

GAO

Report to the Chairman, Subcommittee on
Commerce, Consumer Protection, and
Competitiveness, Committee on Energy
and Commerce, House of Representatives

June 1989

ADP PROCUREMENT

Navy Improperly Restricted Competition for Its Civilian Pay System



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**Information Management and
Technology Division**

B-226935

June 21, 1989

The Honorable James J. Florio
Chairman, Subcommittee on Commerce, Consumer
Protection, and Competitiveness
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

This report is in response to your December 14, 1988, request that we review allegations by several computer companies that the Navy improperly restricted competition in certain automated data processing (ADP) procurements. As agreed with your office, we reviewed the decisions related to one of these procurements—the Navy Standard Civilian Pay System (NAVSCIPS). These decisions resulted in the award of two contracts totaling almost \$30 million for International Business Machines, Inc. (IBM) computers and related equipment—a \$3 million contract with IBM in November 1986 and a \$26.7 million contract with Federal Computer Corporation, a systems integrator, in August 1987.¹

We found that the Navy—in its haste to meet a December 1988 deadline set by the Assistant Secretary of the Navy (Financial Management)—deviated from accepted systems development practices in making several key technical decisions. Specifically, the Navy selected a data base management system, hardware, and the 10 sites where the system would run without conducting appropriate studies and developing adequate support. Taken together, these decisions concerning Navy hardware procurements improperly restricted competition to specific IBM hardware and related equipment.

Additionally, the Navy's actions resulted in a system design that did not meet its needs. As a result, the Navy has selected new data base management software and reduced the number of NAVSCIPS processing sites. We believe these changes are so substantial that it is not prudent for the Navy to use its current contract to procure additional hardware for NAVSCIPS without clear evidence that it represents the most cost effective solution.

¹ A systems integrator teams with different vendors to create a system, and usually does not manufacture its own equipment.

We are therefore recommending that the Navy (1) cease further deliveries under the yet-to-be-completed second contract, (2) determine the most cost effective number of sites needed to process NAVSCIPS, (3) promote full and open competition by recompeting the hardware using functional specifications, and (4) determine, on the basis of the results of the recompetition, whether to continue the current contract or terminate it and award a new contract for the required hardware.

Background

The Comptroller of the Navy established the NAVSCIPS project in 1979 to develop a standard Navy civilian payroll system designed to enhance productivity and reduce support costs. The Deputy Secretary of Defense reaffirmed this objective in April 1985 by establishing an objective that each of the military services should have a standard civilian pay system by the end of 1988. The Assistant Secretary of the Navy (Financial Management) set December 1988 as the Navy's goal for implementation of NAVSCIPS.

Following years of planning and assessing system alternatives, programmers and analysts at the Navy Comptroller Standard Systems Activity, a central design activity, worked from 1984 through 1986 developing NAVSCIPS system programs using the Self-Explaining Extended Data Base (SEED). The design activity staff used Perkin-Elmer minicomputers (which are not IBM-compatible) to develop and test the programs, which were to run on minicomputers to be located at 34 payroll office sites. In May 1986, as programming and testing neared completion, the design activity determined that the Perkin-Elmer hardware lacked sufficient power to process NAVSCIPS and that an alternative hardware solution was needed. Subsequently, the design activity moved systems development and testing to an existing IBM 4361 computer available at a local Navy data processing facility.

In November 1986, the Assistant Secretary of the Navy (Financial Management) approved a plan for the NAVSCIPS system. Under this plan, the SEED data base and IBM 4381 or equal computers were to be used at 10 regional processing sites. To help meet the December 1988 deadline, the Navy adopted a two-step acquisition strategy for NAVSCIPS hardware. The first step was to quickly procure two IBM 4381 or equal computers and related peripherals (such as disk drives) to be used at a prototype site in Great Lakes, Illinois and to test the system in Pensacola, Florida.²

²Although IBM hardware was installed in Great Lakes, it was never used as a prototype. This hardware was later moved to the design activity in Pensacola for NAVSCIPS system testing.

A \$3 million contract was awarded to IBM in November 1986 for two IBM 4381 computers and peripheral equipment. This hardware was installed in December 1986.

