

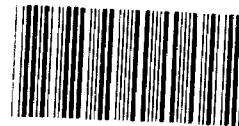
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Fact Sheet for the Chairman,
Subcommittee on Defense, Committee on
Appropriations, House of Representatives

August 1987

ATTACK WARNING

ADP and Communication Modernization Programs for Warning and Assessment



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**Information Management and
Technology Division**

B-209661

August 10, 1987

The Honorable Bill Chappell, Jr.
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

As requested in your October 30, 1986, letter and subsequent discussions with your office, we have developed information on the purpose and status of five programs for modernizing the Tactical Warning and Attack Assessment (TW/AA) system's data processing and communications capabilities. These five initiatives are the (1) Communications Systems Segment Replacement, (2) Space Defense Operations Center IV, (3) Command Center Processing and Display System Replacement, (4) Survivable Communications Integration System, and (5) Granite Sentry programs. In the early 1980's, the Air Force began these modernization programs so that our nation's leaders would have timely, unambiguous warning and assessment information in the event of a missile or bomber attack on the United States.

After discussions with your office, we agreed to prepare an interim report on any cost increases and system development issues that have occurred in the TW/AA data processing and communication modernization programs. The second phase of our audit will focus on system integration activities and technical aspects of system development that may affect these programs.

Our audit work for this report was conducted from January 1987 to March 1987. We examined cost, schedule, management, and contract information provided by the Defense Department and the Air Force. We conducted this work at the Office of the Secretary of Defense, the Office of the Joint Chiefs of Staff, and the Air Force Headquarters in Washington, D.C.; the North American Aerospace Defense Command (NORAD), United States Space Command, and the Air Force Space Command at Colorado Springs, Colorado; and the Air Force Systems Command, Electronic Systems Division, at Hanscom Air Force Base, Massachusetts.

In addition, we interviewed key officials at the (1) Office of the Secretary of Defense, Office of the Joint Chiefs of Staff, and Air Force Headquarters in Washington, D.C.; (2) Air Force Space Command at Colorado

Springs, Colorado; and (3) Air Force Systems Command, Electronic Systems Division, at Hanscom Air Force Base, Massachusetts.

The following describes the purpose and status of the five programs.

Communications System Segment Replacement Program

The Communications System Segment Replacement program is intended to ensure uninterrupted communications to support the United States Space Command's ballistic missile warning, air defense, and space defense missions. Messages received from the various missile, air, and space sensor systems are to be distributed by this replacement system to mission centers at the Cheyenne Mountain Complex for processing.

The replacement system will be developed in two separate blocks. Block I is intended to automate the monitoring and technical control of the communication lines entering the Cheyenne Mountain Complex. Block II is planned to provide message processing and distribution capabilities. The program developer, Electronic Systems Division, estimates the program acquisition cost to be \$242.7 million through fiscal year 1992.

The contract for the full-scale development¹ of block I was awarded in June 1984, and the block II development contract was awarded in February 1987. Block I was originally scheduled to be completed in 28 months, but the software contractor incurred a \$6.8 million cost overrun and a projected 9-month schedule delay, from October 1986 to July 1987. According to the program manager, 3 months of this slippage were attributed to the need for redesigning circuit equipment after the contractor and the government disagreed over design requirements. The program manager also stated that the remaining 6-month delay resulted from the underestimation of software required to accommodate the block I computer systems.

During the fiscal year 1988 budget process, the Electronic Systems Division's acquisition cost projection for the replacement system increased from \$230 million to approximately \$350 million, or about a 50-percent increase. On the basis of a joint Electronic Systems Division and Air Force Space Command sponsored study² that reviewed the technical and programmatic requirements of the Communications System Segment

¹The full-scale development phase includes developing, engineering, fabricating, and testing all items necessary for system support.

²Communications System Segment Replacement Requirements Review Final Report dated February 1986.

Replacement program, the system's requirements were reduced to lower the estimated acquisition cost to \$242.7 million.

One requirement eliminated was the physical separation of communication support for the missile, air, and space missions. The replacement system was initially designed to provide a physically separated software and hardware communication subsystem to support each mission. Communication subsystems will now be functionally separated by software, and not physically separated by hardware. The program manager has stated that this approach would be acceptable because the selected computer hardware is designed to continue effective mission processing even if some components fail to operate properly.

