Audit Report

OFFICE OF THE INSPECTOR GENERAL

USE OF CONTRACTOR COST AND SCHEDULE CONTROL SYSTEMS FOR THE SSN-21

Report Number 92-052

February 19, 1992

Department of Defense

The following acronyms are used in this report.

CPR .....Cost Performance Report
C/SC.....Cost and Schedule Control
DCAA.....Defense Contract Audit Agency
DoE.....Department of Energy
JIG.....Joint Implementation Guide
SAR.....Subsequent Application Review
SUPSHIP.....Supervisor of Shipbuilding, Conversion and Repair

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

February 19, 1992

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION
COMPTROLLER OF THE DEPARTMENT OF DEFENSE
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)

SUBJECT: Audit Report on the Use of Contractor Cost and Schedule Control Systems for the SSN-21 (Report No. 92-052)

We are providing this report for your information and use. Comments on a draft of this report were considered in preparing this final report.

A draft of this report was provided to the addressees for comments on November 27, 1991; however, comments were not received from the Navy by February 12, 1992. DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. Therefore, the Under Secretary of Defense for Acquisition; the Assistant Secretary of the Navy (Research, Development and Acquisition); the Commander, Naval Sea Systems Command; and the Seawolf Program Manager must provide comments on the unresolved recommendations by April 20, 1992. See the "Status of Recommendations" section at the end of each finding for the unresolved recommendations and the specific requirements for your comments. If appropriate, you may propose alternative methods for accomplishing desired improvements. We also ask that your comments indicate concurrence or nonconcurrence with the material internal control weaknesses highlighted in Part I.

We appreciate the courtesies extended to the audit staff. If you have any questions on this report, please contact Mr. Russell A. Rau, Program Director, at (703) 693-0186 (DSN 223-0186) or Ms. Patricia A. Brannin, Project Manager, at (703) 693-0392 (DSN 223-0329). The planned distribution of this report is listed in Appendix D.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosure

cc:
Secretary of the Navy

OFFICE OF THE INSPECTOR GENERAL

AUDIT REPORT NO. 92-052 February 19, 1992
(Project No. 1AE-5006.04)

USE OF CONTRACTOR COST AND SCHEDULE CONTROL SYSTEMS FOR THE SSN-21

EXECUTIVE SUMMARY

Introduction. At the time of our audit, the SSN-21 nuclear attack submarine was in the detailed design phase at Newport News Shipbuilding, Tenneco Corporation, and Electric Boat Division, General Dynamics, and had started initial construction at Electric Boat Division. In January 1992, the President announced that only one SSN-21 class submarine should be built. The truncation of the program does not affect the findings and recommendations in this report.

Objective. The SSN-21 was one of nine programs included in the "Audit of the Effectiveness of DoD Use of Contractor Cost and Schedule Control System Data on Major Defense Acquisition Programs." The audit objective was to evaluate the effectiveness of the implementation and DoD oversight of cost and schedule control systems and the use of data reported by contractors complying with cost and schedule control system criteria.

Audit Results. The Navy and shipbuilding contractors have adapted cost and schedule control systems to modular submarine design and construction. The implementation of the system represents a major improvement in cost and schedule control. However, our audit identified conditions that require management attention.

o Newport News Shipbuilding did not have a validated cost and schedule control system for the SSN-21 design contract N00024-87-C-2046, awarded to Newport News in 1987. In addition, the Supervisor of Shipbuilding, Conversion and Repair, Newport News, had not provided surveillance as required by DoD Instruction 5000.2. As a result, the Navy had no assurance that contractor reported data were accurate or complete or that projected costs-at-completion were reasonable (Finding A).

o Naval Nuclear Propulsion Program contracts did not contain requirements to comply with cost and schedule control system criteria because of a 1972 waiver granted by the now disestablished Naval Material Command. Although the Government performed considerable oversight on nuclear propulsion contracts,

an integrated cost and schedule system did not exist. As a result, the contractors' systems did not provide an overall project status for senior DoD officials (Finding B).

Internal Controls. Findings A and B identified material internal control weaknesses in that controls were not effective to ensure that the contractor's cost and schedule control system for the design of the SSN-21, including the nuclear propulsion systems, met the criteria prescribed in DoD Instruction 5000.2 or that the data reported from the system were reasonable. These internal control weaknesses are further described in Part I of the report.

Potential Benefits of Audit. Implementation of Recommendations A.1., A.2., and A.3. will provide assurance that data reported by Newport News are accurate. Recommendation B. will result in an integrated system for assessing Nuclear Propulsion Program cost and schedule status. See Appendix B for a summary of the benefits of the audit.

Summary of Recommendations. We recommended a demonstration and validation review of the cost and schedule control system for the SSN-21 design contract. We also recommended surveillance on the Newport News design contract and the Electric Boat subcontract with Newport News. In addition, we recommended that the Nuclear Propulsion Program's cost and schedule control system waiver be voided and the Cost and Schedule Control System Criteria be applied to nuclear propulsion contracts when appropriate.

