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SUBMARINE FORCE STRUCTURE AND ACQUISITION POLICY

HEARING

BEFORE THE

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

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SUBMARINE FORCE STRUCTURE AND ACQUISITION POLICY

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE,
Washington, DC, Thursday, March 8, 2007.

The subcommittee met, pursuant to call, at 3 p.m., in room 2212, Rayburn House Office Building, Hon. Gene Taylor (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. GENE TAYLOR, A REPRESENTATIVE FROM MISSISSIPPI, CHAIRMAN, SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

Mr. TAYLOR. The committee will come to order.

We are very fortunate today to be joined by Vice Admiral John Donnelly, Commander of Submarine Forces; Commander Carl Mauney, Director of the Submarine Warfare Division; Rear Admiral William Hilarides, United States Navy, Program Executive Officer of Submarines; and Ms. Allison Stiller, Deputy Assistant Secretary of the Navy for Ship Programs.

This committee over the past few years has expressed concerns that our Nation has not kept pace with our submarine requests, with our submarine building to meet current and future needs. The committee hopes to address that this year and in the years to come. We note that there have been a number of submarine studies that show the submarine force shrinking in future years to what I think most of us would agree is an unacceptable level, but we are laymen. We come from all parts of the country, and we are not experts in the field. You people are. So we would welcome your testimony today. Hopefully, all of our concerns are your concerns and we can find common ground, and where we can do some good for our Navy, we hope to do so. We are honored to have you here.

I now turn to my ranking member, the gentleman from Maryland, Mr. Bartlett.

STATEMENT OF HON. ROSCOE G. BARTLETT, A REPRESENTATIVE FROM MARYLAND, RANKING MEMBER, SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

Mr. BARTLETT. Mr. Chairman, before I forget, I would like to ask unanimous consent to place in the record a statement from our colleague, Jo Ann Davis, who cannot be here today.

Mr. TAYLOR. Without objection.

[The prepared statement of Mrs. Davis can be found in the Appendix on page 56.]

Mr. BARTLETT. Thank you.

In the interest of time let me submit my opening statement for the record, too, so we can get right to the testimony.

[The prepared statement of Mr. Bartlett can be found in the Appendix on page 53.]

Mr. TAYLOR. I thank you very much.

The Chair now recognizes the gentleman from Connecticut, Mr. Courtney, for an opening statement.

STATEMENT OF HON. JOSEPH D. COURTNEY, A REPRESENTATIVE FROM CONNECTICUT

Mr. COURTNEY. Thank you, Mr. Chairman.

With that presentation, I am going to keep my remarks very brief to get us moving along here, but I want to thank you and the staff of the subcommittee and the ranking member for responding to my requests for this hearing. Myself and Congressman Langevin, and I know members from Virginia, Mrs. Davis and Mr. Forbes, come from a part of the country where the industrial base exists for building nuclear submarines, and I think we have got a great story to tell about the progress that has been made over the last few years in terms of the production of *Virginia*-class submarines. I personally saw the latest submarine, the USS *Hawaii*, which was delivered ahead of schedule and, according to Admiral Haney of the Groton sub base, was in almost perfect condition, which, again, is the result of a lot of hard work that both the Navy and both companies that produce nuclear submarines have put in over the last few years to make the production more efficient and to reassure the taxpayers of that as we consider this decision that they are going to have a program, a shipbuilding program, that they can have confidence in, and again, as you have said on many occasions, the decision we are making here this year is really not about the sub fleet today; it is about the sub fleet 10 years and 15 and 20 years down the road, and I am looking forward to the testimony to help us make good decisions as we move forward in this session of Congress.

[The prepared statement of Mr. Courtney can be found in the Appendix on page 143.]

Mr. TAYLOR. Thank you.

I would ask the witnesses—there are a couple of things that I would hope you would address, and to you, it is going to sound almost simplistic, but for the American people who are going to pay for these submarines, I would hope that you would walk them through the time it takes from the day that Congress authorizes a submarine to the time that you actually purchase the power plant for the submarine before that submarine becomes an operational part of your fleet. I would hope you would walk us through the decline in the submarine production and the decline in the size of the fleet, at what point the Nation would bottom out, what kind of concerns you have about that timeline. I am told it is somewhere around 2020 when we would reach an unacceptable number of submarines, but also how long it would take us to respond to that if we do not start responding right now, and even if we do respond right now, if we were to put an additional submarine in the budget this year and next year, how soon we can start turning this around, and also the need to maintain the industrial base. I think

it is fairly obvious to everyone at this podium that there are not too many other things that a submarine designer can do in his off time to make a living. He is either designing submarines and building submarines or he is going on and finding another job, but he is not going to be dropping back and forth between the two.

So, with that in mind, Mr. Forbes, do you have an opening statement?

Mr. FORBES. No.

Mr. TAYLOR. Ms. Bordallo, do you have an opening statement?

Ms. BORDALLO. I do not have an opening statement, but I do have some questions.

Mr. TAYLOR. Great.

With that in mind, who would prefer to begin?

Admiral DONNELLY. I will begin, sir.

Mr. TAYLOR. Okay. Vice Admiral Donnelly, thank you.

Vice Admiral, because the committee has a five-minute rule, this subcommittee does not, so within the bounds of fairness, if you could keep it to ten minutes or less, we would certainly welcome it if you can get your point across in that time.

Admiral DONNELLY. Yes, sir. Certainly, I can do that, sir. Chairman Taylor and Representative Bartlett——

Mr. TAYLOR. Admiral, would you hold it for one second? The other gentleman from Connecticut is going to join us—I am sorry—Rhode Island, somewhere a long ways from the shores of the Gulf of Mexico.

I would ask unanimous consent that the gentleman from Rhode Island would join the subcommittee for the day without objection.

STATEMENT OF VICE ADM. JOHN J. DONNELLY, COMMANDER NAVAL SUBMARINE FORCES, U.S. NAVY; REAR ADM. CARL V. MAUNEY, DIRECTOR OF SUBMARINE WARFARE, U.S. NAVY; REAR ADM. WILLIAM H. HILARIDES, PROGRAM EXECUTIVE OFFICER, SUBMARINES, U.S. NAVY; AND ALLISON STILLER, DEPUTY ASSISTANT SECRETARY OF THE NAVY (SHIP PROGRAMS), U.S. NAVY

STATEMENT OF VICE ADM. JOHN J. DONNELLY

Admiral DONNELLY. Chairman Taylor, Representative Bartlett, distinguished members of the Subcommittee for Seapower and Expeditionary Forces, Rear Admiral Van Mauney and I thank you for your continued support for our men and women in uniform and for the opportunity to appear before you today. I am honored to join Deputy Assistant Secretary Stiller, Rear Admiral Mauney, and Rear Admiral Hilarides, and I thank you for the opportunity to represent the men and women of your Navy and of your submarine force.

As you have requested today, we will discuss the Navy's required attack submarine force level, how we developed it and the impacts of altering the Navy's future shipbuilding plan. We will also address the submarine force's current operational tempo and fleet requirements and relate them to the future force structure. Our remarks will be unclassified. However, we are prepared to provide classified details to the committee, if desired.

First, let me say something about the cornerstone of our force, our people. I have always been proud to be a submariner. My father was a submariner. My son is a submariner, and in my first month as a submarine force commander, I have been repeatedly reminded of the caliber and of the quality of my fellow submarine sailors. They are talented and motivated. They have chosen to serve their Nation on the world's finest submarines.

As an example, I recently visited sailors of the USS *Hampton* just before she departed Norfolk on her way to the Pacific for deployment. They were well-trained, enthusiastic and eager to go do what they have been trained to do. At the end of her deployment, *Hampton* will pull into her new home at the Port of San Diego, California as part of the Quadrennial Defense Review.

Moving back to the topic of operations, today's submariners make up a small portion of our Navy, approximately seven percent of our personnel who operate 24 percent of our ships. They are out in front, around the globe every day, providing our national security. Even while serving in a capacity outside the Undersea Enterprise, such as on Joint Staffs or in Iraq and in Afghanistan, these sailors use their unique talents and submarine force experiences to make valuable contributions to joint operations and the Nation's defense.

Currently, our 14 nuclear powered ballistic missile submarines remain ready and vigilant, submerged in a secure and survivable posture, able to rapidly respond to national tasking. We have also brought on line the nuclear powered guided missile submarine with the first one, USS *Ohio*, deploying later this year.

Now let me turn from current operations to our future force structure. The Chief of Naval Operations has developed a shipbuilding plan that builds a Navy the Nation needs—a Navy that is both affordable and that meets with acceptable risk the future national security requirements outlined in the 2006 Quadrennial Defense Review. Force structure requirements were developed and validated through detailed joint campaign and mission level analysis and optimized through innovative sourcing initiatives.

In 2005, the Chief of Naval Operations (CNO) directed an effort to examine existing force structure studies, including the 1999 Chairman of the Joint Chiefs of Staff Attack Submarine Study and the 2005 Decision Memorandum III Study as well as a number of other submarine studies, to support his decisions regarding the right SSN force structure mix with the Navy's long-term shipbuilding plan. To maximize return on investment, the focus was for a Navy that was able to fight the Global War on Terror, execute maritime security operations and win in any major combat operation (MCO). The SSN force structure was examined using a capabilities-based assessment, which included peacetime demand and deterrents and warfighting requirements. The analysis found that 48 was the minimum number of SSNs that presented an acceptable risk and still allowed for an affordable plan for long-range shipbuilding.

There will be some increased risk during the 2020 to 2034 time frame when the shipbuilding plan results in an SSN force structure below 48 to a minimum of 40 SSNs, and the Navy is looking to mitigate this shortfall by fully funding cost reduction measures and fully implementing cost reduction measures for the *Virginia*-class

SSN, which met this week. It is anticipated that the shipbuilders will also reduce construction time, thereby accelerating ships to the front lines.

Another option, *Los Angeles*-class and *Seawolf*-class submarines. Together, these initiatives could mitigate the current 14-year requirement gap to as few as six years.

Finally, let me emphasize how important it is to sustain the submarine force of 48 SSNs, 14 SSBNs and 4 SSGNs. That is the right size and shape for our Navy and for our Nation, and to sustain that force we need an effective and stable shipbuilding plan presented by the Navy, including that program that builds two *Virginia*-class submarines per year starting in 2012.

I am certain that our submarines will continue to be in high demand, and I assure you that they will be forward-deployed and ready for any task. Day in and day out, your submariners gather intelligence. They shape the environment, and they help avert the next conflict. Yet, they stand ready to act quickly and decisively if needed.

Again, on behalf of your sailors, Navy civilians and families of the submarine force, I thank you for the opportunity to appear before you, and I stand ready to answer your questions.

[The joint prepared statement of Admiral Donnelly and Admiral Mauney can be found in the Appendix on page 65.]

Mr. TAYLOR. Thank you, Admiral.

Secretary Stiller.

STATEMENT OF ALLISON STILLER

Secretary STILLER. Mr. Chairman, Congressman Bartlett, members of the subcommittee, it is a privilege for Admiral Hilarides and me to appear before you to discuss the Navy submarine industrial base issues. I request that our written testimony be submitted for the record.

Mr. TAYLOR. Without objection.

Secretary STILLER. We thank you for this opportunity to discuss the acquisition side of the submarine business, and specifically, we will address the submarine construction and design industrial base, the Navy's plan to reduce the average per unit cost of *Virginia*-class to $2 billion, the fiscal year 2005 baseline, by fiscal year 2012, and the procurement strategies to increase the build rate of submarines.

The submarine industrial base is composed of two major components, the construction base and the design base. As you know, the Navy is currently procuring one *Virginia*-class nuclear attack submarine per year. Nine of the *Virginia*-class submarines are under contract with three ships delivered and another six under construction. The tenth will start construction in early fiscal year 2008. The Navy's 2013 shipbuilding plan calls for procuring two *Virginia*-class submarines per year starting in fiscal year 2012. The submarine construction base will remain stable until then, when we will see an increase due to the two submarines per year.

Though the submarine construction base is at a sustained and constant level, this does not imply that the submarine construction base is at its optimal level. Instead, while far from robust, it is at

a sustaining and constant level, two attributes that could not have been said ten years ago.

The submarine design industrial base has more challenges. The Navy has recognized the potential impact of losing a national submarine design capability and is taking active steps to mitigate this risk. We commissioned RAND to study this unique portion of the industrial base. They evaluated strategies for managing submarine design resources, including shipyards, critical component suppliers and the Navy itself. They concluded that extending the period of the design of the next submarine class would alleviate the concern over the erosion of critical design skills.

RAND recommended that the Navy consider accelerating the next submarine design to mitigate excess cost delays and risks that a design gap would cause. They also said sustaining workers in excess of current demand was found to be the least expensive. The shipyards would be able to more efficiently accomplish the next design by retaining a minimum range of 800 to 1,050 designers and engineers to perform design work during the design gap. The shipyards are addressing specifics of the critical skills problem, so RAND did not repeat that effort. However, RAND described the recommended sustained workforces by general skill category. The Navy has elected to preserve the critical engineering skills in two ways, first by investing approximately $300 million in Research, Development, Training & Evaluation (RDT&E) across the Five Year Defense Plan (FYDP) and cost design.

Next, I would like to discuss the *Virginia*-class cost reduction plans. Cost reductions will be achieved by implementing a three-part approach. The first part will be realized by ordering two *Virginia*-class submarines a year starting in fiscal year 2012 as part of the seven ships multi-year procurement contract with Economic Order Quantity. This effort will reduce the per-unit cost by $200 million in fiscal year 2005 dollars.

The second part of the cost reduction initiatives estimated to save an additional $100 million per boat include realigning work between the two shipbuilders to increase production efficiencies, full utilization of the capital expenditure initiative, reducing the construction span from seven to five years, and modifying how we install and test nonpropulsion electronic systems.

The third part of the initiative is designed for cost reduction and is intended to lower costs by an additional $100 million per boat. These redesign efforts will not impact the ship's capabilities and will include simplifying systems, using lower cost components and implementing the use of technologies to improve construction techniques. Together, these three initiatives will help us reach our goal of $2 billion a copy in fiscal year 2012.

Finally, I will discuss potential procurement strategies to increase the build rate of submarines. One option for increasing the build rate of submarines is to fully fund nine SSNs, starting at two a year in fiscal year 2010. This would require the next contract to cover nine instead of seven hulls and require an additional $5.1 billion in FCN funding in the FYDP. We also considered alternative financing strategies spanning three years that utilize either incremental funding or advance appropriations. For this approach, nine SSNs procured between fiscal years 2009 and 2013 would still re-

quire an additional $1.7 billion of shipbuilding conversion (SCN) funding within the FYDP and an additional $3.4 billion beyond the FYDP. Any alternative funding strategy that requires additional SCN funding without top-line relief would cause significant deviation from the Navy's 313 shipbuilding plan, significantly increasing the risk of destabilizing the plan and negatively impacting other shipbuilding programs and the associated industrial facilities and suppliers.

In summary, the Navy and industry are working together to reduce the cost and deliver these critical platforms. We have established a solid foundation to meet our goal of two ships for $4 billion in fiscal year 2012. We have addressed the RAND conclusions in the near and far term, and we have concluded that alternative financing strategies cause significant downstream builds which negatively affect other aspects of the shipbuilding account.

Mr. Chairman, we would like to thank you for this opportunity to discuss the Navy's submarine industrial base and look forward to answering your questions.

[The joint prepared statement of Secretary Stiller and Admiral Hilarides can be found in the Appendix on page 58.]

Mr. TAYLOR. Thank you, Ms. Stiller.

Any additional opening statements?

Admiral HILARIDES. No, sir.

Admiral MAUNEY. No, sir.

Mr. TAYLOR. Secretary Stiller, I hear you talking of the advantages of multi-year procurement, the advantages of buying two a year. What I did not hear you say is, if all of these things make sense to do in 2009, 2010, why don't they make sense to do now. Since we know we are going to have a shortfall of submarines in the future, if we know that even if we start now we still have a shortfall but we can lessen that shortfall, why doesn't the Administration that has grown the defense budget by approximately $150 billion since they took office request those submarines now?

Secretary STILLER. As I mentioned, there is the three-prong approach. The multi-year is part of it, and we have a multi-year right now for the block, the first block, and what we are talking about is requesting authority for the next block of ships that we would also like to buy in a multi-year. We do see that providing savings, and that is about $200 million per boat.

The other part of it, to get to the $2 billion a year, requires the investment in R&D dollars that we have talked about. That is $300 million that goes through the FYDP. In order to reduce those, simplify the systems and to introduce the cost reduction initiatives, it is going to take us until we get to 2012 before we can realize that additional $200 million per boat in savings, and so that is why the Department is focused on fiscal year 2012 to getting to $2 billion a year.

Mr. TAYLOR. You keep speaking of 2012. Now, is that to order the ship, to fund the ship or to have the ship delivered?

Secretary STILLER. It is to order and fund the ship. The ships will go——

Mr. TAYLOR. So, by your admission, it is going to take five to seven years after that?

Secretary STILLER. Yes, sir. One of the initiatives is to reduce the construction cycle time from seven to five years. Yes, sir.

Mr. TAYLOR. I think we have an opportunity because of the leadership of Chairman Skelton, because of the leadership of Chairman Murtha to begin that process this year and the cooperation of some other committee chairmen who are working with us to move some funds around. I wish the Administration had been a bit more aggressive on this, but that is neither here nor there. The opportunity is there. I believe the need is there. So my question for you is:

It is my understanding that the longest lead time for procurements will be for the nuclear propulsion plant.

Secretary STILLER. Yes, sir.

Mr. TAYLOR. What type of funding would you need should this committee, should the House, should the Senate see fit to get this program going sooner rather than later? What kind of funding would you need from that vendor to initiate this process?

Secretary STILLER. Typically in submarine procurement, we have two years of advance procurement that comes before you buy the submarine. So, realistically, looking at this, you really could not start construction on the submarine until fiscal year 2010 because you do require two years of advance procurement money. Advance procurement money in the first year is usually on the order of about $400 million. I will defer to Admiral Hilarides in case I have missed something there.

Admiral HILARIDES. No. That is correct.

Mr. TAYLOR. I would hope what I have just told you is not a surprise to you.

Secretary STILLER. No, sir.

Mr. TAYLOR. I would also hope that given what I think is the move again of those important players to see this happen that you would begin initial conversations with those suppliers so that we could know exactly what that dollar amount is and so that, since there is a need that everyone agrees to, that we can start filling that need now rather than later, but we will need your help and guidance on that.

Secretary STILLER. Yes, sir.

Mr. TAYLOR. Is that a reasonable request?

Secretary STILLER. Yes, sir, and as I mentioned in my opening statement, the multi-year procurement authority that we have sent over as a legislative proposal covers seven boats. If there are additional boats that would need to be added, that has to be included in the multi-year authority as well.

Mr. TAYLOR. Is there any hope of additional savings with those additional boats? Has anyone in your office calculated that scenario?

Secretary STILLER. Well, for the fiscal year 2010 boat, we know we will not be able to achieve $2 billion a year because we will not have invested the time and the resources that we need to get to the $2 billion goal. So a fiscal year 2010 submarine—as I said, if we look at that alternative, it causes us to add $5.1 billion to the FYDP that we do not have, and if we do that, it is going to be part of other critical shipbuilding programs that are in the account. As for the Economic Order Quantity, I will defer to Admiral Hilarides.

Admiral HILARIDES. Sir, the two additional boats would cause more learning. Again, with every boat you build the shipbuilders learn. The costs come down as a result of that learning. So there would be a benefit to the follow-on ships. It is not exactly calculable, but in the learning curves that are used to project our shipbuilding costs, that is part of it. Economic Order Quantity—buying nine ship sets worth, over seven ship sets worth does lower the costs in basic economic principles. Yes, it would lower the cost in things that you bought, that the Economic Order Quantity buys, and the number of years from when you buy it in the Economic Order Quantity to when you use it determines the total amount of savings that accrues to Economic Order Quantity. So, since they are closer to 2009, there is less than there would be for the 2011 and 2012 ships, but there is a savings that would accrue in that. Yes, sir.

Mr. TAYLOR. Admiral, I want to give you the opportunity to play the devil's advocate because I would rather hear it from you than from anybody else, but I think we did have, to the best of my recollection, the Secretary of the Navy on record last week saying that if additional funds were made available that would be one of his priorities.

Is there anything in your overall pipeline that would keep this from happening? For example, do you have enough sailors to man it? Are there enough young people processing through the school of Charleston to man it? Is there anything that this committee has missed that would tell us that this is not a good idea?

Admiral HILARIDES. Sir, we have not gone all the way into the vendor base and looked at every supplier to say, "In this year, could that supplier ramp up to two per year?" the CNO shipbuilding plan has brought stability to shipbuilding, and we have continued to stand by that plan because that stability is what really lets the shipbuilders make the right investments and get the things lined up for the most efficient production. In that vendor base, I know there are some pretty fragile suppliers. Generally, giving them additional business earlier is better. I do not know of any of those vendors that would have a problem, but I have not done the analysis to tell you that they would all be able to provide their equipment.

Mr. TAYLOR. Would anyone else on the panel like to comment on that?

Admiral DONNELLY. Sir, we have 52 SSNs today, and if you were to authorize additional submarines in 2010 and 2011 which would not be delivered until 2015 and 2016, manning would not be an issue.

Mr. TAYLOR. What if they were authorized in 2008?

Admiral DONNELLY. Well, I mean the construction would begin in 2010. We have enough people or we could adjust our recruiting and our personnel programs to accommodate it.

Mr. TAYLOR. And are you in agreement?

Admiral MAUNEY. I know of no other consideration that we have looked at to limit this particular approach.

Mr. TAYLOR. The Chair recognizes the ranking member, the gentleman from Maryland.

Mr. BARTLETT. Thank you very much.

One of the biggest challenges that we face in the designing and the building of submarines is maintaining our industrial design base. Clearly, if, as our chairman and I both wish, we could move up the calendar our commitment to two submarines a year, that makes it easier, but absent that, what is your plan to make sure that we have designers available in the future to design the submarines, because we are not doing that now?

Admiral HILARIDES. Yes, sir.

The two per year really affects mostly the construction base. It does not do a lot for the design base. What the RAND study told us is that, as we come off the designs for *Virginia* and the SSGN that, as the designers drop below a critical minimum—and the RAND study does make an attempt to define that critical minimum—it says that we should do something to sustain those designers. Again, construction will not do it. It has got to be a design. By the CNO shipbuilding plan, we logically would start the next design in about 2012, and that provides a couple of years of gap between when the designers would go away and when they would have to come back up for that.

The RAND study also did a series of sort of "what if" drills about what we might do. We are assessing those options and the other options that are in front of us, and we will be coming forward with a plan that ensures we keep those critical designers on the books so that they are ready to design that next submarine for the Nation, sir.

Mr. BARTLETT. How do we do that? If we do not have a submarine for them to design, how do we keep them on the books?

Admiral HILARIDES. The RAND study specifically recommended accelerating the design of the next SSBN and designing it in a different way than we have designed ships before—instead of a dramatic ramp-up just before you start construction, doing it in a more measured fashion over a longer period of time—and we are assessing that option. We just have not had a chance to fully vet that to see if that makes sense, sir.

Mr. BARTLETT. Do our authorizations and appropriations bills need to reflect that or do you have the option of doing that within the gross amount of money we give you?

Admiral HILARIDES. Sir, for now, we have the resources required. This issue really comes up in 2010, in fiscal year 2010, and so the follow-on budgets, I would suspect, would reflect the results of our study of those plans and of our putting in a plan that will sustain that base.

Mr. BARTLETT. But if we moved up the procurement two years for two submarines a year, then the problem goes away?

Admiral HILARIDES. No, sir. Again, that is not principally a design effort; it is a construction effort. The design effort is pretty much unrelated to the *Virginia*-class. The *Virginia* cost-reduction efforts do help. That is, we are hiring designers to figure out how to change the design such that it can be produced more effectively, but when that work completes, there will still be a gap between then and when we logically would start the next submarine design.

Mr. BARTLETT. But if we are building these more quickly, wouldn't we get to the next ones quicker?

Admiral HILARIDES. Sir, the requirement for the follow-on SSBN is determined by the end of life of the SSBNs that are currently in the fleet, and so that number is not affected by the *Virginia*-class. It is affected by the *Ohio*-class SSBNs.

Mr. BARTLETT. So this program is independent of whether we ramp up the design or not?

Admiral HILARIDES. The design base is independent in a very large measure, and I would defer to Ms. Stiller to tell you there are probably some interlinkings but not in the main sense of the design base.

Mr. BARTLETT. So tell me, what will they be doing absent a design challenge? See, the problem I have is I know you can keep some people on board. I suspect that if they do not have meaningful things to do, you will not keep the best people on board.

Admiral HILARIDES. That is correct, sir.

My opinion is that the best use of their time is to design that next SSBN, but again the Navy has not come through with the results of the RAND study to lay that plan in place.

Mr. BARTLETT. Is there anything you need from us to expedite that?

Admiral HILARIDES. Sir, I do not believe there is anything we need this year.

Mr. BARTLETT. Thank you.

Thank you, Mr. Chairman.

Mr. TAYLOR. I thank the gentleman.

The Chair now recognizes the gentlewoman from Guam, Ms. Bordallo.

Ms. BORDALLO. Thank you very much, Mr. Chairman.

Admiral Donnelly and the other gentlemen and, of course, our Secretary Stiller, thank you very much for your testimony today.

I am interested in receiving an update on the progress being made on the Trident submarine conversion program, and I respectfully request that you discuss with the subcommittee today your level of satisfaction with the progress being made to date on this effort, and also I would appreciate your discussing today your level of satisfaction with the two converted submarines that I believe rejoined the fleet last year.

Last, Admiral, I am interested in knowing more about the role, if any, that Guam can play or will play in supporting the missions carried out by the submarines.

Admiral DONNELLY. Yes, ma'am.

We are very satisfied with the SSGN program. We have actually had three ships delivered to date. The *Ohio* was the first, and she will deploy later this year in the fall time frame. Behind *Ohio* is USS *Florida* and then USS *Michigan*, and all three of those ships have been delivered to the Navy. They are in various stages of sea trial, of final outfitting and evaluation and testing. The USS *Georgia* is the fourth and final SSGN, and we expect she will deliver in the September 2007 time frame. Those ships will be on a slightly different patrol cycle. They will have two crews, and the plan is that one crew will operate the ship, once it is forward-deployed, for about 75 days, and then the ship will pull into port and do a crew swap, and then the next crew will do about a 21-day voyage, repair, maintenance period, and then we will take the ship out for 75 days.

We will do three of those cycles, and then the ship will return to its home port of either Bangor, Washington or Kings Bay, Georgia—we plan to put two SSGNs in Bangor and two in Kings Bay—and then we go through about a 100-day maintenance period where more extensive maintenance would be performed, and then the cycle would repeat. We do plan, as you know, to use Guam as one of those forward-staging bases where the crew swaps and voyage repairs will occur. We do have some dredging projects in the harbor to enable that much larger submarine to get into the pier in Guam, and we are very excited about the capability that these ships bring to the Navy, and we look forward to the first deployment of *Ohio* this year.

Ms. BORDALLO. Thank you. Thank you very much, Admiral, and we want to thank you all for discussing it with me prior to this meeting and giving me the date of the arrival of the nuclear sub, the USS *Buffalo*. Thank you.

Thank you, Mr. Chairman. I yield back.

Mr. TAYLOR. Thank you.

The Chair recognizes the gentleman from Virginia, Mr. Forbes.

Mr. FORBES. Thank you, Mr. Chairman. Thank you for holding this hearing.

I want to thank all of our witnesses for their patience in working with us to educate us on these matters.

The first question I have is just the timeline. I am trying to go through the sequencing and make sure I understand it. If Chairman Taylor had it within his power to write you a check today and say "we want to bring on line a new sub or a new carrier," give me the timeline before it would be deployed from today, if he presented the check to you today.

Admiral HILARIDES. Sir, if I may, the basic timeline is this: two years prior to authorization, we need two years advance procurement (AP) to buy long lead materials. In the propulsion plant, there is a small tranche of one year advance procurement that gets the rest of the government furnished equipment in place, and then the year of authorization starts the clock on the construction, but really your two years on the clock that you asked. By the tenth ship of the *Virginia*-class, we believe will be at a five-year construction span, somewhere close to that. So about five years from that authorization that ship would go out to sea on its trials.

We also intend to change the construction such that that ship does not require a shipyard period after that, but what we call the "post shakedown availability." Our intent would be to reduce that to the smallest possible. So, about a year after that delivery, so the sixth year after authorization, she would start her pre-overseas movement workup and about six months after that she would deploy.

So, from today, from the AP, it is 7 plus about 2, and from the authorization, it is the 5 plus 2.

Mr. FORBES. So, doing your math, if you would tell me exactly how many years of the years you have just told me from today—if Mr. Taylor presents you with a check, tell me what the total number of years would be before it would be deployed.

Admiral HILARIDES. That would be 11, sir.

Mr. FORBES. That is 11 years.

So, if today he could say we need a new sub, we would be looking at 11 years before we could have it deployed?

Admiral HILARIDES. Yes, sir.

Mr. FORBES. Any idea on the carrier?

Secretary STILLER. The carrier has four years of advance procurement funding required. The construction cycle of the carrier—Mr. Petters can best answer this on the second panel, too—is longer than the submarine. It has got a seven-year construction cycle, and then it has a similar on the back end of how long you have to do your workups and your trials before you deploy. So I would add about four more years to your number from the submarine.

Mr. FORBES. So, from 11, you would give me 15?

Secretary STILLER. Yes, sir.

Mr. FORBES. So, if Mr. Taylor were to authorize that today and he had it in his power, that would be 15 years?

Mr. TAYLOR. Mr. Forbes, I understand my limitations. "if this committee."

Mr. FORBES. "if this committee."

Fifteen years. If whoever would come in here and we had 11 years for a sub, it would be 15 years from today. Now——

Admiral DONNELLY. Mr. Forbes, if I may, I am not sure that Admiral Hilarides has got the math exactly right.

As I understand it for a submarine, it is two years advance procurement, five years construction. That is seven years. Then with the PSA and the POM workup, it would be nine years.

Mr. FORBES. So your total would be nine years?

Admiral DONNELLY. Nine years for a submarine.

Mr. FORBES. So 9 years for a sub, 15 years for a carrier.

Is my time about up?

Can you tell me—we hear all the time the words "acceptable level of risk." can you tell us what that means, anybody?

Admiral DONNELLY. I assume you are talking about the period——

Mr. FORBES. When we are told how many subs we need, we are always told 48 subs is an acceptable level of risk, and that is kind of like giving a symbol of this is the certification. That is okay. You know if you have it.

So what is an "acceptable level of risk"? How do we define that?

Admiral DONNELLY. That is a tough question, sir.

I look at this as a shortfall. Under the current 30-year civilian plan, in 2020 we will dip below 48 submarines, and we will remain below 48 fast attack submarines until 2033, so that is a 14-year period when our force levels will be below the minimum required force level of this most recent 2005 study. So there is risk associated with that. Quantifying that risk is a function of your assumptions about what that future from 2020 to 2033 will look like. So we are undertaking a number of steps to mitigate that risk such as if those shipbuilders can deliver the ship in 60 months as opposed to 72 months. That will accelerate two ships to the front line, and that will help fill that shortfall period.

As I mentioned in my oral statement, we have identified 19 hulls, by hull number, and that we could extend their service lives based on their fuel remaining. Now, that would require some addi-

tional maintenance periods for those ships, but we think we could get 10 additional 6-month deployments from those 19 ships, and that would further mitigate that shortfall period but not completely.

Mr. FORBES. My time is up, but let me just state my concern and maybe you could get back to me either privately after this or in writing.

I look at our Quadrennial Defense Review (QDRs), and I recognize that just a few years ago, when we looked at a country like China, for example, we felt they were not going to be involved in carriers. You know, that was the wording we were getting. That was what we were hearing. Then many of us thought, oh, yes, they are going to be involved in carriers. We wrote about that. We talked about it. Then, all of a sudden, we get the satellite imagery of their retrofitting the carrier that they are doing. We find them at the Moscow air show, looking at planes that would only fly on the Super Carrier. We now have, you know, the generals coming out and saying they will have carriers on line or could have in about 2010.

We also had the same problem looking at subs. You know, we had language that indicated they were not concerned about their having a sub program. We then find out they have got underwater docking bases and what they are doing with the Kilos and the production of subs that are there.

My concern is, when we are looking at an acceptable level of risk, we better be calculating some of that and factoring it in because we cannot afford 9-year windows and 15-year windows if we find out it is different 2 years from now or 3 years from now, and I think that is one of the things this subcommittee is very much concerned about. Are we allocating those risks?

My time is up. The Chairman has been very lenient with me, but at some point in time I would love to have that discussion with you or maybe it is something we can get our hands around and look at what we are projecting on that.

Mr. Chairman, thank you.

Mr. TAYLOR. Thank you, Mr. Forbes.

The Chair recognizes the gentleman from Connecticut, Mr. Courtney.

Mr. COURTNEY. Thank you, Mr. Chairman.

Before I forget, there is a statement, actually, from the Governor of Connecticut, which I wanted to submit to the record.

Mr. TAYLOR. Without objection, it will be added to the record.

[The prepared statement of Mr. Rell can be found in the Appendix on page 141.]

Mr. COURTNEY. Thank you, Mr. Chairman.

As a new member up here talking to other new members about this issue, obviously coming from where I come from, it is obvious why this issue, the question of the size of our sub fleet, is an important one for the national security of this country, but frankly some folks who are not from my region or perhaps from Virginia sometimes are a little confused about why in the sort of post-Cold War era this is a need for our Nation's national defense, and I thought maybe we could just step back from the prior discussion about production schedules and ask you, Admiral Donnelly, if you

could sort of comment on what you see the need is for submarines so that, as we deliberate on this question of the size of the fleet, people clearly understand why it is important.

Admiral DONNELLY. Yes, sir.

The submarine force has been active around the world in the past year. We have provided submarine deployments for each of the regional combatant commanders and for U.S. Strategic Command (USSTRATCOM), of course, and for Special Operations Command. Submarines are not a Cold War relic. They are a highly modern sensor suite, strike platform that utilizes stealth, endurance, mobility, persistence to gather intelligence, to be forward in what we call "intelligence preparation" of the battlefield. You could think of a submarine as a scout that is out every day, walking the ground and providing valuable information about the environment. There is a deterrent value in the submarine because of its stealth. It is never seen. It may be there. It may not be there. We are using submarines extensively in the global war on terror. Using their stealth capability and their impressive intelligence-gathering capabilities, we can and have been gathering intelligence that is briefed at the very highest levels of our government and of our military. We are monitoring the activities and the plans of the enemy, and our submarines are very heavily employed throughout the world. I would be happy to provide classified details in an off-line session.