Space Defense Operations Center IV Program

The Space Defense Operations Center IV program is intended to (1) automate the manual space defense functions, (2) enhance current space surveillance automated functions, and (3) develop a single integrated data processing system for the space defense and surveillance function in the Space Defense Operations Center.

The program will be implemented in three blocks. Block A provides computer equipment and software to automate space defense operations. Block B enhances the space surveillance function for high-interest satellites and provides system hardware for space surveillance processing. Block C is intended to complete the enhancements to support the space surveillance detection and tracking functions and to support anti-satellite testing.

Block A is in full-scale development. The block A initial operational capability was originally scheduled to be completed in August 1985. According to the program manager, the initial operational capability has been delayed 23 months because of problems with software integration, construction delays, and system testing and is now scheduled for completion in July 1987. Block B contract was awarded in June 1986 and is scheduled for completion in March 1989. Block C contract is scheduled for award in March 1989 and is scheduled for completion in September 1991. The Electronic Systems Division estimates the program acquisition cost to be \$390.8 million through fiscal year 1992.

Command Center Processing and Display System Replacement Program

The Command Center Processing and Display System Replacement program is intended to provide computer systems with additional capability to support the ballistic missile warning and attack assessment mission. This program is intended to display identical ballistic missile warning and nuclear detonation information to our nation's primary command centers³ and replace the current missile warning data processing system.

Contracts for the concept definition and design phase were awarded in August 1985. The command center system contract for full-scale development was awarded in June 1987. The Electronic Systems Division estimates the program acquisition cost to be \$266.1 million through fiscal year 1992.

The command center system is also intended to provide the capability to display manually entered messages that consolidate warning information from ballistic missile, air, space, and intelligence systems. Current program schedules call for the command center system to provide this capability beginning in June 1991. However, the Air Force Space Command is considering deleting this specific requirement because another TW/AA program—Granite Sentry—is expected to provide a similar automated capability about 6 months after the command center system's manual capability would be implemented.

Survivable Communications Integration System Program

The Survivable Communications Integration System program is intended to provide the capability to transmit critical missile warning messages simultaneously over multiple communication systems. This program is intended to provide the ability to use up to five communication systems and a secure voice capability between individual sensor sites and command centers.

The program entered full-scale development in August 1986. The Electronic Systems Division estimates the program acquisition cost to be \$122.2 million through fiscal year 1992. A total of 26 systems will be procured—21 for operational locations and 5 for testing and training. At the time of our review, we did not identify any cost increases or system development problems with this program.

³The primary command centers are the National Military Command Center, Alternate National Military Command Center, Strategic Air Command Command Post, and Cheyenne Mountain Complex.

Granite Sentry Program

The Granite Sentry program is intended to improve the United States Space Command's ability to perform a variety of attack warning and assessment missions. The program will replace the Modular Display System and the air defense portion of the NORAD Computer System,⁴ and upgrade the command post, the Air Defense Operations Center, Battle Staff Support Center, and Weather Center in the Cheyenne Mountain Complex.

Program development began in November 1986. The Electronic Systems Division estimates the program acquisition cost to be \$137 million through fiscal year 1992. Early estimates of the program acquisition cost were around \$350 million. However, these earlier estimates were reduced to \$137 million, reflecting the Air Forces' decision to have the Air Force Space Command develop most of the applications software as an in-house development project, using commercial off-the-shelf computer equipment and system software.

Granite Sentry program responsibilities are divided between two organizations. The Electronic Systems Division is responsible for overall program management, while the Air Force Space Command will perform in-house software development of applications programs.

Air Force officials have stated that a draft program management directive requires Granite Sentry program officials to (1) establish a clear delineation of responsibility between the Electronic Systems Division and the Air Force Space Command and (2) develop overall system requirements by April 1988.

We have discussed the contents of this report with Defense officials and have included their comments where appropriate. As agreed with your office, we did not obtain official agency comments. We performed our review in accordance with generally accepted government auditing standards.

⁴The NORAD Computer System and the Modular Display System currently process and display ballistic missile, air, and space defense warning and assessment information entering the Cheyenne Mountain Complex.

We are sending copies of this report to the Secretary of Defense; the Director, Office of Management and Budget; the appropriate congressional committees; and other interested parties upon request.

Sincerely yours,



Carl R. Palmer
Associate Director

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