Secondly, in August 1987, the Navy awarded a \$26.7 million contract to Federal Computer Corporation to install up to 11 IBM 4381 computers and peripheral equipment at designated processing sites. Under this contract, a minimum of \$5.6 million in equipment must be procured. As of May 1989, one computer and related equipment costing \$4 million had been delivered from the second contract and installed at a prototype site in Norfolk, Virginia. It is processing 9,000 of the Navy's 310,000 civilian payroll accounts.

Because of technical problems with the SEED data base, the Navy has decided to run NAVSCIPS on a different data base. In addition, to save money, the Navy has reduced the number of processing sites from 10 to 3.

Inadequately Supported Technical Decisions Led to Improperly Restricted Competition

Federal procurement regulations require agencies to acquire information resources in a manner that is cost effective, technically sound, and that will satisfy the minimum needs of the government. Toward that end, agencies must consider alternative approaches for satisfying their requirements, and adopt an acquisition strategy that encourages full and open competition. As will be discussed in the following sections, the Navy made a series of decisions that deviated from federal procurement regulations and accepted systems development practices. Specifically, we found that the

- Navy had inadequate support for its technical decisions to select the SEED data base and IBM 4381 or equal hardware, and
- Navy's decision to select 10 sites was not based on a comparative study of alternative approaches.

Taken together, the decisions effectively mandated that a mainframe computer, equal in size and type to an IBM 4381, be used to process the NAVSCIPS work load.³ However, from what we could determine from available literature and other information, IBM is the only manufacturer that markets a mainframe computer of this size. Thus, the procurements

³The Navy's basic computer requirement was for an IBM 4381-P11 or equal processor, which can process at the rate of 1.3 million instructions per second.

were effectively restricted to IBM computers. Finally, the Navy's disregard of these standard practices resulted in a system design that did not succeed and had to be redesigned.

SEED Data Base and IBM or Equal Requirements Not Adequately Supported

In November 1986, the Assistant Secretary of the Navy (Financial Management) approved the SEED data base and IBM or equal requirements. This approval was based on recommendations by the design activity and the Navy Office of Information Resources Management, and on a July 1986 study by the Planning and Systems Evaluation Division, Office of the Comptroller.⁴ Design activity officials stated that they recommended this approach because they believed that 1) the SEED data base, which was used by the NAVSCIPS programs, would work effectively on IBM or equal hardware; and 2) converting to another data base that would work on non-IBM compatible equipment would be too costly and time consuming. However, the decision to run NAVSCIPS with the SEED data base on IBM or equal hardware was based on inadequate supporting analyses. Further, the SEED data base was later discarded because of significant technical problems and has been replaced by another data base as part of the Navy's revised NAVSCIPS system design.

The Federal Information Resources Management Regulation (FIRMR) requires agency ADP managers to technically verify that proposed ADP software and hardware can support mandatory system requirements.⁵ In recommending the SEED/IBM or equal design the design activity relied on the findings of an internal October 1986 software conversion cost study. The study used a resource cost model to show that a SEED/IBM or equal conversion would be the least costly alternative and would require the least amount of time to accomplish.⁶ However, according to a design activity official, benchmark testing was not performed to verify that the SEED data base and IBM 4381 or equal design would work effectively with the NAVSCIPS system programs.

Three studies confirmed the need for a benchmark. A June 1986 study of NAVSCIPS performance problems on the Perkin-Elmer minicomputers recommended that any new hardware design be benchmarked before a

⁴Navy Standard Civilian Payroll System Assessment, (Office of the Comptroller, Planning and System Evaluation Division, July 18, 1986).

⁵Federal Information Resources Management Regulation, Part 201-30.013-3 (a).