Mr. COURTNEY. Admiral Mauney, do you want to comment on that?

Admiral MAUNEY. Yes.

I would add that we also participate in a number of other activities. We are working with our allies to build a coalition of nations that respect national interests and global security. We have an active program in the Pacific and in fact in all of the geographic areas.

Additionally, we are cooperating with our own forces to maintain our dominance of the areas in which we need to operate to be prepared to gain access if directed by our national leaders, and those complement the global war on terror with a longer view toward maintaining our national security.

Mr. COURTNEY. Thank you.

Again, a lot of people may be watching this through webcast or through the press, and again, members on this committee, I think, have the benefit of great briefing papers from staff, and just so that there is some clarity as far as the public who may be listening or interest in this issue, again, I just want to clarify comments that have been made earlier about what is going to happen in the future, starting in 2013. I believe that was the year that you mentioned, Admiral Donnelly, when there is going to be a rate of decommission that is going to affect the size of the fleet.

Again, maybe you can state for the record so we can make sure that that is clearly stated what is actually going to happen starting around that time frame.

Admiral DONNELLY. Sir, the date is 2020 under the current shipbuilding plan, and at that point, we will be decommissioning large numbers of our *Los Angeles*-class submarines that were built at a rate of about five a year. Although, by that time, we will be building two a year *Virginia*-class, the two a year increase does not off-

set the five per year decrease because of the end of life. So there is a 13–14 year period from 2020 to 2033 when our projected force levels will drop below 48, which is our best estimate of the minimum number we need to meet the combatant command requirements in wartime and peacetime.

Mr. COURTNEY. Again, just to be clear, because the staff has given us the benefit of this with their materials, there actually will be a period where it will dip close to 40 within that decade or so.

Admiral DONNELLY. Yes, sir. The year 2027 to 2028. The number bottoms at 40 and then begins to come back up.

Mr. COURTNEY. So to follow up on Mr. Forbes' question about acceptable levels of risk, what we have to decide here is really whether or not the decisions we make today which will have an effect on that number down the road, using our best possible judgment, is actually an acceptable level of risk for our Nation. I mean that is pretty much the decision we have before us; isn't that correct?

Admiral DONNELLY. Yes, sir. I think that is an important consideration in the decision, and as I mentioned before, we are looking at a number of initiatives that we can use to also mitigate that risk. Given the number of hulls, it will be what it is, and then there will be a shortfall, I think, regardless of what action this committee takes. You know, we will be paying the price of a long period of time when we did not build submarines in sufficient numbers from about in the 1990's. So my job and the job of my successors will be to take what we have and to do the best we can through the various, innovative techniques. We have already begun that process in the redistribution of attack submarines from the Atlantic to Pacific, which will shorten transit times and which will provide more presence for the given number. We are also looking at a number of other alternatives that we might be able to employ to get us through that period.

Mr. COURTNEY. That kind of involves looking into a crystal ball, to some degree, as the world changes, and nothing is static in terms of security challenges.

Admiral DONNELLY. Exactly, sir.

Mr. COURTNEY. Just one other follow-up question if I could, Mr. Chairman.

Secretary Stiller, when you talked about the design part of our industrial base—and actually, we have some folks who are here in the audience, listening very anxiously to your testimony, and I welcome them from my district—there is also the production piece of the industrial base also, which I believe brings a skillset which may not be quite as technically trained as maybe the designers and engineers, but clearly at the production level it is not assembly line production when you build a submarine, and we are seeing stress as far as that part of the industrial base.

Would you agree?

Secretary STILLER. Well, sir, I think we are seeing—as I said in my oral statement, we are seeing a much more steady pace in the production industrial base than we did, say, ten years ago when we had a hiatus in submarine construction, and so, looking at the health of the design of the industrial base versus the production industrial base, yes, sir, there are critical skills there that we need to maintain, and we look very closely at that and at the one-year

ramping to two-year. We feel very confident that the skillsets that we need there on the production side are there, and yes, we do value them as well.

Mr. COURTNEY. Again, I would respectfully point out that in the last 18 months there are about 2,000 jobs that have been eliminated at Electric Boat because of this production schedule, and if we stay on track to 2012, before we go up to two a year, based on everything I know, that workforce is going to continue to be under a lot of pressure because it is just not sustainable without some of the repair and maintenance work that may not be there at Electric Boat, and you know, I can just tell you, as someone who stood outside those factory gates at 5:30 in the morning, greeting people, it is getting older in terms of the people who are there doing the production work, and I really think that—again, I applaud the fact that the Navy has used the foresight with the RAND study to look at preserving those design and engineering skills, but there is another piece to this, too, in terms of where the shipbuilding schedule is sort of leaving the production side of the equation as well, and you do not have to comment on that. If you would like, you certainly are welcome to, but that is certainly, I think, another of the challenges that we have as a committee and as a Congress to make sure that the whole workforce is looked at in terms, again, of these decisions that we are about to make.

Secretary STILLER. Yes, sir.

Mr. COURTNEY. All right. Thank you, Mr. Chairman.

Mr. TAYLOR. Thank you, Mr. Courtney.

The Chair now recognizes the gentleman from Rhode Island, Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

I want to thank you all for your testimony here today.

Mr. Chairman, I want to thank you for allowing me to rejoin the committee today. I have enjoyed my work on the Intelligence Committee, but I certainly miss the work on the Armed Services Committee, and I welcome the opportunity to return today.

If I could just start with one question with respect to the work our submarines do in the field, and I believe it was Admiral Mullen who had testified previously before the Armed Services Committee that right now our submarines are only able to meet about 60 percent of the mission requests of our combatant commanders in the field right now.

Do you concur with that number, Admiral Donnelly?

Admiral DONNELLY. Yes, sir. If I could, just to clarify, the combatant commanders submit requests for forces, and those requests go to the Joint Staff where they are evaluated and validated and prioritized, and the Joint Staff ranks those as critical, high priority, priority, and routine, and then it allocates the available forces to the combatant commanders accordingly, so that becomes my requirement is the Joint Staff validated allocation. I am meeting 95 percent of my requirement in all of the critical mission requests and about 95 percent of the high priority, but overall, if you go back to the original requests from the combatant commanders, Admiral Mullen is exactly right. I think it is 62 percent of those original requests that are actually being satisfied after that global force management process and the allocation.

Mr. LANGEVIN. I just said we recognize that as a significant number that are going unfulfilled, and again, these are from combatant commanders in the field.

Going to Mr. Forbes' question, does the Navy's future submarine force structure plan to provide adequate capability against emerging threats? Mr. Forbes mentioned China. How does the plan address China's growing submarine fleet?

Admiral MAUNEY. Yes, sir.

Our analysis and Admiral Donnelly's opening statement briefly covered the three more recent—the Joint Staff in 1999, the program decision in 2003 and 2005—and the Navy's force structure analysis considers the range of what our Intelligence Community sees, and using their best analysis, it provides an estimate. That estimate has risk associated with it. There are unknowns. We use those estimates in parallel with detailed analysis of potential situations in which our submarines and, in fact, all of our forces would be employed to determine how they perform given the design criteria that we use in building submarines and surface ships and aircraft.

From that performance, we look at how many we would need. Generally, you come up with a range of submarines—48 being what we call the "sweet spot"—in the range of 45 to 50, which is the minimum number several studies have come up with. Those allow us to perform the critical missions in warfighting as we would postulate them. That warfighting consideration is then done in additional analysis, in parallel, using peacetime forward presence. As Admiral Donnelly mentioned, we have been providing about 10 submarines a year forward presence to the combatant commanders to accomplish the missions that we have been required by the Joint Staff to accomplish.

One of the assumptions that you make is how much is that going to change over time, and the assumption that was made was that this force structure, or this forward presence number, is about right given what our Intelligence Community forecasts for the future, and that is the force structure of about 45 to 50 will meet both the 10 submarines of forward presence per year as well as our warfighting needs as we have analyzed it.

Mr. LANGEVIN. But even given that, you recognize, according to Admiral Donnelly's testimony, that in the outyears, 2028 and 2029, our force structure, our submarine force structure, drops below or to about the level of 40. We are going to be at a significant disadvantage, and that troubles all of us.

Because I know my time is limited, if I could, I would like to go back to the issue of the multi-year contract and getting two subs per year. As to the multi-year procurement plan, I guess estimates are it saves us about $80 million per ship. Going back to the chairman's question, if we were to add more ships into the mix, adding an eighth or a ninth, what does that do in terms of bringing costs down using multi-year contracts? What do we expect to save?

Secretary STILLER. Right now, for the second multi-year contract that we have been talking about in fiscal year 2009 through fiscal year 2013, we assess the savings to be about $200 million per boat, and we have not—and as Admiral Hilarides said earlier, there would be some if you added an additional submarine, one or two.

There would be additional savings that we have not yet calculated because of the learning that you would see with two boats a year. Would it be significantly more? No. I mean it is not going to be another $200 million, but there would be some savings, but we have not calculated that.

Admiral HILARIDES. We just have not run those numbers, sir.

Mr. LANGEVIN. Okay. If I could ask one last question.

We talked about and you mentioned here today the fact that we can get the build cost down to about $2 billion per ship. Could you discuss in more detail the design changes you deem most important for the cost reduction, obviously, and design and describe the elements in your budget request to support those efforts?

Admiral HILARIDES. Sir, there are about 300 different initiatives that we are working on, and they have, some of them, a relatively small cost effect on a per hull basis, but additively, they will get us to the target that we need. We are shooting for more than $100 million out of these cost reduction initiatives, but in order to do that, we have these, and many of them are small ones, simple things like taking out hydraulic pipes and valves and putting in electric actuators, changing the way we buy government furnished equipment, and some big ones that would involve major changes to the structure of the ship. They are all under evaluation in terms of how well we can execute them, how much cost they take out and their impact on the capability of the ship. That analysis is going on this year, and our shipbuilders have been very, very helpful in helping us sort all of that out. They have been the source of many of those ideas. We will put that hull package together, and it will form the basis of the cost reduction, and again there are about 300 that are under assessment, and as we decide to incorporate them, then we and the shipbuilders agree on the amount of savings that accrue, and then we put those in play, and again the goal will be to have the predominance of the savings in place by the fall, and we have just started that process with the shipbuilders.

Mr. LANGEVIN. How much weight are you giving to the government's investing in the capital equipment up front? Sometimes the SSR is reticent to invest in that equipment, particularly if we do not know if ships are going to be built, so it will not necessarily make the investment. If it is not used, it is a big waste of money.

What about the government's funding some of the upfront costs of investing in the capital equipment? Could you comment on that and what degree that would achieve a significant savings?

Admiral HILARIDES. Yes, sir.

The current contract has some contract incentives that the shipbuilders have made great use of. It is called Capex. Ms. Stiller referred to it in her opening statement. That incentivizes and helps the shipbuilder get the capital investment required to improve the shipyards. Both of our shipbuilders have made good use of that, continue to propose projects under that contract's capital expenditure that are helping us bring the cost of those ships down. We would intend in the next multi-year to work to have those incentives be in place as well, and of course, that would be part of the negotiations that would go in, but it has been so successful for us that we would intend to continue that as a going-in plan to those negotiations, sir.

Mr. LANGEVIN. That is good to hear.

I want to thank the panel for your testimony here today and for answering our questions, and thanks for the job you do.

Thank you, Mr. Chairman. I yield back.

Mr. TAYLOR. Thank you, Mr. Langevin.

It would be the Chair's intention to now recognize those members who came after the gavel, so that would be Mr. Ellsworth, Mr. Wilson should he return, and Mr. Sestak.

The gentleman from Indiana, Mr. Ellsworth.

Mr. ELLSWORTH. Thank you, Mr. Chairman.

Thank you all for your testimony. I apologize for being late, so I may have missed something. You know, I think a lot of my questions got answered in some of the other questions, but I would ask—you know, Mr. Courtney sounded out about how many job losses when we cannot estimate it in the shipyard and cannot estimate how much they need when they are waiting for our Federal Government to decide how many ships we need, but how does that trickle down? If you will, tell me how that trickles down.

Also, I do not want to assume that everything that goes into a sub is made there at the shipyard. There are outside contractors, and I guess I would ask how difficult that is to find the people who are making the equipment that is not the hull or in the ship, keeping them out there hanging, and then, in turn, is it a concern that it goes—and I do not know this—to foreign companies, and if that is the case, is there the concern for either foreign companies that make that equipment and foreign materials that go into our equipment, and would that be a concern if that is the case?

Secretary STILLER. I am going to start and then turn to Admiral Hilarides for the specifics on the submarine vendor base.

One of the goals of the SSN 313 plan has been to introduce stability into the ship so that the shipyards can plan, and we have made no changes as we submitted the budget from fiscal year 2007 to fiscal year 2008 to the shipbuilding plans so that the industry can plan and understand the industry even at the sub vendor level to know what the Navy's plans are for construction not only in submarines but across the board in carriers, amphibious ships, auxiliary ships, and SARC combatants. We do have a monitor on critical vendors, and I am going to turn that over to Admiral Hilarides, who is a specialist on the submarine side. We are in a soul search situation in a lot of cases there.

Admiral HILARIDES. Yes. The vendor base is fragile, and I think, in Ms. Stiller's testimony, she said it is sustainable but not optimal, and I think that is true of our vendor base as well. We do not have foreign vendors producing things for the submarine. We have U.S. suppliers for the things that go into the ship, and we see some stress on those suppliers, but we do not see anything that makes us say we have to go look at alternate suppliers or develop foreign suppliers for the ship, so it is not optimal but stable.

Mr. ELLSWORTH. Mr. Chairman, thank you. Like I said, most of my questions were answered, so I yield back.

Mr. TAYLOR. I thank the gentleman.

The gentleman from Pennsylvania, Mr. Sestak.

Mr. SESTAK. I apologize for being late.

Admiral, if you put some submarines in Guam, if you had a dry dock there to do the maintenance, rather than how you have been doing it by bringing them back to Hawaii or when they have been brought all the way back to California, and you put the training facilities in Guam, what is the difference in the operational availability with the investment of those submarines in Guam?

Admiral DONNELLY. It would clearly improve the operational availability. I do not have the exact number. The limiting factor, of course, is when we send the ship out of Guam for maintenance, the PERSTEMPO rules then require us when the ship gets back to Guam to stay in home port for as long as she was gone.

Mr. SESTAK. So, if you had the training facilities and the dry dock there, this would probably cost $1 billion, I would imagine—I just pulled that out of the air—but whatever it is, my limited understanding is the operational availability would be quite significantly changed. Is that wrong? You would not have to worry about the PERSTEMPO.

Admiral DONNELLY. I think it would improve. Clearly, we are getting about 48 days of mission time per year above—for the Guam boats, 48 mission days above what a rotational deployment submarine would provide.

Mr. SESTAK. Is it possible to get that figure, Admiral?

Admiral DONNELLY. I can provide that to you, sir.

Mr. SESTAK. Okay. Admiral, also, why not put more out there if, really, the only remaining force of import as far as the submarine fleet might be is, let us just say, China, and if time is of essence in getting there, why don't we put more out there?

Admiral DONNELLY. Well, there are certainly some infrastructure challenges with doing that—family housing, enlisted bachelor quarters, all of the MWR hospitals, schools.

Mr. SESTAK. Is there anything being done to say how much more it would cost with the difference of, let us say, 11 submarines out there?

Admiral DONNELLY. Something is being done.

Mr. SESTAK. Could I see that?

Admiral DONNELLY. I do not have that with me, but we will provide it to you, sir.

Mr. SESTAK. The other one I was curious about—and I only bring that up because there are scenarios when time matters as we all know. I mean China is so different from the Soviet Union.

Admiral, the Joint Staff attack submarine study, the number of oppressants was 68; is that correct?

Admiral MAUNEY. Yes, that is correct.

Mr. SESTAK. And that is kind of the joint, non-naval kind of study?

Admiral MAUNEY. It was conducted by the Joint Staff, relatively independent of the Navy, but it included Navy personnel, and certainly I think Admiral Donnelly's predecessor contributed when questions were asked.

Mr. SESTAK. The reason I bring it up is do you remember what the wartime scenarios were and what the number of submarines were based upon.

Admiral MAUNEY. We have reviewed those. Yes, sir.

Mr. SESTAK. The launch of China to Korea and Russia into Poland, should we update that study for wartime requirements since it is such a major part of the testimony and for the analysis, potentially, of the different wartime scenarios?

Admiral MAUNEY. The details of the study, of course, as you know, are classified, sir, and we can certainly discuss those in a different forum if you would desire.

As to whether the study should be invaded, as you know, also, other studies—PDM–3 and then the Navy's force structure study—did review the assumptions, conclusions and used a more recent campaign analysis to determine their conclusions.

Mr. SESTAK. The last question is of the distributed Anti-Submarine Warfare (ASW) task force. The ASW, how does that dovetail well? I guess this is yours, Admiral. How does that work?

Admiral MAUNEY. The current Navy's ASW doctrine is a total force doctrine. It envisions a number of different elements of the concept of operations, which includes distributed forces, aviation, submarines, surface ships, and a layered approach to the problem.

So I think submarines are an important part of ASW. They are capable and continue to be part of this total picture.

Mr. SESTAK. Is there still the effort to pursue this distributed ASW concept, the one with, for instance, the advanced deployable system, which I gather has just been canceled; is that right?

Admiral MAUNEY. There is an effort. Admiral Mullen has reiterated in the last six to eight months on a number of occasions that ASW is a priority of his in terms of the Navy and the Navy's capabilities. We continue to look at these distributed approaches and have several projects in the works that were funded by Task Force AFW and continue under the resource sponsors today and will deliver in due course, or we will continue to learn if they are not effective, if that turns out to be the case.

Mr. SESTAK. But that system is canceled?

Admiral MAUNEY. Yes, sir. The advanced deployable system concept of operations was examined by the fleet. And for reasons which included the tethering of specific ships to the communications from those systems at a pretty short leash, Fleet Forces Command determined that was not a viable concept considering the other concepts in ASW. We will complete that program in the near future with a test of the system, and we will carry those lessons into additional examinations and projects of the future for ASW.

Mr. SESTAK. So it is the tethering that was the challenge?

Admiral MAUNEY. Yes, sir. That is my understanding.

Mr. SESTAK. So technologically it could work, but it is that short tether that they can't roam once they leave and run away.

Admiral MAUNEY. The tether that was the issue that was identified to me, and the system, as I understand it, has not yet been fully tested. That is scheduled for later this year, but did meet the general attributes that were attributed to the system in the initial documentation.

Mr. SESTAK. Thank you.

Mr. TAYLOR. We have been pretty lenient with the five-minute rule with your questions.

Mr. SESTAK. The Navy has, by and large, by my understanding, has been justified for structure on presence. And so the reason I

was curious on the warfighting scenario is that is important to what you are using today. In particular, as you have worked at Guam and other places, what is the most efficient way to achieve that? That is what I am most interested in, because the study did say, the GS Study, 68. I think it was 55, and I think it came in at 68 at the end. Is that correct, Admiral?

Admiral MAUNEY. Yes. That is correct. It wasn't 100. I think it was 55 to 68.

Mr. SESTAK. It actually went to 68 and 155, but the select came in with 68. So the present number, I understand, was what the war-time scenario, which I gather was subsumed within that, which we look at for it, which I think might be the same or is the smaller number.

Admiral MAUNEY. The studies considered both warfighting and presence, and they are both presented to decision-makers who end up measuring and assessing the risk. In this case it was the Navy leadership, and the number of 48 was the balance that they selected from a number of considerations. I would say that it is not only for force presence, but it is concepts from the analysis based on different warfighting scenarios as well.

Mr. SESTAK. I don't think there is a more versatile platform than the submarine for presence or warfare.

Just how you take those warfare scenarios and do what you just said, take the presence and bring them together and look at some operational base in a strategic operation of ours, and how much you want to put there to help meld those two to a less efficient way was the reason for my questions.

Thanks very much, Mr. Chairman.

Mr. TAYLOR. Thank you, Mr. Sestak.

Admiral Donnelly, for the record, since on several occasions Congress has been accused of building and buying platforms that the Nation didn't need or the military didn't want, for the record, should Chairman Skelton, should Chairman Murtha, both of our Senate counterparts, show their willingness to build this additional platform for this year? Would you prefer to have it this year or wait for the Administration here to build the program?

Admiral DONNELLY. Sir, that is an excellent question.

Mr. TAYLOR. That is why you make the big bucks.

Admiral DONNELLY. No. I am the submarine force commander, but I am also a naval officer, and I would say I am a naval officer first and submariner second.

Of course, I would love to have two additional submarines, as you suggest. We could use them. They would greatly mitigate the problem that we will have between 2020 and 2033.

But—and I would have to qualify this—the CNO has built a shipbuilding plan, a 30-year shipbuilding plan, that balances across the Navy for surface ships, logistic ships, amphibious ships and submarines, and takes into account the industrial base across the entire Nation, not just the submarine shipbuilders. And as a naval officer, I honestly support the CNO's 30-year shipbuilding plan because it has balance across it. There are periods when our aircraft carriers dipped below the minimum number that we would like, as the submarines did, too. But in balance, that is the right plan for the Nation.

Mr. TAYLOR. If you had the assurances at the top line so that no other programs would suffer as a result, what would your answer be?

Admiral DONNELLY. That we would have to have two additional shipbuilders. And that is consistent with, I think, Admiral Mullen's testimony that I heard as well.

Mr. TAYLOR. As a matter of curiosity, what would the hull capacity of that ship be?

Admiral HILARIDES. Addition is not my strong suit, as I indicated earlier.

Mr. TAYLOR. I think we have got that.

Admiral HILARIDES. I believe it would be the 786.

Mr. TAYLOR. Seven hundred eighty-six. Would you know a cap vendor that could possibly have a cap that says USS *Missouri*? I have a very strong feeling that could seal the deal. Just as a suggestion.

And the CNO, the Secretary of the Navy, was also asked the same question.

We thank our panel very much. We thank you for your service to the Nation and the men and women that you represent here today. We will try to get to those ships sooner rather than later.

Any additional questions for this panel?

Okay. This panel is dismissed. Thank you.

The subcommittee now welcomes our second panel: Mr. John Casey, President of Electric Boat Corporation; Mr. Mike Petters, Corporate Vice President and President of Northrup Grumman Newport News Shipyard; Mr. Winfred Nash, President of BWXT Nuclear Operations Division; and Mr. Ronald O'Rourke, senior naval analyst, Congressional Research Service. So we welcome you for your testimony.

It is the tradition of this committee to have the witnesses stay within five minutes. Without objection, I would be asking to ask unanimous consent to let them speak up to ten minutes.

Hearing no objection, so ordered.

Who would like to begin?

STATEMENT OF JOHN P. CASEY, PRESIDENT, ELECTRIC BOAT CORPORATION

Mr. CASEY. I am John Casey, President of Electric Boat Corporation. With me today, along with my personal staff, are the leaders of the two unions of Electric Boat (EB), Ken Delacruz and John Wardy, and collectively we speak for the talent and capability that resides in southeastern Connecticut and Rhode Island.

Mr. Chairman, Ranking Member Bartlett and other members of the committee, we are really pleased and excited about the fact that you scheduled this hearing today to talk about submarine procurement rates. I am pleased to be joined on the panel with Mike Petters, the government's nuclear vendor from BWXT, and naval analyst and a great thinker, Ron O'Rourke.

I would like to request my written submittal become part of the record and just cover the highlights here.

I did ask that some pictures be distributed to you all that really exemplify some of the recent successes of Virginia. There is a picture of the bow of the USS *New Hampshire* recently delivered from

Newport News, and you can see that is fully one-quarter of the entire ship. You can see a picture of the stern, part of which was built at Newport News, part of which was built at Quonset Point. Together they were joined there, and they were recently shipped up, as recently as yesterday afternoon. In fact, I was on the phone with the admiral when that barged shipment went by with the stern of that vessel.

We have also got the midsection there of 777, and I believe you have got the USS *Hawaii* at sea with the beautiful sunset in the background from this past December, a ship that was delivered ahead of its schedule, created over a decade ago. You all talked about the time frame for these vessels. That ship was delivered ahead of its schedule. It was delivered a decade ago.

You have requested our view on five topics related to the most complex weapons system known to man. These five topics are the *Virginia*-class Acquisition Strategy, the CNO's cost challenge, the USS *Virginia* CAPEX program, our ability both in terms of infrastructure and people to up the procurement rate in advance of 2012, and any alternate funding strategies that we might be able to conceive.

Submarine procurement—in answer to the first question relative to acquisition strategy, submarine procurement has fluctuated dramatically, as you see in my written testimony. There have been three significant policy changes in the last ten years. Over a decade ago, there was a plan to sole-source submarine production. Over a decade ago there was a plan to start two ships per year, and during that ensuing decade, there was a six-year period where only one submarine was delivered to the United States Navy as a result of a holiday taken from submarine shipbuilding activities.

The current plan, as we discussed, keeps one a year in the budget until fiscal year 2011, and there are two starting in fiscal year 2012. Of that, ships that have been authorized, in Block I there are four ships, Block II there are six ships. Five of those six were bought in a multiyear procurement. So when I refer to those blocks, it is just for reference point of view.

The plan, as you have all discussed already, will create, in essence, a force-level shortfall, and the Navy testified that they are trying to mitigate that, including using activities we have, accelerate production down to five years as a means of getting more ships to the fleet sooner.

My primary concern as a shipbuilder is the cyclical demand this one-per-year production rate or procurement rate will cause to the people that work on the waterfront in my Groton front shipyard. The plan needs to be stable. It needs to be increased in terms of volume in order to achieve the $2 billion ship. They need to be bought in a multiyear procurement. We need to be a two-year. We need to use economic quality techniques, and the government vendors need advanced procurement moneys. In fact, we could use advanced procurement moneys in the shipyard to accelerate manufactured items that we build that are very similar to the items that are bought through the vendor base.

There was a question asked during earlier testimony, I think it was by Mr. Ellsworth, regarding the national vendor base. I think it is interesting to point out the approximately $20 billion that

have been obligated for submarine procurement to date. Almost $7 billion of that money, not counting me, Mike, or the nuclear vendor, are allocated to vendors across the country. In fact, there are over 15 States in this country where over $100 million of submarine pieces and parts are manufactured.

We are working very closely with the Navy to reduce the cost. And the cost has three major constituents: the government-provided material, the contractor-furnished material, and the shipyard labor we use to build these ships. We are working with the Navy through a model. We are working on inherent costs, the design; structural costs, the schedule; systemic costs, the way we acquire materials; and realized cost, the efficiency of our people in a shipyard. We are not just leaning on the people. We are looking at all four key elements of cost.

The total cost, of course, on the labor side has two components. There are the number of hours you spend and how much you charge per hour.

Dollars we charge per hour include absorption of overhead. Electric Boat has been very aggressive at cutting down on our overhead expenses. If we took the future procurement rates, pricing rates, excuse me—the future pricing rates in the early 1990's, and applied those to the programs for the next decade, we would have had a certain cost for the products we have produced for the United States Navy.

Through our aggressive re-engineering, we have reduced those costs by $2.7 billion, and 95 percent of those savings have been accrued for the United States Government.

Meeting the $2 billion challenge will require support from all of us, all of the stakeholders, including the ones at the table, but the Navy as well. And it also presumes that there aren't any significant perturbations for the global economy, including major commodity pricing changes. Working together, we can make it happen. It cannot be done if we only buy one ship per year.

There was also a question on the Capital Expenditure program, in particular on our *Virginia* class. This Capital Expenditure (CAPEX) program is one where a portion of the profit that we would ordinarily receive is allocated to CAPEX, tied to the CAPEX process.

CAPEX incentive payments equal the invested costs; 50 percent of that profit or of that cost can be applied when a project is authorized, including Navy authorization, 50 percent when it is implemented.

There are three recent very successful examples: light metal fabrication facility, a coatings facility, and a transportation project. The total investment was about $30 million. The total savings are about $270 million over the life of the program, approximately an 8-to-1 return. There is a significant balance of money remaining. My teammate will talk about some of the items he has done at his yard. It is a good method to incentivize shipbuilders to make investments they might not otherwise make.

The next question they asked was about increasing production prior to 2012, And I love this question. I love it because, as an example, at 5 o'clock this morning, I am at the gym—in fact, it happens to be in your district, Mr. Langevin—practicing Ashtanga

yoga. Somebody comes over to me and says, "John, can I ask you a personal question?"

I said, "Certainly." "Will there be any more layoffs this year?"

I have answered that question almost every day, every day for the last ten years of my life. EB has the infrastructure in place to build up to three SSNs per year. Minimal investment will be required in tools and equipment to accelerate this production. Our workforce can grow. We grew—in fact, we were so small, we were 1,500 people until 1998. We doubled the size of that workforce in the Groton waterfront to support the Navy's maintenance requirements. But we have sustained this low-submarine-production-rate environment because we had the *Jimmy Carter* multimission platform being built, because we had an SSGN program, and because the Navy asked us to participate in maintenance work. Those things, I am told, two are gone, and the third one is going away. All those are now happening at the same time.

There is no new submarine design for the first time in the history of naval nuclear power. Continued rollout for Electric Boat at current levels and maintenance work could actually save $65 million on *Virginia*-class procurement rates during the next ten years.

As far as alternative funding strategies are concerned, 20 of 30 planned *Virginia* ships have, in fact, been contracted or authorized. There are, in fact, in my opinion, more options through acquisition processes and strategies to acquire those remaining 20 ships more efficiently than the first 10. The traditional approach, multiyear procurement, using advanced procurement moneys like the $70 million we recommended be put into the advance procurement line this year to get us going early, that isn't to get to two a year necessarily, that is to make sure we reduce the cost of the ones we are building in Block II, to allow the shipyards themselves to use advanced procurement money for the parts we manufacture. We don't all just assemble. There are some things that can't be bought that we manufacture. And to expand the use of economic or quantity of moneys. And one last item would be to authorize the Navy to procure one set of main machinery as a spare. Every program would have a main machinery spare. That would avoid any potential for that particular piece of equipment of hindering our ability for delivering that next ship as soon as possible.

A more difficult option that hasn't been considered would be to—think about this for a second. There have been on Block II ships about $7 billion obligated already. Because of the time it takes to build ships, we will not use all of those funds until we deliver the last ship of that block. So in my mind, there is an opportunity to look at *Virginia*-class procurement from a programmatic point of view rather than looking at it from a ship-by-ship point of view. I am not an expert in that area. Clearly you are going to have to ask people in the Office of Management and Budget (OMB) and the Treasury whether or not those alternatives are acceptable.

Let me wrap up, and I probably have taken more than the allotted time.

The *Virginia* program metrics are outstanding, in my opinion. The cost is under control. It is predictable. We are achieving the schedules that we sent many, many years ago, and the Navy has testified to the performance of these vessels, including testimony

that the first ship reached initial operational capability this past Monday.

Three of the first ten ships have been delivered. Seven remain. The submarine cost reduction plan is under way. We can, in fact, meet the challenge if, in fact, we are given the opportunity to do so. We have two ships per year. Your support is absolutely critical to our success here.

So I have talked about product, I have talked about the performance, and as the leader of the organization, I have to close with the people. That is what makes the difference in these vessels going to a place that cannot otherwise sustain human life. Many of us go on these initial sea trials. There are thousands of people that participate in the creation of these vessels. When you put yourself inside of one, you have to be satisfied that the people who are participating in that process have their heads in the game. And they do, and I am proud of them, and we have got to make sure we preserve that.

Thank you. I would be glad to take your questions.

Mr. TAYLOR. Thank you.

[The prepared statement of Mr. Casey can be found in the Appendix on page 103.]

Mr. TAYLOR. Who would like to go next?

The Chair recognizes Mr. Petters.

STATEMENT OF C. MICHAEL PETTERS, CORPORATE VICE PRESIDENT AND PRESIDENT, NORTHROP GRUMMAN NEWPORT NEWS

Mr. PETTERS. Thank you, Mr. Chairman.

Mr. Chairman, Ranking Member Bartlett, and distinguished members of the Seapower and Expeditionary Forces Subcommittee. I would like to thank you again for this opportunity to appear before you to discuss *Virginia*-class submarine program and the acquisition policy for the submarines.

In your invitation, Mr. Chairman, you asked me to address several questions, and I believe Mr. Casey has sort of highlighted those. I responded to all of your questions in my written testimony, and I request that that be accepted into the record.

For my statement, I would like to discuss just two of those questions, if I might. First, you asked if the Electric Boat Newport News team could meet the Navy's challenge of two submarines for $4 billion in 2012 in 2005 dollars, and my response to that is a solid yes.

You also asked if we have the ability to accelerate production to two submarines a year before 2012. If the question is can we do it, the answer to that is another solid yes. If the question is should we do it, that response is obviously more complicated, and you have heard some testimony already on that today. That answer is clearly a function of stability of the entire shipbuilding base and the shipbuilding plan, as the CNO has already testified, and I will talk a little bit more about that in a minute.

First, let me tell you why I have so much confidence in the *Virginia*-class program. This confidence comes from our experiences in the past year and on the continuing strength of the team relationship. As partners, we have struggled together, learned together,

and today we are succeeding together. And together the team accomplished much in 2006.

In June, Newport News delivered USS *Texas*, the second submarine to the *Virginia* class and importantly our first submarine delivery in 10 years, and I can tell you I rode that initial sea trial, and I agree 100 percent with Mr. Casey, you rely on everybody to have their head in the game when you go out on that first dock.

We are all very proud of the way we have reentered the submarine business at Newport News, and we recognize the important role that the Congress played in making this happen, and we are very grateful. The Nation is very well served by having two great shipyards in the submarine business.

In August, we closed a pressure hull on the fourth ship, USS *North Carolina*, well ahead of this milestone for USS *Texas*. This came as a result of applying lessons learned from USS *Texas* as well as the third ship in the class, USS *Hawaii*, which our partners delivered in December. And we are now marching toward an April 21st christening for USS *North Carolina*, followed by the launch on May 5th with sea trials, and delivery at the end of this year.

Importantly, USS *North Carolina* is the first of our ships with a shortened construction schedule, and we have been able to do this because of the innovation, sharing lessons learned, and significant movement down the construction learning curve. Reduced schedules will result in lower costs, and this is one of the ways we will achieve the Navy's cost target.

We also finished our work on USS *New Hampshire* and shipped our final module to our partners at Electric Boat, as Mr. Casey pointed out. USS *New Hampshire* was the first of the class to have a 1,600-ton bow supermodule. This unit included the sail for the first time, a production change that will save the program many manhours. Newport News will install this sail on this unit for every ship regardless of which yard is to deliver the ship to the Navy. Also important is the fact that we delivered this module with greater work content than any previous module while achieving an 18 percent reduction in manhours from our work on USS *Hawaii*.