Management Comments. We did not receive comments on a draft of this report from the Assistant Secretary of the Navy (Research, Development and Acquisition); the Commander, Naval Sea Systems Command; and the Seawolf Program Manager by February 6, 1992, as required. The Under Secretary of Defense for Acquisition did not believe the recommendation to void the Nuclear Propulsion Program waiver was necessary because the waiver was moot. A full discussion of the management comments is in Part II, and the complete text of the comments is in Part IV. Comments to this final report are requested by April 20, 1992.

Audit Response. We believe that the recommendation to void the waiver is necessary because the waiver is still being used.

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This report was prepared by the Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD. Copies of the report can be obtained from the Information Officer, Audit Planning and Technical Support Directorate, (703) 693-0340.

PART I - INTRODUCTION

Background

The SSN-21 Seawolf nuclear attack submarine represents an upgrade of the SSN-688 class submarine and is designed to meet foreign threats into the 21st century. The SSN-21 will replace aging SSN-585 Skipjack and SSN-594 Permit class ships, which will reach their 30-year useful lives during the 1990's. As of September 1991, the SSN-21 submarine was in the detailed design phase at Newport News Shipbuilding and Drydock Company, Tenneco Corporation (Newport News), and Electric Boat Division, General Dynamics Corporation (Electric Boat), and had started initial construction at Electric Boat.

On April 30, 1987, the Navy awarded cost-plus-fixed-fee contract N00024-87-C-2046 to Newport News for the design of the SSN-21 Seawolf class submarine. The estimated contract cost was $325 million. As of June 30, 1991, the value of the Newport News prime contract was $532.8 million. The contract included a $51.4 million subcontract with Electric Boat, Newport News' only competitor for submarine construction. As of June 30, 1991, the estimate-at-completion for the prime contract was $644.4 million, and the estimate-at-completion for the subcontract was $156.8 million.

Objective

Our overall audit objective was to evaluate the effectiveness of the implementation and oversight of contractor cost and schedule control (C/SC) systems and the use of data reported by contractors complying with C/SC system criteria. The SSN-21 was one of nine major weapon systems included in the overall audit. While conducting the audit, we found that certain requirements had not been met on SSN-21 C/SC systems. We are reporting these issues separately because they are SSN-21 specific, and because action should be taken on the identified issues before the overall report is issued.

Scope

We conducted this program audit of the SSN-21 from March through September 1991 and reviewed records dated from 1962 to 1991 related to the SSN-21 Program and to Nuclear Propulsion Programs. We also discussed the issues related to the C/SC system with Government and contractor personnel involved in the acquisition and oversight of the SSN-21. The audit was made in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were deemed necessary. A list of the activities visited or contacted is in Appendix C.

Internal Controls

We evaluated the implementation of DoD policies and procedures related to C/SC systems, specifically, DoD Instruction 5000.2. The audit identified material internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. Controls were not effective to ensure that the contractor's C/SC system for the design of the SSN-21 met the criteria prescribed in DoD Instruction 5000.2 or that the data reported from the system were reasonable. The recommendations in this report, if implemented, will correct this deficiency. Copies of this report are being provided to the senior officials responsible for internal controls within the offices of the Secretary of Defense and the Secretary of the Navy.

Prior Audits and Other Reviews

Since 1986, the General Accounting Office has issued three reports on the SSN-21 Program. The DoD Inspector General has issued two reports on the SSN-21 Program. We did not follow up on the prior audit reports because they contained no findings or recommendations related to our objectives.

PART II - FINDINGS AND RECOMMENDATIONS

A. VALIDATING AND REVIEWING COST AND SCHEDULE CONTROL SYSTEM

Newport News did not have a validated C/SC System for SSN-21 design contract N00024-87-C-2046, which was awarded to Newport News in 1987. In addition, the Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP) at Newport News had not provided surveillance as required by DoD Instruction 5000.2, and Newport News had not conducted surveillance of its subcontract with Electric Boat. The Navy failed to validate the C/SC system and inappropriately used the lack of a validation as a basis for not conducting adequate surveillance activities. As a result, the Navy had no assurance that contractor reported data were accurate or complete and that projected estimates-at-completion were reasonable.

DISCUSSION OF DETAILS

Background

A C/SC system should properly relate cost, schedule, and technical performance and provide DoD with a valid and reliable status of the contractor's performance on the contract, as well as a means of projecting future performance. DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," February 23, 1991,* includes the criteria that a contractor's C/SC system should meet. DoD Instruction 5000.2 requires that contracts estimated to exceed $60 million for research and development or $250 million for procurement have a C/SC system that meets the C/SC system criteria. After the award of a contract that meets the threshold, the Government determines whether the contractor's system meets the criteria and is properly implemented on the contract, that is, validates the system. If a contractor's C/SC system was validated on a previous contract and no significant changes to the contractor's system were made, the Government can conduct a Subsequent Application Review (SAR) to determine whether the validated system has been properly applied to provide performance measurement for the current contract.

