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Report to Congressional Committees

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NEW ATTACK SUBMARINE

Program Status

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National Security and
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Congressional Committees

The Congress, the Department of Defense (DOD), and the Navy agree that the Navy needs a new attack submarine (NSSN) that is significantly less costly than the previous class of attack submarines, the Seawolf. However, the estimated cost of the NSSN program is rising. We evaluated the status of the NSSN program to identify areas of potential risk for rising costs and to provide information on the submarines' potential performance. We conducted this review under our basic legislative responsibilities and are addressing it to you because the matter discussed in this report falls within your Committee's jurisdiction.

Results in Brief

The NSSN program is not likely to meet the objective of producing a submarine that is significantly less costly than the Seawolf. Based on Navy estimates for a 30-ship, single shipbuilder program, the Seawolf's average acquisition cost was estimated to be about $1.85 billion compared to the NSSN's estimate of about $1.5 billion.[1] Based on a 30-ship, two shipbuilder program, the Navy's current estimated acquisition cost for the fifth ship of the NSSN class has already risen from about $1.5 billion to about $1.8 billion as of March 1996. In addition, there is a potential for other cost increases because of a variety of program risks.

The National Defense Authorization Act for fiscal year 1996, Public Law 104-106, directed the Navy to accelerate construction of the first two submarines and to use two shipyards instead of one to build the first four submarines. According to the Navy, this change has increased the estimated cost of developing and building 30 NSSNs by $3 billion. Although we believe the cost categories seem reasonable, we have no basis to agree or disagree with the total program estimate because the Navy has not provided support for the costs associated with the individual categories. Historical evidence shows that some cost increases may occur. The impact of competition is generally expected to result in decreases in production costs. Such results will depend on the Navy's acquisition strategy, which has not yet been determined.

According to DOD, a $3.8-billion increase in budget authority for the Fiscal Year 1997-2001 Future Years Defense Plan period will be needed to acquire two submarines earlier than originally planned as directed by the law.

[1]Unless otherwise noted, all costs are in constant 1995 dollars.

We believe there is a potential for other cost increases because of a variety of program risks.

- Anticipated changes in the ship's design or the addition of new technologies are likely.
- The NSSN command, control, communication, and intelligence (C3I) combat system development and integration program is highly complex and optimistic.
- Development of some prototype equipment is concurrent with ship construction.
- The cost of transferring the submarine's design from the first to the second shipbuilder is based on an optimistic estimate that is less than the actual cost of the last major design transfer.

There is also a divergence of views on the start-up costs for the second shipbuilder.

DOD and the Navy believe the baseline NSSN satisfies military requirements. However, in an April 1995 report, the Commander, Operational Test and Evaluation Force (OPTEVFOR), stated if the NSSN were to just meet design thresholds for survivability, the NSSN might not be operationally effective against the most capable threat. He noted that there are too many variables and unknowns about the systems involved to assess whether the design will meet the requirements. The Navy is addressing the concerns raised by this report. OPTEVFOR is currently reassessing the NSSN design for a program review scheduled in early 1997.

Background

According to Navy documents, producing a significantly less costly submarine would allow the Navy to maintain a force level of 45 to 55 submarines and maintain the current submarine industrial base. The NSSN program is intended to address the Navy's requirement for 10 to 12 new attack submarines by the year 2012 that are as quiet as the Seawolf, but at lower cost and without compromising military utility. Before design evaluation, the Chief of Naval Operations set the attributes and requirements for the NSSN based on the Navy's prospective need to defeat a very sophisticated future Russian threat and to operate in littoral (coastal) areas. The submarine's attributes and requirements are the NSSN's major cost drivers; these include speed, quietness, diving depth, weapons load, and sensor performance. According to the Navy, the NSSN will be a highly effective multimission platform capable of performing antisubmarine and

antisurface ship missions and land attack strikes as well as mine missions, special operations, battle group support, and surveillance.

During submarine design and development, the Navy initiated several acquisition reform measures intended to keep costs under control. According to the Navy, the cost of the submarine will be reduced by about one third, because of the use of Integrated Product and Process Development teams, computer-aided design, commercial off-the-shelf technology, and a performance-based acquisition strategy. The Navy also claims it can save as much as $100 million per ship by incorporating lessons learned from previous submarine programs. The savings expected from these initiatives are included in the Navy's estimated acquisition cost for the fifth ship NSSN.