So I am confident in our ability because of the strength and creativity of this team, that the team continues to show, and because of what we have accomplished this past year in terms of manhours and schedule reductions.

Now, I am also confident because of the progress we are making in reducing the cost and construction. As shipbuilders, we are focused on reducing the 40 percent of costs attributable to labor and the 25 percent of the cost of material we provide for construction. We have made tremendous progress in both areas, and we will only get better.

We are seeing the benefits of learning on each ship we work. We are implementing design and process changes to make each ship more produceable and more affordable. These changes provide manufacturing, schedule and material savings with input coming from a submarine industrial base and actual cost returns on completed production efforts ensuring we are attacking true costs.

And we are working on value streams to cut across the entire shipyard through our Progress Excellence Initiative. As you know, the remaining third of the costs of each submarine is government-

furnished equipment, or GFE, and I know the Navy is working to vigorously to reduce these costs as well. By combining the savings shipbuilders are working to achieve and savings the Navy plans to achieve, I know we can meet the $2 billion price per ship goal, and the last element of those savings will come from volume. The sooner we start producing two submarines per year, the sooner we will see the benefits of being able to order material in larger quantities, and the sooner we will be able to reduce the time between similar construction jobs, which will increase our learning. And learning translates to lower labor costs.

Now, this leads me to your question of supporting accelerated production of two submarines per year. Over the last couple of years, we have invested in our facilities to reduce construction costs. These investments are also integral to the protection of two ships per year. We have invested our capital carefully in facilities and equipment that are multiuse to benefit all of the Navy programs we work at Newport News. We have used the capital incentives in the Block II contract to make changes that are reducing costs and schedules, and I provide some very specific examples of that in my written testimony.

We can successfully start early production as long as we are able to procure from the submarine industrial base material components we need. Acceleration will require all of us to adjust existing work plans and schedules and to take the necessary steps to ensure we have skilled craftsman with the required certifications to do this expanded work.

This careful and detailed planning cannot, however, be accomplished overnight. Authorization and funding must be received in sufficient time for the industrial base in our shipyards to proceed.

I promise you that we at Newport News will respond to the decision to accelerate production enthusiastically and energetically. Yet a decision to accelerate production must not come at the price of destabilizing the entire shipbuilding plan. There must be balance. I remain mindful of the painful lessons about stability that all of us in the shipbuilding industry have learned. We all welcome the stability inherent in the CNO's 30-year shipbuilding plan, and it is important to all of us that accelerating the production of submarines does not destabilize the entire plan.

In the year that has elapsed since my last appearance before you, the Electric Boat Newport News team has accomplished a great deal. We are proud of what our people have achieved with their hard work. To ensure our Navy has the number of ships it needs when it needs them, we must continue to take weeks and months out of our production schedules. We are doing just that today, and we are committed to doing more.

I welcome the attention of Congress and this subcommittee in particular to the submarine needs of our Navy.

Shipbuilders are skilled men and women who choose this difficult occupation because of their strong belief in America and a desire to contribute to our Nation's security. All of us on the Electric Boat Newport News team are working hard to build the most cost-efficient and highly capable nuclear-powered submarines for the world's greatest Navy. It is work we are very privileged to perform.

Thank you, and I look forward to your questions.

Mr. TAYLOR. Thank you.

[The prepared statement of Mr. Petters can be found in the Appendix on page 123.]

Mr. TAYLOR. The Chair recognizes Mr. Nash.

STATEMENT OF WINFRED NASH, PRESIDENT, BWXT, NUCLEAR OPERATIONS DIVISION

Mr. NASH. Chairman Taylor, Congressman Bartlett, and members of the committee, my name is Winfred Nash, President of BWXT's Nuclear Operation Division.

As a long-term supplier of heavy components, including nuclear power units, I believe I bring a unique perspective on the critical issues before you today. BWXT could support a procurement rate of two *Virginia*-class shipsets per year in 2008 and beyond. The additional volume would produce a nine percent savings over current prices and would also yield an eight percent savings in the next *Ford*-class carrier shipset.

Mr. TAYLOR. May I interrupt? Just for the record, I presume you would be willing to make that commitment in writing?

Mr. NASH. Yes, sir.

Mr. TAYLOR. Thank you.

Mr. NASH. An option to drive down costs and to protect schedules, short of authorizing a second *Virginia*-class submarine before 2012, is to fund advance procurement for a second shipset in 2008 at $400 million, which would not only—would not be designated for a specific submarine, but would roll forward for future use. A revolving inventory captures the savings associated with a second submarine shipset without impacting the Navy's planned shipbuilding budget in 50 years. It also provides Congress flexibility in funding future submarine procurements.

Another critical reason for rolling—for having a rolling shipset is the systemic stress that will result from the commercial nuclear renaissance. Nuclear power has become an attractive option for a number of nations. Higher commercial demands could significantly affect price and the availability of raw materials, labor, and facilities. A revolving shipset would substantially alleviate these problems.

Expanding nuclear propulsion to a new class of surface combatant would also have a cost benefit to existing programs.

Fluctuations in the *Ford*-class shipset production schedule would allow BWXT to support an additional near-term procurement beyond a second *Virginia*-class submarine. Depending on the Navy's requirements, this could reduce shipset costs an additional five percent.

In conclusion, BWXT can support a second *Virginia*-class shipset in 2008 and beyond, which would yield production cost savings across the entire Navy program—nuclear program. Additionally, we can support a new class of nuclear-powered surface combatants.

Thank you for the opportunity to testify. I would like to submit a more detailed written statement for the record.

Mr. TAYLOR. Without objection. Thank you.

[The prepared statement of Mr. Nash can be found in the Appendix on page 137.]

Mr. TAYLOR. The Chair now recognizes Mr. O'Rourke.

STATEMENT OF RONALD O'ROURKE, SPECIALIST IN NATIONAL DEFENSE, CONGRESSIONAL RESEARCH SERVICE

Mr. O'ROURKE. Thank you for the opportunity to appear today. With your permission, I would like to submit my statement for the record.

When the *Virginia*-class began procurement in the mid–1990's, the Navy anticipated going to two per year in fiscal year 2002. That was pushed back to fiscal year 2012. If the Navy had begun to procure in 2004, we wouldn't be talking today about the projected attack submarine shortfall.

One option for mitigating the shortfall is to take steps that a force of less than 48 subs can, for a time at least, look more like a force of 48. These steps are possible, but they could have some potential disadvantages such as using a submarine line more quickly. That could eventually force boats to retire before age 33, which could reduce the size of force in the long run below what it otherwise might be.

A second option for mitigating the shortfall is to extend submarine life beyond 33 years. A 1- to 3-year extension could reduce the shortfall, while a 4-year extension could eliminate it. The feasibility and cost of extending service life would need to be examined.

The third option for mitigating the shortfall is to procure one to four additional submarines between fiscal year 2008 and fiscal year 2011. My statement shows a number of options that mitigate the shortfall or eliminate it by combining surface life extension with procurement of one to four additional boats between fiscal year 2008 and fiscal year 2011. Those additional boats could be funded using either traditional funding with advanced procurement, single-year funding with no advanced procurement, incremental funding, or advanced appropriations. These options would permit funding for the boats to be placed in various fiscal years, but they would not substantially change the true amount of funding that would ultimately be needed to procure the boats.

Some testimony to the full committee last week suggested that two years of advanced procurement funding are required to fund the procurement of the submarine, and consequently that no additional submarines could be procured until fiscal year 2010. That is not really the case. Although submarines are normally procured with two years of advanced procurement, a submarine can be procured without advanced procurement funding or with only one year of advanced procurement funding. And, Mr. Chairman, if you don't mind, I want to say that again. Although subs are normally procured with two years advanced procurement, a submarine can be procured without advanced procurement funding or with only one year of advanced procurement funding.

Congress in the past has procured nuclear-powered ships for which no prior-year advanced procurement funding had been provided. Congress did it in fiscal year 1988 with two nuclear-powered aircraft carriers and could do it today with submarines. Congress thus has the option of procuring additional submarines in fiscal year 2008 and 2009 if it wants to. Doing so wouldn't materially change the way the subs would be built. The process would still include about two years of advance work on components and an addi-

tional six weeks of constructional work on the ship itself. The outlay rate would be slower, and the interval between the official year of procurement and the boats entering into service would be longer.

Some other testimony to the full committee last week suggested that if you procured two boats in a certain year, it wouldn't be good to go down to one boat the following year then back up to two boats the next because it would stress the workforce. I am not sure I agree with that either. If you procure two boats in a certain year followed by one boat the next, in other words, a total of three boats in 24 months, the schedule for producing them could be phased such that you could start one boat every eight months. That might actually help the workforce and the rest of the industrial base transition from the current rate of one boat every 12 months to the planned eventual rate for one boat every six months. The Navy's own 30-year shipbuilding plan anticipates going to a two-one-two pattern.

The Navy's goal to reduce the cost of each *Virginia*-class boat to two billion in constant 2005 dollars as a condition for two per year in fiscal year 2012 is the goal that the Navy has set for itself. Congress can take that goal into account, but it doesn't have to control congressional action. Congress can decide to fund two per year in fiscal year 2012 or some other year even if the 2 billion goal isn't met.

My statement includes several schedules and funding approaches for procuring one to four additional submarines between fiscal year 2008 and fiscal year 2011, and in connection with that, there were questions from two of the Members about the cost effects of increasing the number of boats under the next multiyear from a total of seven to a total of nine and what effect that might have on further reducing the costs to the boats.

In response, I can tell you that the current MYP includes five boats, and the Navy at the time of that MYP being approved estimated it would reduce the cost of each boat by about $80 million. But the Navy actually proposed seven boats, and the Navy at the time estimated that if seven boats had been included in that MYP, the savings would have been $115 million per boat, or about 35 million more per boat if you had seven boats in that MYP instead of five.

So if you take the new MYP that the Navy is proposing and increase it from seven to nine, you might see an increase in average savings per boat something along the lines of $35 million per boat. It might be something less because the economies of scale are not as tremendously increased going from seven to nine as they are from five to seven. But I think it is something in that neighborhood that we might be looking at.

The statement also discusses the attack submarine force-level goal and options preserving submarine design and engineering base.

Mr. Chairman, this concludes my statement, and I will be happy to respond to any questions the subcommittee might have.

[The prepared statement of Mr. O'Rourke can be found in the Appendix on page 78.]

Mr. TAYLOR. I am going to briefly follow up your statement and direct your observation to the gentleman from the private sector.

How accurate do you think Mr. O'Rourke is in reflecting those additional savings? Should we have the two ships? Mr. Nash is already on record.

Mr. CASEY. I believe he is entirely accurate.

Mr. PETTERS. I agree with that, too, sir. Our effort is to get to $2 billion by 2012. If you increase the volume between now and then, you start to move that price in sooner than 2012. Whether you—I don't believe you can get there in 2010, but I think that it does bring it in closer.

In terms of the multiyear procurement, the $80 million for five ships going to—I believe he said 115- for seven ships, whether you can get another 35- for two more ships or not, I am not sure that that is exactly right. I think it is a good ballpark to go check.

Mr. TAYLOR. The Chair would request of you gentlemen on your official letterhead a statement to that extent.

[The information referred to can be found in the Appendix on page 149 and 150.]

Mr. TAYLOR. Now, this is just the first of four steps that we have to take to make this happen. We are going to have to speak to our Senate colleagues, the appropriators. I think we all want to see this happen. But it is one thing to say something in passing; it is another thing to have something in your official capacity on your company letterheads, and I would ask that be done.

And now I yield to the gentleman from Maryland.

Mr. BARTLETT. Mr. O'Rourke, the appropriators had told us that they would like to increase shipbuilding by five next year. The Navy has told us that a submarine couldn't be one of those because we have a two-year lead time for procuring some of the lead-time items. You have just testified that we have, in the past, avoided that. Would you tell us how we accommodate what we have been led to believe is an obligatory two-year delay because of these long-lead-time items?

Mr. O'ROURKE. Submarines are typically, normally or traditionally procured with two years of advanced procurement funding. It doesn't have to be done that way. You can fund the entire cost of the ship right up front or some major portion of the cost of the ship up front and declare that to be the year of procurement, and move on the next year and put another submarine in that next year if you want. These are all options for Congress. It does not have to be done the way that it usually is done. And Congress did it with a couple of aircraft carriers in fiscal year 1988, and that is a much bigger issue than doing one additional submarine in this year's budget. That was a $6 billion addition that Congress put in that year.

Mr. BARTLETT. Mr. Casey and Mr. Petters, do you agree with that statement?

Mr. CASEY. Mr. Bartlett, it is clear to me that if we can find a way to commence the activities that lead to two ships per year in the next one or two years, we can accelerate the production of the costs closer to the $2 billion level.

There is no need that we have as a shipbuilder to wait for the advance procurement (AP) moneys or for that money for the nuclear components to be built before we start building a ship. We just have to make sure we work together with the government who

manages the vendor and make sure the parts are available to put in the ship when it is time to put them in the ship so we don't extend the total scheduled time to construct the vessel.

So what I understand Mr. O'Rourke to say is you can eliminate and award AP altogether and authorize the ship's construction right now, work together in a collective fashion on an integrated schedule, which would have the net effect of reducing the overall time to construct the vessel. We did that very successfully on the USS *Jimmy Carter* recently when the Navy engaged Electric Boat to manage the entire vendor-based things that they would ordinarily manage themselves.

I am not suggesting that for the nuclear material. What I am suggesting is an opportunity to integrate the schedules together to make sure we get the pieces and parts when we need them, whether you define them as advanced procurement or part of the initial procurement process.

Mr. BARTLETT. So if we move forward to 12 years from now, we would have an additional submarine if we authorized and funded that procurement this year.

Mr. CASEY. I think the number was more like nine years.

Mr. BARTLETT. We are going to be building some others, too. But in 12 years, we would have more.

Mr. CASEY. Yes.

Mr. BARTLETT. And in nine years, we would have an extra.

Mr. CASEY. Yes, sir.

Mr. PETTERS. I think I agree with everything Mr. Casey said, and I think I would amplify that there has been a lot of testimony today that a significant part of our savings is driving the schedule down to a five-year construction schedule, and we are trying to drive the seven-year plan down to five years.

Whether you can do that and integrate the procurement of the what we call long lead today and still be able to make it in five years or not I think would be something we would have to go spend some time and look at.

But, in general, I think that working things in parallel rather than working them in series could be, and would be, seen as a great way to reduce risk, and you may actually have a net positive effect there instead of a negative.

But I think we have to look at what the impact on the schedule would be.

Mr. O'ROURKE. When I say that Congress has the option of procuring these additional ships now rather than in fiscal year 2010 or fiscal year 2011 or fiscal year 2012, my statement does not depend on any change in the way that the ships are built. You can still build them the normal way with two years of advanced work and six years of construction time. Over time, eventually you have stacked up a lot of boats up front, and over time the shipyards would catch up with that even if they continue to build boats at the normal rate and they would eventually enter service.

So the shipyards are right that there is a potential for changing the way the boats are built that may compress the construction time, but my own testimony about Congress's options for funding additional ships now rather than later does not depend on it. You don't have to assume that to believe that Congress has the option.

Mr. BARTLETT. I was privileged to travel with our Chairman to shipyards all over the world. The last leg of those visits was to shipyards in our country, and we had the privilege of visiting Electric Boat. And I was impressed that you were really working very hard to be more efficient and reduce costs.

We were scheduled to go to Newport News, but a hurricane was also scheduled to go there, and we decided not to compete with the hurricane for a reception at Newport News. And so we now are planning in the very near future to make that visit, too. And I will be pleased if I can find at Newport News the same commitment to cutting costs and achieving greater efficiency than we saw—that we saw at Electric Boat.

Mr. O'Rourke, there is a suspicion that when we designate a risk as being acceptable, that that is an accommodation to the reality imposed by budgets that we can't have any more resources. One of our Members Mr. Forbes asked, how do you characterize that as acceptable? If that is all you can get, that obviously has to be acceptable. As you look over their shoulders, how would you characterize the risk that we will have if we drop from 48 attack subs to 40?

Mr. O'ROURKE. I guess what I would say is I think it raises the question if 48 is acceptable, and you go below 48, are you now at a level of risk that is less than acceptable?

Mr. BARTLETT. But they are telling us that 40 is an acceptable risk. We have some suspicion that we characterize risk to be acceptable when it is unavoidable.

Mr. O'ROURKE. And in last year's hearing on this topic, we talked about low, moderate, and high risk, and I think last year the Navy characterized the risk of that situation as moderate.

Mr. BARTLETT. How would you characterize it?

Mr. O'ROURKE. I would say the same thing as I did last year. If we dip below the force level, we are running the operational risk that is something now more than moderate, something closer to higher risk.

Mr. TAYLOR. The Chair recognizes the gentleman from Connecticut Mr. Courtney.

Mr. COURTNEY. Just to follow up on that last question, Mr. O'Rourke, the determination that 48 was the right target by the Navy last year, that is not the first time that we have sort of gone through that exercise in recent years. I mean, they have actually had different numbers in the past; isn't that correct?

Mr. O'ROURKE. That is right. There has been an evolution in the attack force level goal that affects the outcomes of a number of studies, some of which became official in terms of being folded into things like the Quadrennial Defense Review (QDR) for that coming year.

Mr. COURTNEY. And a number of those have been since the end of the Cold War; isn't that correct?

Mr. O'ROURKE. That is right.

Mr. COURTNEY. The Navy has concluded that the Navy needed a larger number than 48 in the past.

Mr. O'ROURKE. And some of those studies have indicated a need for 55 or more submarines, and one of those that has been mentioned a number of times already was the 1999 JCS study. But

there were others as well. There are some people that believe that 48 is not, in fact, sufficient, that a higher number like 55 or more is better. There are debates on both sides of the issue.

Mr. COURTNEY. Mr. Casey, you alluded in your testimony to a lot of the progress that has been made in terms of proficiency in the recent delivery of the new submarines, and I was wondering if you could elaborate in terms of quantifying how much savings you have been able to create.

Mr. CASEY. I think the most recent and best example I could use was that the USS *Hawaii*, which was recently delivered to the Navy this past December, was delivered for 2 million manhours less than the *Virginia*, the previous ship delivered from Electric Boat. We expect to stay on that learning curve. I think we have about 85 percent of our—this has unionized people as well, which is not typical in industry, but we have 85 percent of the people in our shipyard, unionized and not, participating in activities to improve the safety of how we do the work and reduce the cost of the work that is done and improve the quality of the work that is done.

We are working very closely with the vendors. I think that question was asked relative to accelerating procurement rates. I think the most important information we could provide them is to make sure they know that we are going to buy these two ships, and I think we will have some great response from them.

But let me summarize that and pile it together by stating this: We are heading into a period of time where we are trying to dramatically reduce the cost, reduce the schedule, at the same time one ship per year without the maintenance work on our waterfront causes these eruption cycles. We are going to have to find a way to change the size of the waterfront workforce by about 1,000 people during the years we deliver a ship compared to the years when we don't deliver a ship.

If we get to two a year, that goes away. We can stabilize that workforce, and we don't have to be as concerned about finding something for those people to do in the intervening years.

I believe there are opportunities to look at in the 18 ships that are home-ported in the Groton area, and where there are availabilities on those vessels that do not require moving of the vessels, the Navy has, in fact, asked us to participate in maintenance in some of those vessels. If we can stabilize that workforce and absorb the shipyard overhead via the maintenance work, that can have the net effect of reducing the cost of *Virginia*, as I think the number I gave was about $65 million over the next 10 years.

So those are some examples to answer your question.

Mr. COURTNEY. Thank you.

When Secretary Stiller was here earlier, she seemed to almost suggest that accelerating the production levels to two subs a year would almost put at risk the Navy's plan for bringing down the costs, and I just wondered, Mr. Petters, if you want to comment on that as well.

Mr. CASEY. There are three major constituents in this cost-reduction activity. One is the economic water quality vendor base, about a third of the cost of the ship is contractor-furnished material, about a third of the cost of the ship is government-furnished material, and about a third of the cost of the ship is the labor.

So on the government-furnished material, that portion of it is, in some way, impacted, but in a very small way by these design activities.

What she specifically was talking about are the inherent costs and the design of the ship are part of that cost-reduction package that gets us to a $2 billion vessel measured in 2005 dollars. Nevertheless, we will reduce the cost of ships by accelerating procurement no matter when it is done. The more ships we build, the less dollars per ship will be charged. I don't think there is any question on it. If we buy one at a time, however, we will not be able to achieve the cost savings that are designed.

But she is specifically referring, I believe, to the fact that some of the design activities we are engaged with today, for example, eliminating sonar sphere, will take a couple, three years to complete. And that particular design modification will not be implemented on that first ship if it is authorized this year. It is still a good thing to do. Still, the ships get cheaper. They may not get down to the $2 billion level. I think that was her point.

Mr. PETTERS. I think so, too.

Mr. COURTNEY. And Mr. Ellsworth actually had to leave, and he wanted me to ask a question of Mr. Nash, and I think he kind of alluded to when he had the opportunity to speak to the admirals earlier about decreased workloads on the vendors outside of the Virginia and Connecticut and the industrial base, which includes you as well, and he wanted me to ask you to comment on that.

Mr. NASH. Without question, the fact that we are at one *Virginia* per year, and we have an aircraft carrier every five years, it is definitely a minimum level that we can operate the industrial base. As a result of that, a lot of our subvendors that supply a lot of our materials are our sole source as a result of that, and they have also had to bring in additional work to make sure they can maintain critical mass to continue to support the submarine and aircraft program as a result of that.

So if we were to go below that in terms of one *Virginia* per year and something less than one aircraft carrier for five years, I think we are going to be in a situation where we are going to have to be maintaining resources and not have them a lot—a whole lot to do. So from that standpoint, I think we really need to look at the second *Virginia* as early as we possibly can.

And I would like to make one other point that Congressman Bartlett had asked earlier. In 1998, the country was interested in building two carriers per year, and the way they were able to achieve that is they used a floating set of heavy equipment for that aircraft carrier to do that. And that is where I think the $4 million we have, maybe here this year, may be an opportunity to buy a rotating or revolving set of heavy equipment that could expedite the fabrication of a submarine program.

Mr. COURTNEY. Thank you, Mr. Chairman.

Mr. TAYLOR. The Chair recognizes the gentleman from Virginia.

Mr. FORBES. Thank you, Mr. Chairman.

I want to say to Mr. Casey and Petters both, these pictures are very impressive, but they still don't do justice to the real thing. When you see it, it makes us all proud, and we thank you for the great job that you both do.

Mr. Petters, Mr. Bartlett made the statement that the hurricane stopped him from coming to Northrup Grumman and Newport News. I am going to give you my time. If you could tell us today in a nutshell the changes to the design process, engineering, or construction of subs that Northrup Grumman and Newport News has implemented in order to reduce costs and make them more efficient. And also if you give us the recommendation of what you would like to see done that would help create more efficient procedures; what would they be?

Mr. PETTERS. Thank you, sir. That is a loaded question, so I will try to describe the universe here in 25 words or less.

First of all, Congressman Bartlett, I would invite you again to come visit us. I know you had the chance to visit us once, and I invite the whole committee to come at a time of your choosing to see what we have going on at the shipyards. Our overall scheme of thinking about business in the shipyard is you combine investment and people with investment in your processes to yield really great performance.

We have invested significantly in our workforce over the last ten years from a leadership standpoint as well as from a skilled training perspective to make sure that we have and are able to forecast the need for the kinds of skills that we will need for the ships of the future.

We have also invested very heavily in our processes. On my first day as president, we stood up an organization in the yard known as Process Excellence, which would facilitate our Lean and Six Sigma efforts throughout the shipyard. We actually validate the cost savings that we get out of those programs. We put them in two buckets, a risk-reduction bucket and a cost-savings bucket, which is what the Navy sees.

Today we have validated $55 million worth of savings there that goes in those two buckets, and we think that is just the beginning. That process looks at all of our value streams across the whole waterfront of the shipyard. We look at the pipe value stream as it goes from one end of the shipyard to the other. We look at the steel value stream as it goes from one end of the shipyard. We look at the electrical value stream. We have been investing in our planning processes and our—and we have been looking hard at our overhead, all of the things that we have to do to drive efficient performance into operation.

We combine that investment and process with some very thoughtful investments in our facilities. Since the beginning of 2002, we have invested nearly $400 million in our facilities to improve the efficiency of building aircraft carriers and submarines, and we have already planned for another $300 million of investment to do exactly that.

You know, I said earlier the questions that we were asked, can we go to two submarines a year; yes, we can do that. Should we? Yes, if we can keep it—keep the stability in place. I have to emphasize that. I have a chance in this role to see the—I see the submarine base, but I also see the aircraft carrier base. I see the carrier repair base. I see all of those bases, and I see that all of those bases are fragile, and to find balance has been a very tricky thing for the Navy to work its way through.

I would just ask that we—if we have a plan, let us stick to it, and let us not disrupt our plan.

My friend here from BWXT Mr. Nash has talked about how minimal we are at one submarine a year and one carrier every five years. In fact, the Navy's plan today has one submarine a year until 2012, when we go to two, and we have one carrier every four years. There is a carrier in this year's budget request, but there is also one in 2012. In my experience, that is the first time the Navy has made a commitment to put the next carrier in the budget at the same time as this carrier is in the budget. Those are signs of stability that I think we can't ignore.

And so while I am very hopeful that the committee can lean forward and find a way to move ahead on this program, I encourage you to do that in a way that is not disruptive to stability, because that would then have an effect in my yard relative to the people and the process things and the capital investments that we have made there. We are on a fine balance, and we need to keep that.

Mr. FORBES. Thank you, Mr. Chairman.

Mr. TAYLOR. The Chair recognizes the gentleman from Rhode Island, Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

Again, gentlemen, thank you for being here.

Chairman, again, my thanks for allowing me to rejoin the committee today. I have enjoyed my six years on the Armed Services Committee, and I am so proud of the men and women in uniform who defend this country every day. We have the finest fighting force on the face of the planet because of the men and women who wear the uniform; and I have said this many times, but it is equally important that we have companies like those that are represented here today that build the finest equipment for our men and women in uniform, that help them to do their jobs effectively and keep them safe. So thank you all for your patriotism and for your hard work.

If I could, just so that I am clear on the question of whether to rebuild the submarines with or without advance procurement. What is preferable, and are there significant cost savings so that I am clear whether we build it without advance procurement money or we do it with it?

Mr. CASEY. I think Mr. O'Rourke is probably the most experienced on the difference between the two of them.

My perspective is as a shipbuilder. If I am authorized to build a ship and I am funded at the levels I need progressively over the five-year construction cycle, whether you call it advance procurement, whether you call it initial ship construction authorization, it does not make a lot of difference to me. As long as I know I have a contract to go build a ship and I am authorized to start, I will do that as efficiently as I can. And, in fact, we are not satisfied with how efficient we are on the last one, trying to make each successive build in less hours, a shorter time than its predecessor. So I do not have a strong preference.

We have made some recommendations. Assuming the committee follows the traditional path, the recommendations include $70 million in advance procurement, money to allow our vendors that we buy material from to avoid a gap, if you will, so they can get the

material to us in time to start, assuming the multiyear procurement contract occurs on existing Navy schedule.

We have recommended that the government is authorized to buy a ship spare main propulsion unit so they can have that main propulsion unit available to us when the first multiyear contract ship will sign, and it will not interfere with our ability to get the schedule to build the ship down to reduce the cost. We think there are opportunities in the economic order quantity area for you to go further, and of course, the nuclear vendor, Mr. Nash, testified that he would like to get going, but I do not have a strong preference on how it is done.

We have made some recommendations, as I said, using traditional funding approaches. There are alternatives; Mr. O'Rourke laid out some great ones, and you all probably have some good ones that we have not even thought of, but as long as you get us going and can give the Navy the authority they need to contract with us to start the construction process, we will get it done within the commitments that we have made.

Mr. LANGEVIN. Can you identify a cost saving element? Are there more cost savings one way or the other?

Mr. CASEY. Yes. I think that from a cost savings perspective—and I probably fumbled that a little when Mr. Courtney asked it—relative to the vendor base, we have to have a sum of money that authorizes us to buy ships in a multiyear procurement process. We oftentimes refer to that as "economic order quantity money." with the monies that can be saved through that overall process—you know, about $200 million, in that range, something like that—driving a ship schedule from 7 years down to 5 years and the rest of the construction improvements that we are forecasting, you know, it might be in the range of $100 million or something like that.

We have to have the engines available to make that schedule, and we have to have materials purchased from the vendor base in order to achieve those reduced schedules. If we take our normal seven years, the reason it normally takes seven years is, the first year we are awarded a contract, we are sort of waiting for material to be built by the vendor base so we can start in a meaningful way.

Last, you know, the cycles that are existing, the labor rates that we are able to avoid if two per year is accelerated, will yield considerable savings, and I think the number would be about $65 million. If it is two per year, it is a similar number. If we can find some way to avoid these wild swings in the requirements for the Groton warfront personnel, we have the potential to save a significant amount of money on this program.

Mr. O'ROURKE. Mr. Langevin, also just to answer your question, whether you do it for a couple of years with AP money up front or you fully fund it in a single year with no AP money, that single change, in and of itself, is not going to make any substantial change in the cost of the ship.

The outlay rate will be slower because you have banked all of the money for the entire cost of the ship up front, and some of it will have to wait a little longer to be spent, but the actual cost of the ship, itself, of that one change, is not going to change very much.

However, if you do this, if you procure a submarine in 2008, for example, with a single year of full funding, as part of the initiative

to get the two per year earlier or to include more than seven boats in the multiyear that the Navy is looking for, for 2008 through fiscal year 2012, then that would reduce the cost of the submarines. The one change, in and of itself, of AP or no AP, that is fairly transparent to the cost of the ship; but if it is part of a broader strategy to get to two per year or to include a regular number of folks in the multiyear that the Navy is looking at, then that would reduce the cost of the ships.

Mr. PETTERS. I would just add that, in my experience, there is a whole host of different ways that you can create a funding mechanism for, you know, advanced procurement, advanced appropriations, incremental funding, those kinds of things. Most of the time when we are up here, they are looked at as accounting changes, and we kind of look at it like the area on the curb is always the same, you know, in aggregate, but I think that there are opportunities depending on the way that you approach this. I think there are opportunities when you are out, when you are back at the shipyard, to look at some of these mechanisms as reduction mechanisms, which then translates to some lower cost.

So I think that is another way of saying what Ron has said, that if you did fund the entire ship in 2008 and you allow not only some work to go on in advanced procurement, but also at the shipyards to facilitate and to move ahead and to work slightly in parallel, maybe we do not get the "begin procurement to delivery" time all the way down to five years, but maybe we address some of the cycles that John has going on at Groton which drive some significant costs down, and so the area of the curb would diminish. And I think that is a real challenge as we look at all of these things, because we tend to look at them here just as if they are accounting tricks or accounting exercises, but in fact, there are real operations on the other end of that, that depending on the method that you choose, could have some impact.

Mr. NASH. In terms of whether you fund the ship all at one time or whether you have AP funding for like two years in advance of the funding of the platform itself, we would have to work very closely with the shipyards to see how that type of funding approach would work because there is a certain amount of lead time, especially in some of our heavy forgings, that just takes a couple of years before you can get with the vendors to get it into their cycle to enable them to produce those, to be able to meet the current schedules we have with the shipyard today.

So there would have to be some additional integration and discussion with the shipyard on how we would do that to be sure that we would not end up with long lead items that we produce and that we end up holding the shipyard up, because once you start holding the shipyard up, that is a significant amount of cost. We cannot be caught in that trap.

Mr. PETTERS. Which is why I keep coming back. You cannot assume that we could do it in five years from today. There would have to be some integration and some sort of schedule put out that would integrate both of those factors.

Mr. O'ROURKE. And the option, as I presented, does not require even assuming the achievements of any of that. I presented these options solely on the basis of proceeding with the construction of

boats as we normally would, which is why the outlay would be slower. As to anything that Mr. Petters has talked about, if you can achieve it, then you can get some additional savings, but I am not even going that far in outlining the option in my own statement.

Mr. LANGEVIN. What are the other things that the government could do to take some of the pressure off of the shipyards with respect to capital outlays/capital improvements that need to be made at the other shipyards that would make shipyards more efficient? What are the things that the government could or should do in helping to purchase that equipment so that the risk is not all on the shipyard in the event that, you know, we do not get to building the number of ships that we feel we need to or that new technologies could come on the market that replace the old equipment that you just invested in? Are there things that the government could be doing in those areas?

Mr. CASEY. I believe the capital expenditure (CAPEX) program on the *Virginia*-class that we have today is a model that could work across the entire shipbuilding industry. There are a lot of ways to apply that particular model in the case of *Virginia*. As I tried to explain, the process is tied to the fees or to the profit we are eligible to earn on the contract, but there are other alternatives.

I think the key is to make sure that there is some sort of incentive that is tied to the existing contracts, but there has to be an understanding of what the purpose of that investment will be in the long term. So, when the government gets involved and sort of absorbs what we refer to as the "cost of money," if you will, it makes those hurdle rates a lot easier to rationalize from an industrial point of view.

But I think that the model that we have is a good model, and I think it can be expanded. It happens to be submarine-specific on this given program. There may be some opportunities to look at cross-program models.

Maybe, Mike, you will want to comment on that.

Mr. PETTERS. I think John brought up the right point.

The way the shipbuilding industry is structured today, in order to attract capital, you really have to get the return on the ship you are working on because of the way the contracts are set up. The beauty of the CAPEX program and the submarine program is that the submarine force has recognized that if you actually look at what the return is over the class of ships, then it makes sense for the government to invest in that capital improvement in such a way that the corporations can invest in it as well.

We have done something a little bit different on the carrier program than what we do on the submarine program because we are not now dealing with a production run of 30 ships. But in that case, the Carrier Program Office has come back, and they have looked at some of our major facility improvements, and they have incentivized some of those as well.

We put up shareholder money for those investments to the tune of nearly $200 million, but some of the incentives paid to us for making those investments will get us to the point where we are close to the hurdle rates that we need to justify those incentives, and I think that is the principal issue that you need to look at. I

would respectfully request that the committee look at how do you make investments that would be bigger than just a particular contract you are looking at, because the accounting rules that we have, the financial rules that we have, make it very hard for us to just go and make investments that we have to capture all——

Mr. TAYLOR. Mr. Langevin, may I interrupt for a minute?

I would like to invite all of the panel to the hearing to address that, which is on Tuesday, the 20th. We would welcome your input.

Proceed, Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman.

Mr. O'Rourke, would you like to comment on that?

