

TESTIMONY  
OF  
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BEFORE THE  
SEAPOWER SUBCOMMITTEE  
OF THE  
SENATE ARMED SERVICES COMMITTEE  
April 4, 2001

Thank you, Mr. Chairman for the opportunity to testify before the committee on behalf of General Dynamics Marine Systems. Your invitation requested that I address several issues regarding the status of the shipbuilding industrial base and initiatives to improve cost control, predictability and alternative funding approaches. I will speak to many of those topics in this written submittal. I would also be happy to discuss any of these issues in more detail during your Question and Answer period.

I appreciate the committee's recognition that there are critical issues facing the shipbuilding industrial base. Although we have sized ourselves to low rate production and had many success stories, major challenges still face the shipbuilding industry as well as our customer, the US Navy, to provide the quantity of ships and submarines and the warfighting capability needed to recapitalize our naval forces.

These challenges are further exacerbated by the significantly lower production volumes in our shipyards compared to a decade ago. This low production volume, and attendant peaks and valleys in workload, result in increased production costs driven by less than efficient utilization of our resources. The uncertainty of future workload compounds these challenges as it serves to limit our ability to plan for and invest in our businesses, absent the assurance of a reasonable return on our investment. Further, while we strive to introduce new technology and capability into new ship designs, the budget constraints imposed on the Navy's shipbuilding programs seriously limit these efforts. Lastly, we cannot overlook the fact that, despite the best efforts of industry and the Navy, the risks of construction cost growth and schedule delays are an inherent part of building complex warships in a constrained budget environment. Repercussions from one mis-step are felt by all. If a

problem evolves with any one program, all members on this panel share the burden of recovery.

The staunch “stand alone” mentality that had driven the industry since World War II has evolved to a business environment of shared resources and innovation. Further, the “winner take all” approach has given way to teaming and alliances which integrate the strengths of all of us at the table. One success story on this front is the National Shipbuilding Research Program, NSRP, formerly know as Maritech. NSRP provides a key forum for members of our community, both public and private, to share manufacturing and technology advances. Improvements have a direct impact on the capability, affordability and producibility of naval platforms. Benefits from this program are already being realized by several member shipyards. For example, Electric Boat is already using early results of a joint industry eBusiness project to procure parts for the VIRGINIA Class program. The nation’s smaller ship building and repair yards have received significant benefits from the technology and innovations of the Maritech Program. Lack of funding will slow the progress and support needed to continue these collaborative efforts. A total FY02 request for \$30M, \$10M more than in the anticipated budget request, is recommended to continue this important effort.

While industry has adjusted well to the current low rate production environment – we now need to understand the future. We welcome the administration’s on-going strategic review. I urge all involved to bring these reviews to an expedient closure and provide industry with the definitive direction to develop our strategic long-range plans in a more stable and predictable environment. The confidence this direction brings will allow us to continue the major capital investments being made by our shipyards to improve productivity and advance the manufacturing process. Significant investments have been made at Bath Iron Works with a \$250M Land Level Transfer Facility; Electric Boat with a state of the art combat and control test and integration site and new steel processing center; and NASSCO with upgrades to shipyard plant and equipment.

My testimony today will focus on the status, successes and needs of the industrial bases supporting three major Navy platforms: surface combatants, auxiliaries, and nuclear submarines.

## **Surface Combatants**

GD Marine serves the surface combatant industrial base principally through our Bath Iron Works shipyard located in Bath, Maine. Ten years ago, BIW had almost 12,000 employees and was actively engaged constructing ships in two overlapping US Navy surface combatant programs – CG-47 AEGIS Cruisers and DDG-51 AEGIS destroyers. Additional work involved Coast Guard cutter modernization and Navy ship repair work including the battle damage repair of USS Samuel B. Roberts. Today, the company remains Maine’s largest private employer at an employment level of 7,000.