NSSN Costs Have Risen

Based on Navy estimates for a 30-ship, single shipyard program, the Seawolf's average acquisition cost was estimated to be about $1.85 billion compared to the NSSN's estimate of about $1.5 billion. Based on a 30-ship, two shipbuilder program, the Navy's estimated acquisition cost for the fifth[2] ship of the NSSN class has already risen from about $1.5 billion to about $1.8 billion as of March 1996.

According to the Navy, most of the $250 million increase in the estimated cost of the fifth NSSN is the result of the direction in Public Law 104-106 to add a second shipbuilder to the program and to accelerate the procurement of two of the first four submarines. The Navy's original plan, approved in May 1995, was to build one ship in fiscal year 1998, a second ship in fiscal year 2000, and two ships per year beginning in fiscal year 2002—all at Electric Boat Corporation, Groton, Connecticut. The 1-year gap between construction of the first and second ships, according to Navy officials, would allow the Navy to "mature" the NSSN design and gain experience constructing the first ship before beginning construction of the second ship.

The Navy currently maintains two nuclear-capable shipyards—one to build submarines (Electric Boat, Groton, Connecticut) and one to build nuclear-powered aircraft carriers (Newport News Shipbuilding and Drydock Company, Newport News, Virginia). According to Navy officials,

[2]According to Navy documents, the fifth ship cost is used because it provides a convenient reference point for cost comparisons because the influences of learning and cost improvement have already occurred. Other programs, such as the Los Angeles attack submarine and the Arleigh Burke destroyer also used the fifth ship cost for estimating unit costs. The difference between the previous average acquisition costs of the NSSN and the new fifth ship NSSN cost is estimated to be about $50 million.

the use of the single contractor to build the NSSN would increase savings by avoiding overhead and design transfer costs and achieving the benefits of the experience gained by building 30 ships at one shipyard. The Navy adopted this strategy in response to a recommendation in DOD's Bottom-Up Review to use a single contractor.

However, Public Law 104-106 directed the Navy to start construction of an NSSN at Newport News Shipbuilding and Drydock Company (Newport News) in 1999 and submit a plan for building four NSSNs between fiscal year 1998 and 2001, two of which were to be built by Electric Boat (one in 1998 and one in 2000) and two by Newport News (one in 1999 and one in 2001). The intent of the legislation in introducing competition was to obtain a cost benefit. The act requires that each of the first four submarines develop and demonstrate new technologies that will make each more capable and more affordable than its predecessor.

In its required March 1996 report, DOD indicated it would need an additional $3.8 billion for fiscal years 1997 through 2001 in shipbuilding and conversion (SCN) funds to implement the act. Even with this additional funding, new submarine construction would require about 23 to 38 percent of the available SCN funds versus the historical 22 to 25 percent. The additional funding is to build the baseline design only and does not include funding for new technology insertion or nonrecurring costs related to design changes. DOD said that it would also need an additional $787 million in research, development, test, and evaluation funds to accelerate and develop new technology not included in the current design. According to DOD and Navy officials, the NSSN, as currently designed, is expected to meet all requirements for carrying out its missions.

DOD noted in its report that it would be difficult to afford the plan directed by Public Law 104-106 in the context of other modernization programs. The Department developed and proposed several alternative construction schedules that would add a second shipbuilder and lead to competition. The report states, however, that DOD would face major near-term affordability issues if it pursued the congressional plan or any of the alternatives presented in its report.

DOD did not report the individual cost for each of the first four ships, which we provide in table 1.

Table 1: NSSN Shipbuilding and Conversion Costs

Then-year dollars in billions

Submarine	Cost
1	$3.272
2	2.543
3	2.093
4	2.112
Total	**$10.020**

In addition to construction costs, the Navy estimates it will cost about $3.8 billion (then-year dollars) to design and develop the NSSN. As a result, the Navy will spend a total of about $13.8 billion to develop and buy the first four NSSNs under the revised shipbuilding plan.