Mr. O'ROURKE. No.

Mr. LANGEVIN. Then my final question would be—you know, I have been one of the biggest proponents, along with many of my colleagues, in pushing up the build rate to a year sooner than 2012. It looks like, right now, according to what we have heard from the appropriators, that we are going to be building five ships this year, one of which would be an additional submarine.

Does that get us to the point where we have protected our design base that it protects our industrial base? I mean, it is obviously important from a national security perspective so that we have a submarine force that protects the Nation, that meets the requirements of the Combatant Commanders, that protects the ability to design and build these submarines; and I am concerned, as many have been, that we could lose that capability or degrade it significantly, and that will get harder and harder to come back from. We do not want to be in the position of Great Britain, for example, that is just now trying to reconstitute its submarine building capability.

So how much pressure does that take off of us if we, in fact, do get to start building——

Mr. CASEY. In and of itself, the authorization of an additional ship will not preserve the design capability that exists in this country, namely of the submarines. There are other activities that are required, one of which is related to the *Virginia*-class program, which is what is referred to as the design for an affordability study that the Navy discussed separately, level loading or accelerating the next strategic platform design, which I believe Admiral Hilarides has testified to. It would also alleviate that concern to a large extent.

But as to the authorization of the ship, I cannot answer in the affirmative that that would, in and of itself, satisfy the requirements to sustain the design capabilities in this country.

Mr. PETTERS. I agree with that answer.

Mr. O'ROURKE. Yes. I, actually, wanted to amplify that a little bit.

The Navy talked during the first panel about the option of accelerating the start of the design work on the SSBN, and that does appear to be emerging as the major option or the major element of the strategy for preserving submarine design and engineering bases, especially in the wake of the conclusions reached by the RAND report.

But one other option that is available to Congress, which Mr. Casey just mentioned, is to expand the scope of the already planned redesign work on the *Virginia*-class to include a greater

number of projects than what the Navy has funded, and that, too, is an option for Congress. In fact, it is something that Congress has added money for in prior year budgets. It could continue to do so in the fiscal year 2008 and subsequent budgets.

Mr. LANGEVIN. Very good. Good point. Thank you.

Thank you, gentlemen, for your testimony.

Mr. Chairman, I yield back.

Mr. TAYLOR. Thank you.

The Chair recognizes the gentleman from Maryland.

Mr. BARTLETT. I have one quick question. Thank you very much for your testimony.

I am having a little trouble understanding the concern for instability with the one-ship, two-ship, one-ship procurement. Since it takes several years to build a ship, if I have nine ships to build and I have five years to build them, I think I would spread that work out evenly over the five years rather than having twice as much work in years one, two, three, and four as I have in year five. Am I missing something?

Mr. CASEY. I think the way you just explained it is a little different than what I thought I was answering.

If we stick with the existing plan today, we have one ship planned to be authorized in fiscal year 2009, one in fiscal year 2010, one in fiscal year 2011. Right now, we are building one ship a year from the block, too, so these ships that we are building today, the last of which will be funded in this fiscal year we are in now, fiscal year 2008, are built at a rate of one per year.

There is only one ship in the water, an Electric Boat, every other year. The other ship is at Newport News in the water. We have been able to mitigate the fluctuations in those skill-based people, those skilled craftspeople—for example, the radiological control people, the people who operate the vessel. We have been able to mitigate that through our involvement in maintenance and repair activities.

Now, that is going away. That is going to our naval shipyards, as I have been told, so that will put us in the position of having a ship in the water one year when we deliver a ship and then no ship in the water for a year, a ship in the water for one year and then no ship in the water; and I hope that helps clarify the issue.

When we get to two ships per year, there will be one in the water every year, an Electric Boat. That is why the two per year has for a long time been such an important priority relative to the industrial base view of the world, at least Electric Boat.

Mike can certainly answer a little differently, I think, because of the——

Mr. BARTLETT. That is a different concern than the one I was addressing.

We have been led to believe that we inject instability into the shipbuilding base if we procure one ship, two ships, one ship. I am not having trouble understanding that since it takes, what, five years to seven years, whatever it is, to build a ship. You know, I would simply spread that work out so that I would have an even workload and be thankful for that second ship every other year. Am I wrong?

Mr. PETTERS. Well, sir, I think that—as I see it, I think that there are two definitions of "stability." when I think of "stability," I think of, if you decide to add a second submarine to the plan at the expense of, say, a surface combatant coming out of the plan or the carrier being delayed for another year or something like that which would create some changes in the plan of record because you had to take the money that was designated for these other things and put them into the submarine, that sort of instability would be very detrimental to the entire industry.

If, on the other hand, you are thinking of "stability" as being, once we go to two submarines per year, we can never go back to one submarine per year, I think, as long as—I will speak for myself. As long as I know that the plan is one-two-two, one-two, whatever that plan is and we just stick to it, I can accommodate that. I can make that work as long as we stick to it.

My concern on "stability" is not about whether we go from one submarine to two and then back to one. My concern on "stability" would be, if you go to two and it causes you to do something to other types of ships in the plan that would affect the base—you know, the overall industrial base that is out there. I think that would be a big problem for me; it would be a big problem for the industry.

Mr. O'ROURKE. Representative Bartlett, my point along those lines in my opening statement referred back to some testimony the Navy gave a week ago where they said that if you did two boats in a given year, then went back down to one, then back up to two, that could stress the workforce.

In my own view, I disagree with that because the shipyards can phase the total volume of work that they will understand that they are getting, and it can actually represent a way of helping the workforce transition from a steady rate of one per year to a steady rate of two per year.

If, in between, Congress finds that it can only give one or two extra boats during this four-year period, Congress, in my view, can entertain the option of scheduling them so that it results in two, one, two, one, so that the average rate of about one-and-a-half boats per year could actually help make that transition.

I am sure the shipyards would love to go directly from one per year to two per year, but if Congress decides it can only afford to get one or two extra boats this period rather than three or four, then, in my view, Congress should not feel it has to avoid examining options for adding those one or two boats that would have a one, two, one, two schedule. I do not think that is detrimental. In fact, it might actually be helpful in transitioning to the eventual higher rate.

Mr. CASEY. A simple way to think about it, if I understood you correctly, is three ships every two years is better than two ships every two years.

Mr. BARTLETT. That is how I would see it, sir. Thank you very much.

Mr. NASH. Chairman Taylor, I would like to add one thing.

I am not backing off the nine percent, but I want to be sure. There was one assumption when I said there was a nine percent savings as a result of the second *Virginia*-ship set. That is assum-

ing that the projections we have right now for the second aircraft carrier will be funded on the schedule that is predicted to be scheduled as shown in the contract.

Mr. TAYLOR. Mr. Nash, I am going to ask you an unusual question.

Because of the hurricane in the part of the country where I live, there is now very fierce competition for labor, and I am a proponent of our next generation of cruisers being in power.

Could we, playing devil's advocate, get to the point where, if we were to add the second submarine and continue this and then follow that up with the desire to go—to build the next generation of cruisers with nuclear power, could we find ourselves in a situation where the cost of that plant actually goes up? Or is your industrial base capable of handling that, and does it relate, in your mind, to continuing the reduction in cost of those power plants?

Mr. NASH. With the hardware that we provide, we could support that and, also, as a result of that, we believe there would be about a five percent reduction in the overall cost to the naval reactor program if we could do that.

Mr. TAYLOR. I was hoping that was the answer, but I had to at least throw the other thing out there.

I will open this up to the panel because you are so knowledgeable. Looking for ways to avoid the bottom of the valley as far as the number of vessels and knowing that, for example, the block line cruisers will retire very early, is there anything that we could or should be doing to the 688s now that could help get the additional two or three or four years that we would need to avoid that slump?

Mr. CASEY. I guess I will take a shot at that.

You know, I think that the Navy should really be the one answering this, but the questions I would ask them would be: How could we extend the hull life? One of the limitations on a *Los Angeles*-class submarine, or any submarine, are the number of cycles on the hull. Every time you go test it, you cycle the hull, and it is limited to the number of cycles it can see.

Second is the life of the fuel. How much fuel is in the ship? How much gas is in the tank, so to speak? So one of those two things. It limits the life of every submarine.

How much is left on each of those 688-class ships that are in the fleet today? I cannot answer that. I do not have that information, but I am sure the Navy is in a position to provide details on that.

Mr. PETTERS. Mr. Chairman, I would just add that I think John has got it right. As far as the end of life of ships go, one of the things that we have seen at the end of life of these ships is that the cost of maintenance on an older ship starts to go up more than linearly, and it is——

Mr. TAYLOR. Can that be avoided with enough preventive maintenance?

Mr. PETTERS. I think there is a tradeoff there about how much investment you want to make in it, because some of the systems, for instance, that you put on the ship that were built in the 1980's may not—the people who built those systems may not be around, so you have to go redesign some of those systems.

Now, you are talking about what kind of investment would you make. My suggestion on this issue is that the way to deal with the

force structure issue is not on the back end of the life cycle; it is on the front end of the life cycle. The build rate on the front end is what really drives the force structure. I mean, you can do some things like maybe do another refueling or maybe do a couple of system reengineerings to keep a couple of ships out there, but that is a Band-Aid fix. I think that dealing with the issue on the front end is a lot more efficient because you are not dealing with the increased cost of maintenance, and you are making investments in the right kind of technologies, and you are doing it on the baseline. So——

Mr. TAYLOR. Mr. O'Rourke, any suggestions?

Mr. O'ROURKE. Among other things, you would have to look at the operational implications of husbanding electrical cycles and husbanding core life. If you are going to run the ships slower and not submerge them as often, what does that do to the utility of the submarines during the years that you are operating them?

Plus, there are some issues you mentioned that are things we can do now that can head this off. There is simply the strict aging of materials and brittlement of materials and so on; and the way to get at that is to go in there and replace it. But that simply trades a maintenance cost later for doing a maintenance cost now, and again, when you look at the economics of that, it may not make sense. So this strict aging of materials could be a limiting factor also in addition to the ones that the other witnesses have mentioned.

Mr. TAYLOR. The last thing I would mention is an observation that the Shipbuilding Caucus and I had at breakfast this morning, and I, for one, am pleased about the very helpful work of our Congressman Skelton and Congressman Murtha.

I would certainly encourage all of you to participate to the greatest extent you can in the hearing in a couple of weeks. I would welcome to know, for example, if there is an option of a multiyear procurement for these submarines, two additional ships that we intend to buy, what savings, if any, does that bring. But again, I see a lot of things, a lot of hurdles that we have to cross to make these things happen, getting at least temporarily shorter, and as to all of those who have a desire to see the Navy build more submarines now and more ships now, I would certainly encourage those of you who can work with us to work with us on that.

Mr. Ranking Member.

Mr. Forbes.

Mr. Courtney.

Mr. COURTNEY. Done.

Mr. TAYLOR. Thank you very much for being with us.

The meeting is adjourned.

[Whereupon, at 5:35 p.m., the subcommittee was adjourned.]

A P P E N D I X

March 8, 2007

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 8, 2007

Statement of Ranking Member Roscoe Bartlett
Seapower & Expeditionary Forces Subcommittee
Committee on Armed Services

Force Structure Requirements and Alternative Funding Strategies for the U.S. Navy Submarine Fleet

March 08, 2007

Thank you, Mr. Chairman. Good afternoon, ladies and gentleman. I'm pleased to be with you today to once again discuss the future submarine force structure and submarine industrial base issues. Nevertheless, I am somewhat disappointed to see that the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2008, as well as the President's budget request for Fiscal Year 2008, were submitted to Congress without any changes to the procurement strategy for attack submarines. Last year, we held a hearing very similar to today's to explore the same three issues:

- Why does the shipbuilding plan fail to provide a sufficient number of submarines to meet the Navy's own requirements?
- Has the Navy and industry exhaustively analyzed all alternative funding strategies to minimize submarine construction costs, in order to address the requirements shortfall sooner?

- What measures are the Navy and industry taking to ensure we retain the submarine design base, which is nothing short of a national asset?

After considering the testimony we received, we included language in last year's National Defense Authorization Act, which would require the Navy to maintain no less than 48 operational attack submarines. In conference, we agreed to change the requirement to an expression of the sense of Congress regarding submarine force structure, to give the Navy an opportunity to re-examine the operational impact associated with delaying the increase in attack submarine construction until 2012 and possible funding alternatives. Since no new course of action has been presented with the budget request, I hope we will be provided with some new perspectives this year, which might allay some of our concerns – particularly in light of events in the Pacific. Last year China launched 14 submarines, while we launched only one. While it is undeniable that China's diesel submarines do not offer the same capability as our nuclear attack submarines, these trends suggest that the size of the Chinese fleet could surpass the United States Navy's within a decade and indicate that China's submarine design base is maturing.

With that said, I do want to pass kudos to the Navy submarine community for its efforts to reduce cost and deliver on

schedule. While it is true that the first hulls delivered by Electric Boat and Newport News were delivered late, the third hull, the Hawaii – Electric Boat's second delivery – was delivered at the originally scheduled delivery date, and the fourth hull, the North Carolina – Newport News' second delivery – is also scheduled to deliver on time. Likewise, although the Navy has not seen the labor hour performance it original expected based on a one ship learning curve, it has seen marked progress on a two ship learning curve. In fact, based on predicted labor hours, the Fiscal Year 2008 requested ship, the SSN 783, should be within 20% of the $2.0 billion cost cap mandated for the Fiscal Year 2012 ship. This is promising news! I hope the surface ship community can learn lessons from the submarine acquisition community about how to impose similar cost containment schemes and I hope that industry is using the same kind of rigor on its other shipbuilding contracts.

The Honorable Jo Ann Davis
Statement for the Record
Seapower and Expeditionary Forces Subcommittee
House Armed Services Committee
March 8, 2007

I am pleased that the Subcommittee is holding this hearing on what I believe is one of the most critical national security issues that confront us today. Our nation's submarine fleet is performing a wide variety of missions at this very moment, and it is our responsibility in Congress to provide for that force in the future. Even with the commissioning of Hawaii in May, the attack submarine force structure will be only 52 submarines of the end of this fiscal year. In 2006 testimony, the Navy indicated that attack submarines are only able to handle approximately 60% of their non-critical missions. The discussion always moves to the Navy's definitions of acceptable risk and designation of missions as critical, high, medium, and low. Upon further examination of these definitions, it is alarming that we are asking our Navy submarine force to do so much with so little.

The Navy's "acceptable risk" target is for an attack submarine fleet of 48, but the current Plan of Record, which starts building 2 per year in 2012, will mean reduction below 48 for a period of 14 years, starting in FY2020 and reaching a low of 40 submarines. That poses significant strategic risk to our nation, and I am committed to working with the Navy and industry on this issue.

The Navy's current Plan of Record to start buying 2 submarines/per year starting in FY2012 assumes it can build 2 for $4 Billion in Fiscal Year 2005 dollars. I understand that Electric Boat and Northrop Grumman Newport News have the cost down to around $2.4 billion, and, working with the Navy, have plans in place to make that target. This approach suggests that 2 per year production, by itself, can possibly reduce the cost by $200 million per copy. Additionally, there is $135 million in the budget this year for an effort called the Design for Continuous Improvement, which is a $600 million Navy program, funded out of RDT&E money, that will help drive costs down.

Other approaches to drive down costs include pursuing system simplification, combination, reduction, and redesign, and I am pleased that the shipyards have been looking at modifications such as bow redesign, torpedo room electric actuation, increased use of composites, and production improvements with an eye on the bottom line.

Perhaps the approach with the most potential to reduce costs is the effort to reduce the construction schedule of the Virginia Class Submarine. The resulting reduction in labor costs can significantly drive down costs, and allows our shipyards to take advantage of their institutional knowledge from building multiple submarines. This program is already making strides, and I know the Subcommittee will be pleased to know that there is a cost reduction of 20% in labor man-hours on recurring costs from first delivered ship to second delivered ship at both shipyards. We are expecting North Carolina (currently in Newport News) to come in on schedule. Northrop Grumman Newport News has completed its work on New Hampshire, the first boat of Block 2, with 700,000 fewer

man-hours than what was needed on Hawaii. Additionally, New Mexico is on track to be delivered in 74 months. Also, infrastructure improvements through the Capital Expenditure program for Block II continue the push toward increased efficiency, and provide a model for future investment in other shipbuilding programs.

Overall, the Virginia Class Submarine program is beginning to show what industry can do with a stable work schedule, proper funding, and mature design. I believe that there is more good news in store if we continue to support this program and mitigate the losses from the expected decommissionings of our submarine fleet.

As Congress continues its consideration of the President's Budget request for Fiscal Year 2008, I want to work with my colleagues, industry, and the Navy on the best way forward. Furthermore, I want to take this opportunity to encourage my colleagues to consider authorizing Multiyear Procurement Authority in Block III for the Virginia Class Submarine Program. Our submarine construction efforts have clearly benefited from the Multiyear Procurement on both Block I and Block II, and I believe there are cost savings and efficiencies to be gained from a Block III authorization as well. Block III Multiyear Procurement authority in FY08 will allow achievement of Economic Order Quantity in submarine construction and reduce costs. One of the most significant contributors to achieving the program goal of $2 Billion per submarine is the material cost savings generated from multi-ship buys and volume aggregation. I believe Block III Multiyear Procurement authority is in the best interests of the Navy, industry, and the American taxpayer.

I believe the teaming agreement between Northrop Grumman Newport News and Electric Boat is sound, and I am glad that this issue is receiving the attention that I believe it deserves. Our nation's shipbuilding capacity must be not only sustained but increased for our future national defense needs, and I stand ready to provide for the Navy submarine force of the future.

NOT FOR PUBLICATION UNTIL RELEASED BY THE
HOUSE ARMED SERVICES COMMITTEE
SEAPOWER AND EXPEDITIONARY FORCES
SUBCOMMITTEE

STATEMENT OF

MS. ALLISON STILLER
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(SHIP PROGRAMS)

and

RDML WILLIAM HILARIDES
PROGRAM EXECUTIVE OFFICER FOR SUBMARINES

BEFORE THE

SEAPOWER AND EXPEDITIONARY FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

FORCE STRUCTURE REQUIREMENTS AND
ALTERNATIVE FUNDING STRATEGIES FOR THE
UNITED STATES SUBMARINE FLEET

MARCH 8, 2007

NOT FOR PUBLICATION UNTIL RELEASED BY THE
HOUSE ARMED SERVICES COMMITTEE
SEAPOWER AND EXPEDITIONARY FORCES
SUBCOMMITTEE

ALLISON F. STILLER

Ms. Stiller began serving as the Deputy Assistant Secretary of the Navy for Ship Programs in January 2004. In this capacity, she is responsible for executive oversight of all naval shipbuilding programs, major ship conversions and nuclear refuelings, and the maintenance, modernization and disposal of in-service ships.

Prior to her current assignment, Ms. Stiller served for four years as the Deputy Program Manager in the Amphibious Warfare Program Office (PMS377B), responsible for design, development, acquisition, and fleet introduction of amphibious ships and landing craft. She supervised over 40 individuals and managed four acquisition programs with a total value of $16B.

From October 1997 until January 2000, Ms. Stiller was the Director for Naval and Commercial Construction in the Office of the Assistant Secretary of the Navy for Ship Programs. Her responsibilities included oversight of amphibious and auxiliary ship construction and conversion programs, as well as shipbuilding industrial base matters. During her tenure, Ms. Stiller helped develop and promote initiatives that focused the nation's shipbuilding industry towards commercial viability.

Ms. Stiller is an alumnus of the Commander's Development Program sponsored by the Naval Sea Systems Command. From May 1994 to September 1997, she completed short-term rotational assignments in various offices, including the Office of the Assistant Secretary of the Navy for Ship Programs, Office of the Secretary of Defense (Acquisition and Technology), Capitol Hill, Supervisor of Shipbuilding (Pascagoula, MS), and the Maritime Administration.

From July 1992 to May 1994, Ms. Stiller was Acquisition Manager for the New Attack Submarine Program. She, along with a staff of three, prepared and coordinated all documentation associated with the Milestone 0 and I Defense Acquisition Boards. Ms. Stiller developed the program's Acquisition Strategy, as well as the Test and Evaluation Master Plan. She served as program liaison to an Independent Review Group commissioned by OSD during the January 1994 Milestone I DAB.

Ms. Stiller was the SEAWOLF Combat Systems Mechanical Branch Head from 1982 to 1992. She supervised two individuals in the performance of her duties which included oversight for design and construction of the SEAWOLF torpedo tubes; weapons, stowage, and handling system; external countermeasures; internal countermeasures; turbine ejection system; and towed array handling systems. She worked closely with the lead design yard reviewing and approving ship drawings, as well as coordinating the resolution of issues with the construction yard.

From 1985 to 1989, Ms. Stiller was a private industry supervisor, managing five individuals supporting TRIDENT submarine engineering and logistics efforts.

Ms. Stiller holds a BS in Systems Engineering from the University of Virginia and a MS in Engineering Management from Virginia Tech. She is also a graduate of the JFK School of Government's Senior Executive Fellows Program at Harvard University.

Ms. Stiller and her husband, Michael, reside in Virginia.

REAR ADMIRAL WILLIAM HUNTER HILARIDES
UNITED STATES NAVY

RDML Hilarides was born in Charleston, West Virginia, and was raised in Chicago, Illinois. He attended the United States Naval Academy and graduated in 1981. Immediately after graduation, he served as master of the Naval Academy Sailing Squadron sloop Avenger, competing in numerous offshore racing events.

His shipboard tours include the USS PARGO (SSN 650) based in New London, CT, USS GURNARD (SSN 662) in San Diego, CA, USS MARYLAND (SSBN 738) in Kings Bay, GA, and culminating in command of USS KEY WEST (SSN 722) in Pearl Harbor, HI. During these assignments, RDML Hilarides deployed to the North Atlantic, Mediterranean, Arctic, and Western Pacific, conducted several strategic deterrent patrols, and underwent two major shipyard periods.

Shore tours include Aide and Flag Lieutenant to Commander Submarine Force, U.S. Atlantic Fleet in Norfolk, Virginia, Personnel Assignment Officer at the Bureau of Naval Personnel in Washington, D.C., Action Officer on the Joint Staff in the Force Structure, Requirements and Assessment Directorate, and Requirements and Acquisition Branch Head on the staff of the Chief of Naval Operations, where he served as the Navy representative to the Joint Requirements Panel.

Since becoming an Acquisition Professional, he has served as the Director, Advanced Submarine Research and Development (SEA 93R) and as the Conversion Manager and subsequently the Program Manager for the SSGN Program (PMS 398). He is currently the Program Executive Officer for Submarines.

RDML Hilarides' education includes a Bachelor of Science degree in Physics from the US Naval Academy, Navy Nuclear Power training, a Masters Degree in Engineering Management from the Catholic University of America, the Air Force Command and Staff College, the MIT Seminar XXI program in International Security Affairs, and level three acquisition training.

His personal awards include the Defense Superior Service Medal, the Legion of Merit (2), the Defense Meritorious Service Medal, the Meritorious Service Medal, the Navy Commendation Medal (5), and the Navy Achievement Medal.

Mr. Chairman, distinguished members of the Subcommittee, thank you for providing us with this opportunity to appear before you to discuss the submarine industrial critical skills, the Navy's plan to reduce the average per-unit cost of the VIRGINIA Class to $2 billion (Fiscal Year 2005 baseline) by Fiscal Year 2012, and the procurement strategies to increase the build rate of submarines.

Submarine Industrial Critical Skills

The submarine industrial base is composed of two major components, the construction base and the design base. As you know, the Navy is currently procuring one VIRGINIA Class nuclear attack submarine (SSN) per year from Fiscal Year 2004 to Fiscal Year 2008 under a Multi-Year Procurement contract. One-third of the proposed 30-submarine Class is under contract with three ships delivered and another six currently under construction. The Navy's Annual Long-Range Plan for Construction of Naval Vessels calls for procuring two VIRGINIA Class submarines per year starting in Fiscal Year 2012 with a cost goal of $2 billion per hull calculated in Fiscal Year 2005 dollars. Though the submarine construction base will remain stable until Fiscal Year 2012, this does not imply that the submarine construction base is at its optimal level. Instead, while far from robust, it is at a sustaining and constant level, two attributes that could not have been said ten years ago.

For the first time in its history, the United States Nuclear Submarine Force does not have a new class of submarine design underway. Consequently, the pool of experienced naval architects, designers, and engineers with submarine design experience is atrophying. To better understand this issue, the Navy commissioned the RAND Corporation to independently evaluate cost and schedule impacts of strategies for managing submarine design resources, which include shipyards, critical component suppliers, and the Navy itself.

With regard to shipyard capacity, RAND evaluated two strategies: sustain a number of workers in excess of current design demand or let the workforce erode and then rebuild it for the next submarine design. Sustaining workers in excess of current demand was found to be the least expensive. The shipyards would be able to more efficiently accomplish the next design by retaining a minimum range of 800-1050 designers and engineers to perform design work during the design gap. The shipyards are addressing specifics of the critical skills problem, so RAND did not repeat that effort; however, RAND described the recommended sustained workforces by general skill category.

The RAND study recognized that suppliers provide important capabilities to the submarine industrial base. They surveyed submarine critical component suppliers regarding the potential problems arising from a design gap, and initial indications show that some vendors may be at risk. This concern will continue to be evaluated by the Navy.

Lastly, RAND studied the Navy's roles in submarine design including: (1) the infrastructure and expertise enabling us to be a smart buyer and technical authority; (2)

accomplishing specialized testing, analysis, and evaluation; (3) designing critical components with no commercial viability; (4) integrating combat systems; and (5) developing new technologies for incorporation into successive submarine designs. RAND reviewed these roles, along with workforce structure and trends in Navy organizations, and came to the following conclusion: Sufficient design expertise in the various major skill categories was unlikely to be sustained to support hull, mechanical, and electrical submarine design functions at the Naval Surface Warfare Center's Carderock Division. Approximately $35 million per year would be the minimum requirement to sustain sufficient design capability in these areas across the design gap.

According to RAND, extending the period of the design of the next submarine class would alleviate the concern over erosion of critical capabilities. Based on its analysis, RAND recommended that the Navy consider starting the next submarine design in 2009 to mitigate excess costs, delays, and risks a design gap would cause. If that course of action is not followed, RAND recommended the Navy consider building upon the VIRGINIA Class through spiral development or design without construction as a substitute for working on the next-generation submarine.

The Navy has elected to preserve critical engineering skills in the near-term by investing in cost reduction design initiatives for VIRGINIA Class submarines. The Navy has budgeted more than $300 million in RDT&E, across the FYDP, to achieve the savings required to procure two submarines per year starting in Fiscal Year 2012. In addition, the Navy has accelerated the buy for the OHIO Class replacement. The lead ship will now start in Fiscal Year 2019 (per the Navy's Annual Long-Range Plan for Construction of Naval Vessels). The requirement for the OHIO Class replacement will be driven by the missile requirement. STRATCOM and Navy have begun efforts to define the targeting and warhead requirements. Once this is determined, the Navy will explore platform options for the OHIO Class replacement.

VIRGINIA Class Cost Reduction Plans

The VIRGINIA Class Shipbuilders, General Dynamics Electric Boat and Northrop Grumman Newport News (NGNN), are making significant headway in moving down the construction learning curve and bringing down the cost of these platforms. Most notable is the on-time delivery of the third ship of the class, HAWAII (SSN 776), in December 2006. In fact, NORTH CAROLINA (SSN 777), the fourth ship of the class, being built at NGNN, is on track for an on-time delivery in December 2007. With NORTH CAROLINA's delivery, we will close out the last of the first block of VIRGINIAs. The next ship, NEW HAMPSHIRE (SSN 778), is a stand alone ship that the Navy ordered under the fixed price incentive fee structure of the second construction contract. The remaining five ships under the Block II contract have transitioned to a Multi-Year Procurement with Economic Order Quantity material buy. As these submarines progress through their construction pipeline, we are gaining real-world, real-time lessons that are being applied to follow-on VIRGINIA Class submarines. With each VIRGINIA Class Submarine delivery, the program is showing marked improvement and as we progress through the Block II ships we expect to see even better performance.

The Multi-Year Procurement Contract with Economic Order Quantity purchase of material is the single most important item required to attain the $2 billion (Fiscal Year 2005 $) VIRGINIA Class submarine. For baseline comparison, the Fiscal Year 2007 ship, SSN 782, is budgeted for $2.4 billion (Fiscal Year 2005 $). By ordering two VIRGINIA Class ships in Fiscal Year 2012 as part of a seven-ship Multi-Year Procurement Contract with Economic Order Quantity, the Navy will cut $200 million (Fiscal Year 2005 $) out of the per-unit cost. Multi-Year Procurement offers the largest, most easily attainable cost savings and the lowest risk to the program. Without Multi-Year Procurement authorization in the next seven-ship contract, it is unlikely the Navy will be able to procure two VIRGINIA Class submarines for $4 billion (Fiscal Year 2005 $) in Fiscal Year 2012.

To remove $400 million (Fiscal Year 2005 $) per hull from the Fiscal Year 2012 hulls, the VIRGINIA Class Program Office has established a three-element cost reduction plan. This plan is described in the May 22, 2006 Navy's Report to Congress on "VIRGINIA Class Submarine Technology Insertion to Lower Cost" per Section 215 of the Fiscal Year 2006 Defense Authorization Act. This plan was updated in the February 21, 2007 Navy's Report to Congress on "VIRGINIA Class Cost Reduction" as directed by the Fiscal Year 2007 Senate Armed Services Committee Report 109-254. As previously noted, the first part of this cost reduction plan is signing a contract for seven VIRGINIA Class submarines under a Multi-Year Procurement strategy that will account for $200 million (Fiscal Year 2005 $). Second is improving construction performance. By realigning work between the two shipbuilders for increased module size and efficiency; applying lessons learned to current and future ships; full utilization of the Capital Expenditure incentive; reducing the construction span from seven to five years; and modifying how we install and test Non-Propulsion Electrical Systems, we have the potential to reduce costs by more than $100 million (Fiscal Year 2005 $). To realize the remaining cost reductions, the Navy is looking to redesign portions of the submarine on a capability-neutral basis. The VIRGINIA Class is executing from a solid foundation and we have an understanding of what can be achieved and we believe that by Fiscal Year 2009 the Navy will be signing a contract that includes two VIRGINIA Class submarines for $4 billion (Fiscal Year 2005 $) in Fiscal Year 2012.

The Chief of Naval Operations, in the Navy's Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2008, set Fiscal Year 2012 as the year to purchase two VIRGINIA Class submarines for $4 billion (Fiscal Year 2005 $). Procuring VIRGINIA Class submarines at a rate of two per year prior to Fiscal Year 2012 would reduce the per-unit cost of the ships and it could reduce some risks associated with the $2 billion (Fiscal Year 2005 $) VIRGINIA Class submarines in Fiscal Year 2012. However, starting the two per year build rate will not expedite achieving the $2 billion (Fiscal Year 2005 $) mark and, because of the need for more SCN (inside the FYDP), it could increase the risk to the Long-Range Plan for Construction of Naval Vessels and negatively impact other critical shipbuilding programs and their associated shipyards.

Potential Procurement Strategies

The Navy examined potential procurement strategies to increase the build rate of submarines. As indicated in the February 12, 2007 Navy's Report to Congress on "Accelerating VIRGINIA Class Submarine Construction", one option for increasing the build rate of submarines is to fully fund nine SSNs in Fiscal Year 2009-2013 and begin two per year in 2010. This would require the next contract to be for nine instead of seven hulls and require an additional $5.1 billion in SCN funding in the FYDP. The Navy also considered multi-year funding alternatives that utilize either incremental funding or advance appropriations. Multi-year funding nine SSNs in Fiscal Year 2009-2013 would require an additional $1.7 billion of SCN funding; a decrease of $3.4 billion from fully funding all nine SSNs. By comparison, although multi-year funding eight SSNs (beginning two per year build rate in Fiscal Year 2011) would not increase SCN funding required in the FYDP, it would lead to additional SCN costs beyond the FYDP ($2.6 billion). Any alternative funding strategy that requires additional SCN funding in the FYDP without top-line TOA relief would require reallocating this amount to submarine funding from within current SCN funding levels and would significantly deviate from the Navy's Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2008. Such a funding alternative would increase the risk of destabilizing the Navy's overall shipbuilding plan and negatively impact other shipbuilding programs and associated industrial facilities.

Summary

The VIRGINIA Class program is working to ensure that the Navy will be able to buy two submarines for $4 billion (Fiscal Year 2005 $) in Fiscal Year 2012. The Program Office, shipbuilders, and vendors are working together to reduce costs and deliver these critical platforms. With three ships delivered and six more under construction, the Navy is working off of a solid foundation and is confident that it will meet the Chief of Naval Operations' goal.

The Navy has addressed the RAND study conclusions and addressed the design industrial base through a two prong approach – cost reduction activity and acceleration of the follow-on design for OHIO Class replacement.

In closing, Mr. Chairman, thank you for the opportunity to testify before the Subcommittee regarding submarine industrial base. We will be happy to answer any questions that you may have.

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STATEMENT OF

VICE ADMIRAL JOHN J. DONNELLY

COMMANDER NAVAL SUBMARINE FORCES

AND

REAR ADMIRAL CARL V. MAUNEY

DIRECTOR OF SUBMARINE WARFARE

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

ON

FORCE STRUCTURE REQUIREMENTS AND ALTERNATIVE FUNDING STRATEGIES

FOR THE UNITED STATES SUBMARINE FLEET

8 MARCH 2007

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HOUSE ARMED
SERVICES COMMITTEE

Mr. Chairman and distinguished members of the Subcommittee on Seapower and Expeditionary Forces, Rear Admiral Van Mauney and I thank you for the opportunity to represent the men and women of your Navy and your Submarine Force.

We represent submariners that make up a small portion of our Navy – approximately 7% of the personnel operating about 24% of our ships. Our people are the cornerstone of our Force. They are talented, motivated and have chosen to serve their nation on the world's finest submarines, submarine tenders, and support staffs. Operating nuclear submarines is complex and demanding, so our standards have to be high. Submariners feel a sense of purpose because they are fully employed doing important work. They are out front around the globe every day providing for our national security. Even while serving in a capacity outside the Undersea Enterprise, such as on joint staffs, or in Iraq and Afghanistan, these Sailors use their unique talents and Submarine Force experiences to make valuable contributions to joint operations and the nation's defense.

As you have requested, today we will discuss the Navy's required attack submarine force level – how we developed it, and the impacts of altering the Navy's future shipbuilding plan. We will also address the Submarine Force's current operational tempo and Fleet requirements, and relate them to the future force structure. Our remarks will be unclassified; however we are prepared to provide classified details to the committee, if desired.