Since General Dynamics acquired BIW in 1995, substantial reengineering of all aspects of the business has been underway. Reengineering and process improvement remain a continuous focus at BIW. Major overhead reductions have been made which will save the Navy and taxpayers hundreds of millions of dollars on current and future contracts. General Dynamics has invested over \$250M at Bath to construct a state of the art world-class shipbuilding Land Level Transfer Facility. This facility will be officially dedicated on May 5<sup>th</sup>, the same day the keel of DDG-90, named for your respected colleague the late Senator John Chafee, will be laid down on it.

The facility modernization at BIW will provide the yard’s skilled production workforce a better, more efficient work environment. It will permit them to erect and outfit larger sized modular ship units earlier in the construction process and reduce cycle time. BIW will be able to launch ships at a higher level of completion, compress schedule duration at key stages and reduce or eliminate a number of related costs. The US Navy and taxpayer stand to share the benefits of this major investment as a result of reduced costs for US Navy ships.

Significant success has been achieved in the current DDG-51 program with the design and construction of the first two Flight 2A upgrade ARLEIGH BURKE Destroyers. Both shipbuilders, BIW and Litton Ingalls, and the Navy have worked in a 3-D CAD environment to accommodate system and design changes affecting 60% of the ship’s overall design and 80% of its drawings. This major effort was accomplished on schedule and on budget. The first two ships, DDG-79 (Oscar Austin) and DDG-80 (Roosevelt), one from each builder, have performed very well on sea trials.

The shipbuilding industry is excited by the Navy's forward leaning acquisition strategy on the DD-21 program. It represents the next important step forward in Acquisition Reform. Its innovative acquisition approach and aggressive performance and cost goals are leveraging the very best competitive resources available. This competitiveness is evident in the Blue and Gold Teams ship designs and total systems solutions. By providing the industry demanding performance requirements and challenging cost goals, and allowing us to make the cost-performance tradeoffs, we are confident that DD-21 will deliver to the Surface Navy next-generation technology and warfighting capability, at significantly reduced Total Ownership Costs.

The DD-21 design is more mature at its current stage than any previous surface ship program at similar milestones. DD-21 is being developed in a fully integrated environment encompassing the total ship's systems. This will not only reduce potential errors in design products when ship construction begins, but also provide a superbly capable, operationally ready warship from Day One.

The DD-21 design and construction approach builds on the successes of the VIRGINIA Class submarine program. Detailed design products will be mature for production and issued months before construction will begin. One particular early focus in the DD-21 program is to ensure that whichever design solution is chosen by the Navy at downselect, the total ship system design can and will be efficiently producible at both DD-21 shipbuilders. Unprecedented initiatives have been made to ensure this result, and will pay significant dividends in terms of production efficiency and reduced cost. DD-21, like VIRGINIA, will be constructed in two shipyards based on a common design and a shared data environment.

#### **Critical Need for More Effective Bridge between DDG-51 and DD-21 Programs**

A matter of major concern has been the procurement rate of DDG-51 Class ships as the Navy transitions to DD-21. DDG 51 production rate has declined from five ships a year to four ships a year to three ships a year. It is our greatest concern that the FY01 budget projects a procurement rate of only two DDGs per year for the next three fiscal years. At such a low level of procurement, ship unit costs will increase and cause significant erosion of surface combatant skills at both shipyards. This is a specialized industrial base facing a period of great uncertainty and declining surface combatant workload as it transitions to the next generation surface combatant program,

DD21. An industrial base erosion and subsequent reconstitution will increase the costs of remaining DDG-51 ships and add to the costs and risks to the start up of the DD-21 construction program.

Based on the FY01 SCN budget and projected FY02 plan, only 7 destroyers are planned to be procured from FY02 through FY06 - 6 DDGs and a single DD-21. That equates to a procurement rate of less than 1.5 ships per year for the next five years compared to today's procurement rate of 3 ships per year of which each DDG builder receives the equivalent of 1.5 ships per year. This two ship per year level does not support surface combatant force level requirements or sustain the industrial base. The Navy's shipbuilding funding challenge during the FY02 – FY06 time frame has been exacerbated by the funding spikes of nuclear aircraft carrier refueling and construction in FY02, FY05 and FY06, leaving little room for required surface combatant funding.

