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HOUSE ARMED SERVICES COMMITTEE
SEAPOWER AND EXPEDITIONARY FORCES
SUBCOMMITTEE

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BEFORE THE

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

SHIPYARD MODERNIZATION AND COST REDUCTION MEASURES FOR SHIPS

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INTRODUCTION

Mr. Chairman, distinguished members of the Seapower and Expeditionary Forces Subcommittee, thank you for this opportunity to appear before you to discuss the topic of Shipyard Modernization and Cost Reduction Measures for Ships.

First, we would like to thank you for your continued interest in naval shipbuilding and the future of our Navy. In particular, the discussions of shipyard modernization and cost reductions are vital for the capabilities of our Navy, and for our ability to acquire and support the Navy's 313 Shipbuilding Plan in a cost effective manner.

The Subcommittee asked that the Navy address how the private shipyards can modernize and become more efficient for new construction of Naval vessels. The primary focus will be on the March 2007 Assessments of Naval Vessel Construction Efficiencies and of Effectiveness of Special Contractor Incentives Report to Congress; however the testimony will also cover two other reports, which were delivered in late February 2007 and address shipbuilding efficiencies. These reports cover the Shipbuilding and Ship Repair Industrial Base and Ship Systems Commonality.

SHIPBUILDING/SHIP REPAIR INDUSTRIAL BASE CAPACITY

The US naval industrial base for new construction is composed of six major private shipyards sites, which constitute the first tier of naval construction; and several second tier shipyards that construct smaller naval vessels.

The Navy has initiated an aggressive investment strategy to build an affordable 313-ship fleet tailored to support the National Defense Strategy and the 2006 Quadrennial Defense Review. The Department plans to procure seven ships in FY 2008 for the US Navy, and we are serving as the executive agent for one Joint High-Speed Vessel for the US Army. As required by Congress, the Department of the Navy recently submitted its Annual Long Range Plan for Construction of Naval Vessels which reinforces the 313-ship fleet plan introduced last year. The FY 2008 Annual Long Range Plan for Construction of Naval Vessels represents the Department's commitment to stability and predictability which in turn minimizes disruption in shipbuilding and facilitates efficiency and effectiveness in our industrial base.

The Navy's FY 2008 new construction shipbuilding plan recognizes the need for aggressive requirements and cost control measures that can only be achieved in partnership with industry utilizing realistic assumptions within our ability to instill discipline in shipbuilding requirements and industry's ability to drive capital investments to reduce cost. Given the importance of requirements-containment and cost-reduction to the viability of the shipbuilding plan, the Navy continues to evaluate each ship class and identify cost reduction opportunities while balancing warfighting requirements, costs, and industrial base realities. Each of these three elements is inextricably tied to the other: changing requirements may result in cost changes which in turn may impact on the industrial base.

The DoN requires an industrial base which is reliable, cost-effective and adequate to meet the Nation's strategic objectives. Without stability, shipbuilders are not incentivized to invest in

facilities and labor improvements or reduce vessel costs. A stable, robust, funding profile is the primary factor necessary to sustain those industrial capabilities which support Navy shipbuilding. Such funding focuses market demand across a broad spectrum of industry segments to meet emerging and projected DoN requirements. The Navy's 2008 Annual Long Range Plan for Construction of Naval Vessels seeks to align the Navy's force structure to meet its operational requirements in terms of both capability and capacity, while encouraging competition. The three key aspects of the Navy's plan - requirements, cost, and stability provide the demand signal to industry. The Navy is addressing all three elements by developing a reliable and executable shipbuilding plan for the nation's shipbuilding industrial base.

Overall recommendations for managing the capacity of the shipbuilding industrial base require a partnership between the Navy, Industry, and Congress. The Navy can help to stabilize the industrial base by:

- Promoting acquisition strategies that enhance cost reduction such as multi-year procurement, block-buy, teaming for flexibility, open architecture and commonality;
- Encouraging facilities and process improvements through steady workload and a variety of contract incentives;
- Maintaining a level workload to provide the best opportunity for increasing efficiency and effectiveness; and
- Matching the most experienced people to shipbuilding programs with highest risk.