I. The Global Landscape – a backdrop.

Challenges. America is engaged in what will be a long war. Our current enemy is a complex network of ideologically driven extremists. Just how this war will continue to unfold, and the way the global strategic landscape will evolve, remains uncertain.

This uncertainty creates several alternative "futures." Your Submarine Force provides capabilities for national defense in each of these futures and we are ready. First, there is a world dominated by the fight against extremists, a long-term campaign fought on a global scale, involving all elements of national power. Secondly, there is the constant potential for Major Combat Operations (MCO) against a near peer competitor. Third is a world in constant crisis, with hot spots flaring around resources, ideology, religion or other issues. Finally, defending the homeland from direct attack will always be a priority and will be addressed within our borders and abroad; preferably forward, away from our borders. The Submarine Force provides capability which can help posture us against any and all of these.

Capabilities. We are taking action to secure our nation's future. This requires day-in and day-out operations in close proximity to the enemy and other potential adversaries to develop clarity of understanding of their capability and intent. We must work to capture intelligence, not wait for it to come to us. Ensuring maritime security drives the need for a strong, capable, and forward deployed submarine force.

Our capability is the combination of our platform technologies, our crews' abilities, and our Force capacity (which is the number of operational submarines). These are qualities not easily or rapidly reconstituted once lost. The firepower available from a deployed, ready, and clandestinely postured nuclear submarine is an important contribution to our nation's projection of power. Likewise, the sensors, communications and analytical capabilities of a continuously deployed and clandestinely postured submarine contributes to maritime security and provides for our nation's defense.

II. Submarine Force Structure.

In 2006, we deployed 31 of our 52 nuclear powered attack submarines (SSN) throughout the world on lengthy operational deployments. These submarines worked in forward areas, many fully integrated with Carrier Strike Groups, others as part of naval or joint task forces, fulfilling Combatant Commander (COCOM), Fleet, and national tasking. Additionally, the preponderance of our 14 nuclear powered ballistic missile submarine (SSBN) force is underway, submerged, in a secure and survivable posture, able to rapidly respond to national tasking. We have brought the nuclear powered guided missile submarine (SSGN) online with the first one of four deploying later this year. Submarines supported every regional COCOM along with Strategic Command and Special Operations Command. Submarines were sent where they were needed most and transited the Arctic Ocean, the Panama Canal, and the Suez Canal to get there. We are at work every single day, forward deployed around the world.

And we are not alone. As part of Admiral Mullen's Global Maritime Partnership Initiative, we continue working with submarine forces from 27 nations, representing more than 224 submarines. Through operations, exercises, mutual agreements, and staff talks with our allies and partners around the globe, we continue to increase our interoperability and strengthen partnerships in the name of U.S. national security.

The Chief of Naval Operations (CNO) has developed a shipbuilding plan that builds the Navy the nation needs – a Navy that is both affordable and meets with acceptable risk the future national security requirements outlined in the 2006 Quadrennial Defense Review (QDR). Force structure requirements were developed and validated through detailed joint campaign and mission level analysis and optimized through innovative sourcing initiatives (i.e. Fleet Response Plan, optimal basing and forward posturing). The shipbuilding plan and other initiatives increase ship operational availability, and balance and stabilize the shipbuilding industrial base within the Navy's available resources.

Since 1992, SSN force structure has been studied extensively. The 1999 Chairman of the Joint Chiefs of Staff (CJCS) Attack Submarine Study was directed by the Deputy Secretary of Defense to fulfill the language of the 1997 QDR. CJCS, with significant participation of the Fleet and OPNAV, analyzed peacetime forward presence and warfighting requirements in 2015 and 2025 under the prevailing national and maritime strategies and intelligence projections. However, there have been changes in the world situation and our National Security Strategy in the intervening ten years. Force structure has been revisited in the last three years, considering our

current strategies, policies and the updated maintenance profiles and operational capabilities of our new submarines, and has supported the CNO's decisions for force structure and shipbuilding.

The Office of the Secretary of Defense analyzed near term requirements under the 1-4-2-1 force construct and the Fleet's operational plans. This Program Decision Memorandum (PDM) III study concluded between 45 and 50 SSNs would satisfy the nation's needs given reasonable risk assumptions and recommended a 60% Pacific, 40% Atlantic split in basing the force.

In July of 2005, the CNO directed an effort to examine existing force structure studies, including the 1999 CJCS Attack Submarine Study and the PDM III study, as well as a number of other submarine studies, to support his decisions regarding the right SSN force structure mix within the Navy's long-term ship building plan. To maximize return on investment, the focus was for a Navy that was able to fight the Global War on Terror (GWOT), execute Maritime Security Operations, and win in any MCO. The SSN force structure was examined using a capabilities-based assessment (both for our forces and the forces of potential adversaries), and determined the required forward posture for response to any potential MCO in 2020. This analysis examined present and future COCOM demands for SSNs, along with the risks associated with meeting deterrence and wartime requirements against the most stressing MCOs. Based upon this assessment, 48 was the minimum number of SSNs that presented an acceptable risk and still allowed an affordable plan for long-range shipbuilding.

There will be some increased risk during the 2020 to 2034 timeframe when the shipbuilding plan results in a SSN force structure below 48 to a minimum of 40 SSNs, and the Navy is looking at

options to mitigate this risk. During this timeframe, we should be able to meet the COCOMs' critical forward presence requests, and maintain a warfighting surge capability with acceptable risk. The President's budget starts procuring two VIRGINIA Class attack submarines per year in fiscal year 2012, which is a key step in maintaining SSN force structure and providing for an adequate and balanced Navy.

III. Submarine Employment.

Our Submarine Force is built upon a strong legacy of selecting and training the best people, building and maintaining the best ships, and equipping those ships with the latest technology and most advanced equipment. Those people and ships go to sea to practice, they get ready and then deploy. We are busy-- on any given day more than 60% of operational submarines are underway, and of those 38% are deployed forward. Our forward deployed submarines average 79% of their time underway on mission tasking.

Submarines are cost effective. These nuclear powered ships are launched with a "full tank of gas" that lasts for the life of the ship. This negates the need for costly logistics force ships and replenishment ships staged around the globe. We continue to invest in upgraded technology, optimizing the capability of even our oldest submarine hulls.

The effects we deliver can also extend far inland. Timely, reliable delivery of accurate and lethal Tomahawk missiles is vital to most war plans. Our OHIO Class SSBNs, carrying ballistic missiles, remain our Nation's most survivable strategic asset. Insertion of Special Operations

Force (SOF) personnel from SSNs or nuclear powered guided missile submarines (SSGN) can create precision effects across the spectrum of conflict. The emerging capability in the area of Information Operations (IO) allows us to clandestinely shape the environment and reduce risk to our forces.

Our employers are the Combatant Commanders. We provide about 10 SSN-years of deployed presence per year which is sufficient to accomplish all of the COCOMs' highest priority missions. With continued maintenance process improvements in our LOS ANGELES, SEAWOLF, and VIRGINIA Class submarines, we will be able to maintain this annual deployment rate even as the SSN force structure is reduced from 52 today to 48 SSNs over the next 13 years. This force structure provides a sufficient number of SSNs to influence near-peer competitors and contributes to stability operations. The Navy is studying measures that would mitigate the risk when the SSN force structure is below 48. For example, by fully implementing cost-reduction measures for VIRGINIA Class SSN construction, it is anticipated the shipbuilders will reduce construction time for each ship from 72 to 60 months. This would add two additional SSNs to the force before 2020. For those SSNs not in a maintenance period, OPTEMPO is 46%. This indicates that our SSN force is fully employed, but with room for short-term surge.

Enabled by nuclear power, submarines stealthily and persistently operate where others cannot. We operate clandestinely in shallow water, under ice, in congested areas, and in extreme weather conditions. We have the ability to stealthily and rapidly reposition over great distances to respond to emergent crises. We contain sufficient power density to carry out multiple power intensive missions simultaneously. We provide our own self-defense and are self-contained. We

can stay on station a long time. We operate with joint, interagency, and coalition forces when needed - other times we work alone.

From a global perspective, the concentration of our operations has shifted over the past few decades from an Atlantic- focus to a Pacific- focus. SSN distribution needs are being adjusted accordingly. During the height of the Cold War, about 60% of our SSNs were based in the Atlantic. When the Cold War ended and Pacific operations increased, we shifted the balance to 50%/50%. With the transfer of USS HAMPTON from Norfolk, Virginia, to San Diego, California, we have begun implementation of the 2006 QDR intent to shift 10% of the submarine forces from Atlantic to Pacific homeports. When complete in 2010, the new distribution will be 60% Pacific and 40% Atlantic.

The five key attributes, which enable submarines to deliver unique value are:

Stealth

Endurance

Agility

Mobility

Payload

We use these attributes to our advantage - day-in and day-out.

The Submarine Force provides value across the spectrum of conflict. On one end we build maritime security. These are operations to evaluate and shape the environment, and if shaping fails, to make preparations in the pre-hostilities phase for military action. These activities occur

everyday throughout the year. It is important to emphasize that if shaping the will of a nation or extremist group through actions projected from the sea is conducted effectively, then hostilities may never occur. At the other end of the spectrum is combat that could occur during a crisis or Major Combat Operation. Your Submarine Force is capable and ready for either mission.

IV. Needed Future Capabilities.

Overall, the number of submarines in the Navy's 30-year shipbuilding plan provides adequate force structure to meet the nation's needs with acceptable risk. Our SSBNs provide the only survivable nuclear deterrent capability and will remain a viable force until the end of their service life.

The first SSGN, USS OHIO, will deploy in November 2007. The second and third SSGNs, USS FLORIDA and USS MICHIGAN, were delivered in April and December 2006, respectively. When all four SSGNs are operational, with two crews each, we will be able to keep two forward deployed at all times. These platforms provide a transformational capability for our nation. Using the Small Combatant Joint Command Center (SCJCC), the 66 SOF personnel embarked can plan and execute missions to find, fix and finish targets, or SSGNs can attack targets with up to 154 Tomahawk cruise missiles.

The VIRGINIA Class submarine is the epitome of capability, agility and flexibility. Designed after the end of the Cold War, she is built from the keel up with flexibility in mind. VIRGINIA's open architecture electronics allows us to rapidly improve capability at lower cost; and the

modular torpedo room is designed to accomplish multiple missions. With a nine-man lock out chamber, and SOF mission configurable torpedo room, VIRGINIA will provide enhanced SOF capability and mobility in the War on Terrorism. VIRGINIA, more than previous submarine classes, is essential for the future.

In the late 1990's we embarked on an effort to replace our legacy sonar systems with a more capable and affordable system based on an open architecture business model that employs Commercial-Off-The-Shelf (COTS) capabilities. COTS has enabled us to maintain our software and hardware at a fraction of the cost required to replace and upgrade our former legacy systems. This effort has been so successful, we have expanded the concept to our tactical fire control, radio room, electronic surveillance equipment, navigation, periscopes, and torpedoes. The VIRGINIA Class was delivered with an entirely open architecture posture. Recognizing the power and cost effectiveness of the open architecture approach, the Navy, as a whole, is adopting this model in other systems. The bottom line is this process allows us to stay modernized and relevant relatively inexpensively on even our oldest ships.

These programs are providing relevant, cost-effective capability to the joint force today. But there are some challenges. In order to maintain our required force structure, we need to start building two VIRGINIA Class submarines per year in fiscal year 2012. And to do that, we must reduce the per unit cost to $2 billion (in fiscal year 2005 dollars). The Navy has a good plan to achieve this and the Undersea Enterprise will continue to monitor its progress. Achieving this cost goal is an essential part of the Navy's 30-year shipbuilding plan, which is the roadmap for re-capitalizing the fleet. The Navy is also looking at the state of the submarine design industrial

base and any potential action required to preserve it. Ms. Stiller will address these issues in more detail.

We believe that the capability this Nation needs is defined by a sufficient number of submarines, each with attributes described previously and with some increased capability for:

Enhanced connectivity and

Utilization of distributed sensors and weapons

We are already moving toward a greater interdependence between our joint and coalition forces of which our Submarine Force is a current and valued component. While we communicate easily and frequently today with the joint force, we cannot do so from all relevant postures.

We continue to develop new technologies that would provide submarines with communications at higher speeds and increased depth.

We also need stealthily delivered sensors and weapons in quantity. First, we already have the SSGNs, and the SEAWOLF and VIRGINIA Classes coming online with large payload volumes and ocean interfaces. These ships will enable us to define and develop future payloads that will deliver unique capability in the face of future threats.

We envision one of the payload sets in these packages to be knowledge and shaping tools. These will include networks of distributed sensors and weapons, which allow us to better understand and affect a larger area. Whether they are sensors, unmanned or manned vehicles, or non-kinetic

or kinetic weapons, they will inherit the submarine's unique attributes of: stealth, persistence, agility, and mobility. And they will reap the same benefits we have discussed today.

And finally, we must continue to improve the sensors installed on our submarines. We have refined the twin thin-line towed array systems on our SURTASS ships and have plans to transfer this enhanced capability to our submarines.

These capabilities will enable us to assist the Joint Commander through persistent monitoring every day in areas where others can't go.

V. Summary

Our submarines will continue to be in demand, deployed forward, as scouts "walking the field." Day-in and day-out, they will be building maritime security, seeking out ground truth, shaping the environment to avert the next conflict, and ready to engage quickly and decisively. A Submarine Force of 48 SSNs, 14 SSBNs and 4 SSGNs is the right size and shape for our Navy and nation, and to sustain that we need an effective and stable shipbuilding program, a program that builds two VIRGINIA Class submarines per year starting in 2012.

Thank you very much for your time today. We will be happy to respond to any questions.

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STATEMENT OF

RONALD O'ROURKE

SPECIALIST IN NATIONAL DEFENSE

CONGRESSIONAL RESEARCH SERVICE

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

HEARING ON

SUBMARINE FORCE STRUCTURE AND ACQUISITION POLICY

MARCH 8, 2007

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HOUSE ARMED SERVICES COMMITTEE

Chairman Taylor, Ranking Member Bartlett, distinguished members of the subcommittee, thank you for the opportunity to appear before you to discuss submarine force structure and acquisition policy. As requested, my testimony will focus on the following:

- the history, in brief, of the Virginia-class acquisition program, including the changes that have been made to the program of record over the years (pages 1-4);
- the historical trend in submarine force structure and an analysis of future submarine structure based on the current program of record (pages 5-14); and
- an analysis of the current and projected shipbuilding costs for Virginia-class submarines (pages 14-16).

In addition, Appendix A to this testimony discusses the attack submarine force level goal, and Appendix B discusses options for preserving the submarine design and engineering base.

Brief History Of Virginia-Class Program

Program Origin And Aims

The Navy initiated the Virginia-class program in the early 1990s with the goal of designing an attack submarine (SSN) that was less expensive to procure than the Seawolf (SSN-21) class, and better optimized for post-Cold War SSN missions. To make the Virginia class less expensive to procure than the Seawolf class, the Navy accepted a reduction relative to the Seawolf-class design in certain performance characteristics, such as maximum sustained speed and total weapon-carrying capacity, while maintaining other Seawolf-class performance characteristics, such as acoustic stealth. Features that help optimize the Virginia-class design for post-Cold War SSN missions include a reconfigurable torpedo room and a lock-in/lock-out chamber for special operations forces.

Joint Production Arrangement

Virginia-class boats are built jointly by General Dynamics' Electric Boat Division (GD/EB) of Groton, CT, and Quonset Point, RI, and Northrop Grumman Newport News Shipbuilding (NGNN) of Newport News, VA.[1] Under the arrangement, GD/EB builds certain parts of each boat, NGNN builds certain other parts of each boat, and the yards take turns building the reactor compartments and performing final assembly of the boats. GD/EB is building the reactor compartments and performing final assembly on boats 1, 3, and so on, while NGNN is doing so on boats 2, 4, and so on. The arrangement results in a roughly 50-50 division of Virginia-class profits between the two yards and preserves both yards' ability to build submarine reactor compartments (a key capability for a submarine-construction yard) and perform submarine final-assembly work.

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[1]GD/EB and NGNN are the only two shipyards in the country currently certified to build nuclear-powered ships. GD/EB builds submarines only, while NGNN also builds nuclear-powered aircraft carriers and is capable of building other types of surface ships.

The joint production arrangement is a departure from past U.S. submarine construction practices, under which complete submarines were built in individual yards. The joint production arrangement is the product of a debate over the Virginia-class acquisition strategy within Congress, and between Congress and DOD, that occurred in 1995-1997 (i.e., during the markup of the FY1996-FY1998 defense budgets). The goal of the arrangement is to keep both GD/EB and NGNN involved in building nuclear-powered submarines, and thereby maintain two U.S. shipyards capable of building nuclear-powered submarines, while minimizing the cost penalties of using two yards rather than one to build a submarine design that is being procured at a low annual rate.

Procurement Through FY2006

As shown in **Table 1**, nine Virginia-class boats have been procured through FY2007.

Table 1. Virginia-Class Procurement, FY1998-FY2006

FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07
1	1	0	1	1	1	1	1	1	1

Boats In Service

The first two Virginia-class boats entered service on October 23, 2004, and September 9, 2006.

Multiyear Procurement

FY2004-FY2008 MYP. The Virginia-class boat requested for procurement in FY2008 is the fifth of five boats procured under a multiyear procurement (MYP) arrangement for FY2004-FY2008.[2] The Navy estimated that this MYP arrangement will reduce the total cost of the five boats by a total of about $400 million, or an average of $80 million per boat.[3]

Section 8008 of the conference report (H.Rept. 108-283 of September 24, 2003) on the FY2004 defense appropriations act (H.R. 2568/P.L. 108-87 of September 30, 2003) approved the five-boat MYP arrangement for FY2004-FY2008, "Provided, That the Secretary of the Navy may not enter into a multiyear contract for the procurement of more than one Virginia Class submarine per year." Accompanying report language stated that "The Navy's request to procure more than one submarine in fiscal year 2007 and 2008 is denied...."[4] The Navy and other observers interpreted Section 8008 and the accompanying report language as strongly cautioning the Navy against including funding in

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[2]As part of its proposed FY2004 budget submitted to Congress in February 2003, the Navy requested multiyear procurement authority (MYP) to procure a total of seven Virginia-class boats during the five-year period FY2004-FY2008 (i.e., one boat per year for FY2004-FY2006, then two boats per year for FY2007-FY2008). Congress, as part of its action on the FY2004 defense budget, granted authority in appropriation bill language for a five-boat MYP during this period (i.e., one boat per year for FY2004-FY2008).

[3]The Navy estimated that a seven-boat MYP arrangement would have reduced the cost of the seven boats in question by an average of about $115 million per boat.

[4]H.Rept. 108-283, p. 185.

future budgets to support the procurement of a second boat in either FY2007 or FY2008.

FY2009-FY2013 MYP. The Navy for FY2008 is requesting approval for a new MYP arrangement to cover the seven Virginia-class boats planned for procurement in FY2009-FY2013. The Navy estimates that this MYP could save as much as $1.3 billion, or an average of about $185 million per boat, compared to annual contracting.

The Navy believes that approving the MYP in FY2008 rather than FY2009 would greatly increase the probability of achieving the full $1.3 billion in savings because it would enhance the Navy's negotiating position with the shipbuilders and the vendor base.

GD/EB believes that approving the MYP in FY2008 rather than FY2009 could increase the savings of the MYP by as much as $50 million per boat, as long as about $500 million in advance procurement funding for the procurement of EOQ (Economic Order Quantity) components permitted under the MYP is also shifted from FY2009 to FY2008.

Deferral Of Start Of 2-Per-Year Procurement

When Virginia-class procurement began in the mid-1990s, DOD originally projected that the procurement rate would increase to two boats per year in FY2002. (The originally envisaged procurement profile for the Virginia-class program for the years FY1998-FY2002 was 1-0-1-0-2.) In subsequent budgets, the date for starting two-per-year procurement was gradually pushed back. It is now FY2012. **Table 2** shows planned Virginia-class procurement in FYDPs submitted from the mid-1990s to the present.

Table 2. Planned Virginia-Class Procurement In Various FYDPs

FYDP (date submitted)	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
FY95-99 (2/94)	1	0														
FY96-01 (2/95)	1	0	1	0												
FY97-01 (3/96)	1	1[a]	1	1[a]												
FY98-03 (2/97)	1	1	0	1	1	0										
FY99-03 (2/98)		1	0	1	1	0										
FY00-05 (2/99)			0	1	1	1	1	1								
FY01-05 (2/00)				1	1	1	1	1								
FY2002 (6/01)[b]					1											
FY03-07 (2/02)						1	1	1	1	1						
FY04-09 (2/03)							1	1	1	2	2	2				
FY05-09 (2/04)								1	1	1	1	2				
FY06-11 (2/05)									1	1	1	1	1	1		
FY07-11 (2/06)										1	1	1	1	1		
FY08-13 (2/07)											1	1	1	1	2	2

Source: Prepared by CRS using Navy data.
a Included at Congressional direction, but not funded in the plan.
b Submission for FY2002 budget only; no FYDP for FY2002-FY2007 submitted.

Cost-Reduction Goal

The Navy says its plan to increase Virginia-class procurement to two per year starting in FY2012 is contingent on being able to reduce the procurement cost of Virginia-class submarines to $2.0 billion each in constant FY2005 dollars, compared to a current cost of about $2.4 billion each in constant FY2005 dollars. The Navy calculates that the target cost of $2.0 billion in constant FY2005 dollars translates into about $2.6 billion for a boat procured in FY2012, and about $2.7 billion for a boat procured in FY2013.

Funding Requirements For Accelerated Production

Some observers have proposed accelerating the start of two-per-year Virginia-class procurement to a year earlier than FY2012, so as to mitigate a projected future shortfall in SSNs that is discussed in the next section. **Table 3** shows the additional funding that the Navy in 2006 said would have been needed as an addition to last year's FYDP (i.e., the FY2007-FY2011 FYDP) to accelerate the start of two-per-year procurement to FY2009, using the traditional approach for funding the procurement of SSNs. As shown in the table, the Navy estimated that this would have involved adding $400 million in additional funding in FY2007, and a total of $7.4 billion in additional funding over the FY2007-FY2011 FYDP. The $400 million in additional FY2007 funding was authorized but not appropriated.

Table 3. 2006 Navy Estimate Of Funding For Accelerated Virginia-Class Procurement In FY2007-FY2011 FYDP

(procurement funding in billions of then-year dollars, rounded to nearest tenth)

	FY07	FY08	FY09	FY10	FY11	FY09-FY11 total
FY2007-FY2011 FYDP						
Ship quantity	1	1	1	1	1	5
Funding	2.5	2.5	3.5	3.8	3.8	16.1
Acceleration of two-per year procurement to FY2009						
Ship quantity	1	1	2	2	2	8
Funding	2.9	3.1	6.0	5.9	5.6	23.5
Additional funding for acceleration relative to FY2009-FY2011 FYDP						
	0.4	0.6	2.5	2.1	1.8	7.4

Source: U.S. Navy Office of Legislative Affairs, March 3, 2006.

Using the traditional approach for funding the procurement of SSNs, accelerating the start of two-per year procurement in the current (FY2008-FY2013) FYDP to FY2010 might involve adding between $400 million and $500 million in funding to the amount the Navy has requested for FY2008. As discussed in the next section, however, there are other funding approaches for accelerating the start of two-year procurement to FY2010 or some other near-term year.

Submarine Force Structure And Procurement Options

Past And Current SSN Force Levels

During the first half of the Cold War, the total number of attack submarines (both nuclear- and non-nuclear-powered) accounted for an increasing percentage of the total size of the Navy, increasing from roughly 10% of total battle force ships in the early 1950s to about 17% by the late 1970s. Since that time, attack submarines have accounted for roughly 17% to 22% of total battle force ships.

The SSN force included more than 90 boats during most of the 1980s, peaked at 98 boats at the end of FY1987, and then began to decline. The force included 85 to 88 boats during the early 1990s, 79 boats at the end of FY1996, 65 boats at the end of FY1998, 57 boats at the end of FY1999, and 56 boats at the end of FY2000. It has since numbered 53 to 56 boats.

As of end of FY2006, the SSN force included a total of 55 boats, or about 20% of the Navy's total force of 281 ships. The 55 SSNs include the following:

- 50 Los Angeles (SSN-688) class boats;
- 3 Seawolf (SSN-21) class boats; and
- 2 Virginia (SSN-774) class boats.

SSN Force-Level Goal: 48 Boats

The Navy's 313-ship force structure plan, first presented to Congress in February 2006, includes 48 SSNs. Under this plan, SSNs would account for about 15% of the fleet. For a review of SSN force level goals since the Reagan Administration, see **Appendix A** of this testimony.

Projected SSN Shortfall

The Navy's 30-year (FY2008-FY2037) SSN procurement plan calls for procuring one SSN per year in FY2008-FY2011, two SSNs per year in FY2012-FY2028, and 1.5 SSNs per year (in a 1-2-1-2 pattern) in FY2029-FY2037. This plan, if implemented, would not be sufficient to maintain a force of 48 SSNs consistently over the long run. As shown in **Table 4**, the Navy projects that the SSN force under this plan would fall below 48 boats during the 14-year period 2020-2033, reaching a minimum of 40 boats in 2028-2029. Since the Navy plans to retire the four converted Trident SSGNs by 2028 without procuring any replacements for them, no SSGNs would be available in 2028 and subsequent years to help compensate for a drop in SSN force level below 48 boats.

Table 4. SSN Force Level, 2008-2037 (Navy Projection)

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
52	53	52	52	53	54	51	51	49	49	48	49	47	47	46
23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
46	45	44	43	42	40	40	41	43	44	46	48	49	51	52

Source: *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2008*, p. 6.

The potential for the Navy's long-range SSN procurement plan to produce a shortfall in the SSN force over the long run has been discussed by CRS since 1995, in the form of testimony to Congress in 1995, 1997, 1999, 2000, 2002, 2004, and 2006, a 1997 CRS presentation to a Defense Science Board task force on the submarine of the future, which issued its report in 1998;[5] a 1999-2000 CRS report,[6] a 2002 CRS report,[7] and a third CRS report since 2004.[8]

Options For Mitigating Or Eliminating The Shortfall

There are at least three potential options for mitigating or eliminating the projected SSN shortfall:

- take steps to temporarily increase the operational availability of SSNs during the shortfall period;
- extend SSN service life; and
- increase the number of SSNs procured above Navy plans.

Each of these options is discussed below.

Increasing SSN Availability During Shortfall Period

Taking steps to temporarily increase the operational availability of SSNs during the shortfall period could make a force of fewer than 48 SSNs look temporarily more like a force of 48 SSNs in terms of the total number of deployed SSNs or the total number of SSN days on station. Possible steps that could be taken include but are not necessarily limited to the following, some of which could be combined:

- rescheduling planned SSN maintenance away from the shortfall years (i.e., accelerating it to years before the shortfall, or deferring it to years after the shortfall);
- increasing average SSN transit speeds between home port and overseas operating areas during the shortfall period, so as to increase the fraction of deployed time that is actually spent on station;
- reducing transit distances to overseas operating areas during the shortfall period by temporarily transferring some SSNs from home ports in the continental United

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[5]U.S. Department of Defense, Office of the Under Secretary of Defense For Acquisition & Technology, *Report of the Defense Science Board Task Force on [the] Submarine of the Future*, July 1998, pp. 7, 19-20.

[6]CRS Report RL30045, *Navy Attack Submarine Programs: Background and Issues for Congress* (out of print; for a copy, contact the author at 707-7610), by Ronald O'Rourke.

[7]CRS Report RL31372, *Navy Shipbuilding in the FY2003 Defense Budget: Issues for Congress* (out of print; for a copy, contact the author at 707-7610), by Ronald O'Rourke.

[8]CRS Report RL32418, *Navy Attack Submarine Force-Level Goal and Procurement Rate: Background and Issues for Congress*, by Ronald O'Rourke.

States to more-forward home ports such as Pearl Harbor or Guam; and

- operating SSNs during the shortfall period with an average of more than one crew per boat.

Although these measures could, for a time at least, make a force of fewer than 48 SSNs look more like a force of 48 SSNs in terms of the total number of deployed SSNs or the total number of SSN days on station, they have some potential disadvantages:

- Rescheduling planned maintenance away from the shortfall years could reduce average SSN operational availability in years before or after the shortfall. If, in the years before or after the shortfall, the SSN fleet is at or not much above the 48-boat figure, then this might lead to a shortfall in the number of SSNs deployed (or the total number of SSN days on station) in these other years.

- Accelerating planned maintenance for an SSN to a year prior to the shortfall period might lead to a longer-than-optimal interval for that SSN between the accelerated maintenance availability and the SSN's next planned maintenance availability. If such a lengthened interval were deemed undesirable, subsequent maintenance availabilities might need to be similarly accelerated, which could result, toward the end of the ship's life, in a need to schedule one more maintenance availability than would normally be required for an SSN with a 33-year life. This could increase the SSN's total life-cycle maintenance costs and increase the fraction of its life spent in maintenance.

- Deferring planned maintenance for an SSN to a year after the shortfall might lead to a longer-than-optimal interval for that SSN between the previous maintenance availability and the deferred availability. This could complicate the task of maintaining the SSN's material condition during the final years of the lengthened interval.

- Increasing average SSN transit speeds could expend nuclear fuel core life more quickly, which could complicate the task of keeping SSNs in service for 33 years. If SSNs are retired prior to age 33, it could eventually reduce SSN force levels below what they otherwise would be.

- Temporarily shifting the home ports of SSNs could require the construction at the more-forward home ports of additional SSN basing and support facilities that might not be fully utilized after the SSNs are subsequently transferred back to home ports in the continental United States. Shifting SSNs to more-forward home ports, and then returning them years later to home ports in the continental United States, could also impact the quality of life of SSN crew members and their families.

- Operating SSNs during the shortfall period with an average of more than one crew per boat could shorten SSN lives to something less than 33 years by expending nuclear fuel core life and basic ship mechanical life more quickly. If SSNs are retired prior to age 33, it could eventually reduce SSN force levels below what they otherwise would be.

Extending SSN Service Life

As shown in **Table 5**, extending the currently planned 33-year service life of SSNs by one to four years could reduce or eliminate the projected SSN shortfall. Each year of service life extension would reduce the total duration of the shortfall and increase by two boats the minimum size of the SSN force.

Table 5. SSN Shortfall, FY2020-FY2033, As Function Of Service-Life Extension

(shortfall years in lighter gray; maximum shortfall years in darker gray)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33
No extension*	47	47	46	46	45	44	43	42	40	40	41	43	44	46
1-year extension	51	49	49	48	48	47	46	45	44	42	42	43	45	46
2-year extension	52	53	51	51	50	50	49	48	47	46	44	44	45	47
3-year extension	55	54	55	53	53	52	52	51	50	49	48	46	46	47
4-year extension	56	57	56	57	55	55	54	54	53	52	51	50	48	48

Source: Prepared by CRS based on Navy data.
* Baseline situation — no changes to current Navy plan.

The feasibility and cost of extending SSN service lives by one to four years would need to be examined. Issues to address would include, among other things, the mechanical condition of the boats and the operational implications of husbanding nuclear fuel core life enough so that it could suffice for 34 to 37 years of ship operation rather than 33. Due to the need to husband core life, this option might not be compatible with the previously discussed options of increasing SSN transit speed or operating SSNs with an average or more than one crew per boat.

Procuring Additional SSNs

Increasing the number of SSNs procured above Navy plans could reduce or eliminate the SSN shortfall. Adding eight SSNs to the Navy's 30-year shipbuilding plan between FY2008 and FY2022 would eliminate the shortfall. Each SSN that is added to the plan between FY2008 and FY2022 would increase by one boat the minimum size of the SSN force. Increasing the number of SSNs to be procured also generally reduces the duration of the shortfall period.

Since the Navy plans to procure two SSNs per year starting in FY2012, adding SSNs to the shipbuilding plan during the period FY2012-FY2022 would result in years in which three SSNs are to be procured. Some observers have questioned whether it would be affordable to procure three SSNs in a given year while also meeting other Navy funding needs. Interest consequently has sometimes focused on the alternative of adding SSNs to the period FY2008-FY2011, a period during which the Navy currently plans to procure one SSN per year. Since FY2008-FY2011 is a four-year period, this results in a potential maximum addition of four SSNs to the shipbuilding plan.

As shown in **Table 6**, adding one to four SSNs to the shipbuilding plan in the period FY2008-FY2011 would reduce the duration and maximum depth of the shortfall.

Table 6. SSN Shortfall, FY2020-FY2033, As Function Of Procuring Additional SSNs In FY2008-FY2011
(shortfall years in lighter gray; maximum shortfall years in darker gray)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33
0 add'l boats*	47	47	46	46	45	44	43	42	40	40	41	43	44	46
1 add'l boat	48	48	47	47	46	45	44	43	41	41	42	44	45	47
2 add'l boats	49	49	48	48	47	46	45	44	42	42	43	45	46	48
3 add'l boats	50	50	49	49	48	47	46	45	43	43	44	46	47	49
4 add'l boats	51	51	50	50	49	48	47	46	44	44	45	47	48	50

Source: Prepared by CRS based on Navy data.
* Baseline situation — no changes to current Navy plan.

Combining Service-Life Extension and Procuring Additional SSNs

Table 7 shows the matrix of potential options that results from combining SSN service life extension (if feasible) with procurement of additional SSNs in FY2008-FY2011. Points that arise from **Table 7** include the following:

- The duration and maximum depth of the shortfall could be significantly reduced by
  - — extending SSN service life by 1 year and procuring 3 or 4 additional SSNs, or
  - — extending SSN service life by 2 years and procuring 1, 2, or 3 additional SSNs, or
  - — extending SSN service live by 3 years and procuring no additional SSNs or 1 additional SSN;

- The shortfall could be eliminated by
  - — extending SSN service life by 2 years and procuring 4 additional SSNs, or
  - — extending SSN service life by 3 years and procuring 2 additional SSNs, or
  - — extending SSN service life by 4 years and procuring no additional SSNs.

- Procuring more additional SSNs than would be needed to significantly reduce or eliminate the shortfall could
  - — hedge against
    - — unforeseen events (such as collisions or other accidents) that could result in the early removal of one or more SSNs from service, or
    - — the possibility that measures to extend the service lives of some SSNs prove less than fully successful, or
  - — permit the Navy to consistently maintain a force of more than 48 SSNs, should it be decided that 48 is not enough.