The procurement rate for surface combatants is not expected to return to 3 ships per year until FY07 -- after a five-year period of procuring less than a one-and-a-half ships per year. The operational and management challenge of ramping up production should not be underestimated. DD-21's ultimate success will depend heavily on whether actions are taken now to sustain this industrial base sector at a reasonable rate of procurement to support affordable unit costs and deliver the ships the Navy needs.

The need to establish a more effective shipbuilding transition between DDG-51 and DD-21 programs must be addressed this year. This means sustaining current surface combatant procurement at 3 ships per year under a follow-on multi-year contract beginning in FY02. Multi-year contracting for surface combatants has seen proven results. The current DDG-51 multi-year contract saved the Navy \$1.4B and allowed them to buy 12 ships for the price of 11.

Non-DDG-51 shipbuilding work, such as the LPD-17 program, can help from an overall shipyard volume and employment perspective, but sustained surface combatant construction and related engineering work is the only way to ensure that the surface combatant industrial base is adequately maintained and future combatants are affordable.

## **Auxiliaries**

National Steel and Shipbuilding Company, NASSCO, a subsidiary of General Dynamics based in San Diego, California, builds commercial and Navy auxiliary ships.

NASSCO is also a major provider of ship repair services to the Navy's Pacific fleet in San Diego. NASSCO is the only major full service shipyard remaining on the West Coast. General Dynamics has approved an \$80 million investment in facilities at NASSCO which will further improve cost efficiency and expand capacity in the wide beam (post-Panamax) shipbuilding market, such as Alaskan oil tankers. These new facilities will include increasing crane lift capacity to make heavier lifts and reduce ship erection cycle times on future programs. The investments in wide beam capacity include improvements in steel processing, assembly, and outfitting.

At its peak in the early 1980's, NASSCO employed 7800 people. Today it employs about 3500. Currently, NASSCO is completing a program to build a series of 8 Large Medium Speed RO/ROs (LMSRs) for the Navy which will serve the Army's sealift needs, both for prepositioning and CONUS based fast sealift missions. NASSCO builds commercial ships for the U.S. coastal market (Jones Act). Currently, NASSCO has commercial contracts to build two RO/ROs and three crude oil tankers. The 7<sup>th</sup> LMSR, USNS Pomeroy, was recently launched and will be completed ahead of schedule and under budget just like the other 6 LMSRs already completed by NASSCO. The 8<sup>th</sup> and last ship of this series is progressing in a similar manner.

NASSCO has made tremendous strides during the last 10 years through process improvements in their shipyard, and is setting new standards in the US for quality, cost, and schedule performance. This standard has been recognized by the commercial customer.

Key factors that will contribute to NASSCO's continued success are: the stability of the design and funding for the T-AKE program, a commercial product orientation, and ship maintenance opportunities.

Most Navy auxiliary ships, like commercial vessels, are being built today to commercial standards governed by the American Bureau of Shipping (ABS). NASSCO's commercial product orientation has allowed the yard to benchmark itself against international shipbuilders that build the majority of the world's commercial ships.

The U.S. Navy and U.S. taxpayers benefit from the commercial work at NASSCO and other U.S. shipyards. Commercial work helps lower costs on Navy contracts through overhead absorption. More importantly, however, commercial work allows U.S. shipyards to keep focused on implementing the shipbuilding processes used by the best commercial shipbuilders in the world.

### **Stability is critical to NASSCO**

NASSCO is dependent on both military and commercial work to maintain the critical skills necessary to continue design and construction of US naval auxiliaries. With the strategic Sealift program almost complete, the 12-ship T-AKE program, the Navy's new class of auxiliary dry cargo ships, is an important element to the future stability and maintenance of critical skills at NASSCO.

