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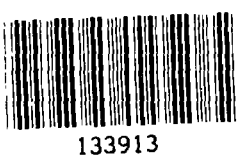
Report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

September 1987

COMPUTER SYSTEMS

Navy Stock Point ADP Replacement Program Needs Better Management Controls



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Washington, D.C. 20548

Information Management and
Technology Division

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September 17, 1987

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

Dear Mr. Chairman:

In your March 7, 1986, letter, you asked us to undertake a study of the automated information systems the Navy is developing to improve its supply operations. In October 1986, we provided you with a report[1] outlining cost and schedule information for the Stock Point ADP Replacement (SPAR) and the Stock Point Logistic Integrated Communications Environment (SPLICE) projects. This report provides additional information on the SPAR project. As agreed with your office, our objectives were to

- determine whether the Navy has plans to review and approve the SPAR development project as required by Department of Defense directives,
- determine whether the Navy will be able to evaluate SPAR's operating improvements and economic worth, and
- evaluate the Navy's plans for making a transition from the current system to the proposed SPAR system.

The SPAR project, which the Navy estimates will cost $2.3 billion over its 24-year life, is intended to improve supply operations by replacing the current system with new equipment and software incrementally at 40 stock point locations from 1987 through 1994. In implementing SPAR, the Navy plans to (1) acquire new automatic data processing equipment, (2) convert current application software and data files to operate on the new equipment, and (3) redesign, that is, modernize, the software to improve stock point operations and solve some of the acknowledged problems in supply management.

Department of Defense Directives 7920.1 and 7920.2 require Defense organizations to review and approve the development of all major automated information systems at key stages of completion. The review and approval process is designed to increase the likelihood that a new system is economically justified, will fulfill users' requirements, and will

[1] Navy Supply Systems: Status of Two Projects for Improving Stock Point Operations (GAO/IMTEC-87-1FS, October 9, 1986).

provide anticipated operational improvements. According to Defense officials, the process is required for system conversions as well as for system modernizations.

Our review showed that the Navy has not complied with Defense requirements for modernization. Specifically, the Navy does not have a scheduled date for review and approval of the modernized system design. An approved design is required to help ensure that the system meets the users' needs and that the automatic data processing equipment selected will efficiently run the modernized system. We are, therefore, making recommendations to the Secretary of Defense to require the Navy to schedule a review of SPAR's modernization design and to defer, by a few months, the acquisition of equipment for 3 of SPAR's 40 planned sites until the modernized systems design is complete.

Our review also showed that the Navy had not adequately quantified the performance and cost measures needed to demonstrate SPAR's operational and economic worth. In addition, the Navy's plan to move from the current system to the new SPAR system was not detailed enough to ensure a smooth transition. After we raised these issues, the Navy initiated corrective action.

Scope and Methodology

In performing our review, we analyzed SPAR project documentation for system planning, costs, schedules, acquisition strategy, and transition planning. We received briefings from and held interviews with Navy officials at the Naval Supply Systems Command, Washington, D.C., who are responsible for managing the development of the SPAR project, and at the Fleet Material Support Office, Mechanicsburg, Pennsylvania, who are responsible for project design and software development. We also interviewed officials at the General Services Administration's Federal Software Management Support Center, Washington, D.C., who are responsible for providing management support and technical expertise for SPAR's software conversion. In addition, we discussed the project's compliance with life-cycle management process requirements with Navy officials and reviewed project files at the Naval Data Automation Command, Washington, D.C. Our review was conducted from May 1986 through May 1987.

Our work was performed in accordance with generally accepted government auditing standards. Although, as you requested, we did not obtain

official agency comments on a draft of this report, we briefed Navy officials directly responsible for SPAR on our findings and have incorporated their views in the report where appropriate.