Under the strategy to use the two shipbuilders, the Navy estimates that the cost of the fifth ship of the NSSN class in fiscal year 1995 dollars will rise from about $1.5 billion to about $1.8 billion as of March 1996. According to the Navy, this change in strategy will result in increased costs such as increased overhead and the loss of experience in building both the lead and follow-on ships when using two shipbuilders and decreased costs such as lower production costs due to competition. The Navy estimates that the net effect for the total program is a cost increase of about $3 billion. Although we believe the cost categories seem reasonable, we have no basis to agree or disagree with the total program estimate because the Navy has not provided support for the costs associated with the individual categories. Historical evidence shows that some cost increases may occur. The impact of competition is generally expected to result in decreases in production costs. Such results will depend on the Navy's acquisition strategy, which has not yet been determined.

Potential for Cost Increases for Variety of Program Reasons

Even without adding a second shipbuilder to the program, there is a potential for cost increases, because of a variety of program risks. A highly complex and optimistic C3I system development and integration program, concurrent system development and ship design and construction, and the lack of fallback systems in the event a system fails suggest that major cost increases are likely. Moreover, major systems historically encounter unforeseen problems during development, resulting in cost increases of about 20 to 40 percent.[3] Further, the Navy's estimates for transferring the design to the second shipbuilder may be understated by hundreds of

[3]Weapons Acquisition: A Rare Opportunity for Lasting Change (GAO/NSIAD-93-15, Dec. 1992).

millions of dollars. The estimated start-up costs for the second shipbuilder range from $1 million to $1 billion.

The Congress authorized and appropriated funds for advance procurement of the first two NSSNs—the 1998 start of construction at Electric Boat and the 1999 start at Newport News. The National Defense Authorization Conference Report for fiscal year 1997 modified the House National Security Committee's recommended provision, which would have authorized funds for both shipyards to (1) design improvements for incorporation into the first four NSSNs and (2) design another new attack submarine that would be more capable but less costly than the NSSN. Instead, the National Defense Authorization Act for fiscal year 1997 provides that the shipbuilders can propose any design improvements to the first four submarines to the Secretary of the Navy. The Secretary will be required to submit an annual report to the authorization committees on actions taken on the proposed design improvements. If any shipbuilder design improvements for the first four submarines are proposed and accepted, it would further increase the cost of the NSSN program for the new design work and the technology insertion. A new estimated cost would need to be determined if another new design is proposed and accepted. If a new design is proposed and accepted, the estimated cost would depend on the submarine's attributes and requirements.

Combat Systems Risks

The Navy is developing a C3I combat system that will integrate 15 subsystems upon delivery to the shipyard. The integration will be at the system level using an open system architecture. For this integration, the Navy plans to use new and existing technology, commercial off-the-shelf (COTS) equipment, and reengineered systems. The ship's prime contractor will provide four of the subsystems—exterior communications, interior communications, nontactical data processing, and ship monitoring. The government will provide the remaining subsystems, including those for radar, navigation, navigation data distribution and display, imaging, and electronics support measures. The government will also provide three subsystems from a C3I system prime contractor—sonar, combat control, and architecture and the system-level integration of all subsystems.

In its April 1995 early operational assessment report on the NSSN, OPTEVFOR considered the C3I open system architecture a high risk because it is a very extensive and ambitious effort with a very short development and integration time frame. The report noted that the development schedule is extremely optimistic for the complexity and scope of the effort. OPTEVFOR

officials stated that the Navy has never attempted such a large-scale integration effort on a submarine. While the BSY-1 and BSY-2 systems did have some level of integration, the NSSN combat system will have to be totally integrated. Of special concern to these officials were the absence of an established system design, a new open system architecture being used for the first time on submarines, network security plans that are still incomplete, a wide aperture sensor system that is still considered immature, COTS technology whose military utility and supportability has yet to be proved, and software development and reuse.

The report noted several areas of risk. Software development and reuse were rated high risk because of historical problems associated with the use of COTS real-time database management systems and multisource data fusion capabilities. Problems with the database management system could cause significant problems with the combat system. The extremely short developmental time line, in comparison with the time lines for developing past C3I systems, specifically the BSY-2, contributes to the risk. The combat and control system architecture, the command workstation, and subsystem integration are concepts unique to the NSSN C3I combat control system. The short developmental time line, incomplete design, and COTS equipment uncertainties add to the risk.