After the Government validates the contractor's system, the Government is responsible for ensuring that the contractor's system remains compliant with the criteria and that data reported on individual contracts are produced in accordance with the

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* On February 23, 1991, DoD revised DoD Instruction 5000.2. The revision canceled DoD Instruction 7000.2, "Performance Measurement for Selected Acquisitions," and incorporated the requirements of 7000.2 into the revised DoD Instruction 5000.2.

validated system. This C/SC system surveillance function consists of selective tests of reported data and periodic evaluations of internal practices during the contract's life. Contract administrative offices, such as Defense Plant Representative Offices of the Defense Contract Management Command and SUPSHIPs in the Naval Sea Systems Command, generally perform surveillance on the prime contracts. Subcontractor surveillance is the responsibility of the prime contractor.

Cost/Schedule Control System Review

The Seawolf's (SSN-21's) design contract, which was awarded in April 1987, stated that the Navy would validate the contractor's C/SC management system within 6 months after contract award. The Navy originally validated a C/SC system at Newport News on November 1, 1983. As of September 1991, a tri-Service validation was in-process based on the extended SAR conducted in February 1991 on the SSN-688 class submarine construction contracts. However, as of September 30, 1991, over 4 years after contract award, the Navy had not validated the contractor's C/SC systems for the SSN-21's detailed design contract.

Newport News supplemented its C/SC system to reflect the design effort for the SSN-21 class submarine. We believe that a C/SC system for a design effort is different from a construction C/SC system. For example, the Newport News supplemental guidance for the SSN-21 C/SC system states that planning the engineering work package may be more difficult than production planning since the work is more dynamic throughout the development phase; therefore, it is more difficult to define the work in discrete terms. Also, the Newport News supplement states that planning and scheduling this development project is difficult to express in discrete terms because of inherent design characteristics that will necessitate changes in order to meet all Naval milestone specifications. Differences in the construction and design efforts are also referred to in the Joint Implementation Guide (JIG), chapter 5, part 5-1(c), "Cost/Schedule Control Systems Criteria Implementation Procedures, Review Type," October 1, 1987. The Preface to the JIG also states that a comprehensive demonstration review of a contractor's C/SC system is required once for research and development effort and once for production effort.

During our audit, we found indications that the C/SC system implemented on the design contract did not fully comply with the C/SC system criteria. For example, Cost Account Managers had too broad a span of control. Two of the three Cost Account Managers we interviewed had budgets exceeding 1 million staff hours, and 1 stated that he had responsibilities associated with 80 cost accounts. Another had partial responsibility for about 45 cost accounts. (The contract was divided between eight Cost Account Managers by functional area, such as Electrical/Electronics,

Machinery, and Piping. The Managers collectively managed 80 cost accounts.) In our opinion, this excessive span of control conflicts with the criteria shown in the JIG. Specifically, implementing the criteria requires that each cost account be assigned to a single organizational element directly responsible for the work and identifiable to a single element of the Contract Work Breakdown Structure.

The C/SC system for the SSN-21 design contract needed to be validated even though the contract had been ongoing since 1987. As of June 1991, the contract was about 60-percent complete, based on the quarterly Cost Performance Report (CPR), with about $252 million to complete the contract. The amount to complete the contract could increase as additional cost and schedule delays occur. Appendix A shows the trend of cost increases that have occurred on the contract as of June 30, 1991. Completion of the contract is not expected until 1995. In addition, any future contract that might be awarded for design efforts will require a validated C/SC system if the contract meets the established criteria.

Prime Contract Surveillance

The Newport News SUPSHIP was not conducting the surveillance required by DoD Instruction 5000.2, part 11, section B(3)(f), "Surveillance." The SUPSHIP Operating Procedures and a Memorandum of Agreement between the SUPSHIP and the SSN-21 Program Office outline the specific requirements for surveillance on the SSN-21 design contract. The SUPSHIP's surveillance consisted only of analyzing the CPRs, which included generating estimates-at-completion, performing trend analyses, and analyzing reported variances. Surveillance activities, such as transaction testing, reviewing changes to the system description, and verifying reconciliations, were some of the required reviews that Newport News SUPSHIP was not performing.

Newport News SUPSHIP officials responsible for cost and schedule surveillance stated that surveillance was minimal because a SAR had not been performed and that unless a system was approved, there was no reason to surveil it. We agree that a SAR had not been done. We also agree that the contractor's C/SC system for the design contract's compliance with applicable C/SC system criteria was not validated. However, we disagree that the absence of a validated C/SC system is a reasonable justification for not performing required surveillance activities. The Navy was making management decisions based on data as if an accepted system had been validated and proper surveillance performed when neither was the case.

Subcontract Surveillance

Newport News was not conducting surveillance of its major design subcontract with Electric Boat. Surveillance of a subcontractor is the prime contractor's responsibility. The Navy directed Newport News to subcontract the SSN-21 propulsion and nuclear reactor designs to Electric Boat according to the 1987 design contract. As of the June 30, 1991, CPR, the subcontract represented approximately 24 percent ($157 million of the $644 million estimate-at-completion) of the total design contract. The December 1990 CPR that Electric Boat provided to Newport News contained a disclaimer that stated that the report "contains invalid budgets and potentially misleading performance data and, therefore, no longer serves as a representative measurement devise." Statements such as this indicate problems with cost and schedule reporting. Surveillance is necessary to ensure that reported data are accurate and that the C/SC system, as implemented by Electric Boat, is properly functioning.

