CSBA CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

TESTIMONY

March 30, 2006

THE 313-SHIP FLEET AND THE NAVY'S 30-YEAR SHIPBUILDING PLAN

By Robert O. Work, Senior Analyst

TESTIMONY BEFORE THE HOUSE ARMED SERVICES COMMITTEE PROJECTION FORCES SUBCOMMITTEE HEARING ON THE AFFORDABILITY OF THE NAVY'S 313-SHIP NAVY AND THE EXECUTABILITY OF THE 30-YEAR SHIPBUILDING PLAN

Mr. Chairman, Congressman Taylor, and Members of the Subcommittee, I am honored to appear before you today to discuss how the Navy's acquisition strategy supports the Chief of Naval Operations' vision for a 313-ship fleet. Given the expertise of the other distinguished members of this panel from both the Congressional Budget Office and the Congressional Research Service, I believe I might best serve the Subcommittee by providing a quick overview of the 313-ship fleet and making some general observations about the affordability of the Navy's associated 30-year shipbuilding plan; whether the plan appears executable; the plan's potential impact on the shipbuilding design and industrial bases; how an alternative competition strategy might lead to a different, less expensive plan; and some alternative funding proposals.

THE 313-SHIP FLEET

The right hand column of Figure 1 outlines the 313-ship fleet developed during the just completed 2006 Quadrennial Defense Review.

This fleet should look relatively familiar to this Subcommittee. It is, essentially, a modified version of the 300-ship fleet designed and approved during the 1997 Quadrennial Defense Review (QDR).[1] After nearly nine years of often boisterous debate both inside and outside the Navy, the declaration of a war on global terrorism and radical extremism, and often strident calls for fleets as large as 360 and 375 ships, the Navy's leadership has finally acknowledged what the Clinton Administration concluded long ago: that a fleet of much more than 300 ships is unlikely given the current degree of US naval superiority, the reality of future budgets, and steadily increasing ship costs.

That said, a comparison between the 1997 and 2006 QDR battle fleets helps to highlight the changes in the makeup of the basic "300-ship navy" that the Department of the Navy (DoN) and the Office of the Secretary of Defense (OSD) believe is best suited to meet the challenges of the 21st century.

[1] The exact make-up of the 1997 QDR fleet was not revealed in the final 1997 QDR Report; it was described only in general terms. As a result, the 1997 QDR fleet is variously described as having between 300 and 310 ships. This testimony estimates the 1997 QDR fleet at 302 ships.

Figure 1: Comparison of the 1997 and 2006 QDR Fleets

Type/Class	1997 QDR Fleet	2006 QDR Fleet
Aircraft Carriers (CVN-21s)	**11+1**	**11 +1**
Submarines	**68**	**66**
Ballistic Missile Submarines (SSBNs)	(18)	(14)
Cruise Missile/Spec Ops Transport Submarines (SSGNs)	(0)	(4)
Attack Submarines (SSNs)	(50)	(48)
Surface Combatants and Mine Warfare Vessels	**132+10**	**143**
CGs/CG(X)s	(27)	(19)
DDGs/DDG(X)s	(57)	(62)
DD-21s/DD(X)s	(32)	(7)
MCMs/MHCs	(16+10)	(0)
Littoral Combat Ships	(0)	55
Expeditionary Warfare Ships	**36+16**	**43+8**
Amphibious Landing Ships	(36)	(31)
Enhanced Maritime Prepositioning Ships MPF(E)	(16)	(8)
Future Maritime Prepositioning Ships MPF(F)	(0)	(12)
Combat Logistics Force Ships	**29**	**30**
Support Vessels	**25**	**20**
Total Ship Battle Force (TSBF)	**302+26**	**313+9**

Note: the numbers in red are ships not included in the official "Total Ship Battle Force."

- The 1997 QDR fleet called for a carrier fleet of 11 active and one reserve carriers. The 2006 QDR fleet has a "requirement" for 11 carriers, but it willingly accepts the added operations and support (O&S) costs required to maintain a twelfth "active spare" after 2019.

- The two submarine fleets are virtually the same in numbers, although slightly different in composition.

    - The 1997 QDR fleet, designed before the 2001 Nuclear Posture Review, called for 18 strategic missile submarines, or SSBNs. The 2006 QDR fleet retains 18 *Trident* submarines, but in two types: 14 SSBNs and four converted cruise missile and special forces transport submarines, or SSGNs. It is instructive to note that these converted SSBNs, which will provide the fleet with 616 covert vertical launch system (VLS) cells—the equivalent missile load of nearly eight DD(X) destroyers—as well as four covert special operations "seabases," were forced upon a reluctant Navy by OSD and Congress. It should therefore be unsurprising that the current shipbuilding plan offers no future replacement for these versatile ships.