SPAR Program Background

Navy stock points, which provide supply and support services to fleet units and shore activities, rely extensively on automation to manage an inventory valued at about $23 billion. By the late 1970's, the Navy had determined that its standard automated supply system, the Uniform Automated Data Processing System for Stock Points, developed in the early 1960's, had significant hardware and software problems. Problems identified by the Navy included: computers that were obsolete, were dependent upon batch, tape, and card processing capabilities, and were incapable of handling projected work-load growth; executive software that was cumbersome and costly to maintain; and telecommunications capabilities that restricted timely operations and provided for only a limited interchange of information with other systems. Further, supply operations were made more difficult because financial and supply data bases were separate, contained duplicate and inaccurate data, and lacked a timely error detection and correction capability. These problems, according to the Navy, had a severe impact on supply support operations at its stock points.

The Navy is developing SPAR to improve and modernize supply operations by replacing the current system with new equipment and software at stock points. The Navy began the SPAR program in 1980 as an equipment acquisition and software conversion effort. It added software redesign, that is, modernization, more than 2 years later. The Navy plans to make a transition from the current system—Burroughs batch processing—to the converted and then to the modernized SPAR system at 11 major supply sites. It plans to move directly to the modernized system at 29 other supply sites. Equipment acquisition and system implementation at the 40 supply sites will take place in increments over a 7-year period from June 1987 through March 1994. The converted system will be installed at the first site in June 1988. The modernized system will replace the converted system at this site in October 1989. The new system will be installed at the fortieth site in March 1994.

Department of Defense Directives 7920.1 and 7920.2 prescribe rules for managing the development of automated information systems. For major systems like SPAR, Defense policy designates the Office of the Secretary of Defense, whose evaluation body is the Major Automated Information System Review Council, to review and approve all plans,

decisions, and documentation at key stages of the development process. In SPAR's case, the Office of the Secretary of Defense delegated approval authority to the Navy. However, the Review Council still conducts periodic reviews of SPAR.

SPAR's Modernization Design Requires Formal Navy Approval

When we began our audit, the Navy had planned all required reviews for SPAR's conversion segment, but had no plans to review the design of SPAR's modernized system as required by Defense directives. A review of the modernized system is important because most of SPAR's benefits are intended to be derived from this system. Until the software for the conversion segment is modernized, the SPAR program is an equipment replacement effort.

The Navy's official approval of the modernized system design is critical for ensuring that the system developed on the basis of this new design will correct known operational problems. Design approval signifies that design specifications are detailed enough for the development of a system that will satisfy users' needs and provide expected operational improvements. Also, detailed design data are needed to determine automatic data processing equipment needs. Design approval is referred to as milestone II in Defense Directive 7920.1 and 7920.2.

SPAR program officials stated that they do not plan to formally review the modernized system until it is fully developed in about June 1990. The system will be considered fully developed when software is running on test equipment. Evaluation and approval at the end of the development stage is called milestone III in Defense Directives 7920.1 and 7920.2. By not conducting a formal review at the earlier design stage, planned for completion by July 1989, the Navy cannot ensure that (1) the programming resources used for system development will yield an effective system and (2) the equipment acquired will be most suitable for the modernized system.

According to the SPAR program manager and other officials, the Navy's equipment contract, awarded in August 1987, will commit the Navy only to buying test bed equipment.[2] According to these officials, follow-on equipment purchases for additional sites will be made by exercising contract options. Generally, equipment for conversion will be acquired in increments before equipment for modernization. Conversion equipment will replace faulty equipment to ensure continuous system operation

[2]Automatic data processing equipment that is used to develop, test, and modify software

before the modernized system design is completed. Between March 1988 and July 1989, the Navy plans to acquire equipment for the first four conversion sites. We agree that the Navy needs to acquire equipment for the test bed and the first conversion site to help it fully develop the converted system. However, because the modernized design is not scheduled for completion until about July 1989, it would be prudent for Navy officials to evaluate and approve the design before acquiring equipment for the three additional conversion sites.