Table 7. SSN Shortfall, FY2020-FY2033, As Function Of Service-Life Extension and Procuring Additional SSNs
(shortfall years in lighter gray; maximum shortfall years in darker gray)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33
No service-life extension of existing boats, plus procurement in FY08-FY11 of...														
0 add'l boats*	47	47	46	46	45	44	43	42	40	40	41	43	44	46
1 add'l boat	48	48	47	47	46	45	44	43	41	41	42	44	45	47
2 add'l boats	49	49	48	48	47	46	45	44	42	42	43	45	46	48
3 add'l boats	50	50	49	49	48	47	46	45	43	43	44	46	47	49
4 add'l boats	51	51	50	50	49	48	47	46	44	44	45	47	48	50
1-year service-life extension of existing boats, plus procurement in FY08-FY11 of...														
0 add'l boats	51	49	49	48	48	47	46	45	44	42	42	43	45	46
1 add'l boat	52	50	50	49	49	48	47	46	45	43	43	44	46	47
2 add'l boats	53	51	51	50	50	49	48	47	46	44	44	45	47	48
3 add'l boats	54	52	52	51	51	50	49	48	47	45	45	46	48	49
4 add'l boats	55	53	53	52	52	51	50	49	48	46	46	47	49	50
2-year service-life extension of existing boats, plus procurement in FY08-FY11 of...														
0 add'l boats	52	53	51	51	50	50	49	48	47	46	44	44	45	47
1 add'l boat	53	54	52	52	51	51	50	49	48	47	45	45	46	48
2 add'l boats	54	55	53	53	52	52	51	50	49	48	46	46	47	49
3 add'l boats	55	56	54	54	53	53	52	51	50	49	47	47	48	50
4 add'l boats	56	57	55	55	54	54	53	52	51	50	48	48	49	51
3-year service-life extension of existing boats, plus procurement in FY08-FY11 of...														
0 add'l boats	55	54	55	53	53	52	52	51	50	49	48	46	46	47
1 add'l boat	56	55	56	54	54	53	53	52	51	50	49	47	47	48
2 add'l boats	57	56	57	55	55	54	54	53	52	51	50	48	48	49
3 add'l boats	58	57	58	56	56	55	55	54	53	52	51	49	49	50
4 add'l boats	59	58	59	57	57	56	56	55	54	53	52	50	50	51
4-year service-life extension of existing boats, plus procurement in FY08-FY11 of...														
0 add'l boats	56	57	56	57	55	55	54	54	53	52	51	50	48	48
1 add'l boat	57	58	57	58	56	56	55	55	54	53	52	51	49	49
2 add'l boats	58	59	58	59	57	57	56	56	55	54	53	52	50	50
3 add'l boats	59	60	59	60	58	58	57	57	56	55	54	53	51	51
4 add'l boats	60	61	60	61	59	59	58	58	57	56	55	54	52	52

Source: Prepared by CRS based on Navy data.
* Baseline situation — no changes to current Navy plan.

Alternative Funding Approaches For Procuring Additional SSNs

Alternatives for funding the procurement of one to four additional SSNs in the period FY2008-FY2011 include but are not necessarily limited to the following:

- **full funding with advance procurement** — the traditional approach, under which there are two years or so of advance procurement funding for the SSN's long-leadtime components, followed by the remainder of the boat's procurement funding in the year of procurement;
- **single-year full funding** — full funding of the SSN in the year of procurement, with no advance procurement funding in prior years;
- **incremental funding** — partial funding of the SSN in the year of procurement, followed by one or more years of additional funding increments needed to complete the procurement cost of the ship; and
- **advance appropriations** — a form of full funding which can be viewed as a legislatively locked in form of incremental funding.[9]

Procuring SSNs Without Advance Procurement Funding

Recent Navy testimony to the full House Armed Services Committee suggested that two years of advance procurement funding are required to fund the procurement of an SSN, and consequently that additional SSNs could not be procured until FY2010 at the earliest.[10] This testimony understates Congress' options regarding the procurement of additional SSNs in the near term. Although SSNs are normally procured with two years of advance procurement funding (which is used primarily for financing long-leadtime nuclear propulsion components), an SSN can be procured without advance procurement funding, or with only one year of advance procurement funding. Consequently, Congress has the option of procuring an additional SSN in FY2008 or FY2009, even though no advance procurement funding has been provided for such ships in prior-year budgets. Doing so would not materially change the way such an SSN would be built — the process would still encompass about two years of advance work on long-leadtime components, and an additional six years or so of construction work on the ship itself. The outlay rate for the SSN could be slower, as outlays for construction of the ship itself would begin two years later than normal (for an SSN procured in FY2008 or FY2009 with no advance procurement funding) or one year later than normal (for an SSN procured in FY2009 with a single year of advance procurement funding in FY2008).

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[9]For additional discussion of these funding approaches, see CRS Report RL32776, *Navy Ship Procurement: Alternative Funding Approaches — Background and Options for Congress*, by Ronald O'Rourke.

[10]At a March 1, 2007, hearing before the House Armed Services Committee on the FY2008 Department of the Navy budget request, Representative Taylor asked which additional ships the Navy might want to procure in FY2008, should additional funding be made available for that purpose. In response, Secretary of the Navy Donald Winter stated in part: "The Virginia-class submarines require us to start with a two-year advanced procurement, to be able to provide for the nuclear power plant that supports them. So we would need to start two years in advance. What that says is, if we were able to start in '08 with advanced procurement, we could accelerate, potentially, the two a year to 2010." (Source: Transcript of hearing.)

Procuring SSNs With Single-Year Full Funding

Single-year full funding has been used in the past by Congress to procure nuclear-powered ships for which no prior-year advance procurement funding had been provided. Specifically, Congress in FY1988 used single-year full funding to procure the nuclear-powered aircraft carriers CVN-74 and CVN-75. Under the Administration's proposed FY1988 budget, these two ships were to be procured in FY1990 and FY1993, and the FY1988 budget was to make the initial advance procurement payment for CVN-74. Congress, in acting on the FY1988 budget, decided to accelerate the procurement of both ships to FY1988, and fully funded the two ships that year at a combined cost of $6.325 billion. The ships entered service in 1995 and 1998, respectively.

Procuring SSNs In A 2-1-2 Pattern

Some potential approaches for procuring additional boats in FY2008-FY2011 (see next section) would result in a pattern of procuring two boats in a given year, followed by one boat the following year, and two boats the year after that — a 2-1-2 pattern. Recent Navy testimony to the full House Armed Services Committee suggested that if the procurement rate were increased in a given year to two boats, it would not be best, from a production efficiency point of view, to decrease the rate to a single boat the following year, and then increase it again to two boats the next year, because of the workforce fluctuations such a profile would produce.[11]

This statement may overstate the production-efficiency disadvantages of a 2-1-2 pattern. If two boats were procured in a given year, followed by one boat the next year — a total of three boats in 24 months — the schedule for producing the three boats could be phased so that, for a given stage in the production process, the production rate would be one boat every eight months. A production rate of one boat every eight months might actually help the industrial base make the transition from the current schedule of one boat every twelve months (one boat per year) to one boat every six months (two boats per year). Viewed this way, a 2-1-2 pattern might actually lead to some benefits in production efficiency on the way to a steady rate of two boats per year. As mentioned earlier, the Navy's 30-year SSN procurement plan calls for procuring SSNs in a 1-2-1-2 pattern in FY2029-FY2037.

Potential Approaches For Procuring Additional Boats In FY2008-FY2011

This section discusses some potential funding approaches for procuring one to four additional boats in FY2008-FY2011. The examples shown are illustrative but not exhaustive, as there are many possible permutations.

Procuring One Additional Boat. One potential approach to fund a single additional boat in FY2008-FY2011 would be to procure the boat in FY2011 using the traditional approach — full funding in FY2011 with advance procurement in FY2009 and FY2010. This option would require

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[11]At a March 1, 2007, hearing before the House Armed Services Committee on the FY2008 Department of the Navy budget request, Representative Taylor asked which additional ships the Navy might want to procure in FY2008, should additional funding be made available for that purpose. In response, Secretary of the Navy Donald Winter stated in part: "If we're going to go to two a year in 2010, we really need to go to two a year for 2010, 2011 and out from there on. We don't want to go to two a year and then back to one a year. I think that would create too much stress into the workforce there." (Source: Transcript of hearing.)

little or no additional procurement funding in FY2008.

A second potential approach would be to procure the boat in FY2010 using the traditional approach — full funding in FY2010 and advance procurement funding in FY2008 and FY2009. This approach could require between $400 million and $500 million in additional advance procurement funding in FY2008. This approach would also preserve an option for adding a second additional boat in FY2011, should Congress decide next year that it wanted to fund a second additional boat in FY2011.

Procuring Two Additional Boats. **Table 8** below shows three potential profiles for procuring two additional boats in FY2008-FY2011 (i.e., a total of six boats during this period).

Table 8. Some Potential Profiles For Procuring Two Additional Boats

FY08	FY09	FY10	FY11
1	1	2	2
1	2	1	2
2	1	2	1

In first profile **in Table 8**, the additional boats in FY2010 and FY2011 could be funded in the traditional manner, with advance procurement funding starting in FY2008 for the FY2010 boat and in FY2009 for the FY2011 boat.

In the second profile in **Table 8**, the additional boat in FY2009 could be procured with single-year full funding in FY2009, which would not require any additional funding in FY2008. Under this approach, the boat might enter service in FY2017, as opposed to FY2015 for a boat procured in FY2009 that had received traditional advance procurement funding starting in FY2007. Alternatively, the second boat in FY2009 could be procured with a combination of funding in FY2008 and FY2009 (and perhaps also FY2010). Under this approach, the FY2008 funding might be limited to the $400 million to $500 million that would be required for long-leadtime components, and the boat might enter service in FY2016.

In the third profile in **Table 8**, the additional boat in FY2008 could be funded using either single-year full funding in FY2008, or two-year incremental funding (i.e., split funding) in FY2008 and FY2009. In either case, the boat might enter service in FY2016, as opposed to FY2014 for a boat procured in FY2008 that had received advance procurement funding starting in FY2006. The additional boat in FY2010 could be procured with advance procurement funding starting in FY2008 (which might permit the boat to enter service in FY2016) or with advance procurement funding starting in FY2009 (which might permit the boat to enter service in FY2017). The remainder of the boat's procurement cost could be fully funded in FY2010, or divided between FY2010 and FY2011 (split funding).

Procuring Three Additional Boats. **Table 9** below shows two potential profiles for procuring three additional boats in FY2008-FY2011 (i.e., a total of seven boats during this period).

Table 9. Some Potential Profiles For Procuring Three Additional Boats

FY08	FY09	FY10	FY11
2	1	2	2
1	2	2	2

In the first profile in **Table 9**, the additional boat in FY2008 could be procured using either single-year full funding in FY2008, or split funding in FY2008 and FY2009. In either case, the boat might enter service in FY2016, as opposed to FY2014 for a boat procured in FY2008 that had received advance procurement funding starting in FY2006. In the second profile, the additional boat in FY2009 could be procured with single-year full funding in FY2009, or with a combination of funding in FY2008 and FY2009, in which case the FY2008 funding might be limited to the $400 million to $500 million that would be required for long-leadtime components.

Procuring Four Additional Boats. If four additional boats were procured in FY2008-FY2011, with one additional boat in each year, then the additional boat in FY2008 could be procured using either single-year full funding or incremental funding. The second boat could be procured with advance procurement funding in FY2008 followed by either full funding in FY2009 or incremental funding in FY2009 and one or more subsequent years. The additional boats in FY2010 and FY2011 could be funded in the traditional manner, with advance procurement funding starting in FY2008 and FY2009, respectively.

Current And Projected Virginia-Class Shipbuilding Costs

Table 10 shows unit procurement costs for Virginia-class boats in then-year dollars and constant FY2005 dollars, and the percent cost growth on the earlier boats in the program. Points that can be made in connection with the figures the table include the following:

- The first ship (SSN-774) is considerably more expensive than the others because its procurement cost included much of the detailed design and non-recurring engineering (DD/NRE) costs for the class, as is traditional for a lead ship in a Navy shipbuilding program.

- The large percentage cost growth on the second ship (SSN-775) reflects in part challenges experienced at NGNN in building its first submarine since the Los Angeles (SSN-688) class submarine Cheyenne (SSN-773), which was commissioned in 1996.

- The constant-dollar unit procurement cost is relatively stable for SSNs 778 through 786, suggesting that, for these boats, learning curve benefits have been (or are expected to be) limited, or have been (or are expected to be) offset by other cost increases, or both.

- SSNs 784 through 787 were planned for procurement at a rate of two boats per year in the FY2004 budget, but one boat per year in the FY2008 budget. If these three boats had been planned for the same rate of procurement in both budgets, the percentage increase in their costs in the final column of **Table 10** might be more comparable to the 14.9% figure for SSN-787, which was planned for procurement at a rate of two boats per year in both the FY2004 and FY2008 budgets.

Table 10. Virginia-Class Unit Procurement Costs
(cost figures in millions of dollars)

Hull number	Fiscal year procured	Current estimated procurement cost		% increase in procurement cost compared to cost as shown in	
		Then-year dollars	Constant FY2005 dollars	the budget for the FY in which the boat was procured[a]	an earlier budget where that boat's cost was projected[b]
774	98	3,752.1	4,671.9	11.2	11.2 (FY98)
775	99	2,713.8	3,308.8	23.8	25.2 (FY98)
776	01	2,210.4	2,530.7	9.5	8.2 (FY98)
777	02	2,332.1	2,650.8	2.5	10.1 (FY98)
778	03	2,242.0	2,416.0	2.3	16.8 (FY00)
779	04	2,254.6	2,348.5	4.8	17.3 (FY00)
780	05	2,289.2	2,289.2	2.0	18.9 (FY00)
781	06	2,378.4	2,283.6	0.0	2.5 (FY03)
782	07	2,604.4	2,403.5	0.0	9.7 (FY03)
783	08	2,653.7	2,360.2	n/a	20.0 (FY04)
784	09	2,864.5	2,459.4	n/a	17.9 (FY04)[c]
785	10	2,783.0	2,307.0	n/a	24.8 (FY04)[c]
786	11	2,904.2	2,323.8	n/a	28.8 (FY04)[c]
787	12	2,590.8	2,000.9	n/a	14.9 (FY04)
788	12	2,590.8	2,000.9	n/a	n/a
789	13	2,684.1	2,000.8	n/a	n/a
790	13	2,684.1	2,000.8	n/a	n/a

Source: Prepared by CRS using U.S. Navy data on current estimated procurement costs provided to CRS on March 2, 2007, and SCN account justification books for FY1998-FY2008.

a Percent cost growth calculated from cost for that boat as estimated in the budget in which the boat was procured.

b Percent cost growth calculated from cost for that boat as projected in an earlier budget, shown in parentheses. With the exceptions of SSNs 774 and 775, the earlier budget shown was the first in which the cost of the boat appeared in the SCN account justification book.

c SSNs 784 through 787 were planned for procurement at a rate of two boats per year in the FY2004 budget, but one boat per year in the FY2008 budget. If these three boats had been planned for the same rate of procurement in both budgets, the percentage increase in their costs in the final column of Table 10 might be more comparable to the 14.9% figure for SSN-787, which was planned for procurement at a rate of two boats per year in both the FY2004 and FY2008 budgets.

As mentioned earlier, the Navy says its plan to increase Virginia-class procurement to two per year starting in FY2012 is contingent on being able to reduce the procurement cost of Virginia-class submarines to $2.0 billion each in constant FY2005 dollars, compared to a current cost of about $2.4 billion each in constant FY2005 dollars. As shown in **Table 10**, the Navy projects that it will meet that target.

The Navy says that, in constant FY2005 dollars, about $200 million of the $400 million in sought-after cost reductions would be accomplished simply through the improved economies of scale (e.g., better spreading of shipyard fixed costs and improved learning rates) of producing two submarines per year rather than one per year. The remaining $200 million in sought-after cost reductions, the Navy says, is to be accomplished through changes in the ship's design and in the shipyard production process. The design changes, the Navy says, are scheduled to be ready for boats procured in FY2012. Consequently, the Navy says, the $2.0 billion target cost cannot be fully achieved before FY2012. The Navy says that if improved economies of scale and changes in the ship's design and in the shipyard production process are not sufficient to achieve the $2.0 billion target, it may consider reducing the capabilities of the Virginia class in certain areas until the target is achieved.[12]

Two additional points can be made in connection with the $2.0 billion cost target:

- The Navy has established cost-reduction targets for several of its shipbuilding programs, but the Virginia-class program is apparently the only program that must meet its cost reduction target as an internal Navy condition for retaining all ships of that type in the Navy's shipbuilding program. This raises a potential question regarding the comparative incentives for other shipbuilding programs to meet their cost-reduction goals.

- The Navy's goal to reduce the cost of each Virginia-class boat to $2.0 billion in constant FY2005 dollars as a condition for increasing the procurement rate to two boats per year in FY2012 is a goal that the Navy has set for itself. While Congress may take the $2.0-billion goal into account, it need not control congressional action. Congress may decide to fund the procurement of two boats per year in FY2012 or some other year even if the $2.0-billion goal is not met.

Mr. Chairman, distinguished members of the subcommittee, this concludes my testimony. Thank you again for the opportunity to appear before you to discuss these issues. I will be pleased to respond to any questions you might have.

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[12]For more on the Navy's plan for reducing the procurement cost of the Virginia-class design, see William Hilarides, "2 For 4 in 2012, The Virginia-Class Road Ahead," *U.S. Naval Institute Proceedings*, June 2006: 68-69.

Appendix A: SSN Force-Level Goal

The SSN force-level goal has evolved over time. This appendix summarizes the evolution of the goal since the Reagan Administration (1981-1989), and recent debate concerning the appropriateness of the current 48-boat goal.

Previous Administrations

The Reagan Administration's plan for a 600-ship Navy included an objective of achieving and maintaining a force of 100 SSNs. The George H. W. Bush Administration's proposed Base Force plan of 1991-1992 originally called for a Navy of more than 400 ships, including 80 SSNs.[13] In 1992, however, the SSN goal was reduced to about 55 boats as a result of a 1992 Joint Staff force-level requirement study (updated in 1993) that called for a force of 51 to 67 SSNs, including 10 to 12 with Seawolf-level acoustic quieting, by the year 2012.[14]

The Clinton Administration, as part of its 1993 Bottom-Up Review (BUR) of U.S. defense policy, established a goal of maintaining a Navy of about 346 ships, including 45 to 55 SSNs.[15] The Clinton administration's 1997 QDR supported a requirement for a Navy of about 305 ships and established a tentative SSN force-level goal of 50 boats, "contingent on a reevaluation of peacetime operational requirements."[16] The Clinton administration later amended the SSN figure to 55 boats (and therefore a total of about 310 ships).

The reevaluation called for in the 1997 QDR was carried out as part of a Joint Chiefs of Staff (JCS) study on future requirements for SSNs that was completed in December 1999. The study had three main conclusions:

- "that a force structure below 55 SSNs in the 2015 [time frame] and 62 [SSNs] in the 2025 time frame would leave the CINC's [the regional military commanders-in-chief] with insufficient capability to respond to urgent crucial demands without gapping other requirements of higher national interest. Additionally, this force

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[13]For the 80-SSN figure, see Statement of Vice Admiral Roger F. Bacon, U.S. Navy, Assistant Chief of Naval Operations (Undersea Warfare) in U.S. Congress, House Armed Services Committee, Subcommittee on Seapower and Strategic and Critical Materials, *Submarine Programs*, Mar. 20, 1991, pp. 10-11, or Statement of Rear Admiral Raymond G. Jones, Jr., U.S. Navy, Deputy Assistant Chief of Naval Operations (Undersea Warfare), in U.S. Congress, Senate Armed Services Committee, Subcommittee on Projection Forces and Regional Defense, *Submarine Programs*, June 7, 1991, pp. 10-11.

[14]See Richard W. Mies, "Remarks to the NSL Annual Symposium," *Submarine Review*, July 1997, p. 35; "Navy Sub Community Pushes for More Subs than Bottom-Up Review Allowed," *Inside the Navy*, Nov. 7, 1994, pp. 1, 8-9; *Attack Submarines in the Post-Cold War Era: The Issues Facing Policymakers*, op. cit., p. 14; Robert Holzer, "Pentagon Urges Navy to Reduce Attack Sub Fleet to 50," *Defense News*, Mar. 15-21, 1993, p. 10; Barbara Nagy, " Size of Sub Force Next Policy Battle," *New London Day*, July 20, 1992, pp. A1, A8.

[15]Secretary of Defense Les Aspin, U.S. Department of Defense, *Report on the Bottom-Up Review*, Oct. 1993, pp. 55-57.

[16]Secretary of Defense William S. Cohen, U.S. Department of Defense, *Report of the Quadrennial Defense Review*, May 1997, pp. 29, 30, 47.

structure [55 SSNs in 2015 and 62 in 2025] would be sufficient to meet the modeled war fighting requirements;"

- "that to counter the technologically pacing threat would require 18 Virginia class SSNs in the 2015 time frame;" and

- "that 68 SSNs in the 2015 [time frame] and 76 [SSNs] in the 2025 time frame would meet all of the CINCs' and national intelligence community's highest operational and collection requirements."[17]

The conclusions of the 1999 JCS study were mentioned in discussions of required SSN force levels, but the figures of 68 and 76 submarines were not translated into official Department of Defense (DOD) force-level goals.

George W. Bush Administration

The George W. Bush Administration's report on the 2001 QDR revalidated the amended requirement from the 1997 QDR for a fleet of about 310 ships, including 55 SSNs. In revalidating this and other U.S. military force-structure goals, the report cautioned that as DOD's "transformation effort matures — and as it produces significantly higher output of military value from each element of the force — DOD will explore additional opportunities to restructure and reorganize the Armed Forces."[18]

DOD and the Navy conducted studies on undersea warfare requirements in 2003-2004. One of the Navy studies — an internal Navy study done in 2004 — reportedly recommended reducing the attack submarine force level requirement to as few as 37 boats. The study reportedly recommended homeporting a total of nine attack submarines at Guam and using satellites and unmanned underwater vehicles (UUVs) to perform ISR missions now performed by attack submarines.[19]

In March 2005, the Navy submitted to Congress a report projecting Navy force levels out to FY2035. The report presented two alternatives for FY2035 — a 260-ship fleet including 37 SSNs and 4 SSGNs, and a 325-ship fleet including 41 SSNs and 4 SSGNs.[20]

In May 2005, it was reported that a newly completed DOD study on attack submarine requirements called for maintaining a force of 45 to 50 boats.[21]

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[17]Department of Navy point paper dated Feb. 7, 2000. Reprinted in *Inside the Navy*, Feb. 14, 2000, p. 5.

[18]U.S. Department of Defense, *Quadrennial Defense Review*, Sept. 2001, p. 23.

[19]Bryan Bender, "Navy Eyes Cutting Submarine Force," *Boston Globe*, May 12, 2004, p. 1; Lolita C. Baldor, "Study Recommends Cutting Submarine Fleet," *NavyTimes.com*, May 13, 2004.

[20]U.S. Department of the Navy, *An Interim Report to Congress on Annual Long-Range Plan for the Construction of Naval Vessels for FY 2006*. The report was delivered to the House and Senate Armed Services and Appropriations Committees on Mar. 23, 2005.

[21]Robert A. Hamilton, "Delegation Calls Report on Sub Needs Encouraging," *The Day (New London, CT)*,

(continued...)

In February 2006, the Navy proposed to maintain in coming years a fleet of 313 ships, including 48 SSNs.

Debate Over Appropriateness Of Current 48-Boat Goal

Navy View.[22] In support of its position that 48 is the correct number of SSNs to meet future needs, the Navy in 2006 argued the following:

- The figure of 48 SSNs was derived from a number of force-level studies that converged on a figure of about 48 boats, making this figure an analytical "sweet spot."
- A force of 48 boats is a moderate-risk (i.e., acceptable-risk) force, as opposed to the low-risk force called for in the 1999 JCS study.
- A force of 48 boats will be sufficient in coming years to maintain about 10 forward-deployed SSNs on a day-to-day basis — the same number of forward-deployed boats that the Navy has previously maintained with a force of more than 50 SSNs. The Navy will be able to maintain 10 forward-deployed SSNs in coming years with only 48 boats because the force in coming years will include an increased number of newer SSNs that require less maintenance over their lives and consequently are available for operation a greater percentage of the time.
- U.S. regional military commanders would prefer a day-to-day forward-deployed total of about 18 SSNs, but total of 10 will be sufficient to meet their most important needs.
- All 10 of the forward-deployed SSNs are needed for day-to-day missions such as intelligence, surveillance and reconnaissance (ISR), while about 7.5 of these submarines are also needed to ensure that an adequate number of SSNs are in position for the opening phases of potential conflicts in various locations.

On the issue of meeting U.S. regional military commanders' requirements for day-to-day forward-deployed SSNs, the Navy states:

> Each Combatant Commander (COCOM) requests assets to execute required missions utilizing the Global Force Management Process. Broad categories of mission types are used to make requests including: National and Fleet ISR, Exercise and Training (supporting US tactical development), Exercise and Operations (supporting US engagement strategy), Carrier Strike Group (CSG) /Expeditionary Strike Group (ESG) tasking, OPLAN (war plans) support, and Other. As assignment of Critical, High Priority, Priority or Routine is assigned to each of the

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[21](...continued)
May 27, 2005; Jesse Hamilton, "Delegation to Get Details on Sub Report," *Hartford (CT) Courant*, May 26, 2005.

[22]This section is based on Navy testimony to the Projection Forces subcommittee of the House Armed Services Committee on March 28, 2006, and to the Seapower subcommittee of the Senate Armed Services Committee on March 29, and April 6, 2006.

requested missions. The theater allocation request process prior to 2004 did not include a priority breakdown. In general, ISR missions have been assigned as Critical or High Priority requirements. Other mission areas have been assigned from High Priority to Routine, based on the relative importance to the theater commander. No allocation is currently requested to support OPLAN or Other mission areas.

Each COCOM has authority to use its allocated SSNs as required to meet current national and theater priorities. The CJCS [Chairman Joint Chiefs of Staff] allocation order to the Submarine Force strictly directs an allotted number of SSN days of presence be provided, capable of meeting each theaters' [sic] taskings. The breakdown of mission priorities into Critical, High Priority, Priority and Routine is predominantly a construct to demonstrate how a COCOM could meet their priorities, given a specific level of SSN presence. It serves as an aid to the CJCS in apportioning limited SSN presence to the various theaters.

The number of SSNs allocated against Critical Missions enabled COCOMs to meet all requirements in 2004 and 2005, and 99% of the requirements in 2006. For High Priority missions, sufficient SSNs were allocated to meet 25%, 50% and 34% of requirements in 2004, 2005, and 2006 respectively. Overall, the number of SSNs forward deployed was sufficient to cover 66%, 61% and 54% of Combatant Commanders' requested SSN mission taskings in 2004, 2005, and 2006 respectively.[23]

Alternative View. Some observers believe that more than 48 SSNs will be needed to meet future needs. One such observer — retired Vice Admiral Albert Konetzni, Jr., a former commander of the U.S. Pacific Fleet submarine force — argued the following in 2006:[24]

- The Navy's SSN force-level analyses called for a force of 48 to 60 SSNs. In this context, a force of 48 SSNs looks more like a sour spot than a sweet spot.
- The Navy's SSN force-level analyses reflect "reverse engineering," in which an SSN force-level number is selected at the outset for affordability reasons, and assumptions used in the force-level study are then adjusted to produce that figure.
- The 1999 JCS study on SSN requirements remains valid today.
- All of the U.S. regional military commanders' requirements for day-to-day forward-deployed SSNs, and not just the 60% or so of those requirements that are being met, are critical.
- In light of the potential size of China's submarine force in 2020, a force of 48 SSNs

[23]Source: Written response by Vice Admiral Charles L. Munns, Commander Naval Submarine Forces, to a question posed by Representative Rob Simmons at a March 28, 2006, hearing before the Projection Forces Subcommittee of the House Armed Services Committee on submarine force structure. Munns' written response was provided to CRS on July 5, 2006, by the office of Representative Simmons and is used here with the permission of that office.

[24]These points are based on Konetzni's testimony to the Projection Forces subcommittee of the House Armed Services Committee on March 28, 2006.

in that year will be insufficient.[25]

[25]For more on China's submarine force, and China's naval modernization effort in general, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities — Background and Issues for Congress*, by Ronald O'Rourke.

Appendix B: Submarine Design And Engineering Base

This appendix summarizes recent discussion concerning options for maintaining the submarine design and engineering base.

Recent Concern

The part of the submarine industrial base that some observers are currently most concerned about is the design and engineering portion, much of which is resident at GD/EB and NGNN. (A small portion is resident at some makers of submarine components.) With Virginia-class design work now winding down and no other submarine-design projects underway, the submarine design and engineering base is facing the near-term prospect, for the first time in about 50 years, of having no major submarine-design project on which to work.

Navy and industry officials, some Members of Congress, and some other observers are concerned that unless a major submarine-design project is begun soon, the submarine design and engineering base will begin to atrophy through the departure of experienced personnel. Rebuilding an atrophied submarine design and engineering base, Navy and industry officials believe, could be time-consuming, adding time and cost to the task of the next submarine-design effort, whenever it might begin. Concern about this possibility among some Navy and industry officials has been strengthened by the UK's difficulties a few years ago in designing its new Astute-class SSN. The UK submarine design and engineering base atrophied for lack of submarine-design work, and the subsequent Astute-class design effort experienced considerable delays and cost overruns. Submarine designers and engineers from GD/EB were assigned to the Astute-class project to help the UK overcome these problems.[26]

Potential Options

Navy and industry officials appear to agree that preserving the submarine design and engineering base over the next several years will require funding submarine design and engineering work that is in addition to the amount of such work currently planned. In assessing options for additional submarine design and engineering work, issues of interest include the total volume of work that the options would provide, and the number of submarine design and engineering skills they would engage and thereby help preserve. Options for additional work for the submarine design and engineering base over the next few years include the following:

- **Expanded Virginia-class modification effort.** The Navy is currently funding certain work to modify the Virginia-class design, in part to reach the Navy's Virginia-class cost-reduction target. The scope of this effort could be expanded to include a greater number and variety of modifications. An expanded modification effort would add to the amount of submarine design and engineering work currently

[26]See, for example, Andrew Chuter, "U.K. Spending Mounts for U.S. Help on Sub," *Defense News*, September 13, 2005: 4; Richard Scott, "Electric Boat Provides Project Director for Astute Class," *Jane's Navy International*, May 2004: 33; Richard Scott, "Astute Sets Out on the Long Road to Recovery," *Jane's Navy International*, Dec. 2003, pp. 28-30; Richard Scott, "Recovery Plan Shapes Up for Astute Submarines," *Jane's Defence Weekly*, Nov. 19, 2003, p. 26.

programmed, but by itself might not be sufficient in terms of volume of work or number of skills areas engaged to fully preserve the submarine design and engineering base.

- **New Advanced SEAL Delivery System (ASDS).** The ASDS is a mini-submarine that is attached to the back of an SSGN or SSN to support operations by Navy special operations forces (SOF), who are called SEALs, an acronym that stands for Sea, Air, and Land. DOD has decided, after building one copy of the current ASDS design, not to put that design into serial production. Some observers have proposed developing a new ASDS design with the intention of putting this new design into serial production. This option, like the previous one, could add to the amount of submarine design and engineering work currently programmed for GD/EB and NGNN, but by itself might not be sufficient in terms of volume of work or number of skills areas engaged to fully preserve the submarine design and engineering base.

- **Diesel-electric submarine for Taiwan.** In April 2001, the Bush Administration announced a proposed arms-sales package for Taiwan that included, among other things, eight diesel-electric submarines.[27] Since foreign countries that build diesel-electric submarines appear reluctant to make their designs available for a program to build such boats for Taiwan, some observers have proposed that the United States develop its own design for this purpose. This option would generate a substantial volume of work and engage many skill areas. Uncertainty over whether and when this project might occur could make it difficult to confidently incorporate it into an integrated schedule of work for preserving the U.S. design and engineering base. Although the project would engage many skill areas, it might not engage all of them. Skills related to the design of nuclear propulsion plants, for example, might not be engaged. In addition, this project might raise concerns regarding the potential for unintended transfer of sensitive U.S. submarine technology — an issue that has been cited by the Navy in the past for not supporting the idea of designing and building diesel-electric submarines in the United States for sale to foreign buyers.[28]

- **New SSN design**. Developing a completely new SSN design as the successor to the Virginia-class design would fully support the design and engineering base for several years. The Navy in the past has estimated that the cost of this option would be roughly equivalent to the procurement cost of three SSNs. The House version of the FY2006 defense authorization bill (H.R. 1815) proposed this idea, but the idea was not supported by the Navy, in large part because of its cost, and the

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[27]For more on the proposed arms sales package, including the diesel-electric submarines, see CRS Report RL30957, *Taiwan: Major U.S. Arms Sales Since 1990*, by Shirley A. Kan.

[28]An additional issue that some observers believe might be behind Navy resistance to the idea of designing and building diesel-electric submarines in the United States for sale to foreign buyers, but which these observers believe the Navy is unwilling to state publicly, is a purported fear among Navy officials that the establishment of a U.S. production line for such boats would lead to political pressure for the Navy to accept the procurement of such boats for its own use, perhaps in lieu of nuclear-powered submarines. The Navy argues that non-nuclear-powered submarines are not well suited for U.S. submarine operations, which typically involve long, stealthy transits to the operating area, long submerged periods in the operating area, and long, stealthy transits back to home port.

conference version of the bill did not mandate it.

- **Accelerated start of next SSBN design.** Given the ages of the Navy's 14 current SSBNs, work on a replacement SSBN design would normally not need to start for several years. The start of this project, however, could be accelerated to FY2008. The project could then be carried out as a steady-state effort over several years, rather than as a more-concentrated effort starting several years from now. This option could provide a significant amount of submarine design and engineering work for several years, and could engage all submarine design and engineering skills. The total cost of this effort would be comparable to that of the previous option of designing a new SSN, but this option would accelerate a cost that the Navy already plans to incur, whereas the option for designing a new SSN would be an additional cost.

RAND Analysis

The Navy has acknowledged the need to devise a strategy to preserve the submarine design and engineering base, and asked the RAND Corporation to study the issue. The RAND report, which is to be published shortly, concludes that accelerating the start of design work on the next SSBN, and carrying out this work as a steady-state effort over several years, could maintain the submarine design and engineering base for several years. An exception, RAND found, relates to designers and engineers employed by about 50 supplier firms that design the submarine components they make for the Navy. The RAND report concluded that accelerating the start of design work of the next SSBN might not help maintain the designers and engineers at some of these firms.[29]

[29]RAND briefing on the study provided to Navy, industry, and congressional staff (including CRS), February 9, 2007.