    - The 1997 QDR called for a nuclear attack submarine fleet of 50 SSNs. Since then, the number of battle force SSNs has been perhaps one of the most hotly debated topics in the Department of Defense, with numbers developed during study after study ranging from 40 to over 70 boats. After all the debates, the 2006 QDR settles on essentially the same number as the one developed nearly a decade ago—48 boats—a reflection of the both the continuity in our two-major combat operations force sizing and planning construct as well as the high costs of these superb vessels.

- One of the biggest noticeable difference between the 1997 and 2006 QDR fleets is found in their respective plans for the future surface combatant and mine warfare fleets. The 1997 QDR had a three-tier structure including 84 AEGIS/VLS combatants (27 *Ticonderoga*-class guided missile cruisers (CGs) and 57 *Arleigh Burke*-class guided missile destroyers (DDGs)); 32 DD-21 land attack destroyers; and 16 small, dedicated mine warfare ships. Not counted as part of the battle fleet were ten additional mine warfare ships operated in the naval reserves. The AEGIS/VLS combatants were considered the "top-end" of the fleet; the DD-21s and mine warfare ships were envisioned as the economical "low-end" of the fleet. In contrast, the 2006 QDR calls for 26 large DD(X)/CG(X) combatants exceeding 14,000 tons apiece; 62 DDGs or DDG(X)s; and 55 new Littoral Combat Ships (LCSs) with no dedicated mine warfare vessels (in either the active or reserve forces). The DD(X)s/CG(X)s are now considered the technological flagships and "top-end" of the fleet; the DDGs/DDG(X)s the multi-purpose workhorses; and the modular LCSs the economical "low-end" of the fleet. It bears remembering that the LCS was generally forced upon a reluctant Navy by intense pressure from OSD, much like the SSGN. In other words, two of the most innovative platform additions to the fleet since 1997 were largely pressed upon the Navy by outside forces.

- Another major change is found in the makeup of the future Expeditionary Warfare Fleet. The 1997 QDR fleet called for a force of 36 amphibious ships, capable of carrying 2.5 Marine Expeditionary Brigade (MEB) equivalents. Not included in the fleet count were 16 ships in the enhanced Maritime Prepositioning Fleet (MPF(E)), capable of deploying the equipment and supplies to outfit and support three additional MEBs for 30 days of sustained combat operations. This resulted in a 1997 QDR Expeditionary Warfare Fleet of 52 ships capable of either employing or deploying a total of 5.5 MEB equivalents. In contrast, the 2006 QDR fleet includes a requirement for 31 amphibious ships capable of carrying approximately 1.9 MEBs. Not included in the fleet count is a single legacy MPF(E) squadron of five to six ships capable of delivering the equipment and supplies for another MEB. However, a new addition to the fleet count are 12 "transformational" future Maritime Prepositioning Fleet (MPF(F)) ships capable of "seabasing" one MEB, supported by two "dense-packed" legacy MPF(E) ships. The 2006 QDR expeditionary maneuver fleet thus consists of 50-51 ships capable of employing or deploying a total of 3.9 MEB equivalents.

- The requirement for combat logistics fleet ships (those ships tasked with replenishing ships at sea with fuel, ordnance, and dry stores) and support vessels has remained at roughly the same level, although once again the desired mix of ships has changed. The 1997 QDR Fleet called for a total of 29 combat logistics force ships (4 fast combat support ships, 12 T-AKEs, and 13 fleet oilers) and 25 support ships (four joint command ships; two submarine tenders; four salvage ships; seven fleet tugs; and eight ocean surveillance ships). The 2006 QDR Fleet calls 30 combat logistics force ships (4 fast combat support ships, 11 T-AKEs, and 15 fleet oilers) and 20 support ships (two command ships; two tenders; four salvage ships; four fleet tugs; four ocean surveillance ships; and four high-speed transport vessels).