Although difficult, surveillance is even more critical for an unvalidated system because the risk of having unreliable data is greater. We believe surveillance of the contractor's C/SC system is an internal control function that ensures that the system works properly and that reliable data are obtained, maintained, and fairly disclosed in reports. The greater the risk of the C/SC system not being maintained or getting reliable data from the system the more extensive the surveillance should be.

Given the difficulties that could arise because of the competitive relationship between Newport News and Electric Boat, Government surveillance of the Electric Boat subcontract with Newport News is warranted. For example, competitors have no incentive to cooperate or work closely with each other. Sharing information poses the problem of divulging sensitive information, which true competitors protect vigorously. Newport News and Electric Boat are reluctant to share cost information because any benefit a competitor receives may affect future contract awards. As of September 1991, Newport News and Electric Boat were the only submarine builders in the United States. Therefore, the contractors were not only competing for the SSN-21 design and construction contracts, they will also compete for future submarine contracts.

Conclusion

As of June 1991, the estimate-at-completion of the design contract for the SSN-21 was $644.4 million, which was almost double the original contract target cost of $325 million. Without a validated system and a review of the validity of the data, the Navy had no assurance that contractor reported data were accurate or complete or the estimate-at-completion for the design contract was reasonable.

Although increases in the contract design cost do not necessarily indicate poor performance or management, closer attention must be focused on the C/SC system to ensure that further work is done efficiently and problems are identified promptly. A validated system would benefit the Government and contractor for the 4 years remaining on the contract by providing assurance that a system is in place to track both cost and schedule status and by providing reliable input to management decisions. The validation of the C/SC system as applied to the SSN-21 design contract should be conducted promptly given that the 1987 contract required validation within 6 months of contract award, and further delinquency can jeopardize the Government's interest.

RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Assistant Secretary of the Navy (Research, Development and Acquisition) direct a demonstration and validation review of the Seawolf's design cost and schedule control system at Newport News.

2. We recommend that the Commander, Naval Sea Systems Command, direct the Supervisor of Shipbuilding, Conversion and Repair at Newport News to provide surveillance as required in DoD Instruction 5000.2, and as agreed to in the Memorandum of Agreement with the Seawolf's Program Office.

3. We recommend that the Seawolf Program Manager enter into a Memorandum of Agreement with the Supervisor of Shipbuilding, Conversion and Repair at Electric Boat to provide surveillance on the Newport News Shipbuilding design subcontract with Electric Boat in accordance with DoD Instruction 5000.2.

MANAGEMENT COMMENTS AND AUDIT RESPONSE

Comments to the November 27, 1991, draft of this report were not received by February 6, 1992, from the Assistant Secretary of the Navy (Research, Development and Acquisition); Commander, Naval Sea Systems Command; and Seawolf Program Manager.

On January 29, 1992, the Secretary of Defense proposed concluding the SSN-21 program after construction of the first submarine. This proposal does not eliminate the need for the recommendations because of significant remaining expenditures on the design contract, the possibility of Congressional action to continue the program, and the applicability of a validated C/SC system to future programs, such as the new Centurion submarine. Comments on this final report are required by April 20, 1992.

STATUS OF RECOMMENDATIONS

		Response Should Cover:		
Number	Addressee	Concur/ Nonconcur	Proposed Action	Completion Date
1.	Assistant Secretary of the Navy (Research, Development and Acquisition)	X	X	X
2.	Commander, Naval Sea Systems Command	X	X	X
3.	Seawolf Program Manager	X	X	X

B. COST AND SCHEDULE CONTROL SYSTEM REQUIREMENTS FOR THE NUCLEAR PROPULSION PROGRAM

The Navy's Nuclear Propulsion Program contractors did not maintain systems to plan and track contract cost and schedule data that complied with C/SC system criteria. The Navy had exempted the Nuclear Propulsion Program from the C/SC system criteria in 1972, and the Under Secretary of Defense for Acquisition had not reviewed the exemption for its continued applicability. Although nuclear propulsion contractors' methods used to track cost and schedule data were extensive, the methods were not based on earned value or otherwise integrated cost and schedule performance. As a result, the contractors' systems did not provide an overall project status for use by senior DoD officials.