John P. Casey
President
Electric Boat Corporation

Testimony Before the
House Armed Services Committee
Seapower and Expeditionary Forces
Subcommittee

Washington, DC
March 8, 2007

**NOT FOR PUBLICATION UNTIL RELEASED BY
HOUSE ARMED SERVICES COMMITTEE**

John P. Casey became President of General Dynamics Electric Boat on Oct. 1, 2003.

He assumed his current position after serving as Vice President - Operations, with responsibility for all construction activities at the Groton shipyard and the Quonset Point, R.I., Facility.

Before that, he was Vice President – Programs, overseeing existing submarine construction programs as well as strategic planning, business development and materials acquisition functions.

He also completed an assignment as Site Manager for Electric Boat's Quonset Point Facility, with responsibility for all facets of nuclear-submarine construction and manufacturing. These activities included steel processing and fabrication, machining, piping, sheet metal and electrical component assembly, and major unit packaging and outfitting to 1400-ton ship sections.

Mr. Casey joined Electric Boat in 1979 and has held several positions including General Superintendent – Machine Shop, Foundry and Electrical Trades; Director of Estimating and Contract Changes; Manager of 688-Class Ships Management; SSN-751 Ship Manager; and Superintendent – Pipe Coverers.

Currently, Mr. Casey is a member of the Board of Directors of the American Shipbuilding Association, the Naval Submarine League, the Connecticut Business and Industry Association and The Westerly Hospital.

A graduate of Worcester Polytechnic Institute where he earned a BS in Civil Engineering, Mr. Casey also holds an MBA from Rensselaer Polytechnic Institute and an MS – Management from MIT's Alfred P. Sloan Fellows Program.

Introduction

Good afternoon. I'm John Casey, President of General Dynamics Electric Boat Corporation.

I want to thank the committee for conducting this hearing on submarine force structure and acquisition policy. My testimony will address each of the specific areas identified in the Chairman's invitation to testify.

VIRGINIA Class Acquisition – Historical

In 1996, Congress directed that VIRGINIA Class submarines be constructed by the two shipyards capable of constructing nuclear warships, Electric Boat (EB) and Northrop Grumman Newport News Shipbuilding (NGNN). Subsequent to this direction, EB and NGNN entered into a unique co-production team arrangement. Under this arrangement, construction work is split evenly between the two shipbuilders and the yards alternate final assembly and delivery. The Design/Build process established for the VIRGINIA Program as well as advances in modular construction techniques were critical factors in enabling the successful implementation of the co-production plan. Modules and hull cylinders are fabricated at Electric Boat's Quonset Point facility and shipped by barge to the two assembly yards. Northrop Grumman Newport News fabricates modules and installs them into hull cylinders for final assembly in their shipyard or ships them by barge to Groton for final assembly. Each shipyard produces the same designated sections for each ship with the exception of the reactor compartments which are produced by both yards for ships they deliver. This approach maximizes the production learning curve with repetitive module fabrication, and preserves nuclear submarine construction capability at both builders. Alternating ship deliveries between the shipyards also permits each yard to retain unique submarine test, sea trial, and delivery experience.

Looking back to the early 1990s clearly shows how dramatically the Navy's submarine procurement plan has fluctuated. Over the eight-year period from 1990 through 1997, the Navy procured only three submarines; SSN773, the last Los Angeles Class, and the second and third SEAWOLFs, SSN22 and SSN23. And there was a four-year gap between the authorizations of the two SEAWOLFs. As the chart below indicates, we have seen 10 changes to the VIRGINIA acquisition profile in as many years, with the start of two ships per year postponed by a decade, from 2002 to 2012.

Changes to VIRGINIA Class Procurement

	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	TOTAL
DEC 95	1	0	1	0	2	2	2	2	2	2	2	2	2	2	2	24
DEC 96	1	1	0	1	1	0	1	2	2	2	2	2	2	2	3	22
NOV 97	1	1	0	1	1	0	1	2	2	2	3	3	2	3	2	24
FEB 98	1	1	0	1	1	0	1	2	2	2	3	3	2	3	2	24
OCT 98	1	1	0	1	1	0	1	1	2	2	3	3	3	3	2	24
MAR 99	1	1	0	1	1	1	1	1	2	2	3	3	2	3	2	24
JUN 00	1	1	0	1	1	1	1	1	1	2	2	3	3	2	3	23
JUN 01	1	1	0	1	1	1	1	1	1	2	2	3	2	2	3	22
APR 02	1	1	0	1	1	1	1	1	1	1	2	2	2	2	3	20
MAY 03	1	1	0	1	1	1	1	1	1	2	2	2	2	2	3	21
MAR 04	1	1	0	1	1	1	1	1	1	1	1	2	2	2	2	18
JAN 05	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	15
JAN 06	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	15

VIRGINIA Class Acquisition – Current

The Office of the Secretary of Defense established the requirement for 48 fast attack submarines to support Combatant Commander Requirements. The Navy's recently submitted long-range shipbuilding plan supports the attack submarine force level at 48 ships. The current VIRGINIA acquisition plan calls for VIRGINIA procurement to

continue at a rate of one ship per year through fiscal year 2011 and ramp up to two ships per year in fiscal year 2012. Despite this increase, the plan will leave the Navy short of its attack submarine force level requirement for 14 years, starting in 2020 and going through 2033. Understandably, the Navy is evaluating several options to mitigate this shortfall including the shipbuilders' efforts to reduce overall construction span times.

This shortfall was a key discussion item in several hearings held by Congress last year. It was noted at one of those hearings that the low point in force structure will occur just as the converted Ohio Class SSGNs will be leaving service. Starting procurement of two ships per year earlier than the current Navy plan would mitigate the risk posed by the SSN force level shortfall by making it less deep and over a shorter span. Accelerating 2/yr VIRGINIA procurement was also a consideration for the 2006 Quadrennial Defense Review. The report recommended "a return to steady-state production rate of two attack submarines per year not later than 2012 while achieving an average per-hull cost objective of $2 billion" in FY2005 dollars.

The lead ship of the VIRGINIA Class, USS VIRGINIA, was delivered in October 2004, within four months of the original schedule established a decade earlier. The ship completed its first deployment in September 2005, and in the words of the commanding officer, "performed remarkably." The second ship, USS TEXAS (SSN775) was delivered at NGNN on June 20, 2006. This was the first submarine delivered at NGNN after a ten-year hiatus in submarine construction. The third ship in the program, USS HAWAII (SSN776), was delivered by Electric Boat on December 22, 2006, ahead of its original contract delivery schedule and built for two million labor hours less than VIRGINIA. The fourth ship of the class, the last of the Block I contract, is over 80% complete and is scheduled to deliver from NGNN near the end of the year. Six additional ships, at various stages of construction at Electric Boat and Northrop Grumman Newport News, are under contract in the Block II Multi-Year procurement. Electric Boat and the Navy are planning for the next Multi-Year procurement for the ships to be procured between FY09 and FY13. This Block will include ramping up to a procurement rate of two ships per year in FY12, an essential step in lowering per-ship costs. By all standards

– cost, schedule and technical performance - the VIRGINIA Program is well on its way to being a benchmark for other DOD and Navy shipbuilding programs.

Ability to Meet CNO's Cost Challenge

Submarine procurement costs are comprised of material and labor. Of the total material and labor cost of each ship, the shipbuilders, along with the supplier base, manage approximately 70 per cent. The remaining 30 per cent is material that is procured by the Government and provided to the shipbuilder. This Government furnished equipment consists largely of nuclear propulsion plant equipment that is bought one to two years in advance of full ship funding.

Electric Boat, working with its shipbuilding partner and the Navy, has developed an aggressive plan to attack all elements of shipbuilder labor and material costs in order to achieve the CNO's target cost. Our plan focuses on four key initiatives:

1. Construction Schedule Reduction: Reducing the construction schedule from 84 months to 60 months, facilitated by improved construction and material planning systems, with enhanced manufacturing, modular assembly, and final assembly and test. We are already forecasting approximately 66 months for the later ships of the Block II procurement. This schedule reduction has been facilitated by increasing degrees of modular outfit and test prior to launch. This has enabled us to reduce the afloat period of test and trials from 14 months on the USS VIRGINIA (SSN774) to 8 months on HAWAII (SSN776).

2. Improving Labor Efficiency: Maximizing workforce stability of the shipbuilders as well as across the submarine supplier base. This effort includes a major emphasis on the application of Lean Six Sigma and lessons learned across all processes at the shipyards and suppliers. We are in our 5th year of applying Lean Six Sigma tools to the entire submarine design, construction, test, and repair process. To date, we have trained over 500 Electric Boat employees in Lean Six Sigma. Lean Six Sigma at Electric Boat is

deployed enterprise wide with a strong focus on leadership development, process management and, most importantly, employee engagement. In 2006, Electric Boat completed 131 Lean Six Sigma projects producing a net hard savings of $16.2M. We also have 223 more projects in process. This resulted in a program return on investment of over 6:1. The VIRGINIA CAPEX program is also a major enabler of infrastructure projects to support this effort.

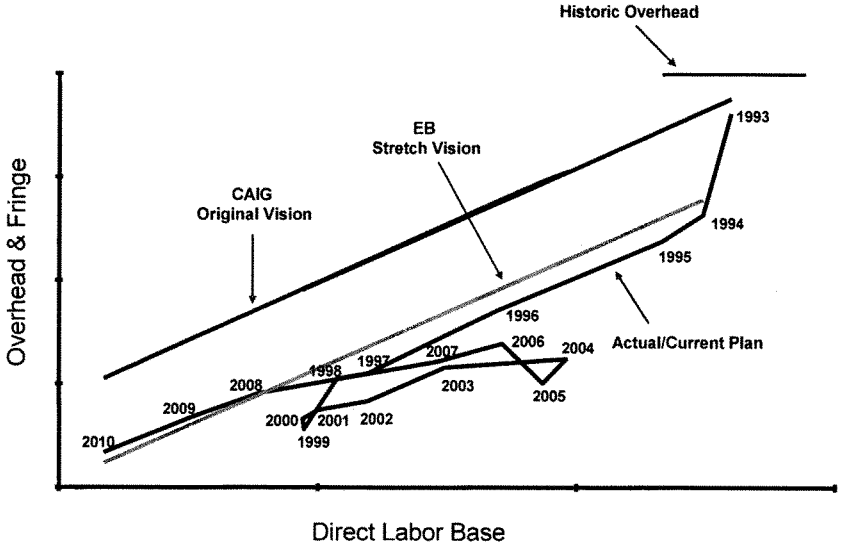
3. Design For Affordability: A key part of our approach to reduce ship construction cost involves integrating new technology and affordability initiatives in high cost areas of the ship design. More than fifty-five cost reduction initiatives are being evaluated for development under Design For Affordability. Some examples of the major cost reduction efforts include:

- Redesign of the bow section of the ship to simplify the ship's structure and systems, resulting in reduced construction cost while maintaining performance requirements
- Simplification of propulsion plant systems design
- Development and integration of low-cost, low-maintenance quiet permanent magnet motors and controllers to replace the existing complex of hydraulic piping and systems
- Leveraging the advancement of high solid and epoxy paint technology for application in construction

4. Acquisition Strategy: Implementing a Multi-Year acquisition plan that supports efficient material procurement and construction, utilizing Advance Procurement (AP) and Economic Order Quantity (EOQ) funding to reduce material costs and achieve construction schedule reduction. Our effort to procure a spare Main Propulsion Unit in FY08, and the resulting cost reduction estimated by the supplier on the Block III units, is just one example of the savings achievable through creative acquisition strategies. Moreover, expanding the use of AP to allow the shipbuilders to accelerate construction

will greatly enhance our ability to level load production facilities, further enabling reduced construction costs.

In addition to this comprehensive plan, Electric Boat continues to tightly control its overhead costs. At the outset of the VIRGINIA program, Electric Boat was provided an overhead cost target by the government's Cost Analysis Improvement Group (CAIG). It was suggested by the CAIG that Electric Boat dramatically reduce its overhead costs as volume declined in order to maintain affordable labor rates. The CAIG provided a forecast for this reduction.



Electric Boat responded to this challenge by implementing even deeper cuts in overhead. Today, the "CAIG Line" has been institutionalized at Electric Boat and continues to be used today to monitor our overhead costs. More importantly, we have beaten our "Stretch Vision" every year. Our commitment to this plan will result in overhead savings of $2.7B over the period 1993 – 2010 – with greater than 95% of these savings being returned to the government.

Aggressive overhead management alone cannot assure competitive labor rates; sufficient business volume is essential to absorb this overhead cost, as well as to sustain our unique skills and capabilities. Electric Boat's forecast today shows a dramatic fall-off in our Groton production workforce as we complete the SSGN conversion program and reduce our participation in the maintenance and repair business. In our Engineering business outlook, for the first time in the history of the nuclear submarine program, there is no new design in the Navy's plan.

Meeting our cost challenge will require the commitment of all stakeholders. Shipbuilders and suppliers must continue to work to reduce costs, while meeting schedule commitments, and, most importantly, ensuring an unyielding commitment to quality. The Navy must maintain a stable shipbuilding program with increased procurement to 2 ships per year not later than FY2012; and they must achieve cost reductions to government furnished material and equipment. The shipbuilders and the Navy must work together to negotiate a fair and equitable Multi – Year contract for Block III ships. Finally, we will look to the Congress to provide the necessary funding and support of this vital submarine program.

Working together, and only by working together, we can meet the VIRGINIA cost challenge!

Shipyard Improvements

Since 2000, Electric Boat has invested almost $200M for capital improvements to its Groton shipyard and Quonset Point manufacturing facility. Recently, Electric Boat invested $70M to repair and modernize its Graving Dock #3, the supporting dock structure for the Groton Land Level Construction Facility. Currently, Graving Docks #1 and #2 are also being refurbished. The total project cost for these graving dock repairs is $65M and is being partially funded by the State of Connecticut through property tax exemptions and low rate loan packages.

In addition, the Navy has entered into a long-term agreement for access to the company's Graving Docks. Entering into this agreement allows the Navy to retire their current floating dry dock at the Submarine Base in Groton and avoid the drydock overhaul estimated to be at least $20M.

At Quonset Point, the facility investments to improve the VIRGINIA Class submarine construction process include a new $12.4M steel processing facility, which was dedicated December 17, 2001. This 45,000 square foot, state-of-the-industry facility has reduced the time required to process a batch of steel by greater than 50%. The machinery includes: automated blast machine; laser marker for increased accuracy; water jet, which cuts plate up to eight inches thick; high definition plasma cutter for double-bevels to 1.5" thick; laser cutter for plates to ¾" thick.

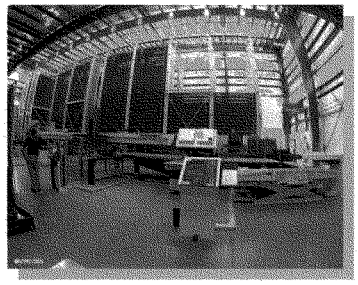
VIRGINIA CAPEX Program

The overarching vision for the VIRGINIA Class Improvement Initiative is to provide greater value to the Navy by reducing the cost of VIRGINIA Class construction. To achieve this vision, it is our intent to establish a more affordable and sustainable VIRGINIA Class co-production build plan by leveraging the strengths of respective facilities to realize greater production efficiency; achieve a reduction in total shipyard labor hours for construction; achieve a reduction in cycle time for final outfit, test, and delivery; and improve the combined learning curve efficiency. This initiative is enabled through the VIRGINIA Class Capital Expenditure or CAPEX Program.

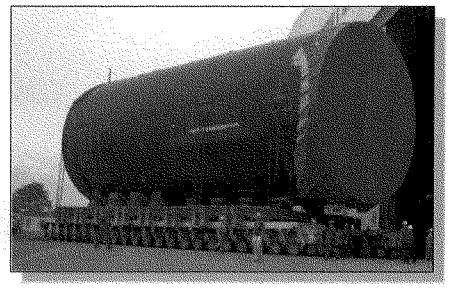
The Block II VIRGINIA submarine construction contract ties $231M of profit to five specific incentives: labor cost control; material cost control on 35 major components that drive CFE material cost; schedule performance on key construction events; total cost performance; and CAPEX. CAPEX provides profit incentives of up to $91M to the shipbuilders to invest in facilities and process improvement projects that provide cost savings to the program. The contractors prepare a business case analysis for potential projects which is then presented to the Navy for review and approval. Approval is at the sole discretion of the Government and based upon the Government's determination that the proposed project is in the best interests of the VIRGINIA program. Within thirty days after approval by the Government and commencement of a project, a Special Incentive not to exceed 50% of the estimated investment cost is paid to the shipbuilder. Upon successful implementation of the project, an additional Special Incentive not to exceed 50% of the original estimated investment cost is then paid to the shipbuilder.

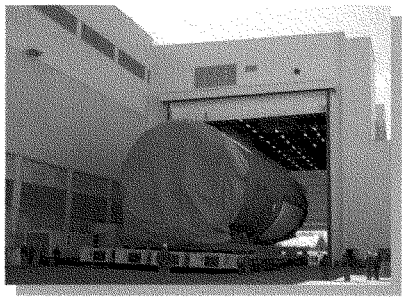
To date, $36M of the potential $91M CAPEX incentive payments have been earned by Electric Boat and Northrop Grumman Newport News. Three infrastructure improvement projects at EB have been completed with CAPEX funding:

Light Metal Fabrication Facility



Module Transportation & Facilitization Project





Coatings Facility

Over 3 million manhours of savings for ships in the VIRGINIA submarine program through these three initiatives.

The Light Metal Fabrication Facility project is designed to achieve a step change in cost, accuracy, expanded capabilities, and performance of light metal fabrication and structural assembly of VIRGINIA Class components. The savings will be accomplished by the reduction in labor hours performed during the manufacturing and assembly process for light metal assemblies. The scope of light metal fabrication and assemblies work includes ventilation assemblies, joiner type work, stowage & lockers, consoles and special fittings. Ground breaking for the facility took place in November 2004. The

facility achieved full on-line capability in November 2005. The state-of-the-art technology and machinery, with its sorting, cutting, punching, bending and shaping capability, is considered the most advanced facility of its kind in the United States. The forecasted gross total VIRGINIA Class cost saving for the $10M investment is $31M. In addition to the cost benefits, the new machines and process flow will help to improve worker safety as well as the quality of the parts, and ultimately the final product, through greater accuracy and precision.

The VIRGINIA Class Submarine Coatings Facility is a self-contained, environmentally controlled building with requisite systems and equipment to support cost-effective application of coatings associated with submarine construction in both axis-horizontal and axis-vertical orientations. These coatings include tile and mold-in-place (MIP) special hull treatment (SHT), high solids and traditional epoxy paints, sound-damping, anti-sweat, and various other coatings. The Coating Facility includes equipment for complete surface preparation of internal ship structures and tanks, main ballast tanks, hull cylinders and ship sections, and a mechanized blasting system for exterior hull surfaces. The Coatings Facility will accommodate improved construction sequence and shorten final assembly time. The Coating Facility Project will enable a total savings of approximately $139M for the VIRGINIA Class through the investment of ~$9.4M.

The Module Transportation & Facilitization Project will increase the level of submarine modular construction efficiency by developing a transport system and infrastructure that transports modules up to 2,000 tons, versus the previous 1,580-ton system. This project will reduce VIRGINIA Class construction cost by enabling maximum submarine modular construction. Implementation of this project permits the creation of four essentially complete modules that are shipped to the final assembly facility. The completion of this additional work in a shop environment enables a reduction in construction risk by enabling earlier testing and alignment of critical systems and components. Increased module outfitting increases module weight from 1,580 tons (the heaviest module currently shipped) to ~2,000 tons. Overall module lengths will also increase to a maximum of 120 feet. To accommodate the heavier, longer modules, capital

improvements were required to the existing support and transfer / transport system. This increase in efficiency results in approximately $12M in cost savings for Block II and approximately $99M over the VIRGINIA Class for an investment of $13.1M.

There is a balance of approximately $55M remaining in the pool of funding available for Block II CAPEX. Several other capital investment efforts are planned at both Electric Boat and Northrop Grumman Newport News. Electric Boat plans include upgrades to the Groton shipyard's Land Level Ship Construction Facility (LLSCF) built in the early 1970s specifically for OHIO Class construction. The purpose of this CAPEX project is to create a manufacturing environment that facilitates the most efficient and cost-effective VIRGINIA Class Final Assembly & Test approach. The proposed upgrades and modifications to the LLSCF are part of a plan that re-engineers the overall Final Assembly & Test process and leverages other ongoing lean manufacturing initiatives in Groton operations.

Ability to support acceleration of 2 ships per year

Infrastructure

Key facilities are in place to support the higher throughput of VIRGINIA Class submarines planned for FY12. Electric Boat made significant facility investments during the 1970s and 1980s to efficiently support the Cold War submarine procurement rate and to accommodate new methods of construction. These improvements included the Land Level Ship Construction Facility (LLSCF) at Groton to replace the traditional inclined building ways hull erection and launch, and automated pressure hull section construction at the Automated Frame and Cylinder (AFC) facility in Quonset Point. The LLSCF enabled modular construction with larger, heavier, and more completely outfitted hull sections, a dramatic improvement over the traditional inclined building ways. The AFC enabled Electric Boat to reduce associated structural trade manhours by approximately 75 percent and produced units with greater dimensional accuracy to enable the more extensive and efficient modular outfit of the SEAWOLF and VIRGINIA Classes.

During the Cold War, Electric Boat had sized its production facilities to the prevailing workload, with capacity based on a throughput of two 18,750-ton ballistic missile submarines (SSBNs) and three 6,900-ton attack submarines (SSNs). In the early and mid 1990s Electric Boat re-engineered and re-aligned its production facilities to affordably operate in a Low Rate Production environment of approximately one submarine delivery every other year. Obsolete and redundant equipment was eliminated, almost half of the leased property at Quonset Point was returned to the State of Rhode Island, and over 45 buildings were demolished at Groton. Some decisions were fairly easy to make, either because the equipment in question was easily replaceable (e.g. portable welding machines), or because the facility was already approaching obsolescence (e.g. the sliding ways on which the attack submarines had been built). In some cases, such as the massive fixtures used to assemble pressure hull cylinders in the Automated Frame and Cylinder Facility (AFC) at Quonset Point, there were redundant fixtures so that a few of each kind could be removed from production, reducing capacity but not diminishing capability.

At Quonset Point, the manufacturing shops such as steelwork, sheetmetal, pipe, electrical, and machining all have the capacity required, especially as many currently operate on essentially a single-shift basis. As already noted, the AFC, even with some fixtures removed, can accommodate increased production, and we have the space to outfit and test complete modules. At Groton, the LLSCF was originally sized to produce two SSBNs per year, and can handle up to three SSNs per year, or three times the expected increase. The "COATS" (Command & Control System Module, Off-hull Assembly and Test Site) Facility is a unique land based integration and test facility for Virginia Class combat systems modules and electronic equipment. This facility is already capable of handling up to two ships per year and would not require duplication, but would require some modification to accommodate the additional volume. The bottom line is that with minimal investment, Electric Boat would be fully facilitized and equipped to produce up to three attack submarines per year. The facility costs to increase production would include increased quantities of tools and equipment, including such items as certain unique jigs, fixtures, and facilities associated with the VIRGINIA Class.

People

Increasing the production workforce will be challenging, but recent experience demonstrates that we can accomplish the build-up satisfactorily. Along with the facility reductions during the 1990s, the production workforce also shrank significantly. From over 12,000 individuals directly supporting construction contracts in 1992, only around 4,000 were similarly engaged when LRP was reached in 1998. The reduction of construction personnel coupled with a similar reduction in engineering, submarine maintenance, administrative, and overhead personnel took Electric Boat from a total employment of around 18,000 in 1992 to just over 8,000 in 1998. Despite the drastic reductions, care was taken to ensure that all critical production knowledge and skills were retained in the down-sized workforce, and that we would have the correct cadre of individuals to serve as mentors when the workforce had to grow again.

Starting from a low of approximately 1,500 in 1999, the Groton Operations workforce increased from its LRP level to approximately 3,000 by the end of 2003. The increase over this timeframe was driven by a combination of work on the first VIRGINIA Class SSN, completion of the Multi-Mission Platform (MMP) modification and delivery of the USS Jimmy Carter (SSN-23), and resumption of submarine maintenance activity to accommodate overflow from the naval shipyards that increase represented a more complex workforce management problem than the future VIRGINIA Class ramp-up.

This doubling of the workforce, in four years, is significantly more (and faster) than the 500 total employment increase (starting from around 1,300 on roll) required over 3 years to accommodate the VIRGINIA Class 2-per-year production rate.

Similarly, over the years 2000 through 2004, the Quonset Point facility increased its workforce from a low of approximately 1,300 to 2,000 employees, with the increase attributable to work on the MMP and on manufacturing for the SSGN conversions performed at the Puget Sound and Norfolk Naval Shipyards. This growth rate exceeds

the less than 30% increase, from 1,400 to 1,800, which will be required in 2012 through 2015 for the VIRGINIA Class ramp-up.

Our primary concern is not so much the ability to ramp up, but rather the ability to avoid the cyclic labor demand manifested by Low Rate Production. The Groton waterfront trades face workload swings of 50% per year until the ramp up to 2 ships per year is felt. These cycles challenge our ability to retain our critical skills and create labor inefficiency. As noted above, these swings were previously mitigated by work on SSGN conversions, SSN23 special hull section design and construction, and submarine maintenance work. Continued participation in future maintenance work will preserve key skills and capabilities as well as ensuring lower labor rates.

During our earlier build-up, we continued to deliver quality products, affordably, and on schedule, and we intend to do the same as the VIRGINIA program ramps up.

Funding Alternatives

Alternative funding approaches could provide the means to further reduce the cost of ships. In exploring possible alternatives, we must ensure that the requirements of all constituents are considered. Industry objectives focus on ensuring business stability, an ability to manage risk, and delivering value to all business stakeholders: customers, shareholders, and employees. Customers intend to meet all funding requirements, acquire quality products and services at affordable prices, and to maintain necessary program and contract oversight and control. Finally, Congress weighs the benefits of various funding approaches and potential cost savings.

To date, VIRGINIA ship acquisition has been funded with the traditional "full funding" policy. Specifically, each ship is funded through the use of Advance Procurement (AP) funding in each of the two years prior to full funding. This AP funding is used to purchase long lead time components and material. In the case of the Block II ship

construction contract, the customer utilized a Multi – Year contract, with Economic Order Quantity (EOQ) funding to purchase multiple ship sets of material to achieve cost reductions. This approach is also planned for the upcoming Block III ship construction contract.

Electric Boat recommends two changes to the Navy's FY08 VIRGINIA funding plan.

First, we recommend that Congress add $70M in SCN AP funding to the FY08 budget for the FY09 ship. This additional AP will be used to procure additional material and components. Additionally, we would look to use a portion of this funding to allow advance construction activity at the shipyard, a key step to achieving schedule improvements and cost reductions.

Second, we recommend that Congress authorize the Navy to procure a spare main propulsion unit in FY08 and approve an additional $115M in OPN funding for this component. Ordering a shipset of this machinery with OPN funds in FY08 sustains the workforce for the vendor and results in significant cost savings for the next Multi-Year ship procurement. Ordering and having this shipset of machinery available to the shipbuilder ensures that material will be available to the shipbuilder on time, enabling us to further reduce VIRGINIA construction schedules. Absent the need during program production, the ship set would be available for installation on the last ship of the class or remain a spare at the Government's discretion.

Looking to the future, we continue to look to new and innovative means to fund major ship programs in an effort to drive out cost. Some alternatives include:

1. Maintaining the current full funding approach, but providing AP for shipbuilders to accelerate construction start in advance of full funding in order to achieve more efficient construction schedules and maintain a more level-loaded and efficient workforce.

2. Increasing the use of EOQ funding, within Multi-year contracting, will help to achieve greater cost savings in the procurement of material and engineered components.

3. Alternatives to Full Funding where funding is allowed to be spent as appropriated rather than phased over several years for each individual ship.

The Navy, last month, issued their "Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY2008". In their report, the Navy identified several specific efforts aimed at maintaining control of requirements growth and ship costs. Within this list was the following:

> "The Navy plans that make greater use of contract incentives, such as steep share lines combined with performance incentives, Multi-Year procurements, fixed price contracts (when and where appropriate), are expected to contribute to real cost containment in future shipbuilding plans."

We look forward to working with the Navy and the Congress in the pursuit of new and innovative funding and contracting strategies, toward the goal of delivering the highest quality and most affordable ships to the Navy.

Summary

The VIRGINIA Class Program is well on its way to becoming a benchmark DOD acquisition program in terms of cost, schedule and performance. With three ships delivered and construction progressing smoothly on the remaining ships under contract, VIRGINIA is a mature program with demonstrated success. As a mature program, it is not subject to the risks inherent in new development programs and it is incumbent on the shipbuilders to focus our efforts on program execution and unit cost reduction. To this

end, Electric Boat and Northrop Grumman Newport News are sharply focused on achieving the VIRGINIA cost challenge.

Procurement of VIRGINIA Class submarines can be more efficient. Your understanding and ability to change the acquisition approach for future ships will be a key factor in helping us deliver the lowest cost submarines. Your continued support for submarine programs is critical to our success. I sincerely appreciate your efforts to visit our shipyards and understand the issues we are facing and welcome you to return to Electric Boat in the future.

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THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND
EXPEDITIONARY FORCES

STATEMENT OF

C. MICHAEL PETTERS

CORPORATE VICE PRESIDENT AND PRESIDENT,

NORTHROP GRUMMAN NEWPORT NEWS

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON THE

US NAVY SUBMARINE FORCE STRUCTURE AND ACQUISITION POLICY

MARCH 8, 2007

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SUBCOMMITTEE ON SEAPOWER AND
EXPEDITIONARY FORCES

Chairman Taylor, Ranking Member Bartlett, distinguished members of the Seapower and Expeditionary Forces Subcommittee, thank you for this opportunity to appear before you again to discuss the Navy's submarine force structure and acquisition strategy.

Introduction

In my testimony for this subcommittee's hearing on submarines last March I discussed briefly the history and capabilities of Northrop Grumman Newport News, our role in producing the great nuclear submarines that continue to serve our Navy so well, the issues we face as shipbuilders with capital investments, investments we are making in our skilled people, and changes we are making to our processes. I will not repeat that discussion here today, but will say that after another year as president of Northrop Grumman Newport News, I am even prouder of our 19,000 shipbuilders for all that they accomplished in 2006 and the path we are on for achieving new heights in the years ahead.

I testified last year that the teaming arrangement between Northrop Grumman Newport News and General Dynamics Electric Boat for the production of *Virginia*-class submarines was "strong and functioning well." I can tell you that this statement has been validated time and again in the last year. As we complete delivery of more and more *Virginia*-class submarines, the wisdom of this arrangement becomes ever clearer. Thanks to teaming, we have preserved the nation's submarine industrial base and brought to bear the talents and capabilities of two great shipyards, all for the good of the Navy and the nation.

2006 – A Year of Achievement

Since last testifying before you, Northrop Grumman Newport News delivered its first submarine in 10 years – *USS Texas,* the second in the *Virginia*-class – on June 20, 2006. This was an exciting day for all of us at Newport News and Groton. She was

subsequently commissioned in Galveston, Texas on September 9 and set off on a path to full combat readiness for the Navy.

In August, we closed the pressure hull on the fourth ship of the class, *North Carolina.* This is a critical milestone that marks the transition of the ship from construction to final outfitting and testing. We are now working toward christening on April 21 and launch on May 5 with sea trials and delivery at the end of this year. Based on the lessons we have learned from *USS Texas* and *Hawaii*, we are accelerating the planned delivery of the ship by several months. Our progress on *North Carolina* at pressure hull closure was well ahead of *USS Texas* at the same point and comparable to where Electric Boat was on *Hawaii*, which they delivered on an accelerated schedule.

In December, our partners at Electric Boat delivered the third ship of the class, *Hawaii*, to the Navy and it was subsequently placed in shake-down service with the active fleet.

As 2006 drew to a close, we were completing work on the final module and first "super-module" to be produced by Newport News for *New Hampshire*, the fifth *Virginia*-class submarine. We shipped this 1600 ton bow module to Electric Boat in February 2007 with the sail already installed – a change in construction process implemented after study by the team and a determination that this change could help reduce costs and improve overall schedule performance. With this change, we will now be installing the sail on all subsequent submarines, regardless of who is to deliver it to the Navy. We shipped our modules for *New Hampshire* to Electric Boat with some fifty thousand man-hours of increased Newport News work scope while, at the same time, we achieved 18 percent reduction in total man-hours compared to *Hawaii*. Shipment of this module marks the completion of Newport News's work on *New Hampshire*. Electric Boat will deliver the ship to the Navy in 2009.

Throughout the year, we continued our work on our modules for *New Mexico*. Thanks to process improvements and greater efficiency of our people, this was the first ship to have all of the structural modules delivered for outfitting according to the class construction

plan. This accomplishment will help us achieve our goal of accelerating delivery of this ship.

You should note that the achievements I have just summarized were only in our *Virginia*-class program at Northrop Grumman Newport News. In the rest of the shipyard, 2006 was also a year of strong performance. We christened and launched CVN 77, *George H. W. Bush*, the last of the *Nimitz*-class nuclear aircraft carriers. We continued the mid-life refueling, overhaul and modernization of the nuclear aircraft carrier *USS Carl Vinson* and prepared it to leave the dry dock during 2007. We continued building advance procurement modules for the CVN 78, *Gerald R. Ford*, the first of the new class of carriers for the 21st century. When completed, this ship will serve in the nation's defense well past the middle of the century. Finally, we re-delivered the nuclear submarines *USS Minneapolis-St. Paul* and *USS Oklahoma City* after extended maintenance periods and began a dry dock maintenance period on *USS Toledo*.

Along with all of this work, we continued our focus on developing our people and improving our processes throughout the shipyard to drive out cost and improve performance as I discussed with you last year. Our efforts throughout the shipyard are paying off in strong performance in every program.

Let me turn now to the specific questions you asked that I address for today's hearing.

Virginia-Class Submarine Acquisition Strategy

The successful *Virginia*-class acquisition strategy has been distinguished by two key elements – teaming and stability.

In the FY 1998 National Defense Authorization Act, Congress authorized the Navy to procure the first four *Virginia*-class submarines under a teaming arrangement which Electric Boat and Newport News had proposed in December 1996. A formal teaming agreement was signed by both companies in February 1997. Subsequent Authorization

Acts have continued the requirement to procure this class of submarines from an Electric Boat – Newport News team.