In other words, despite a lot of heat and light generated by institutional debates, Congressional prodding, and multiple studies, the "300-ship" battle fleet recently sent to Congress looks remarkably close in numbers and platform types as the "300-ship" battle fleet designed nearly nine years ago. However, reviewing the changes in the composition of these numbers, two things stand out. First, while the total requirement for both active and reserve surface warships and mine warfare vessels has remained remarkably steady (142 ships to 143 ships in the 1997 and 2006 QDR fleets, respectively), as will be discussed below, the 2006 QDR surface fleet is substantially more expensive (and dramatically

improved in capability) than the 1997 QDR fleet. Second, one of the key bill payers for this substantially improved surface fleet is the Expeditionary Warfare Fleet—which although is similar in numbers is the only component of the battle fleet that has been substantially reduced *in capability* since the 1997 QDR, with the battle fleet's capability to employ and deploy Marines having been cut by nearly 30 percent.

This latter circumstance seems out of touch with the fact that we are in the midst of a "Long War" that is likely to see the constant repositioning of ground forces to deny terrorists operational sanctuaries; in a world in which the majority of strategists and commentators warn of increasing difficulty in securing both political and operational access; and in a world that is witnessing an amphibious renaissance in most allied navies. However, it is in keeping with the Navy's Cold War conflation of power-projection operations and strike warfare; the post-Cold War rise to prominence of the surface combatant community, and with the Navy's (and perhaps OSD's) general antipathy toward spending money on amphibious ships and capabilities. Indeed, it is hard not to get the impression that the current 313-ship fleet is one that has been molded and developed by surface warriors for surface warriors, and one that has been largely unconstrained by fiscal concerns, concerns over the negative impact the plan seems certain to have on the US industrial and design base, or concerns over the need to build and maintain a "balanced" fleet. Each of these points will be discussed in turn.

Fiscal Concerns

Despite the broad similarities between the 1997 and 2006 "300-ship" fleets, the current fleet will cost substantially more to build and maintain. According to figures from the Congressional Budget Office (CBO), the average amount of money devoted to shipbuilding between 1992 and 1999 (including nuclear carrier and submarine refuelings)—the time frame approximating the Clinton Administration—was about $8.9 billion annually in Fiscal Year 2007 (FY 07) dollars. From 2000 through 2006, the time that approximates the first Bush Administration, the average shipbuilding budget jumped substantially, to approximately $11.7 billion annually—a 31 per cent increase. The Navy's own projected average shipbuilding costs over the President's Future Years Defense Program (FYDP) are approximately $15.4 billion, representing yet another 30-plus percent increase. However, the CBO estimates that the true costs of Navy plans might be higher. Indeed, CBO projects that average shipbuilding costs between FYs 07 and 35 may approach $20 billion annually.

There are two primary drivers behind these dramatic increases. The first is the dramatically higher fiscal demands to recapitalize and maintain the future surface combatant fleet. Whatever the final cost of the DD(X)s and CG(X)s, they will be substantially more expensive than past surface combatants. The fifth ship of the DD-21—the conceptual and design forefather of the DD(X) soon to enter production—was supposed to cost approximately $750 million in FY 1996 dollars. Given the most favorable projections (i.e., those made by the DoN), the average cost for the seven DD(X)s is targeted at $2.8 billion per ship. In contrast, CBO has estimated that the average cost of the seven DD(X)s to be $3.7 billion a ship. Similarly, while the Navy projects the average cost of 19 CG(X)s to be $2.7 billion (reflecting a two per year build rate vice one per year for the DD(X)), the CBO projects the average to be closer to $3.2-3.3 billion. In other words, the Navy is soon to spend somewhere between $71-89 billion on these 26 ships.

Meanwhile, OSD told the Navy immediately after the 2001 QDR that it could continue to pursue a DD(X)/CG(X)-type platform only if the future Navy program included a smaller combatant. This smaller combatant is now known as the Littoral Combat Ship. Moreover, OSD mandated that the Navy needed to hold the cost of the ship down so that it could buy a minimum of three LCSs for the price of

one *Burke*-class DDG, which at the time was going for $1.2 billion a copy. This implied a maximum per ship cost of $400 million per ship, and helps to explain the Navy's original tasking to industry that the cost of the "sea frame" (i.e., hull and basic combat systems) not exceed $220 million per hull, and the cost of its "mission modules" not exceed $180 million. It appears the Navy is still close to meeting the overall target of $400 million per ship although it looks like the basic hull will be more expensive and the mission modules less expensive.

In any event, in addition to the 26 very expensive DD(X)s and CG(X)s now in the plan. with a new battle force requirement for 55 LCSs the future surface combatant fleet will consume the fiscal shipbuilding equivalent of **80** DDGs. Given that the 143 surface combatants represents the bulk of the 313-ship fleet (46 percent), these facts help to explain the disproportionate impact that the surface combatant plan is having on the high expected costs for the Navy's 30-year shipbuilding plan.

