

GAO

Report to the Acting Secretary of the Air
Force

May 1993

DEFENSE SUPPORT PROGRAM

Ground Station Upgrades Not Based on Validated Requirements



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**National Security and
International Affairs Division**

B-252536

May 21, 1993

**The Honorable Michael B. Donley
Acting Secretary of the Air Force**

Dear Mr. Secretary:

This report summarizes our review of whether planned upgrades costing up to \$95 million to Defense Support Program (DSP) ground processing stations are supported by validated operational requirements. DSP is a strategic surveillance and early warning satellite system.

Results in Brief

It is premature to upgrade DSP ground stations because the Air Force has not completed validation of operational requirements as required by Department of Defense (DOD) Instruction 5000.2 and Air Force Regulation 57-1.

We also found that including global processing capability in the upgrades may not be cost-effective. Global processing would enable the Air Force to process data generated by the total DSP satellite constellation network at a single ground station. However, Air Force officials stated there are no corresponding plans to reduce the number of ground stations. This factor, together with the incomplete requirements process, raises considerable doubts about the Air Force's plan to spend a total of \$95 million at this time to upgrade the stations.

Background

DSP is a strategic surveillance and early warning satellite system with an infrared capability to detect ballistic missile launches (intercontinental and submarine-launched). It provides near real-time detection information in support of DOD's tactical warning and attack assessment mission and is supported by a network of fixed- and mobile ground stations that process and disseminate information to military commanders worldwide. The DSP satellite system has been operational since the 1970s.

The Air Force plans to upgrade DSP fixed-ground station computer hardware and software to enhance operational capability and address an evolving threat. In May 1987, the Air Force contracted to replace the existing DSP ground station software known as System 8, with a revolutionary software upgrade known as System I. However, because of significant cost growth and schedule slippage, the Air Force terminated

the System I program in December 1992. Instead, the Air Force now plans to upgrade System 8 software and replace related DSP ground station computer hardware.

The Air Force's current plan to upgrade DSP ground stations will cost about \$95 million—\$58 million in hardware upgrades, \$29 million in software upgrades, and \$8 million for transition and testing. Planned hardware upgrades will replace computer processors purchased during the 1980s that are difficult to maintain and no longer have sufficient capacity, according to Air Force officials. Planned software upgrades include (1) dual stereo processing designed to provide better information on missile direction, launch point and launch times; (2) central global processing, which will enable all satellite data to be processed at one location; and (3) mission processing enhancements that provide more accurate data on missile trajectory. To help fund the upgrades, DSP program officials told us that they plan to redirect about \$5 million in fiscal year 1993 funds remaining from the canceled System I program and request fiscal year 1994 funds for computer hardware.

DSP Requirements Have Not Been Validated

Upgrade of System 8 ground station software and hardware is premature because the Air Force has not yet validated operational requirements. Validated requirements are needed to verify the need for planned DSP ground station upgrades. DOD Instruction 5000.2 and Air Force Regulation 57-1 require that an operational requirements document, identifying minimum acceptable performance characteristics, be prepared for all major weapon systems such as DSP. An operational requirements document identifies the minimum acceptable performance required to satisfy mission needs and is used to establish test criteria for operational test and evaluation.

The Air Force is currently in the process of validating operational requirements for the DSP satellite and ground station network system. Air Force officials stated an operational requirements document is expected to be validated and approved in September 1993. Program officials acknowledged that an operational requirements document should be validated before any System 8 upgrade activities are started.

Global Processing Upgrade May Not Be Cost-Effective

Including global processing capability in the System 8 upgrade may not be cost-effective because the Air Force does not plan to reduce the number of DSP ground stations. Currently, satellite data is processed by the various individual ground stations and is not integrated with information received

by other DSP ground stations. However, central global processing would permit a single ground station to process and integrate data generated by all DSP satellites. The DSP program office estimated the cost of including the global processing capability in the System 8 upgrade to be about \$20 million.

A contractor study found that central global processing could improve missile surveillance operations and eliminate the need for overseas ground stations. However, Air Force officials told us there are no plans to reduce the number of ground stations. In addition, DSP and Air Force Space Command officials stated that they are not certain whether capabilities provided by central global processing would be utilized. They also informed us that the Air Force has not approved an operational concept for employing the capabilities of central global processing. Therefore, there is little assurance that global processing capability would be used to improve missile surveillance operations or reduce the number of ground processing stations.

Recommendations

We recommend that the Secretary of the Air Force ensure that (1) the Air Force validates DSP operational requirements before any System 8 upgrade development activities are funded and (2) a cost-effectiveness analysis is performed to determine whether the central global processing capability would be used to reduce the need for a number of ground processing stations and improve missile surveillance operations.

Agency Comments

In official oral comments on this draft report, DOD stated that the Air Force would develop and validate an operational requirements document before any funds are spent on new System 8 upgrades. DOD also stated that the Air Force would thoroughly evaluate the utility of central global processing before it decides to develop the enhancement.

Scope and Methodology

We interviewed officials and obtained DSP program requirements, DOD and Air Force regulations, and budget documentation from the Office of the Secretary of Defense and the Department of the Air Force in Washington, D.C. We also interviewed officials from the Air Force Space and Missile Systems Center, Los Angeles, California; Air Force Space Command, Colorado Springs, Colorado; and the Air Force Test and Evaluation Center, Kirtland Air Force Base, Albuquerque, New Mexico.

We conducted our review between October 1992 and January 1993 in accordance with generally accepted government auditing standards.

As you know, 31 U.S.C. 720 requires that the head of a federal agency submit a written statement on actions taken on these recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations 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 interested congressional committees, the Secretary of Defense, and the Director of the Office of Management and Budget. We will also make copies available to others upon request.

Please contact me on (202) 512-4841 if you or your staff have any questions. Major contributors to this report are listed in appendix I.

Sincerely yours,



Louis J. Rodrigues
Director, Systems Development
and Production Issues

Major Contributors to This Report

**National Security and
International Affairs
Division, Washington,
D.C.**

**Howard R. Manning, Assistant Director
James A. Elgas, Evaluator-in-Charge**

**Los Angeles Regional
Office**

**Sam Van Wagner, Regional Assistant Manager
Dale M. Yuge, Senior Evaluator
Frank Moore, Evaluator**

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