The LMSR program was a high military priority after the Gulf War. Funding to increase our sealift capability enjoyed strong Congressional support and resulted in a predictable funding stream for the LMSRs. NASSCO, however, was awarded a contract to build a lead ship with a series of options, subject to future funding. While NASSCO and their suppliers focused on designing a ship for maximum producibility, the uncertainty of future funding limited the ability to order materials economically or to make facility investments that would help lower costs. Fortunately, the LMSR program was funded as planned and NASSCO has successfully delivered six ships ahead of schedule and under budget. The final two ships are following the same trend. However, if the Navy could have awarded NASSCO an initial contract for all 8 ships and allowed them to be built to the yard's most efficient schedule, the savings in schedule and cost could have been further optimized.

The T-AKE program is the only near term opportunity for Navy auxiliary ship design and construction. The program is being bid based on shipyard-developed designs and the Navy plans on minimum changes. These factors should help to ensure a stable design and allow for series production. It is noted, however, that program funding stability, like on the LMSR program, is, once again, a major concern. NASSCO hopes to continue their LMSR success story on the T-AKE program. If funding stability could be eliminated as a risk for the T-AKE program, NASSCO could truly focus on producing this series of ships at the lowest cost. The optimum approach to realize cost savings on this program would be to quickly make the award of the first two ships that are

already funded and then to find a funding approach which reduces or eliminates the risk of future funding after the design has been validated.

NASSCO success in winning new commercial shipbuilding contracts requires continued Congressional support for the Jones Act. NASSCO will need a combination of Navy and commercial work to maintain its shipbuilding capabilities.

Finally, the Navy needs stable funding for ship repair. Ship repair facilities such as NASSCO cannot plan to perform repair availabilities efficiently when the lack of funding either forces a reduction in the scope of work on a given availability or results in the total cancellation of an availability on short notice.

## **Submarines**

The nuclear submarine program was a first major defense program impacted by the end of the Cold War. Thirty-six submarines were procured in the 1980's, only 7 were procured in the 1990's. The Seawolf submarine program, forecasted initially to be 30 ships, was cut to three.

Based on the corporate vision to be affordable at low rate production, Electric Boat in 1993 undertook a complete reengineering of its business. This required us to redefine and resize our facilities, business processes, and organization. Key objectives were to be properly sized to demand, utilizing "best practices" for all processes and procedures, and incorporating a culture of world class performance. As a result, Electric Boat has led the industry in shedding excess production capacity, reducing overhead and infrastructure costs, and developing tools and methods to preserve critical skills and capabilities during the current period of low rate production. These actions have resulted in cost savings of over \$1.3 billion with over 90% of those savings accruing to the government.

We also recognized that in order for the submarine industry to successfully meet the challenge presented by this major market change, the supplier base must be actively engaged in the reengineering process. Consequently, through an "Extended Enterprise" approach, we challenged our supplier base to reengineer their facilities for "Affordable Low Rate Production."

Prior to designing VIRGINIA, Electric Boat initiated a comprehensive review of submarine design and construction process with the goal of reducing nuclear submarine acquisition and life-cycle costs. Design and construction methods in use by a broad spectrum of US and international industries – aircraft, automotive, power-plant equipment, nuclear reactor plant equipment, and shipbuilding – were evaluated to improve the overall understanding of the design and build process, and eliminate inefficient work practices. The VIRGINIA Class design/build process has produced ship construction drawings that are significantly more accurate, and more producible, than any previous submarine program. The fidelity of the design product has contributed to 92% fewer changes (as identified by the trades during construction) on the lead VIRGINIA Class ship compared to the lead Seawolf ship.