⁶NAVSCIPS Application Software Conversion Cost Study, (Navy Comptroller Standard Systems Activity, Pensacola, Fla., Oct. 29, 1986).

final alternative was selected.⁷ In addition, the Navy Comptroller's July 1986 study recommended that production requirements (which include the data base) be benchmarked to determine appropriate NAVSCIPS performance requirements.⁸ Finally, in February 1987, the Federal Computer Performance Evaluation and Simulation Center reported on the SEED data base. While concluding that no intrinsic design flaws could be detected, it stated that a benchmark test was preferable to modeling to ensure that the data base could meet the system's needs.⁹

Design activity officials were not certain as to why no benchmark test was conducted. According to one design activity official, there was enough time to conduct a benchmark of the SEED data base, IBM 4381 hardware, and NAVSCIPS applications, but no benchmark was done. Another official said that the design activity did not benchmark the entire system because officials believed that NAVSCIPS processing problems were related to the Perkin-Elmer hardware and the system programs, not the SEED data base.

Navy officials said that, in addition to the design activity's recommendation, the Assistant Secretary relied in part on the Comptroller's July 1986 study in approving the SEED data base and IBM or equal computers. However, the report did not recommend the SEED data base and IBM or equal computers. Instead, the study presented this solution as only one of several alternatives. The study stated that the SEED data base was not a valid technical requirement for NAVSCIPS in that any similar data base could also operate effectively on the system. It also stated that requiring IBM or equal hardware for NAVSCIPS "implies a sole source procurement, which does not appear to be justified." The study recommended instead that alternatives in addition to IBM or equal hardware be considered. It specifically endorsed Sperry (now UNISYS) equipment as a viable alternative for several reasons, including

- the Navy had personnel skilled with Sperry equipment,
- available Sperry hardware was already in place at nine sites, and
- the time needed to convert the data base and system programs to Sperry hardware did not appear to be prohibitive.

⁷NAVSCIPS Performance Evaluation, (Navy Comptroller Standard Systems Activity, Pensacola, Fla., June 6, 1986).

⁸Navy Standard Civilian Payroll System Assessment, (Office of the Comptroller, Planning and Systems Evaluation Division, July 18, 1986).

⁹NAVSCIPS Performance Evaluation, (Federal Computer Performance Evaluation and Simulation Center, Alexandria, Va., Feb. 1987).

In June 1988, nearly a year after the second NAVSCIPS hardware contract had been awarded based on the SEED/IBM or equal requirements, the design activity determined that the SEED data base could not support system implementation, and decided it had to be replaced. According to the Federal Computer Corporation (the prime contractor for NAVSCIPS), because of SEED's design, each time a user logs on the computer, the IBM operating system makes a copy of the data management language, consuming system memory. Eventually, as more users log on, system access is limited because all available memory is being used. Design activity officials conceded that they would have discovered this problem with the SEED data base if they had adequately tested the SEED/IBM design. They are planning to complete a benchmark of the new data base in July 1989 to ensure it will handle the NAVSCIPS work load under the revised system design.

Ten Processing Sites Not Justified

Until May 1986, the Navy planned to run its standard pay system on Perkin-Elmer minicomputers located at 34 payroll offices. In July 1986 (after determining that the Perkin-Elmer hardware was inadequate) the Navy decided to process its standard payroll system at 10 regional processing centers located at the Navy Regional Data Automation Centers and the Navy Data Automation Facilities. However, this decision was not justified by a comparative cost analysis of alternative approaches, and coupled with the decision to use the SEED data base and IBM or equal computers, resulted in restricted competition for NAVSCIPS.

The determination that NAVSCIPS would be processed at 10 sites was a critical decision because it had a direct impact on the size and amount of required hardware. The work load at 10 sites required a low-end mainframe, which effectively restricted competition to the IBM 4381. From what we could determine from available literature and other information, no other manufacturer markets a computer of this size.¹⁰ If, on the other hand, the Navy set up NAVSCIPS at only one, two, or three sites, it would have opened up competition. The increased work load at a fewer number of sites would have required larger computers that are marketed by several vendors.

The Navy could not provide documentation justifying its decision to run NAVSCIPS at 10 sites. Specifically, no alternatives analysis, as required by the FIRMR, was conducted to determine whether running the system at 10

¹⁰The Navy's basic computer requirement was for an IBM 4381-P11 or equal processor, which can process at the rate of 1.3 million instructions per second.

sites was cost effective.¹¹ According to a design activity official, the decision to process NAVSCIPS at 10 sites was based in part on an analysis of the processing capabilities of the IBM 4381. Design activity staff estimated that one IBM 4381 could process about 30,000 payroll accounts. Since NAVSCIPS was required to handle 310,000 accounts, according to a design activity official, it was estimated that 10 IBM 4381 computers would be needed to meet payroll data processing requirements.