According to the Navy's May 1995 NSSN risk assessment, the ship construction schedule has little flexibility to accommodate unanticipated development, test, or integration problems or delays in the C3I system delivery to the shipyard. Traditionally, however, problems have arisen in developing similar large systems. For example, both the BSY-1 combat system for the Improved Los Angeles-class and the BSY-2 combat system for the Seawolf-class submarines had problems that resulted in late delivery and increased costs. The BSY-2 combat system was to be delivered in two phases with all of the hardware and 86 percent of the software in November 1993 and the remaining software in November 1994. However, the BSY-2 experienced development problems, and the first phase was not delivered to the shipbuilder until July 1995. The second phase will not be delivered until after the ship, which was previously scheduled for delivery to the Navy in October 1996, or 8-1/2 years after the award of the BSY-2 contract in March 1988.

The NSSN combat system is scheduled to be delivered to the shipyard by November 2000, about 4-1/2 years after award of the combat system contract. After delivery of a fully functional C3I system in November 2000, there will be another 1-1/2 years for integration and testing activity for the

NSSN lead ship. The total time for development, integration, and tests prior to ship installation is 6 years, about the same as the original schedule for the BSY-2. Navy officials believe the schedule is achievable because the use of COTS hardware and software will reduce the need and time to develop both hardware and software.

With fleet introduction of the NSSN, the Navy will need to support three different submarine combat systems—the BSY-1 on the 688I class, the BSY-2 on the three Seawolfs, and the new NSSN fully integrated C3I system. This involves separate logistics, training, and life-cycle support programs.

DOD and the Navy believe that the risk associated with the C3I system is low and noted that significant design maturity has occurred since the April 1995 OPTEVFOR report, which has mitigated many of the identified risks. The Navy is currently addressing the concerns raised by the report. OPTEVFOR will reassess the NSSN for an early 1997 program review and will issue a follow-up report in December 1996.

Other Areas of Risk

According to OPTEVFOR officials, subsystems being developed outside the NSSN program, such as the photonics mast, for inclusion in the C3I system also pose a potential problem because any cost increases, technical problems, or delays in these programs could have a major impact on the NSSN program.

In addition, the Navy, on the recommendation of industry experts in open systems, has selected Asynchronous Transfer Mode (ATM) as its networking technology for integrating the 15 combat subsystems included in the C3I system. ATM is considered by some to be a maturing telecommunications technology; the standard-setting bodies[4] and industries in the telecommunications market have yet to agree on ATM implementation standards. Even though the Navy will use equipment and software from the BSY-1 or BSY-2, some subsystem interfaces will have to be modified to accommodate the new network interface requirements to achieve interoperability. Meanwhile, any changes to interim ATM standards could result in additional interface redesign and slow the combat system's testing and integration.

According to Navy officials, the standard-setting bodies have agreed to 47 interface standards, and an additional 21 will be finalized by the end of

[4]Telecommunication standards are developed by groups representing industry, government, and academia that reach consensus on the implementation of technology to achieve interoperability within the industry.

1996. They also stated that the interface standards needed to integrate the C3I combat system are already well defined. According to Navy officials, the C3I development schedule includes a "technology refresh" concept that provides an opportunity to update the C3I system before the system is delivered to the Navy. Any changes to ATM standards could be incorporated as part of this process.

In addition to the ATM, the combat system's lightweight wide aperture array, which is vital to the ship's combat system performance, is not yet under development for use on the NSSN.

Concurrent Development and the Lack of Alternatives

The NSSN will use several new technologies and prototype systems that are being developed concurrently with ship design and construction and for which the Navy has no alternative technologies available should problems arise. Failure of any one of these systems would likely result in performance problems, cost increases, and delays in delivery of the submarine to the Navy.

An example of a system that could pose a problem is the submarine's air conditioning system, which requires the use of a new refrigerant and design of a new air conditioning unit. This new unit will still be under development while the ship is being built. The technological challenges include the size of the unit and achievement of the necessary level of quietness. Prototype testing will overlap with the construction of the lead ship, and if problems arise, extensive rework could be necessary. Since the Navy has no alternatives for this development, such rework could result in delayed delivery of the submarine to the Navy.

The propulsor (propeller) also presents a major technological challenge. While the propulsor is being designed for power, speed, and quieting efficiency, an OPTEVFOR early operational assessment noted that a full-scale model of the propulsor is needed to determine whether it will meet its quieting requirements. Because of the concurrent development of the propulsor and the ship, however, the Navy will have to select a final propulsor design before full-scale testing is complete. According to the Program Manager, the results of large-scale testing are promising, but meeting the propulsor requirements remains a definite technological challenge.