If the high cost for the surface combatant plan is the primary near-term driver of runaway shipbuilding costs, then the primary long-term driver appears to be the replacement for the 14 SSBNs now in the fleet. With 42-year expected service lives, the submarines will need to be replaced starting in the 2020s. There are simply too many uncertainties now to even guess the potential costs of their replacements. Among the unknowns are the total number of nuclear warheads that must be carried by the SSBN force, the size of the missile it will carry, whether or not the problem of mixed loads of conventionally and nuclear-armed missiles can be resolved, and whether the *Virginia*-class SSN can be modified to perform the SSBN mission. The Navy has inserted a planning figure of $3 billion per submarine in their 30-year plan, but some outside estimates for the SSBN(X) are running as high as $6 billion a ship. Given the uncertainties associated with the SSBN replacement plan, as well as the wide range of projected shipbuilding costs associated with the submarines themselves, it is impossible to judge the long-term viability of the current plan.

Even using the Navy's conservative planning estimates, however, the challenging combination of these two fiscal drivers should give the members of this Subcommittee some pause. Together, they help to explain the basic outlines of the current 30-year shipbuilding plan, which, in a nutshell, boils down to this:

- Build relatively cheap auxiliaries, seabasing ships, and LCSs in the early years of the plan, and then stop;

- Start building 26 very expensive replacements for the *Ticonderoga*-class guided missile cruisers (7 DD(X)s and 19 CG(X)s) long before the *Ticos* are scheduled to retire, thereby resulting in seven ships over the stated requirement for 88 large surface combatants in 2021;

- And then, in the late 2020s/early 2030s, simultaneously attempt to recapitalize amphibious ships, auxiliaries, DDGs, SSGNs, SSBNs—and even the replacements for the LCSs now in production, which have a 25-year expected service lives, and which will require replacement starting in 2030.

Unsurprisingly, then, a graph of the number of ships in the total ship battle force (the number of "countable" ships in the Navy's battle fleet) looks like a roller-coaster, with the number of ships in the fleet climbing to 329 battle force ships in 2019 and then falling to 292 ships in 2031—only 11 more ships than we have today. Moreover, even when projecting the future costs of the DDG(X) at only $1.9 billion in FY 07 dollars (the contemporary cost of a *Burke*-class DDG built at the rate of one per year),

the bottom starts to drop out of the surface battle line (cruisers and destroyers) in the late 2020s. Indeed, after climbing to 95 major surface combatants in 2021 (eight more than required), the DDG fleet falls to 47 ships in 2035—15 ships (nearly 25 percent) below the stated requirement of 62 ships. This is by no means an anomaly; in addition to missing its own self-generated requirement in large surface combatants, the plan either overshoots or misses its targets in aircraft carriers, attack submarines and SSGNs over the 30-year planning horizon.

If the basic outlines of the plan were not troubling enough, the general fiscal climate and the internal assumptions upon which the plan is based should give the Subcommittee even more reason for concern. We are in the ninth year of a projected 11 year defense build-up. If defense budgets continue to see real increases through FY 09 as now planned, the period between FYs 99 and 09 will represent the longest period of sustained annual defense budget increases since the end of World War II. Defense build-ups are normally followed by periods of sharp declines in real defense spending. Moreover, the budget environment after 2010 is especially sobering due to the impacts on mandatory spending caused by demographic pressures and high sustained budget deficits. As a result of these facts, there has likely been no time since the end of the Cold War in which conservative budgetary projections are more called for.

It is therefore encouraging to see that Navy planners are at least projecting a flat Departmental topline for the foreseeable future. This appears to be a reasonable assumption, although it is by no means the worst of a wide range of potential outcomes. However, although Navy planners forecast a period of relatively flat defense budgets, they believe they will be able to sustain shipbuilding budgets that will be substantially higher than those seen since the end of the Cold War for at least the next three decades and beyond. Indeed, the 30-year shipbuilding plan associated with the Navy's 313-ship battle force assumes that shipbuilding budgets between FY 07 and FY 11 will *average* over $15 billion per year, with a range between $11.1 billion in FY 07 to a high of over $18.4 billion in FY 11. In comparison, shipbuilding budgets between FY 00 and FY 05—a period of rapid real increases in overall defense spending—averaged "only" $11.7 billion.