In order to meet the additional affordability challenges presented by a constrained SCN budget, the VIRGINIA Class teaming approach was developed to permit the creation of an affordable and capable attack submarine fleet. Electric Boat and Newport News Shipbuilding, traditionally strong competitors, entered into a revolutionary arrangement that provides the most affordable acquisition approach for the VIRGINIA Class program and maintains two nuclear capable shipyards. Enabled by a new design/build process, and advanced modular construction techniques, each shipyard is constructing pre-assigned modules for each ship, and alternating final outfitting, assembly, test and delivery. This teaming arrangement is designed to produce an improved learning curve and substantially reduce construction costs for the entire production run. Cost savings by this team arrangement and the design/build approach have amounted to \$700 million.

Electric Boat is also pursuing additional means to provide savings to the Navy and utilize the Groton shipyard workforce. Further affordability and resource utilization initiatives are being realized with the submarine Regional Maintenance partnership with Electric Boat and the Navy at the New London Submarine Base and Portsmouth Naval Shipyard.

#### **Multi-year contracting and acceleration of 2 submarines per year**

Increasing ship procurement rates to two ships per year is absolutely essential to achieving the Navy's force level objectives and achieving the efficient production rate so essential to a healthy industrial base. This plan will lead to

increased efficiency and enable the industry to provide more ships for a given unit cost.

In the VIRGINIA class submarine program, the Navy utilized a “Block Buy” construction contract for the first four ships. This acquisition strategy, coupled with the innovative teaming approach to construction developed by Electric Boat and Newport News, was key to enabling the Navy to afford these four ships, and it provided stability to the industrial base during an extended period of low rate submarine production. To date, the benefits of this Block Buy contract have been validated with both manhour and schedule performance tracking to plan.

Contract flexibility and commitment, in the form of a follow-on Multi-Year procurement, with economic order quantity authorization, will help support attack submarine force levels and ensure industrial base stability for both shipbuilders and key suppliers – stability that is key to affordability.

All major facilities at both Newport News and Electric Boat are in place to support higher submarine production rates of at least 2 per year at each yard - construction of the additional submarines could begin as early as FY04. To support this construction level, however, requires authorization of Advance Procurement for long lead material in the FY02 budget.

## **Conclusion**

In summary, the key attributes needed by industry to give the Navy and the country a cost efficient and reliable ship construction base is predictability and stability - both in Navy program plans and in the funding stream available. Additionally, higher production rates will bring industry to a more efficient level of production.

It is as simple, and as complex, as knowing whether we are recapitalizing for a 300 ship Navy or a 220 ship Navy – this is the crucial metric for our future. We have done well adjusting to low rate production; we now must know what the future holds. We are currently building to a 220 ship Navy. If this trend continues, additional downsizing will be required.

If the Navy is to return to build rates required to maintain 300 ships, multi-year and block-buy acquisitions strategies are critical. These smart

acquisition strategies must be coupled with innovative funding approaches that will stabilize the SCN account and avoid the current disruptive funding spikes. Toward that end, I would recommend that Congress and the Administration budget and build 3 DDG 51's per year under a follow-on multi-year contract for FY02 and subsequent years; accelerate the VIRGINIA Class submarine to two ships a year under a multi-year or block-buy program as soon as reasonably feasible; and adopt a reasonable delivery schedule for the T-AKE with the contract option of awarding a multi-year contract within that program at the appropriate time.

Procurement predictability and production rate stability for these programs, along with steady funding for carrier construction and appropriate nuclear refueling can help mitigate the impact of funding uncertainty in the SCN account. This maximizes our current investment in today's programs by building at more economic rates while applying engineering best practices and lessons learned as we evolve to the next generation class of ship.

We need to continue to build on the successes from our recent history. New programs, such as DD-21 have built on the lessons learned from VIRGINIA:

- Invest R&D funding up-front to buy down technical risk
- Implement a seamless design/build approach with early design funding
- Ensure design product fidelity and maturity to maximize construction efficiency with early design funding
- Push the envelope further by invoking aggressive cost and manning goals

Thank you Mr. Chairman and members of the committee for providing us this forum to discuss the critical issues facing us in the shipbuilding industry. I look forward to your questions and comments.