Shipbuilders should:

- Benchmark off of the best of European, U.S. and Asian shipbuilding practices and adopt the best strategies to increase efficiency;
- Buy common components wherever possible;
- Reinvest profit towards shipbuilding advancements and new technology;
- Ensure ship progressing metrics are correctly reported;
- Apply lessons learned across shipbuilding programs; and
- Investigate bulk purchases of commodities such as steel and copper.

The Congress can help with:

- Supporting stability in the shipbuilding plan;
- Providing multi-year procurement authority, when requested;
- Allowing flexibility of funding for cross-class component purchases; and
- Encouraging and creating incentives for commercial work at U.S. shipbuilders.

SHIP SYSTEMS COMMONALITY

The Navy has a number of initiatives and processes in place to capture commonality benefits for the Current Navy and the Next Navy. These include commonality addressed at the ship level, at the system level, at the material level, and in processes. For instance, in the current Navy, commonality is enhanced through commodity contracts across multiple platforms; parts commonality; common processing and display systems; modularity; Open Architecture; and software reuse.

For the Current and Next Navy, we plan to increase commonality as part of the 2008 Annual Long Range Plan for Construction of Naval Vessels. This will be done by reducing the number of ship types; utilizing existing Navy systems on new designs; using adaptive infrastructures to allow technology to evolve without a physical impact to the ship; leveraging commercial technology; increasing modularity; increasing Open Architecture; adopting Class Common Equipment (CCE); and developing a common specification for an integrated product data environment (IPDE). The goal of all these initiatives is to minimize variance within the systems to reduce cost, schedule, and risk. Overall, the Navy is moving towards a warfighting capability-based approach rather than platform-centric approach. This means that Navy develops specific capability and functionality for use Enterprise-wide vice expending additional resources developing multiple systems that provide the same capability but are targeted to one class of ships only.

For the Next Navy, we are addressing commonality in several ways. At the highest level, reducing the number of ship hull types will reduce the number of unique systems in the fleet. Naval Sea Systems Command (NAVSEA) evaluated reducing the number of overall hull types beyond current shipbuilding plans and concluded that the Navy can potentially reduce hull types but decisions would have to be balanced with future threat analyses to examine a feasible timeline for implementation and the correct mix of capabilities. By reducing the overall number of hull types, there may be potential for vast reductions in the number and types of Hull Mechanical and Electrical (HM&E) components in the Fleet. This could reduce life cycle logistics costs, including the procurement of technical data, training, and supply support associated with the procurement of new equipment. Similarly, there is the potential to reduce procurement cost as compared to the current long range plan, because non-recurring costs are reduced by reuse of already approved designs. Test and Evaluation savings could also be realized, if common products were tested once vice on every platform. The Navy has devised an Enterprise Test and Evaluation strategy to eliminate redundant testing of common systems, which is being implemented. In order to achieve this commonality, the Navy must lead a forum on common components, revised specifications, and revised standards.

Regardless of the number of ship hull types, however, open systems architecture and modularity can also support commonality of ship systems. The Navy plans to reduce the number of combat systems baselines from sixteen to five by 2025, through the use of decommissionings or Open Architecture. Although modularity has been explored at a program level, the Navy could fully evaluate the cost advantages of modularity by considering the entire Navy program plan.

Finally, the Next Navy can address commonality through ship design processes. NAVSEA also identified four areas of the ship design process where commonality and interoperability are recommended:

- Product data interoperability.
- Concept and feasibility design tools.
- Technical Warrant Holder tools for certification of designs.
- Design community tools coordination.

Future work will examine modifications to these processes to enhance commonality.

In order to implement any of the solutions outlined in this report, the Navy needs to examine a corporate strategy and develop a uniform approach for ship system commonality, which may include Analysis of Alternatives, determining requirements document inputs and corporate cost savings tracking through captured metrics. A cross-program approach, analogous to that of a financial portfolio manager, may be the best approach as it will facilitate implementation of commonality initiatives by tracking cost advantages at a global level, rather than distributed to programs.