Navy officials diverge, however, on the issue of how the 10 site decision was finalized. According to a senior contracting office official, the decision was made jointly by the design activity and the Naval Data Automation Command, and presented to the Assistant Secretary as the only way to meet the December 1988 deadline. The former project manager stated that it was a joint decision between the Navy Accounting and Finance Center (which was managing the NAVSCIPS project) and the Naval Data Automation Command. However, the former commander of the Naval Data Automation Command explained that although the command agreed to run the system when it was implemented, the commander did not make the decision to use 10 processing sites.

In March 1989, after conducting an analysis using 3 sites, the Navy decided that it would be more cost effective to run NAVSCIPS at 3 sites rather than 10. This study, however, did not consider the full range of alternatives concerning the number of sites. Thus, the Navy does not know which number of NAVSCIPS processing sites would be the most cost effective. Industry officials stated that large payroll systems, such as NAVSCIPS, are normally located at one processing site, because it is usually more efficient and less costly. The Department of Agriculture, for example, currently processes 215,000 payroll accounts at its National Finance Center in New Orleans, Louisiana.

IBM or Equal Specifications Did Not Promote Full and Open Competition

The Competition in Contracting Act and the Federal Acquisition Regulation, which implements the Act, require that procurement specifications be developed to state only the government's actual minimum needs and to promote full and open competition. To implement the Act's requirement for full and open competition, the regulation states that, whenever practicable, an agency's requirements should be stated in terms of functions to be performed or performance required. According to the regulation, the use of a purchase description, such as a brand name or equal specification, should be used only when an adequate specification or

¹¹Federal Information Resources Management Regulation, Part 201-30.009.

more detailed functional description cannot feasibly be made available in time. The Navy's hardware solicitations for the two contracts were improperly restricted to IBM or equal specifications and did not promote full and open competition.

For both solicitations, the Navy used IBM brand name or equal specifications rather than functional ones. The solicitations listed the requirements in terms of specific IBM model numbers and stated that vendors had to match or exceed the equipment's salient characteristics. For example, the solicitations for these procurements had requirements for equipment that were at least equal to an IBM:

- 16 megabyte processor, model 4381 (P11);
- direct access storage device, model 3380; and
- communications controller, model 3725.

Specifying requirements in this manner means that IBM, or vendors bidding IBM equipment, do not have to take any action to qualify.

One design activity official said that functional specifications could have been written for the two solicitations in time to meet the December 1988 deadline. According to this official, the design activity was concerned that if a non-IBM or equal vendor had won either contract, the software conversion could not have taken place in time to meet the deadline. However, according to the contracting officer, this concern was not valid because the solicitations could have been written to reflect software conversion requirements, including any required completion dates.

Also, design activity staff said that they relied on their own experience (two assigned staff had extensive experience with IBM hardware), available NAVSCIPS work load data, information from an issue of *Datapro*,¹² and an IBM representative to develop the IBM or equal specifications. The IBM representative confirmed being involved and said he made himself available to personnel working on the NAVSCIPS requirements. According to the IBM representative, design activity staff often asked questions concerning which IBM models could fulfill certain tasks and he provided the requested information. In addition, the IBM representative supported

¹²*Datapro* is a monthly trade publication that provides detailed information on computers and peripheral equipment available on the market.

the staff's efforts to develop equipment specifications by using a computer program to convert Navy requirements to specific IBM model numbers.

Navy's Continued Use of Its Hardware Contract May Not Be Cost Effective

In August 1987, the Navy awarded a \$26.7 million contract to the Federal Computer Corporation for IBM 4381 computers and peripherals. Competition for this contract was restricted based on two requirements—the SEED data base and 10 processing sites. Now, nearly 2 years after the contract was awarded, the Navy has eliminated these two requirements, and plans to use a different data base and three sites instead of 10. These changes to the original requirements are so substantial that, in our opinion, it is not prudent for the Navy to use its current contract to procure additional hardware for NAVSCIPS without clear evidence that it represents the most cost effective solution.