DISCUSSION OF DETAILS

Background

The Navy has sole source, cost-plus-fixed-fee contracts to procure nuclear reactors from General Electric Company (GE) and Westinghouse Electric Corporation (Westinghouse). GE and Westinghouse provide engineering services for the design and procurement of nuclear reactor components and subcontract for the fabrication of the components. Approximately 90 percent of each nuclear reactor contract with GE and Westinghouse is subcontracted to approximately 150 component manufacturers. The combined components procured by both contractors make up a ship set, all necessary components for a functioning reactor plant installed on a ship or submarine. The remaining 10 percent of the contracts is paid to GE and Westinghouse for engineering design services, procurement activities, and oversight of the production and quality of the component manufacturers. Contracts issued by GE and Westinghouse to component manufacturers are generally fixed-price incentive or firm-fixed-price. The type of subcontract is shifting from firm-fixed-price to fixed-price incentive, which ultimately places more risk on the Government. DoD Instruction 5000.2 exempts firm-fixed-price contracts and subcontracts from having a C/SC system that meets the criteria. However, fixed-price incentive contracts that meet the threshold or other requirements are required to implement a C/SC system that meets the criteria specified in DoD Instruction 5000.2.

In 1987, the Navy awarded contracts for the acquisition of the lead SSN-21 reactor ship set to GE and Westinghouse for $87.9 million and $70.2 million, respectively. In 1990, the Navy modified the contracts to acquire an additional two and one-half follow-on ship sets. The modification resulted in increases to the GE and Westinghouse contracts of $211.3 and $164 million, respectively.

Cost and Schedule Requirements Waived

On December 18, 1972, the now disestablished Naval Material Command issued a directive that exempted the Nuclear Propulsion Program from C/SC system requirements. In 1982, Executive Order 12344 officially combined the Naval Nuclear Propulsion Program, Division of Naval Reactors, with the Department of Energy (DoE). The Nuclear Propulsion Program formally became a joint operation of both the Navy and DoE, with an admiral or equivalent civilian heading both organizations.

DoD Instruction 5000.2, part 11-B2(b)(2), states that procurement contracts of $250 million or more (in FY 1990 constant dollars) shall comply with the C/SC system criteria. In addition, DoE Order 2250.1C-5(f) specifies that cost or fixed-price incentive contracts that exceed $50 million, are of high DoE or national interest, or have high risk known or expected during execution would be subject to C/SC system criteria coverage. The procurement of the lead ship reactor and follow-on reactors exceeds the dollar threshold of either DoD or DoE regulations and therefore C/SC system coverage should be required.

Nuclear Propulsion Cost and Schedule Control System

GE and Westinghouse use essentially the same methodology to track cost and schedule performance. Costs are accumulated and segregated by contract and system component. Both contractors have a system that identifies the prime contract and all items that are procured under that contract. Any cost variances can be traced to a particular component. The contractors compiled schedule information by subcontractor and by reactor project. Detailed information is maintained for all components from each of the approximately 150 subcontractors. Schedule variances can be traced to any particular component.

The systems that the prime contractors used did not comply with C/SC system criteria for several reasons, the most important being the lack of a measure of earned value. Earned value is the budgeted cost of work performed, that is, the planned value of work accomplished. Actual variances from the budgeted amounts provide a measure of performance for specific work tasks or groups of tasks. The importance of earned value is shown in the C/SC system's ability to measure the program's status and identify problem areas. The Nuclear Propulsion Program is unique in that the two prime contractors do not fabricate or assemble the components but subcontract the efforts out. A C/SC system, which measures the efforts of the prime contractor and subcontractors in overall terms, would benefit senior Navy officials and prime contractor management by allowing them to better assess Program status and identify cost and schedule impacts on the Program.

The industrial base for nuclear component fabrication is declining. Vendors are less willing to invest capital for declining military programs. Competition, which can act as a means of controlling costs, can no longer be relied upon. Without "market pressures," such as competition, C/SC systems become more important for managing contractor performance.

Conclusion

The revised DoD Instruction 5000.2, part 11-B(2)b, states that:

> Unless waived by the milestone decision authority or a designated representative, compliance with the cost/schedule control system criteria shall be required on significant contracts and subcontracts within all acquisition programs, including highly sensitive classified programs and major construction programs.

Since the waiver was granted nearly 20 years ago by a Command that no longer exists and the procurement environment has changed, the Under Secretary of Defense for Acquisition, as the milestone decision authority for the SSN-21 Program and other major Defense acquisition programs that rely upon the nuclear program, should review the need for a waiver for the Nuclear Propulsion Program.

The basic premise of a C/SC system is to provide contractor and Government program managers accurate data to monitor execution of their programs. Although we found that GE and Westinghouse closely tracked costs and schedule, we did not find an integrated C/SC system. The systems in place at both contractors provided considerable data to support individual cost or schedule information; however, we could not easily determine overall program status. The contractors' systems also lacked a means of determining earned value, a cornerstone for determining the status of the program.

RECOMMENDATION FOR CORRECTIVE ACTION

We recommend that the Under Secretary of Defense for Acquisition void the 1972 Naval Nuclear Propulsion Program waiver from Cost and Schedule Control System Criteria and assess, on a case by case basis, the need to apply or waive cost and schedule control system requirements.