ASSESSMENTS OF NAVAL VESSEL CONSTRUCTION EFFICIENCIES AND OF EFFECTIVENESS OF SPECIAL CONTRACTOR INCENTIVES

The Navy has implemented improvements for contractor furnished equipment/government furnished equipment (CFE/GFE), which are designed to eliminate duplicate inspection processes, reduce cycle times, and reduce rework. Similarly, in terms of design solutions, an Integrated Data Environment (IDE) is used as a repository for all ship drawings. This facilitates common designs, common parts, and configuration management. Production activities have also been targeted for cost reductions. A number of Lean/Six Sigma events were carried out to reduce the time and manpower needs for production tasks. These improvements allow more efficient construction and outfitting of the units prior to assembly.

In order to foster productivity changes, the Navy has utilized both performance specifications and contracting incentives. The Navy has moved away from standards to design specifications, which allow the contractor to meet requirements with increased “trade space”, enabling continuous competition and exploitation of commercial techniques, materials, and designs. The second area of emphasis is contracting strategies. There are two main contracting incentive vehicles that the Navy has used recently to improve the infrastructure of the shipbuilders. The first is the specialized case related to Hurricane Katrina, in which the Navy has special authority to pay for infrastructure improvements in Gulf Coast Shipyards. The law provides not less than \$140 Million for improvements to the Gulf Coast shipyards. While these funds were, in part, designated to expedite the repair of damaged facilities, they were also designated for improvements to the facilities which would result in future cost savings.

Since the Navy requires special regulatory relief to directly fund shipbuilding capitalization projects, contract incentives are more typically used as a means to motivate contractors to make improvements in processes and facilities. The Navy has recently implemented a number of different shipbuilding facilities investment incentives. For instance, the VIRGINIA Class Capital Expenditure (CAPEX) program is a 1.5 percent special incentive that is included in the VIRGINIA Class Block II multi-year ship construction contract. This program allows a portion of the overall contract profit to be diverted to fund a series of incentives. To earn the incentive, the shipbuilder has to show the cost/benefit analysis of the improvement. The Navy has up to \$91 Million available to fund this program over the life of the contract (through 2008). At this time, the shipbuilder teams have identified \$35.6 Million of projects, for a return of \$320 Million in future cost avoidance.

Similarly, the DDG 51 Class program has implemented a CAPEX-type infrastructure improvement project called the “Ultra Hall”. Using primarily contract withholdings and

incentives, Bath Iron Works (BIW) will build two outfitting bays and purchase additional equipment. This plan allows the shipbuilder to reduce staffing, reduce costs, improve quality, and enhance the modular construction of surface combatants as BIW is able to do a larger portion of the construction in a more modern covered facility. These savings will be realized on DDG 51 ships under construction, as well as future shipbuilding programs.

On the CVN 78 program, contracting incentives are used to motivate Northrop Grumman Newport News to meet cost targets. Coupled with incentives for technical performance in the design contract, the cost target incentive provides a balanced approach to cost, schedule, and performance control. As with CAPEX incentives, a fee recovery provision exists to recover a significant portion of the fee if the contractor deviates from previously provided cost estimates during construction contract proposal submission. In terms of capital improvements, the CVN 78 construction preparation contract incentivizes NGNN to make capital facility improvements in time to support CVN 78 ship construction.

CONCLUSION

The Navy has several efforts in progress designed to maintain a robust and modern shipbuilding industrial base. A key component of this effort is ensuring a stable demand signal from the Navy, so that the new construction shipyards can invest in modernization, knowing that there is a potential for return on investment.

The Navy is achieving cost reductions and efficiencies through commonality efforts. These efforts are composed of examining commonality at the system, ship, material, and process levels. In the long term, the Navy anticipates a substantial reduction in the procurement costs, test and evaluation, training costs, supply costs, and delivery schedules on future ship designs. The potential also exists to substantially reduce the number of hull types in the future Fleet.

To ensure the private shipyards are our partner in all of these modernization and cost reduction efforts, the Navy has implemented contract incentives. The CAPEX initiative, and other similar to it, demonstrates a successful means to motivate shipyard improvements. By modeling future contract incentives after CAPEX, the Navy can ensure the future of Navy shipbuilding is secure.

The Navy takes seriously the Subcommittee's desire that we examine shipyard modernization and contract incentives to increase efficiencies and reduce costs. The Navy will examine all of the factors discussed today when making future choices. We appreciate the opportunity to appear before the Subcommittee.