In June 1988, the design activity determined that the SEED data base caused degraded system performance on the IBM 4381 computers and had to be replaced. The Navy is currently converting its system programs from the SEED data base to a new data base management system that is already being successfully used in two other large payroll systems at Agriculture and the Air Force. Further, according to design activity staff, this new system will be fully benchmarked in July 1989 to ensure that it can meet the Navy's needs.

As part of the change to three sites, the Navy has modified its existing contract to procure two upgraded IBM 4381 computers for each of the three planned NAVSCIPS processing sites. According to the Navy, this revised approach will cost less than the previous plan because fewer total IBM 4381 computers will need to be delivered from the Federal Computer Corporation contract and having fewer sites will reduce operations and maintenance costs. The Navy estimates it will save \$800,000 a year in reduced operating expenses by changing to three sites. In addition, the modifications to the existing contract reflect a \$4.6 million reduction in hardware and software procurements, maintenance costs, and other expenses.

By removing the SEED data base and cutting the number of processing sites, the Navy eliminated the requirements that restricted the \$26.7 million contract awarded to the Federal Computer Corporation. Competition based on the Navy's changes to its NAVSCIPS system design would be materially different from the competition originally conducted, which was based on questionable requirements.

Specifically, there are substantial and material differences between the computers needed to process 310,000 total accounts at 10 sites and those needed to process the same 310,000 accounts at only three sites. The latter computer would require significantly greater processing power and storage, and would effectively be a different machine. In addition, the Navy's system changes have a clear effect on competition. The Navy's original 10-site requirement was for a low end IBM 4381 or equal computer, a requirement that, as far as we could determine, only IBM could meet. Under the current three-site design, however, the Navy plans to use two upgraded IBM 4381 computers at each site—a requirement that could be satisfied with a single larger computer at each site. Several vendors market large computers capable of fulfilling this requirement and could compete for a contract requiring these larger computers. Therefore, in our opinion, the change from 10 to 3 sites provides the opportunity to materially expand the field of competition.

Conclusions

Developing and implementing a new computer system, such as NAVSCIPS, is a risky, time consuming, and expensive undertaking. To mitigate the possible impact of these factors, federal procurement regulations require agencies to ensure that the government's needs are effectively met at the lowest overall cost. In addition, the law and regulations prescribe full and open competition as a means to attain economy and efficiency in satisfying the government's ADP needs. The Navy's efforts to acquire the necessary hardware and software to support NAVSCIPS were not supported by sound technical decisions and did not promote full and open competition.

We believe the Navy's management approach to implementing NAVSCIPS was shortsighted. It is difficult for us to accept the notion that the December 1988 deadline was so critical to the Navy's mission that it precluded following federal regulations and accepted systems development practices. The Navy's hasty approach resulted in a system design that improperly restricted procurement competition, did not meet the Navy's requirements, and did not work. Consequently, the Navy has revised its system design by eliminating key requirements—using the SEED data base and having 10 processing sites—which restricted competition for the contract won by Federal Computer Corporation. Furthermore, the Navy decided it was more cost effective to use 3 rather than 10 processing sites for NAVSCIPS without considering other alternatives. The Navy has no assurance that using three sites is the most cost effective approach, without conducting an analysis of the full range of site alternatives.

Finally, under these circumstances, we believe the Navy's plan to continue using its contract with Federal Computer Corporation is not prudent. Only by recompeting against its actual minimum needs and comparing the results with the existing contract will the Navy be able to assure itself that it has selected the most cost effective approach.

Recommendations

To ensure that the Navy selects an appropriate system configuration and achieves full and open competition in accordance with federal procurement law and regulations, we recommend that the Secretary of the Navy direct the Assistant Secretary for Financial Management to:

- Cease any further orders for hardware and software under the current contract with Federal Computer Corporation;
- Determine the most cost effective number of sites needed to process NAVSCIPS by conducting an analysis of the costs and benefits of the full range of site alternatives;
- Promote full and open competition by recompeting the NAVSCIPS requirements using functional specifications; and
- Determine, given the results of the recompetition, whether to continue the current contract, limit orders to the \$5.6 million minimum, or terminate it for the convenience of the government and award a new contract to fulfill the NAVSCIPS requirements.