MANAGEMENT COMMENTS

The Director, Acquisition Policy and Program Integration, Office of the Under Secretary of Defense for Acquisition, stated that he believed the need to void the waiver was moot because "it died a natural death" when DoD Directive 5000.1 and DoD Instruction 5000.2 were issued in February 1991. However, he stated that the Navy contracts are subject to DoD Instruction 5000.2 and should be assessed on a case by case basis for application of appropriate cost and schedule management control requirements (Part IV).

AUDIT RESPONSE TO MANAGEMENT COMMENTS

Although we agree that the 1972 waiver is out of date, we do not agree that the recommendation to void it is moot. The Navy has continued to use the waiver as the basis for excluding C/SC requirements from the nuclear propulsion contracts, even after the reissuance of DoD Directive 5000.1 and DoD Instruction 5000.2. The December 1991 Defense Acquisition Executive Summary Report for the SSN-21 still reports that the Navy has waived implementation of C/SC requirements for Naval Nuclear Propulsion Program procurements. We also agree with the Director's comments that C/SC application to the current contracts is probably inappropriate because of the preponderance of small subcontracts. However, as stated by the Director, application of C/SC requirements to the Navy's nuclear propulsion contracts should be made on a case by case basis. Changes in the contracting environment for nuclear propulsion items may make the application of C/SC systems to future nuclear propulsion contracts appropriate. We also agree that the acquisition policy documents have changed significantly. However, the requirements for C/SC systems remained essentially the same. For all these reasons, we continue to recommend an explicit pronouncement from the Under Secretary of Defense for Acquisition to the Navy stating that the 1972 waiver is no longer recognized. Formal action of that type would preclude any continued Navy misunderstanding concerning the matter.

STATUS OF RECOMMENDATIONS

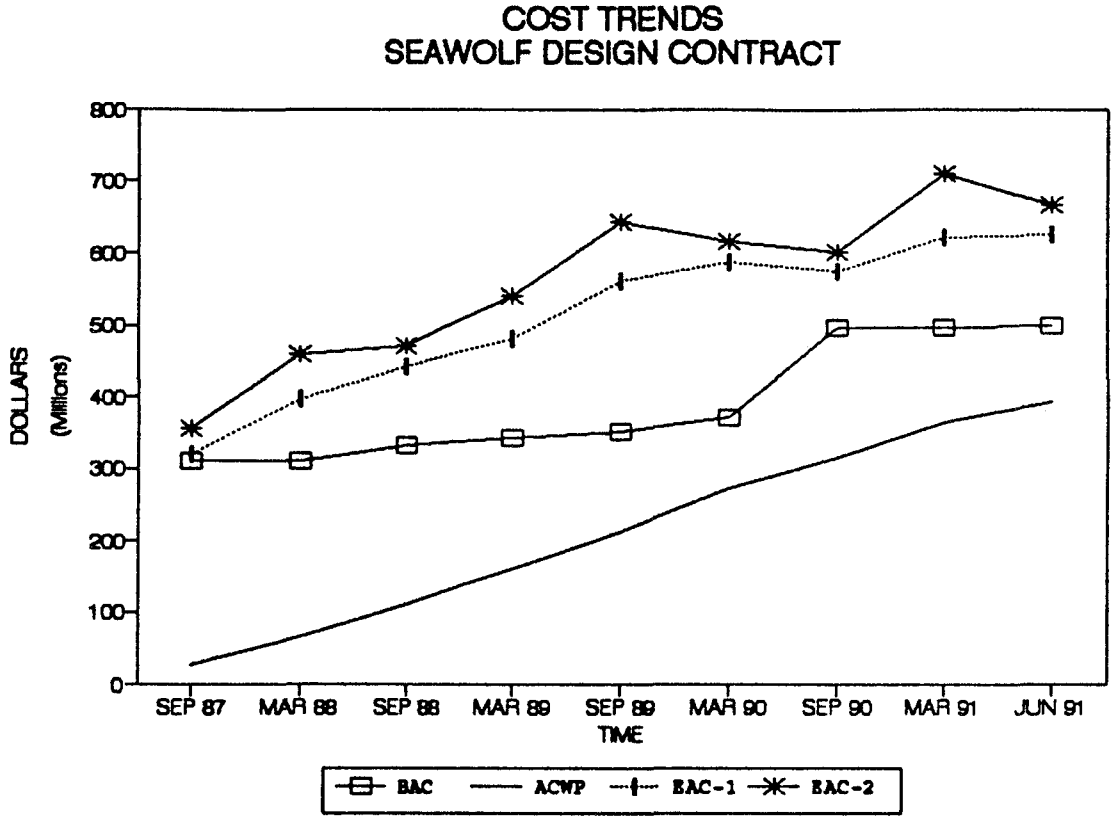
		Response Should Cover:		
Number	Addressee	Concur/ Nonconcur	Proposed Action	Completion Date
B.	Under Secretary of Defense for Acquisition	X	X	X

PART III - ADDITIONAL INFORMATION

Appendix A - Cost Trends on the Seawolf Design Contract
Appendix B - Summary of Potential Benefits Resulting from Audit
Appendix C - Activities Visited or Contacted
Appendix D - Report Distribution

APPENDIX A: COST TRENDS ON THE SEAWOLF DESIGN CONTRACT

The chart below shows the increasing trends in the Estimate-at-Completion for the Seawolf Detail Design Contract N00024-87-C-2046. Also, it shows the relationship between the Actual Cost and the Estimate-at-Completion.