Another example of a potential problem involves the electronic warfare support measures (countermeasure surveillance system). Because of other

Navy priorities, funding for this program was reduced and the program had to be restructured to meet the needs of the NSSN. According to Navy program officials, the system will now use COTS and existing systems to meet the performance and schedule requirements of the NSSN.

The photonics mast program has also been restructured because of a $10-million increase in cost. A prototype of the mast and its photonics sensor are currently at sea being tested on the USS Phoenix. According to the NSSN Program Manager, the NSSN is designed to incorporate a nonpenetrating imaging (i.e., photonics) system as opposed to the traditional submarine periscope. If the photonics mast were unavailable, the Navy would need an alternative sensor that is compatible with the overall ship design, such as the improved nonpenetrating periscope (INPP), which is currently being tested on the USS Phoenix. The mast is one of the systems being developed outside of the NSSN program for the C3I system. If any problems with sensor performance and delivery arise, there would be some program impact.

Design Transfer Costs Are Optimistic

According to program documentation and the Program Manager, the estimated $2.5 billion (then-year dollars) to build the first Newport News ship includes $154 million (then-year dollars) to transfer the submarine design data from Electric Boat to Newport News. However, this cost may be understated, according to program officials, since the last major design transfer for a complex ship design between shipyards—for the DDG-51—cost about $400 million to $500 million. The Program Manager stated that, while optimistic, the $154-million estimate was based on the use of integrated product and process development teams, close coordination between the contractors, and other acquisition reform initiatives.

Range of Potential Start-up Costs

There is a range of estimates for start-up costs at Newport News. According to Navy program officials, costs are estimated to be $250 million. According to a 1993 U.S. submarine production base report,[5] start-up costs at Newport News could range from $607 million to over $1 billion, depending on the length of time various areas of the shipyard and submarine production lines have been closed. According to Newport News officials, the only start-up cost identified to date is $1 millon to restart the shell and ring assembly area. These officials said that there may

[5]The U.S. Submarine Production Base, An Analysis of Cost Schedule and Risk for Selected Force Structures, Rand, National Defense Research Institute, 1993.

be other start-up costs but Newport News has only been involved in the program since February 1996, and it is too early to develop cost estimates since the scope of the NSSN program is still evolving.

Potential Operational Effectiveness

According to Navy officials and documents we obtained, the Navy has traded performance for cost savings. Compared with the Seawolf, the NSSN is slower, carries fewer weapons, and is less capable in diving depth and arctic operations. On the other hand, the NSSN is expected to be as quiet as the Seawolf, will incorporate a vertical launch system and have improved surveillance as well as special operations characteristics to enhance littoral warfare capability.

DOD and the Navy believe the baseline NSSN satisfies military requirements. However, an April 1995 report by the OPTEVFOR Commander expressed concern that if the NSSN were just to meet design thresholds for survivability, the NSSN may not be operationally effective against the most capable threat. The report noted that there were too many variables and unknowns about the systems involved to assess whether the design will meet requirements.

The Navy is addressing the concerns raised by that report. OPTEVFOR officials said they are currently involved in reassessing the NSSN design for an early 1997 program review and expect to issue a follow-up assessment in December 1996.

Scope and Methodology

We reviewed and analyzed Navy and DOD documents and studies and discussed the status of the new NSSN, Seawolf submarine, and C3I combat system programs with Navy program officials in Washington, D.C., and at the Naval Undersea Warfare Center, Newport, Rhode Island. We held discussions about these programs with representatives from the offices of the Defense Advanced Research Projects Agency; the Chief of Naval Operations; the Assistant Secretary of the Navy for Research, Development, and Acquisition; and the Secretary of Defense. We also discussed the programs with representatives from Electric Boat Corporation, Groton, Connecticut, and Newport News Shipbuilding and Drydock Company, Newport News, Virginia, and the Supervisors of Shipbuilding at these respective shipyards. In addition, we analyzed the results of the NSSN's early operational assessment and discussed the results with the Commander, Operational Test and Evaluation Force, Norfolk, Virginia.

In our cost comparison, we did not calculate any potential benefits that might result through competitive pressures by introducing a second shipyard. Although competition, with a resulting cost benefit is possible, it is by no means certain. Achieving any cost benefit will be determined by how the Navy implements the acquisition strategy, which has not yet been determined.

We conducted our review from June 1995 to August 1996 in accordance with generally accepted government auditing standards.