We conducted our review from January 1989 through May 1989, in accordance with generally accepted government auditing standards. We discussed the results of our review with Navy officials during the course of our work and have incorporated their views where appropriate. In accordance with your wishes, we did not obtain official agency comments on a draft of this report. Complete details on our objective, scope, and methodology are included in appendix I.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this report. At that time, we will send copies to the Chairmen of the House and Senate Committees on Armed Services; the Chairmen of the Senate Committee on Governmental Affairs and the House Committee on Government Operations; the Secretary of Defense; the Secretary of the Navy; the Chief Executive Officer, IBM; and will make copies available to others upon request. This report was prepared under the

direction of Mr. Jack L. Brock, Jr., Director, Government Information and Financial Management. Other major contributors are listed in appendix II.

Sincerely yours,

A handwritten signature in cursive script that reads "Ralph V. Carlone".

Ralph V. Carlone
Assistant Comptroller General

Objective, Scope, and Methodology

In a December 14, 1988, letter the Chairman of the Subcommittee on Commerce, Consumer Protection, and Competitiveness of the House Energy and Commerce Committee asked us to investigate allegations that the Navy unnecessarily restricted competition in certain ADP procurements. Following subsequent discussions with the chairman's office we agreed to restrict the scope of our review to one acquisition: NAVSCIPS. This system was one of the eight procurements senior executives from six computer companies identified in a letter to then Defense Secretary Carlucci as examples of Navy contracting abuses.

The specific objective of this assignment was to determine whether the Navy unnecessarily restricted competition in acquiring NAVSCIPS hardware. To accomplish our objective, we reviewed the Competition in Contracting Act and federal procurement regulations, such as the Federal Acquisition Regulation, to determine requirements for promoting full and open competition for government contracts. In addition, we reviewed the FIRMR to determine what specific regulations guide agency ADP system development, testing, and acquisition. Our assessment of the Navy's ADP procurement procedures was limited to issues related to NAVSCIPS contracts.

To assess the technical adequacy of the studies Navy performed to determine critical system requirements, we analyzed procurement solicitations, planning documents, requests for procurement authority, assessments of the hardware and software selected for the system, and management approvals of procurement actions. Many of the Navy's key decisions regarding NAVSCIPS were not well documented. In those instances, we relied on testimonial evidence from Navy personnel to assess these decisions. To clarify existing documentation, we met with NAVSCIPS project officials, technical staff, procurement officials, and managers. We interviewed Navy officials at the following activities:

- Navy Accounting and Finance Center, Washington, D.C., the project manager of the NAVSCIPS project;
- Navy Comptroller Standard Systems Activity, Pensacola, Florida, the central design activity responsible for developing the system;
- Naval Data Automation Command, Washington, D.C., the command responsible for processing NAVSCIPS at designated sites;
- Navy Regional Data Automation Centers, Pensacola, Florida and Washington, D.C., two of the centers providing data processing support for NAVSCIPS; and
- Automated Data Processing Selection Office, Washington, D.C., the procurement office for the second NAVSCIPS hardware contract.

To determine whether the requirements for NAVSCIPS hardware procurements were overly restrictive, we

- reviewed the specifications presented in the two solicitations;
- reviewed information from Datapro and other computer research publications;
- discussed with vendors the specifications they had identified as overly restrictive; and
- assessed the design activity's methods for developing specifications by interviewing key personnel who performed such work.

In addition to Navy personnel, we met with IBM and Federal Computer Corporation representatives to obtain their viewpoints on the NAVSCIPS project. We also met with representatives of other computer companies, including Amdahl Corporation; Cincom Systems, Inc.; Storage Technology Corporation; NCR Comten Corporation; and PacifiCorp Capital, Inc. to obtain information concerning Navy procurement practices and concerning NAVSCIPS procurements.

We discussed the contents of this report with Navy officials during the course of our work and have incorporated their views where appropriate. In accordance with the Subcommittee Chairman's wishes, we did not obtain formal agency comments on this report. Our work was performed in accordance with generally accepted government auditing standards.

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