EAC - Estimate-at-Completion
EAC-1= BAC/CPI
EAC-2= (BAC-BCWP/CPI * SPI) + ACWP
Where CPI = BCWP/ACWP
SPI = BCWP/BCWS
ACWP - Actual Cost of Work Performed (Cumulative)
BAC - Budget at Completion
BCWP - Budgeted Cost of Work Performed (Cumulative)
BCWS - Budgeted Cost of Work Scheduled (Cumulative)
CPI - Cost Performance Index
SPI - Schedule Performance Index

APPENDIX B: SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT

Recommendation Reference	Description of Benefit	Type of Benefit
A.1.	Program Results. Determine the status of the contractor's C/SC system. Also, obtain assurance that the system complies with the C/SC system criteria and that the system is properly implemented.	Nonmonetary.
A.2., A.3.	Program Results. Obtain assurance that the contractor's C/SC system continues to be consistently and effectively maintained.	Nonmonetary.
B.	Program Results. Determine if a C/SC system would provide a better means of measuring overall program status.	Nonmonetary.

APPENDIX C: ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition,
  Director, Acquisition Policy and Program Integration

Department of the Navy

Assistant Secretary of the Navy (Research, Development and
  Acquisition), Arlington, VA
SSN-21 Program Office, Naval Sea Systems Command, Arlington, VA
Nuclear Propulsion Directorate, Naval Sea Systems Command,
  Arlington, VA
Supervisor of Shipbuilding, Conversion and Repair, Groton, CT
Supervisor of Shipbuilding, Conversion and Repair,
  Newport News, VA

Defense Agency

Defense Contract Audit Agency:
  General Electric Company, Schnectady, NY
  Electric Boat, Groton, CT
  Newport News Shipbuilding and Drydock Co., Newport News, VA
  Westinghouse, Monroeville, PA

Non-DoD Federal Organization

Department of Energy:
  Office of Deputy Assistant Secretary for Naval Reactors,
    Arlington, VA
  Office of the Inspector General, Washington, DC

Non-Government Activities

General Dynamics, Electric Boat Division, Groton, CT
General Electric, Machine Apparatus Operation, Schnectady, NY
Newport News Shipbuilding and Drydock Company, Newport News, VA
Westinghouse, Plant Apparatus Division, Monroeville, PA

APPENDIX D: REPORT DISTRIBUTION

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition
Assistant Secretary of Defense (Production and Logistics)
Comptroller of the Department of Defense

Department of the Navy

Secretary of the Navy
Assistant Secretary of the Navy (Financial Management)
Assistant Secretary of the Navy (Research, Development and Acquisition)
Comptroller of the Navy
Commander, Naval Sea Systems Command
Program Manager, SSN-21 Program Office, Naval Sea Systems Command
Supervisor of Shipbuilding, Conversion and Repair
Deputy Commander, Nuclear Propulsion Directorate, Naval Sea Systems Command

Defense Agency

Director, Defense Contract Audit Agency

Non-DoD

Office of Management and Budget
U.S. General Accounting Office, NSIAD Technical Information Center

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PART IV - MANAGEMENT COMMENTS

Under Secretary of Defense for Acquisition

Comments from Under Secretary of Defense for Acquisition

OFFICE OF THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301-3000

ACQUISITION

14 FEB 1992

(AP&PI)

MEMORANDUM FOR DIRECTOR, ACQUISITION MANAGEMENT, OIG, DoD

SUBJECT: Audit Report on the Use of Contractor Cost and Schedule Control Systems for the SSN-21 (Project No. 1AE-5006.04)

My comments on the subject draft audit report are attached. I commented on all the recommendations, not just the one addressed to the Under Secretary of Defense (Acquisition), because my office played a significant role in the events leading to the Cost/Schedule Control Systems Criteria (C/SCSC) reviews for the SSN-21 Seawolf program.

As you know, my office has long been concerned whether the now defunct Naval Material Command acted wisely by granting in 1972 a C/SCSC waiver for Naval Nuclear Propulsion Program contracts. Much of that concern reflected inability to gain access to the program to review the contracts in detail. An attempt by the Department of Energy Inspector General was also unsuccessful. Your draft report finally provides the needed details. Based on your description of the contracts, with their extensive subcontracting and relatively small prime contractor cost, it appears C/SCSC application may not be necessary and that alternative reporting may be preferable. I agree that the 1972 waiver is obsolete because the Naval Material Command no longer exists and because policy has changed, but do not believe that the Under Secretary of Defense (Acquisition) needs to "void" the waiver.

I appreciate the new light you have shed on the Nuclear Propulsion Program contracts, and look forward to receiving the reports on the remaining programs covered by your C/SCSC audit.