Agency Comments

DOD did not concur with statements in our draft report and said that (1) the NSSN will not be more costly than the Seawolf; (2) NSSN unit costs will not continue to rise and significant cost increases should not be expected due to risk associated with the C3I system or design transfer between the two shipbuilders; and (3) the NSSN will be able to defeat the most capable threat.

Regarding costs, DOD said that on a lead ship basis in fiscal year 1998 dollars, the NSSN would be approximately $600 million less than construction costs of the Seawolf and on a follow-on ship per unit basis, the NSSN was estimated to cost at least $300 million less in fiscal year 1995 dollars. DOD also said life-cycle costs of the NSSN are expected to be approximately 15 percent less than those of Seawolf.

We did not evaluate life-cycle costs. In its comments on acquisition costs, we believe DOD has used inappropriate comparisons that deviate from previous assessments. First, a lead ship cost comparison is not normally used because design, start-up, and other related costs are included that would not be included in follow-on unit ship cost comparisons. For example, the Navy's estimate for the construction costs of the lead Seawolf includes cost increases related to late and incomplete design drawings, late development and delivery of government-furnished equipment such as the BSY-2 combat system, welding cracks, and problems with the torpedo doors. Second, the Navy used a fifth ship acquisition cost for comparison purposes on both the Los Angeles and Arleigh Burke class programs. The Navy believes a fifth ship unit cost is more appropriate for cost comparison because the influences of learning curves and cost improvements have occurred and can be realistically reflected in estimated unit costs. Use of a lead ship unit cost basis for comparisons ignores these influences and is different from the commonly

accepted practices DOD and the Navy use in unit construction costs for comparison purposes.

DOD said we used the $1.85-billion average Seawolf cost cited in the Navy's NSSN cost and operational effectiveness analysis and that this was the average cost of the 2nd through 30th Seawolf built at a single shipyard and expressed in 1995 dollars. We did use this basis to determine the previous acquisition cost of both the Seawolf and the NSSN. Our comparison of the average acquisition costs of the Seawolf and the NSSN, under the original program, is on a comparable basis (30-ship program, single shipbuilder, and constant 1995 dollars). We then compared the Navy's cost estimates of the fifth ship of the NSSN class using a single shipyard and using two shipyards to show the impact of Public Law 104-106, which significantly altered the acquisition strategy.

Regarding the risks associated with the combat systems and concurrent technology development, DOD said that the risk associated with the C3I system is low and that significant design maturity has occurred since the April 1995 OPTEVFOR report, which has mitigated many of the identified risks. In providing a status of the NSSN program, our intent is to identify areas of risk because experience has shown that integrating new technologies and concurrent development and production schedules usually result in cost increases. As we point out in our report, the C3I system is a highly complex development and integration effort and there is prototype equipment development concurrent with ship construction. The Navy's intent to use COTS items may prove successful, but plans to do so do not remove risk from the program.

DOD did not concur with our statement that design transfer costs are highly optimistic. DOD believes that the current estimate is adequate and that it is not appropriate to use the cost of transferring the design of the DDG-51 to estimate the cost of transferring the design of the NSSN. Despite the introduction of more sophisticated technology, we continue to believe that the Navy's estimate may be optimistic because the shipyards use different computer systems. The use of the DDG-51 design transfer as a comparison is appropriate because it is the most recent major design transfer between shipyards, albeit through a paper-based process.

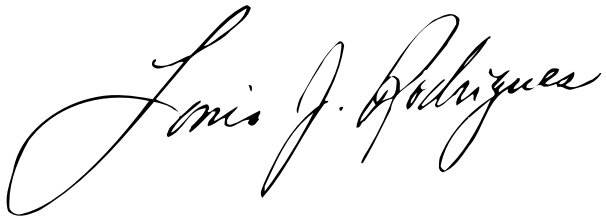
Finally, DOD did not concur with our statement that the NSSN has potential performance limitations. We have modified our presentation regarding the NSSN's ability to defeat the most capable threat to clarify the concerns

raised in the OPTEVFOR report and to present DOD's and the Navy's belief that the baseline NSSN satisfies military requirements.

We have made other changes, as appropriate, based on DOD's technical comments. (DOD's comments are in app. I.)

We are sending copies of this report to the Secretary of the Navy and the Assistant Secretary of the Navy for Research, Development, and Acquisition. Upon request, we will make copies available to other interested parties.