We now have experience as a team delivering three submarines, we are working together on the next six and together we are procuring long-lead material for the tenth and final submarine of Block 2. We have learned a great deal by working with each other and, most importantly, we have proven that teaming Electric Boat and Newport News on submarine construction was, and continues to be, the right way to proceed. Changes to this arrangement at this point would be harmful to the combined efforts we have ongoing to reduce costs, improve designs for better producibility, and improve schedules.

Just as we have seen the efficiency in construction that has come from the teaming agreement's work share arrangement, we have also seen how sharing a single profit pool, as we do today, puts in place the necessary incentives for employees at both yards to work together effectively to reduce costs, to collaboratively and quickly resolve issues which arise, and to share ideas on ways to accomplish work more efficiently. Sharing a single profit pool equally makes the success of each yard dependent on the success of the entire team. Problems that develop at one yard, if not resolved quickly, degrade the performance of both team members. The result of all this is that there has been an active exchange of people, best practices, lessons learned and other information between the two yards – all to the benefit of the program.

When I testified before you last year, I provided a number of examples of our successes as a team and described the various initiatives we had underway to improve performance throughout the program. I will not repeat those examples here, but I believe it is essential that we exploit what we have learned from our ten years of working together as a team and continue this arrangement for the rest of the program. Only in this way can we deliver to the Navy the most sophisticated submarines in the world in the quantities they require and at a price they can afford.

The second element of *Virginia*-class acquisition strategy is stability. Until recently this program was plagued by continual delays of when the Navy would begin procuring two submarines per year. I am happy to see that the Chief of Naval Operations' 30-year shipbuilding plan has been successful at bringing some stability to our industry. This year's plan, unlike many we have seen in the past decade, does not delay the 2012 start date for two submarines per year that appeared in last year's plan. It is hard to believe, but we have seen the start date for two submarines change seven times since 1995 – a clear example of instability. The new stability we are seeing is encouraging, but, as I discussed last year, stability must go hand-in-hand with volume if we are to reduce the costs of these ships. The sooner we are able to increase volume, the sooner we will see more significant reductions in cost.

Stability is enhanced when acquisition is accomplished through multi-year procurement authorizations with advance procurement funding. We have seen the benefits of the current multi-year contract with economic order quantities in Block 2. To date the Electric Boat – Newport News team has achieved a target set by the Navy to save $240 million on material purchases for ships six through ten. The Navy intends to achieve savings of $160 million on government furnished equipment for a total of $400 million in savings. In addition, the shipyards have found $23 million in savings on 35 key material items above and beyond the target of $240 million. We can reasonably expect that similar results will be achieved as the program hits its stride with greater volume.

The benefits of multi-year procurement flow as well to the supplier base which is an essential part of the *Virginia*-class team. You have heard much about the fragility of our submarine industrial base in the past several years. The base continues to be fragile, but multi-year procurements have helped add a degree of predictability to the demand for critical components produced by the industrial base. With predictability, these businesses can make rational, fact-based decisions on capitalizing their business to ensure they can meet both present and future requirements. Thus, multi-year procurement and advanced procurement funding help to shore up the industrial base at the same time that they provide the means for obtaining needed components at the lowest possible price.

While teaming and stability are essential elements for the success of the Virginia-class acquisition strategy, there is today a third element that is also critical – ship over ship performance improvement. Our expectation in this program has always been that we will meet or exceed cost and schedule requirements while maintaining high quality. Given where we are in our program, we must also demonstrate ship over ship improvements in both of these areas without allowing any slippage in the high quality of the submarines we are producing. The bottom line is that ours must be a high performing program if we are to provide the Navy the highly capable submarines it needs to sustain a long-term force structure goal of 48 submarines.

And the *Virginia*-class submarine acquisition program today is, indeed, high performing. It has become a model acquisition program. We are delivering on our commitments, exceeding expectations, and demonstrating improvement with each successive ship.

Capital Expenditure Program (CAPEX)

In the past four years, Northrop Grumman shareholders have invested over $250 million of capital to modernize critical equipment and build new facilities to improve the efficiency of our operations and reduce costs on Navy programs. Some of our investments are in machinery and specialized shops which will benefit all Navy programs. Others are specific to the submarine program where the *Virginia*-class contract has provided additional incentives for us to do so. These incentives require an up-front use of shipyard resources with the possibility of earning an incentive, but only if the improvement actually delivers the savings that we estimated. Both Electric Boat and Newport News propose incentive projects to the Navy and fund them from corporate resources. If the Navy agrees that the anticipated savings are being achieved through the project, the incentive is paid by the Navy and split equally by the two shipyards. This is yet another example of how the success of each team member is tied to the success of their partner. The results we have seen to date make the wisdom of this approach clear.

At Newport News, we are focused on establishing multi-use, multi-purpose facilities that increase our flexibility to do work where it is best for our employees and where the work can be done most efficiently. We have, for example, invested in covered modular assembly and modular outfitting facilities because we know that weather affects productivity and productivity drives labor costs. Under the CAPEX incentive program, we have added the necessary equipment, services and connections necessary to one of the bays of the submarine Modular Outfitting Facility (MOF) to create a second bay capable of final assembly work on submarines. Prior to this, only one bay was equipped for covered, final assembly work in the MOF. Thus, a follow-on submarine would reach a point in its construction when it would have to move to the one final assembly bay displacing the nearly complete submarine in that bay. This ship would be moved outside of the MOF, closer to its ultimate launch site, where final preparations for launch would be performed. With this second bay appropriately equipped, two submarines can now complete their preparations for launch protected from the weather and without the expense of an additional move from one end of the MOF to the other before being launched. This project has been implemented and is paying dividends in the construction of *North Carolina*. This is also an excellent example of a Block 2 incentive being used for the benefit of both Block 1 and Block 2 submarines. Moreover, this improvement was a step that had to be taken to be able to produce two submarines per year efficiently.

Similarly, we have invested in upgrades to our Covered Module Assembly Facility (CMAF) to enable more efficient construction of the sail, habitability module, auxiliary machinery room module and sonar sphere. With these upgrades in place, we are seeing efficiencies in the production of these modules across all areas which will contribute to both further cost reduction and schedule improvement.

In the next five years we will continue our capital investments at Newport News with more than $300 million across all programs. In my view, this is a clear indication of our commitment to the Navy to reduce costs on their programs in every way that we can.

Meeting the $2 Billion Challenge

In my testimony last year I expressed confidence that the Electric Boat – Newport News team could meet the Navy's $2 billion challenge "if the current positive trends continue for shipbuilding costs, the government successfully executes its plans to reduce the cost of government furnished equipment, and we increase the rate of submarine production to two ships per year under a multi-year procurement with economic order quantity (EOQ) purchases." Our experience in 2006 has only served to strengthen my confidence in the ability of the Electric Boat – Newport News team to meet this challenge.

I would like to highlight briefly a few of the key things we are doing to be able to get to two submarines for $4 billion. Specifically, I want to discuss how we are reducing labor costs through learning improvements and reducing labor and material costs through design for affordability changes as well as other process improvements.

Shipbuilders and Navy officials know that the cost of Navy ships has three components: shipbuilder labor, shipbuilder material, and government costs which include government material and support agency costs. Currently on the *Virginia*-class, shipbuilder labor accounts for about 40 percent of the total cost; shipbuilder material accounts for about 25 percent; and government material and support accounts for about the remaining third. As shipbuilders, we continue to take steps to reduce our labor and material costs and we are making great strides, but to be successful, attention must be given to all three components. The Navy must continue to take steps to stabilize requirements, minimize unnecessary design changes after production begins, and reduce the cost of government furnished equipment and support provided by Navy laboratories and other Navy agencies. My comments throughout my testimony today address only the 65 per cent or so of costs that I have influence over as a shipbuilder. We are doing our part to reduce costs on what we control and I am confident the Navy is addressing its third of the costs with equal vigor.

There is ample evidence from previous classes of submarines and other serial ship production that when production goes into series, labor costs are reduced as a result of doing tasks multiple times and learning how to do them more efficiently. Our history with the production of *Los Angeles*-class submarines in the 1990's demonstrated a steady decline in man-hours required to build these ships as shipbuilders had the opportunity to find more efficient ways to accomplish similar tasks from ship to ship. As a result, we were able to sustain steady movement down a learning curve.

Similar to our experience on the *Los Angeles*-class, both shipyards today are seeing nearly a twenty percent reduction in labor man-hours on recurring costs from their first delivered ship to their second. From *Virginia* to *Hawaii*, the Electric Boat – Newport News team saw fifteen percent reduction in labor. From *Texas* to *North Carolina*, the team is on track for about eighteen percent reduction in labor. The ability to achieve such reductions is even more remarkable given the significant impact of very low production rates of *Seawolf* at Electric Boat and the fact that there was no submarine construction at Newport News for ten years prior to our work on *USS Texas*. All the evidence indicates that the trends are moving in the right direction – downward.

For example, on *New Hampshire,* the lead boat of Block 2, we completed our work for 700,000 fewer man-hours than what we needed on *Hawaii*. As I indicated earlier, we also completed more work on the modules for *New Hampshire* than on similar modules of *Hawaii* and we finished nearly $10 million under budget.

In addition to the benefits of learning, we are beginning to experience cost savings from many of the design for affordability initiatives that are under way. Some of these initiatives will reduce the time required to perform certain work, such as modifications to some critical bulkheads, changes to the way the sail is produced, and movement of components from one module to another. Others, such as changing the material used for certain pump impellers and paints and coatings, will reduce the cost of procuring some contractor furnished equipment (CFE) and some government furnished equipment (GFE). As long as design changes are limited to those that reduce costs or are essential for ship

performance, they can be beneficial. Our experience with the *Los Angeles*-class, however, shows that there are risks that come along with design changes and, especially, with major insertions of new technologies. The Navy - Electric Boat - Newport News team understands these risks and is weighing each proposed change carefully to ensure maximum benefit is derived with the least amount of disruption.

Other producibility improvements are being made which are also paying dividends in reduced labor or schedule requirements. Many of these improvements come from skilled craftsmen on the deck plate and shop floor who bring their suggestions forward for consideration. We have begun to achieve savings by implementing suggestions on such diverse issues as changing the way torpedo tubes are assembled, modifying non-destructive testing techniques on certain components, changing the location and timing of some tests and literally hundreds of others. When we see benefit to making such changes, we share this information with our teammates at Electric Boat so they too can benefit from them and they do likewise for us. In the *Virginia*-class submarine program we are seeing once again what shipbuilders everywhere know – when you empower the skilled craftsmen who best know the work, you unleash enormous amounts of energy and initiative that results in smoother, faster and cheaper performance.

In addition to the submarine-specific actions I've described, we are also continuing to focus on process improvement initiatives across the shipyard which I have spoken about on previous occasions. By paying attention to value streams that apply to the entire shipyard and knocking down unintentional obstacles, we are improving processes which affect every ship we repair or build. We are making good progress in these efforts and are seeing the impact of them in every program.

There are two final ingredients to getting to $2 billion. First is the continued wise use of capital investment to enhance the infrastructure necessary to produce at full efficiency. This includes full utilization of the CAPEX initiatives the Navy has wisely put in place for Block 2 submarines. As I discussed earlier, we are seeing great benefit from this

incentive program and hope that the Navy will see the wisdom in continuing such incentives into Block 3 as well.

Finally, as I have said many times before, we cannot neglect the importance of volume in getting to the $2 billion target. Volume will spread overhead costs, improve production efficiency and enable material savings. When shipbuilders are able to buy required construction material and components from subcontractors in volume, savings are achieved. Just as shipbuilders achieve learning curve savings with volume production, suppliers are better able to manage their workforces, maintain continuity in production, maintain critical skills, and achieve un-interrupted learning curve efficiencies. As production rates increase, the shipyards use economic order quantity purchases to aggressively negotiate with vendors and to achieve the lowest price on these materials. All of these benefits are limited when volume is one submarine per year.

Watching the performance of this team throughout 2006, I continue to be confident that we can meet the challenge of "two for $4 billion" in 2005 dollars. But performance and innovation alone are not enough. Nor is volume alone enough. It takes the combination of volume with good performance, innovation, process improvements and investment to successfully reduce costs. There is no doubt in my mind that the teaming agreement and its unique equal sharing of work and profit, coupled with cost reductions in GFE by the Navy, is the best way for the shipbuilders to meet the Navy's $2 billion challenge.

Our Ability to Increase Production Prior to 2012

You have asked if the Electric Boat – Newport News team has the ability to accelerate production to two submarines per year before 2012. From my perspective at Newport News, the answer is a solid "yes." But if there is going to be a decision to accelerate production, it needs to be made soon so that there is sufficient time to procure long-lead material and to adjust existing work plans and schedules. The careful and detailed planning that will be required in this situation cannot be accomplished overnight. The sooner we get started, the sooner we will assure our success.

The availability of material is critical to successfully accelerating production. If we are to start building two submarines each year before 2012, adequate advance procurement funding in this year's budget is essential. We will need the right amount of funds and they must arrive in time to meet ordering schedules. I have already commented on some of the issues the submarine industrial base has been confronted with in recent years. Suppliers need adequate time to expand their production capabilities and to obtain parts from the next tier of suppliers before they can deliver the materials we need to begin building the ship. My experience tells me that several hundred million dollars will be needed in the FY 2008 defense authorization and appropriations acts to ensure the right material is on hand when needed for starting construction.

To be clear, if advance procurement funding and authorization is provided for production of two submarines per year before 2012, we will support this decision energetically and enthusiastically. I remain mindful, however, of the painful lessons that our entire industry has learned from instability and I appreciate the importance of the stability inherent in the Chief of Naval Operations' 30-year shipbuilding plan. A decision to accelerate production must not come at the price of destabilizing the entire shipbuilding plan. While large shipyards like mine could, most likely, weather more instability, the challenge this would pose to the shipbuilding industrial base – those critical suppliers of components and piece parts operating across the entire country – would be significant and could have serious adverse implications for every class of ships.

Thus, answering the question of how to fund acceleration of submarine construction is just as critical to the future security of our nation as answering whether we should accelerate it. I am confident that as Congress considers the answers to both these questions, you will weigh carefully the testimony given before this committee by Secretary of the Navy Winter and CNO Admiral Mullen on March 1 as well as the Secretary's February 12, 2007 report to Congress on this subject.

Also for the sake of clarity I should make one final point. Our team is committed to lowering the cost of *Virginia*-class submarines to "two for $4 billion" in 2005 dollars by

the time we arrive at the CNO's planned start date of two submarines per year in 2012. Many of the changes we are working on to bring about these cost savings will take some time to be implemented and to be seen in cost reductions. If the start date for two submarines per year is accelerated, Newport News will continue to do its part to achieve the goal of producing two submarines for $4 billion prior to 2012, but there is no certainty that this could be accomplished in 2010 or 2011. Savings from design and process changes that are being made today and savings from GFE and CFE may require longer than 2010 to be fully recognized. Nonetheless, all of us in this program will do all we can to reduce the cost of submarines as quickly as we can.

Conclusion

I welcome the attention of Congress, and this subcommittee in particular, to the submarine needs of our Navy. Shipbuilders are skilled men and women who choose this difficult occupation because they believe that what they are doing is important and contributes to the nation's security. All of us on the Electric Boat – Newport News team are working hard to squeeze every unneeded man-hour and dollar out of our costs and every possible day out of our schedules.

With the strong support you have always shown our industry, we will continue to build the world's finest nuclear submarines for the world's greatest Navy.

Testimony of Winfred Nash, President, BWXT, Nuclear Operations Division
Before the Subcommittee on Seapower and Expeditionary Forces of the
House Armed Service Committee

March 8, 2007

Rayburn House Office Building, Room 2212

Chairman Taylor, Congressman Bartlett, and Members of the committee:

My name is Winfred Nash and I am the President of BWXT's Nuclear Operations Division.

Thank you for inviting me to testify today before the Subcommittee on Seapower and Expeditionary Forces of the House Armed Service Committee on submarine force structure and acquisition strategy. I am honored to have this opportunity to speak with you.

As the largest supplier of GFE (Government Furnished Equipment) components to the Navy's submarine and aircraft carrier programs, I believe that I can bring a unique perspective to the committee on the critical issue of submarine force structure and acquisition.

I would like to take a moment to tell you a little about the history of BWXT and why our company is critical to answering many of the questions concerning nuclear power shipbuilding.

What is today known as BWXT was formally part of the Babcock and Wilcox Company (B&W), formed in 1867. The first utility power plant in the United States had a boiler designed and supplied by B&W. B&W is the world's expert on steam which is still the most economic medium to generate electricity worldwide. Beginning this year, we reintegrated with B&W and are both now parts of The Babcock and Wilcox Companies.

Our manufacturing capabilities have powered national security since the start of the last century. Teddy Roosevelt's Great White Fleet was primarily powered by B&W boilers. At the end of World War II, at the surrender of Japan, 395 of the 400 U.S. Navy ships in Tokyo Bay were powered by B&W boilers. In the 1950s, B&W became a major U.S. manufacturer and supplier of components for the U.S. Navy's fleet of nuclear powered ships and submarines.

BWXTechnologies, Nuclear Operations Division (BWXT-NOD), a division within BWXT, is a long term supplier of major components of the nuclear power plants operated by the US Navy. Historically, BWXT-NOD has supplied completed power unit

assemblies as well as steam generators and steam system pressurizers, and is presently the sole source supplier of these components.

BWXT has supported the Navy nuclear program since its inception. We are proud to have provided components to the very first nuclear submarine, the Nautilus. Since those early days in the 1950's, BWXT's designing, manufacturing, and operational expertise has assured the success of such programs as the Advanced Test Reactor at the Idaho National Laboratory, Nimitz-class carriers, and the Los Angeles-, Ohio- and Seawolf-class submarines. Today we are proud of our ongoing contribution to the SSGN program, Virginia-class submarines and the newest class of aircraft carriers.

Capacity to Support a Second Virginia-class Annual Procurement

BWXT-NOD can support procurements for the second Virginia-class ship per year. A number of years ago, in anticipation of the eventual need to increase the build rate from one to two per year, BWXT-NOD had either retained or acquired the facility and equipment capacity to support a two per year procurement rate. What remains is to acquire the human resources necessary to staff the facilities and operate equipment at full capacity.

Cost Savings

The added volume associated with a second shipset allows BWXT to more efficiently use its available capacity. In essence, by building only one submarine per year and an aircraft carrier every five years in a facility built to support that plus an additional submarine, we are operating well below our capacity. EachVirginia-class is carrying the BWXT fixed overhead of two submarines.

The resulting efficiencies would yield a 9% savings over current power plant prices. The additional volume would also yield an 8% savings in the production of the CVN-21 power plant.

These cost decreases cross programs for two primary reasons. First, the extremely low volume of nuclear shipbuilding undertaken by the Nation over the past few decades has resulted in a single supplier for nuclear power plants. Incidentally, last year before this Committee, Allison Stiller, Deputy Assistant Secretary of the Navy for Ships, estimated that approximately 80% of the Virginia-class supplier base is sole source. As a result, the same facilities that manufacture aircraft carrier power plants also build submarine power plants.

While having a single source supplier for something as critical as the power plants may seem to increase risk, the reality is that heavy manufacturing is an extremely capital intensive business. So long as acquisition cycles are rationally staggered or volume is adequate to fill a plant's planned sizing, great savings can be achieved and the result is an efficient manufacturing process. Unless and until the Nation drastically expands its

nuclear Navy well beyond anything anticipated today, the most efficient way to produce nuclear power plants is the system that is currently in place, as BWXT has demonstrated with high quality and value since the beginning of the submarine program over 50 years ago. However, working at low volumes with extreme fluctuations of manpower requirements does drive cost higher.

Right now, because of the extreme work load variability associated with nuclear shipbuilding, I am forced to surge my manpower to support an aircraft carrier every five years only to layoff a significant portion of that workforce prior to the next award. When many of the skill sets required to support our activities take, literally, years of training to acquire, hiring and firing is an extremely painful and expensive process. With each cycle, we also lose valuable expertise, as those with the skills to support the front end of the process are lost when their job is done. We must then be prepared to hire, train, and then layoff a whole new cadre of personnel. The resurgence of commercial nuclear power will complicate the process because we will be vying for the same resource pool.

The manpower requirements of a second Virginia-class submarine would help level load those manpower requirements between CVN-21 years, which increases our efficiency and drives down the costs of both power plants.

One attractive option to drive down the program costs and to protect schedules without actually authorizing a second submarine before 2012 is to fund a second shipset of long lead material in 2008 at $400 million, which would not be specifically assigned to a submarine, but would instead roll forward for future use. This would allow us to capture the savings associated with a second submarine while not subjecting the Navy to having to pay for the balance of program out of its future shipbuilding plan, which I understand is a major concern of Naval leadership.

This option is very attractive for a number of reasons. As stated, a revolving inventory would allow us, and much of the submarine industrial base, to better level our work loads over time, thus more efficiently managing our resources and achieving savings. There is another and potentially more critical reason for this, however: the commercial nuclear renaissance. Nuclear power is quickly becoming an attractive option for nations across the world. Some projections show hundreds of reactors being constructed over the next twenty-five year. Given the limited manufacturing capacity, globally, to produce large forgings and tubing and other specialized components and the limited availability of raw resources, such as nickel, higher demand could significantly affect the price of a nuclear power plant. Growing demand in the commercial nuclear sector could also create such gridlock in the system that surging production to meet some future crisis could be difficult. A revolving shipset would substantially mitigate all of these problems.

Expanding the Nuclear Navy beyond Submarines and Aircraft Carriers

I would now like to expand my comments beyond our ability to support a second Virginia-class and talk briefly about our capacity to support growing the nuclear Navy to

include nuclear cruisers and/or large deck amphibious ships. Because this program direction would have major implications for both the Virginia-class and the CVN-21 program, I think my comments are germane.

Adding a nuclear cruiser or large-deck amphibious ship would significantly drive down nuclear power plant costs across the fleet, even beyond the savings associated with the second Virginia-class. If the Navy adds a new class of surface combatant using an existing design, such as CVN 21, BWXT would also be able to support the manufacturing of those components.

That concludes my testimony for today. I thank the Chairman and the rest of the subcommittee for their time.

STATE OF CONNECTICUT
EXECUTIVE CHAMBERS

M. JODI RELL
GOVERNOR

Statement By
The Hon. M. Jodi Rell
Governor, State of Connecticut
To The
Seapower and Expeditionary Forces Subcommittee
House Armed Services Committee
Thursday, March 8, 2007

Let me begin by thanking Chairman Gene Taylor and Ranking Member Roscoe Bartlett for holding this very important hearing on submarines. Let me also thank Representative Joe Courtney for requesting this hearing.

Last year, both of you visited the Electric Boat Corporation Groton, Connecticut. You are familiar with the unique talents of our submarine designers and builders at Electric Boat. Should other members of your committee have any questions about the unique abilities of the world's premiere submarine design and construction corporation, I am extending a personal invitation for them to visit Electric Boat.

Last year, your subcommittee recommended and the Congress approved the authorization of $400 million for long lead procurement to allow the acquisition of two Virginia Class Submarines per year.

Let me commend you on this visionary piece of legislation. Regrettably, the Congress did not appropriate funds necessary to support this important authorization. I would urge the subcommittee to continue its efforts to transition to two submarines per year as soon as funds can be made available.

As the Governor of Connecticut I am, of course, interested in the jobs the two Virginia Class Submarines would bring to our state. But equally important is my concern that the failure to move to two submarines per year will result in layoffs that could, in turn, affect the capability of our industrial base to continue to design and build these magnificent ships. By delaying, for over a decade, the initial planned increase in production to two ships per year, the Navy has forced Electric Boat to layoff thousands of highly skilled workers. It is time to turn this around! We need to build two submarines a year. But, will we find that our finest submarine designers, engineers and builders are not here to do the job?

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As a native of Norfolk, Virginia, I am also fully aware of the need of our Navy to continue to design and build the ships we need to protect our Nation. Submarines played a key role in our national defense in the past, and will continue to do so now and well into the future.

The stealth and lethality of submarines makes them unique as a class of ships. They also play a special role in the Global War on Terror.

If you need proof of the value of submarines after the Cold War, ask any special operations forces personnel their preferred method of clandestine insertion. The answer is always a submarine because of its stealth.

Submarines are a critical part of our intelligence network. The secret successes of the Submarine Force against terrorist targets are rarely reported. But, the Navy's decision to open a counter-terrorism center at Sub Base New London should give you a clue as to where the action is in today's fleet.

The Virginia Class Submarine Program is focused on meeting the Chief of Naval Operations cost challenge. A key element to achieving the $2B submarine (FY05$) is procuring two submarines per year. The Virginia Class Submarine Program is the only shipbuilding program meeting the Navy's cost objectives.

Another factor in your decision should relate to the health and welfare of our Navy families here in Connecticut. As governor, I am proud of the local support we give to our submariners and their families, but I am concerned that extended missions and increasingly longer times at sea due to a decreased number of ships are seriously stressing an already overburdened force. We need more submarines now!

I understand that in 2006, the U.S. Submarine Force could meet only about 60 percent of its missions. This is an unfair burden that is being placed on our submariners and their families that can only be relieved by increasing submarine production.

Let me conclude by saying that published news reports say that China is currently building five times the number of submarines annually that are being built by the United States. The terrorism threat will be with us for a long time. Given these threats, I cannot understand why we would want to delay the long-planned decision to produce two Virginia Class submarines per year to maintain our national security.

Our nation needs more ships, but of the type that can meet the threat effectively, without unnecessarily endangering our sailors. The proliferation of anti-ship weapons means that only subsurface vessels can navigate stealthily and safely near enemy shorelines throughout the world.

Submarines have the stealth, agility, mobility, persistence and firepower to meet our nation's security needs. The Congress needs to apply our tax dollars to funding two Virginia Class submarines per year, and I hope that the Subcommittee will encourage them to do just that!

The Honorable Joseph D. Courtney
United States House of Representatives
215 Cannon House Office Building
Washington, DC 20515

March 8, 2007

FOR IMMEDIATE RELEASE
CONTACT: BRIAN FARBER
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REP. COURTNEY'S PREPARED REMARKS FOR SEAPOWER SUBCOMMITTEE HEARING

WASHINGTON, DC – Congressman Joe Courtney will offer the following remarks (as prepared for delivery) today at a Seapower and Expeditionary Subcommittee hearing on our nation's current and future nuclear submarine fleet strength.

Congressman Courtney is seeking to accelerate the Navy's procurement of *Virginia*-class submarines. The Navy's current plans are to increase production to two *Virginia*-class submarines in 2012.

Congressman Courtney requested the hearing during a private meeting with Subcommittee Chairman Gene Taylor on January 24, 2007.

"Chairman Taylor, let me first thank you for holding this important hearing. Since I joined this committee you and your staff have been an incredible help to me. I also want to thank our witnesses for being here today, especially John Casey of Electric Boat."

"As the Congressman for Connecticut's Second District, I am intimately familiar with the subject matter before us – our nuclear attack submarine fleet. Whether you visit Sub Base New London or talk to yard workers at Electric Boat, it is easy to see the tremendous pride that everyone connected with the submarine program in Southeastern Connecticut has for the work they do. This pride is well earned and I am proud to represent this important region here in Congress."

"There are critical challenges facing the attack submarine fleet that I am interested in addressing here today. First, I am concerned that our SSN procurement rate allows the

size of our submarine fleet drop below the Navy's own stated force requirements and fails to invest in the fleet we need to address the long term strategic threats ahead. Second, I am alarmed at the lack of investment in sustaining the very specialized submarine design workforce. Finally, given the fact that we have key leaders in Congress who are interested in increasing naval shipbuilding this year, I am interested in finding ways that all the stakeholders – Congress, the Navy and the submarine industry – can get to two submarines per year earlier than 2012."

"Based on the Navy's own stated force requirements, we need to sustain an attack submarine level of at least 48 boats. However, under the current shipbuilding plan, our nation will have fewer than that for a 14 year period between 2020 and 2033 -- with a low of 40 ships from 2028 to 2029. The drastic drop in the SSN level is due to the retirement of the Los Angles-Class Submarine, slated to begin retiring in numbers anywhere between one to four boats beginning in FY2014 while being replaced with one or two Virginia-class SSNs. We simply will not building enough ships to replace those going out of service."

"Last week, front page stories in the *Washington Times* and *Los Angeles Times* detailed China's major buildup of submarines -- including five new strategic nuclear-missile boats and several advanced nuclear-powered attack submarines. It really is just a matter of simple math that the size of our fleet is going to be significantly smaller than the Chinese navy's under our current submarine building plan."

"If the fleet we build today is the fleet that protects us tomorrow, then the current shipbuilding plan does not adequately invest in the attack submarine fleet we need to address future threats -- both known and unanticipated."

"We are also not building or designing enough submarines to sustain our submarine construction and design workforces – both true national treasures that we cannot afford to lose. The submarine construction and design workforce are highly specialized fields with unique technical and manufacturing capabilities. I am deeply concerned that continuing to delay the procurement of a second Virginia class submarine and postponing the design of the next generation SSBN submarine will do serious and long standing harm these critical workforces. They are not easily duplicated or reconstituted should they be allowed to fade away."

"The British experience with their Astute-class development program is a significant warning against letting our submarine construction and design workforce slip away. In this case, they allowed their submarine design and engineering workforce atrophy for years from lack of submarine design work. As a result, the Astute class design program faced extensive delays and cost overruns as they struggled to recapture that specialized knowledge and experience. In the end, the UK was forced to rely on designers from Electric Boat to help overcome these hurdles."

"This example should serve as a clear warning to this committee and this Congress. Yet, for the first time in nearly 50 years, we are not designing the next generation submarine.

This places us in the very alarming position of permanently damaging a very specialized workforce that cannot be replaced with the snap of the fingers."

"Last year the Navy asked the RAND Corporation to look in to a strategy to preserve the submarine design and engineering base. Their report, expected to be published soon, concludes that the most effective way to maintain this critical workforce is to begin design work on the next generation of SSBN sooner and over a longer period of time.

The bottom line is that as we look to the long term challenges ahead, it is clear that the most important action that we can take in the short term is to increase attack submarine procurement to two a year as soon as possible."

"We can all agree that the Virginia-class program is a true shipbuilding success story, especially in light of other challenges we see in other shipbuilding programs. Again and again, the talented workforce in Groton and Newport News exceed expectations by delivering an unmatched product on budget, on schedule and performing at record levels. The shipyards and the industrial base have made tremendous progress towards meeting the Navy's cost target of $2 billion per boat by FY2012."

"It is clear that the Navy supports the 30-year shipbuilding plan and is concerned about the impact of any changes by Congress in the submarine program will have on their overall shipbuilding strategy. With no constraints or fiscal limitations, I believe all of would come to the same conclusion – that under our current plan we are simply not constructing enough submarines today to meet the challenges of the future."

"This year we are fortunate to have the leadership of Chairmen Jack Murtha, Ike Skelton and Gene Taylor, all of whom have committed to increasing our investment in shipbuilding this year – including the addition of another Virginia-class SSN. To this end, I am interested to examine ways in which all of the stakeholders – the Congress, the Navy and the submarine industry – can find a way to move forward in this goal together."

"I look forward to discussing these important issues with our witnesses. Once again, thank you, Chairman Taylor, for holding this hearing today."

# # #

DOCUMENTS SUBMITTED FOR THE RECORD

MARCH 8, 2007

GENERAL DYNAMICS
Electric Boat

John P. Casey
President

March 30, 2007

The Honorable Gene Taylor
House of Representatives
Washington, DC 20515

Subject: Seapower and Expeditionary Forces Subcommittee Hearing on Submarine Force Structure and Acquisition Policy

Dear Mr. Chairman:

Thank you for the opportunity to testify before your committee concerning US Navy Submarine Force Structure and Acquisition Policy on March 8, 2007. The purpose of this letter is to respond to the request you made during the testimony.

During the testimony, a question was posed as to what additional savings would be achieved by increasing the Navy's planned seven ship multi-year procurement to a nine ship procurement for the next Virginia submarine block buy. Mr. Ronald O'Rourke, Congressional Research Service, stated, "you might see an increase in the average savings per boat something along the lines of $35M per boat. It might be something less, because the economies of scale are not as tremendously increased going from seven to nine [submarines] as they are from five to seven, but I think it's something in that neighborhood that we might be looking at." His estimate was based on earlier Navy estimates for acquisition of Block II submarines. One of the scenarios evaluated at that time indicated that if two additional ships had been included in the 5 – ship Block II multi-year contract, the per ship savings would have increased from $80M to $115M.

The Navy estimates cited are tied closely to estimates provided by Electric Boat, and are the result of an analysis conducted by Electric Boat in developing VIRGINIA Block II ship cost estimates. A recent independent estimate performed by Electric Boat confirmed that the savings for a nine ship multi-year Block III procurement compared to a seven ship procurement, on a two ship per year basis, would be $35M per ship, with some potential for even greater savings based on our aggressive learning curve initiatives in practice at both shipyards. My *Virginia* class construction team-mate concurs with the savings shown above.

In closing, thank you for conducting an interesting and fruitful hearing on this very important subject. I would be happy to meet again with you and your staff to provide additional details should you be interested.

Very respectfully,

John P. Casey

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March 22, 2007

Chairman Gene Taylor
2269 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Taylor:

During testimony before the Subcommittee on Seapower and Expeditionary Forces of the House Armed Service Committee on March 8, 2007 you requested that I submit a written statement documenting the savings produced by an additional annual Virginia-class procurement.

For the work that BWXT is responsible for, which includes provision of the nuclear power plant, a continuous build rate of two Virginia-class submarine would produce approximately 9% cost reductions over current nuclear power plant prices. A second Virginia-class would produce an additional 8% savings on the CVN-21 aircraft carrier nuclear power plant.

Should the Congress and the U.S. Navy choose to begin production of additional nuclear surface combatants, such as cruisers, I believe, depending on design, that we would achieve an additional 5% price reduction for Navy nuclear power plant production.

The one condition that must be held to produce these savings is for the A1B (current CVN reactor ship set) to continue forward without any additional delays. Due to low throughput volumes and previous deferrals, any additional delays would have a major negative impact on my workforce and the price.

I would like to thank you and the subcommittee for the opportunity to testify before you and to provide additional information. If you should need any additional clarification or information, please contact me at 434-522-5912.

Best regards,

Winfred D. Nash
President, BWXT
Nuclear Operations Division

QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD

MARCH 8, 2007

QUESTIONS SUBMITTED BY MR. TAYLOR

Mr. TAYLOR. Is there any hope of additional savings with those additional boats? Has anyone in your office calculated that scenario?

Mr. CASEY. [The information referred to can be found in the Appendix on page 149.]

Mr. TAYLOR. Is there any hope of additional savings with those additional boats? Has anyone in your office calculated that scenario?

Mr. NASH. [The information referred to can be found in the Appendix on page 150.]