure 1 details the program cost growth by program task.

Most of the cost growth was caused by increases in the core technology demonstrations composed of the three major subsystems that make up a space laser. The subsystems, known as the space laser Triad demonstrations, are the Alpha, LODE, and Talon Gold.

--Alpha will demonstrate the multi-megawatt laser device.

--LODE is the large optics and beam control segment.

--Talon Gold will demonstrate the acquisition, pointing and tracking segment.

These projects were started before development of the Space Laser Program Plan.

The original cost estimate in 1979 for the Triad was \$160 million. At the time the Triad was included in the plan, this estimate had increased to \$510 million, plus \$160 million for Talon Gold shuttle integration. These increases occurred despite several major descoping efforts from 1979 to 1982 to contain Triad costs.

According to DOD officials, the Triad was under a design-to-cost strategy. Under this strategy, as cost estimates increased, the projects were scoped down to stay within preset cost ceilings. By the time the Triad was included in the Space Laser Program Plan, DOD project managers felt that it had been "cut to the bone" and that any further reductions in the scope of the project might render the Triad unable to support the plan's goals. Thus DOD saw only limited possibilities for restraining cost increases through further scope reductions.

The significance of sound initial cost estimates for the SDI effort should be strongly emphasized in your program management. We believe that the cost growth experienced on the Triad projects contributed to program instability. Similar cost growth for the expensive technology components within the estimated \$25 billion SDI effort could quickly undermine the credibility of the entire effort.

MANAGEMENT STRUCTURE OF SPACE LASER PROGRAM
PLAN WAS TOO DIFFUSED TO BE EFFECTIVE

Some of the plan's highest priority tasks were off to a slow start with key milestones being delayed. Also, DOD was not able to adequately monitor the plan's status because the management and funding structure was too diffused to be effective.

DOD had fashioned a decentralized management structure for completing the complex, long-term, Space Laser Program Plan. The successful completion of the plan required that the Air Force, Army and DARPA complete their assigned tasks on schedule and in a coordinated manner to generate the data necessary for the 1987 decision.

However, no single, dedicated program manager was designated to oversee the plan with the authority to obtain and reprogram resources between tasks as necessary to best meet the plan's goals. Rather, groups or committees were established to assure program coordination. Furthermore, no single funding source was set up for the plan. Instead, program funding was handled within existing channels within the Army, Air Force and DARPA.

This management structure did not work well in the environment of annual congressional funding adjustments and reallocations. For example, some of the plan's highest priority tasks set up to resolve the military utility of space-based lasers were reduced or delayed when funding for these Air Force tasks within the plan was not approved by the Congress. Completing these tasks on time was considered critical because, if the results showed little military value, DOD could terminate or redirect the program accordingly. While the Congress was reducing Air Force funds for the higher priority utility tasks, it was significantly increasing DARPA funds to more aggressively pursue promising short-wavelength laser technology.

We would expect that your centralized management of the SDI program will allow you to prioritize funding needs so that critical tasks can be accomplished in a chronological sequence.

Sincerely yours,


Robert M. Gilroy
Senior Associate Director

Enclosure

SPACE LASER PROGRAM PLAN COST GROWTH

	<u>Original total</u>	<u>Current total</u>	<u>Increase</u>
----- (millions) -----			
Military utility tasks:			
Vulnerability and hardening	\$ 84.9	\$ 118.9	\$ 34.0
Utility	33.9	33.3	-.6
Survivability	24.7	29.0	4.3
System definition	45.0	37.1	-7.9
Technical feasibility tasks:			
Basic technology demonstrations (Triad)	510.0	750.4	240.4
Weapon feasibility	107.4	78.3	-29.1
Growth technology task:	<u>102.4</u>	<u>255.6</u>	<u>153.2^a</u>
Total	<u>908.3</u>	<u>1,302.6</u>	<u>394.3</u>
Shuttle integration costs for Talon Gold ^b	<u>160.0</u>	<u>255.7</u>	<u>95.7</u>
Totals	<u>\$1,068.3</u>	<u>\$1,558.3</u>	<u>\$490.0</u>

^aIncrease due to additional work efforts.

^bExcludes estimated shuttle launch costs of \$98 million.