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



Louis J. Rodrigues
Director, Defense
Acquisitions Issues

List of Congressional Committees

The Honorable Strom Thurmond
Chairman
The Honorable Sam Nunn
Ranking Minority Member
Committee on Armed Services
Unites States Senate

The Honorable Ted Stevens
Chairman
The Honorable Daniel K. Inouye
Ranking Minority Member
Subcommittee on Defense
Committee on Appropriations
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The Honorable Ronald V. Dellums
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House of Representatives

The Honorable C. W. Bill Young
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The Honorable John P. Murtha
Ranking Minority Member
Subcommitttee on National Security
Committee on Appropriations
House of Representatives

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Abbreviations

ATM	Asynchronous Transfer Mode
C3I	command, control, communication, and intelligence
COTS	commercial off-the-shelf
DOD	Department of Defense
INPP	improved nonpenetrating periscope
NSSN	new attack submarine
OPTEVFOR	Operational Test and Evaluation Force
SCN	shipbuilding and conversion

Comments From the Secretary of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE

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WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

09 OCT 1996

Mr. Louis Rodrigues
Director, Defense Acquisitions Issues
National Security and International Affairs Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "New Attack Submarine: Program Status" (GAO Code 707112/OSD Case 1227), dated September 17, 1996. The DoD positions with the report are summarized below.

The DoD does not concur that New Attack Submarine (NSSN) will be more costly than SEAWOLF. The construction cost of the lead NSSN is estimated to be approximately $600 million (FY98 SCN) less than the construction cost of the lead SEAWOLF. On a follow-ship per unit basis, the NSSN is estimated to cost at least $300 million less (FY 95 SCN) than a new SEAWOLF, when compared on an equivalent basis. Additionally, life cycle costs of NSSN are expected to be approximately fifteen percent less than those of SEAWOLF resulting from integrated product and process design innovations including modeling and simulation, system simplifications, and use of commercial-off-the-shelf (COTS) and non-developmental item (NDI) components.

The DoD does not concur that NSSN unit costs continue to rise. The baseline individual-ship cost estimate has remained unchanged since the Department authorized engineering and manufacturing development (Milestone II) for the NSSN program in June 1995.

The DoD partially concurs that there would be an increase of about $3 billion (FY 95 SCN) in NSSN program costs if direction in the FY 96 Authorization Act for competitive procurement were to lead to construction of 30 NSSNs at two shipyards.

The DoD does not concur that the NSSN has potential performance limitations that would make it unable to defeat the most capable threat. The GAO claim that this potential exists is based on an April 1995 Early Operation Assessment (EOA) by Commander Operational Test and Evaluation Force (COMOPTEVFOR). The EOA noted that if NSSN survivability were to just meet design thresholds, the NSSN might not be operationally effective against the most capable threat under a stressing scenario. The Department assesses the probability of this situation to be so

low as to be negligible. In particular, the currently approved NSSN design is projected to exceed the key performance thresholds and was assessed by COMOPTEVFOR in the EOA to be potentially operationally effective in an ASW mission against the most advanced threats. Detailed analyses performed as part of the May 1995 NSSN Cost and Operational Effectiveness Analysis (COEA) also support the conclusion that the NSSN will be survivable and effective in ASW missions against highly advanced threats.

The DoD does not concur that significant cost increases should be expected due to risk associated with the C^3I System. The cost risk is assessed as low based on use of COTS and NDI components, and shortened procurement cycles. NSSN C^3I system technology is in-use in the commercial sector and has been successfully demonstrated at sea or in the laboratory-based Open System Critical Item Test program.

The DoD does not concur that significant cost increases should result from design transfer between the two shipbuilders. The current estimate is based on experience from previous submarine programs and is adequate to cover costs of transferring ship design data.

Affordability is a primary tenet of the NSSN Program and has been since program inception in 1991. The focus to reduce costs began with a complete review of operational requirements, and has continued throughout program execution by implementing lessons learned from prior programs and streamlining specifications. The program has instituted an Integrated Product and Process Development approach that engages all stakeholders in the design effort. Combining affordability, capability, and flexibility, the NSSN will satisfy all military requirements at a reasonable cost to ensure the proper force structure for the future.

Detailed comments to the GAO report are attached. Factual corrections were separately provided.

George R. Schneiter
Director
Strategic and Tactical Systems

Attachment

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