The Navy's plan to justify equipment purchases at these sites will not be based on an approved design for modernization. Instead, the Navy plans to acquire this equipment based on test results of simulated programs processing simulated data and a logical data model, which the Navy was still building as we completed our field work. The Navy will use the results of these tests to select the type of equipment that can perform the modernized system's functions. While the Navy needs to acquire equipment for the test bed and first conversion site, we believe that it would be more prudent for the Navy to base its subsequent equipment needs for the modernized system on firm design data and specific system requirements. This data is scheduled to be available only a few months after the Navy plans to order equipment for the three additional conversion sites.

The Navy Plans to Demonstrate SPAR's Operating Improvements and Economic Worth

The Navy is now planning to quantify the performance and cost measures needed to demonstrate how SPAR will improve stock point operations and the system's economic worth. Both Navy and Defense regulations require that quantified measures or benefits be established in early system development and be used to demonstrate a system's economic worth. The determination of economic worth is to be updated as needed and considered in approving a system for continued development. The Navy had not established these quantified measures or benefits and, thus, had no basis for demonstrating SPAR's economic worth. After we brought this matter to the Navy's attention, SPAR program officials initiated corrective actions to establish the measures required to demonstrate SPAR's economic worth.

The Navy now has firm plans to develop a performance baseline, measure expected improvements, and quantify benefits. The Navy's plans, in our opinion, are directed at obtaining the appropriate information needed to establish the quantified measures or benefits for demonstrating the economic viability of the $2.3 billion investment in the SPAR program. These actions are scheduled to be completed in mid-1988. It is

important that an evaluation of SPAR's economic worth be part of the modernized system design review (milestone II) recommended in this report.

The Navy Is Updating Plans for the Transition to SPAR

When we began our review, the Navy's transition plan was not sufficiently detailed to ensure a smooth transition from the existing system to the SPAR system. For example, the Navy's plan included converting the current software to run on the new or replacement hardware, but did not include the details of how the system would be implemented at each stock point once it was converted. In addition, when the Navy changed the SPAR program by adding the modernization segment, it did not provide a feasible method of making a transition from the converted system to the modernized system.

As a result of our review, the Navy acknowledged the need to improve its transition planning. The Navy now has a contractual effort underway for developing the detailed transition plan essential for the successful installation of both the converted and modernized systems. According to the Navy, this revised transition plan is scheduled to be completed in September 1987. Therefore, the Navy should be able to evaluate the adequacy and completeness of the transition plan prior to the implementation of the converted and modernized system at the first host site in June 1988 and October 1989, respectively.

Conclusions

In our opinion, the Navy could strengthen its management control over the modernization segment of the SPAR program. By establishing a system development review (milestone III), the Navy has partially implemented required control over the modernization segment. However, the Navy needs to establish an earlier system design review (milestone II) to fully comply with Defense policy, thereby ensuring that there is a valid basis for future software development and equipment acquisition. The Navy plans large expenditures for acquiring new automatic data processing equipment for stock points under SPAR. Until the Navy completes the modernized system's design, it runs the risk that the new equipment acquired for the converted system cannot be effectively used for the modernized system.

Recommendations

To ensure that the modernized segment of SPAR has appropriate management controls, we recommend that the Secretary of Defense direct the Secretary of the Navy to:

- Establish an additional review for the modernization segment within the SPAR program and ensure that the intent of the review has been fulfilled before allowing the program to enter subsequent development phases. Specifically, the Navy should establish a system design completion review (milestone II) for the modernization segment.
- Defer the acquisition of new automatic data processing equipment for three SPAR conversion sites (excluding the test bed and first site) until the modernized system design is complete (milestone II) and the Navy can ensure that the equipment can be effectively used for the modernized system.

We are sending copies of this report to the Secretary of Defense and the Secretary of the Navy. We will also make copies available to other interested parties on request.

Sincerely yours,

Ralph V. Carlone

Ralph V. Carlone
Director

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