JOHN D. CHRISTIE
Director, Acquisition Policy
& Program Integration

Attachment

AUDIT REPORT ON THE USE OF CONTRACTOR COST AND SCHEDULE CONTROL SYSTEMS FOR THE SSN-21 (PROJECT NO. 1AE-5006.04)

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FINDING A: Validating and Reviewing Cost and Schedule Control System.

Recommendation 1

The Assistant Secretary of the Navy (Research, Development and Acquisition) direct a demonstration and validation review of the SSN-21 design cost and schedule control system at Newport News.

Comments

Although a formal C/SCSC review was not conducted under the aegis of OASN(RD&A), the program office reviewed C/SCSC implementation on the design contract. At that time, the adequacy of shipyard C/SCSC reviews had been called into question by OSD because cost performance reports were poor on several shipbuilding programs. The SSN-21, as a new start program requiring OSD approval, provided a means to begin to resolve this issue. My Cost Management office (then assigned to the DoD Comptroller's office) discussed review plans with the program office, and agreed a limited review was appropriate for the design contract. There was a single product--design drawings--and the program office was satisfied that Newport News would provide reliable earned value information.

With more than half of the contract completed, a C/SCSC review now would be severely limited. It would exclude, for example, organization, scheduling, and budget development procedures. Because the program office has performed a review (although not a "C/SCSC tri-service review"), the contractor could make a strong case for remuneration if another review were conducted. Perhaps most important, the acid test to determine the need for a review is the output product. If poor data were being submitted, some sort of review would be warranted. However, Defense Acquisition Executive Summary (DAES) reports on design data consistently have shown reliable contract status and enabled my office to project reasonable estimates of cost at completion. The program office, of course, had more detailed information.

Finally, there remains a backlog of important C/SCSC reviews to be completed by NAVSEA. I believe those reviews are a higher priority at this time, and am confident that NAVSEA's new C/SCSC managers will ensure appropriate C/SCSC reviews are performed on all applicable future contracts. Any

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future design contract will be subjected to an appropriate review on its merits.

Recommendation 2

The Commander, Naval Sea Systems Command, direct the Supervisor of Shipbulding, Conversion and Repair at Newport News to provide surveillance as required in DoD Instruction 5000.2, and as agreed to in the Memorandum of Agreement with the SSN-21 Program Office.

Comments

I agree. The reasons given for not performing surveillance are indefensible. The Newport News earned value procedures had been reviewed by the program office, and the Supervisor should ensure those procedures are followed consistently.

Recommendation 3

The Seawolf Program Manager enter into a Memorandum of Agreement with the Supervisor of Shipbuilding, Conversion and Repair at Electric Boat to provide surveillance of the Newport News design subcontract with Electric Boat in accordance with DoD Instruction 5000.2.

Comments

I agree with the intent, but it is inappropriate for the Program Manager to assume responsibility for surveillance. Subcontractor surveillance is the prime's responsibility. If (as is likely) Electric Boat objects to surveillance by Newport News because they are competitors, the Navy may agree to perform surveillance. In that case, the Supervisor at Electric Boat would be the logical surveillance organization. However, because principal responsibility for design contract surveillance lies with the Supervisor at Newport News, both SUPSHIPS organizations should collaborate to support the Program Manager.

FINDING B: Cost and Schedule Control System Requirements for the Nuclear Propulsion Program.

Recommendation

The Under Secretary of Defense for Acquisition void the 1972 Naval Nuclear Program waiver from Cost and Schedule Control System Criteria and assess, on a case by case basis, the need to apply or waive cost and schedule control system requirements.

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Comments

The 1972 waiver is clearly out of date. The organization that granted it no longer exists, and the acquisition policy documents have changed significantly. Therefore, there is no need to "void" the waiver because it died a natural death when DoD Directive 5000.1 and DoD Instruction 5000.2 were issued in February 1991. The waiver issue is further clouded because Nuclear Propulsion Program management is shared with the Department of Energy, which has granted the Program a blanket waiver from all project management reporting, including C/SCSC.

However, the draft audit report provides more information than was previously available to OSD, information that suggests the waiver may not be wholly inappropriate. The report notes that about 90 percent of each contract is subcontracted, with the remaining 10 percent (approximately $25 million) paid to the prime contractors for services such as engineering design, procurement, and oversight. C/SCSC probably is inappropriate in those circumstances. If some type of earned value reporting is appropriate, the Cost/Schedule Status Report (C/SSR--essentially a reduced Cost Performance Report without C/SCSC discipline requirements) may be preferable.

The fact that approximately 150 subcontractors share 90 percent of contract cost also indicates that each subcontract is relatively small and below the mandatory dollar value for C/SCSC implementation. Some of the subcontracts may also be C/SSR candidates.

In summary, I believe the need to void the waiver is moot. There is no basis in policy for the Nuclear Propulsion Program to continue to rely on it. Contracts awarded by the Department of Energy are beyond the scope of Department of Defense policy; those awarded by the Navy are subject to DoD Instruction 5000.2. The Navy contracts should be assessed on a case by case basis for application of appropriate cost and schedule management control requirements.

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