With a relatively steady topline as their first planning assumption, how then does the Navy intend to increase the funds dedicated to shipbuilding? By making five more key assumptions:

- ***First, that research and development (R&D) budgets will decline and stay low.*** According to top DoN officials, the decline in R&D is tied to the impending shift in procurement toward a new family of ships including CVN-21, DD(X), CG(X), and the LCS. Admiral Vern Clark, the former Chief of Naval Operations, explicitly called for a diversion of funds from R&D to ship procurement, pointing out that the R&D budget in his last year was nearly $9 billion higher than when he took office in 2000.[2] Accordingly, in the FY 06 budget, DoN R&D funding was scheduled to fall from $17.3 billion in FY 06 to $12.6 billion in FY 10, a real decline of 27 percent in constant FY 06 dollars.[3] However, it would be most unusual for R&D and procurement to diverge in wildly different directions for any substantial length of time. Since the end of World War II, R&D and procurement

[2] Christopher P. Cavas, "US CNO: Find Ship Funds in R&D," Defense News, July 11, 2005, p. 24.

[3] Under Secretary of Defense, Comptroller, National Defense Budget Estimates for Fiscal Year 2006, "The Green Book," April 2005.

have generally followed similar trend lines—when one goes up, so too does the other. Moreover, we may be on the leading edge of a serious maritime competition with China. Given the range of potential disruptive and contested access challenges such a competition might spur, an assumption that R&D can be dramatically reduced and kept low over the next decade or two appears to be a questionable one. Indeed, in FY 06, DoD R&D accounts were similarly forecast to drop to approximately $55 billion in FY 10. This year's forecast is that R&D funding will reach $64.9 billion. Is it reasonable to expect that Navy R&D will go down and stay down?

- ***Second, that personnel costs will remain flat.*** The Navy has an aggressive plan to reduce its overall end strength, with an aim of offsetting the ever-spiraling costs of manpower and diverting internal resources to procurement. However, achieving this noble goal will often be out of the Department's hands. For example, the Navy's FY 07 Unfunded Deficiency List highlights over $250 million of "fact-of-life" manpower increases. Despite the Navy's best intentions, recent history of manpower increases calls into question the assumption that there will be no real growth in DoN personnel accounts. Therefore, it is not certain that planned manpower cuts will result in substantial savings that can be diverted to procurement accounts.

- ***Third, that operations and support (O&S) costs will remain flat.*** This assumption appears to be dead on arrival. There are over $500 million dollars in unfunded O&S costs in the Navy's FY 07 Unfunded Deficiency List. The costs to modernize the 84 programmed AEGIS/VLS guided missile cruisers and destroyers; purchase, sustain, and employ LCS mission modules; initiate and sustain new training lines for integrated electric propulsion systems; not to mention the costs of the "Long War" will continue to put upward pressure on Departmental O&S costs, and likely subvert the ability of Navy planners to contain them.

- ***Fourth, that ship costs across every ship class will be contained.*** The Navy's leadership is committed to containing ship costs. They have embarked on efforts to cut "desirement" out of programs and to reign in ship costs. Nevertheless, they readily admit that the ship costs contained in their 30-year shipbuilding plan are "stretch goals" that may be out of reach. This worry seems warranted; the Department's record in containing ship costs, or accurately projecting ship costs, is not encouraging. As just one example, the recently submitted 30-year shipbuilding plan lists the 2007-2016 "average unit costs" of a CVN-21, DD(X), and CG(X) at $7.9, $2.3, and $2.5 billion, respectively. Recently, Navy briefs have listed the 2007-2035 average costs at $9.4, $2.8, and $2.7, respectively. Even the LCS, the intended low-cost component of the fleet, has not been immune to cost growth. While the 30-year shipbuilding plan listed an average unit cost for the LCS sea frame as $270 million (itself much higher than the $220 million touted by the Navy just one year ago), recent estimates suggest an average cost of nearly $300 million per hull is closer to the mark. *The 30-year shipbuilding plan depends on every single ship hitting its "stretch goals."* Given the Navy's track record, is this a good bet? Not likely.

- ***Finally, the "relief valve" in the DoN's overall procurement account will be the aviation procurement account.*** The CNO has essentially stated that the shipbuilding procurement account will be frozen to help achieve industrial stability, and that the aviation procurement account will be adjusted to ensure this can happen. If anything, however, the aviation procurement plan is even more out of balance than the shipbuilding plan. The Navy plans to introduce two versions of the Joint Strike Fighter; the Multi-mission Maritime Aircraft; the Broad Area Maritime Surveillance System; the carrier version of the Unmanned Air Combat System; a follow-on to the aborted Airborne

Common Sensor Program; over 500 MH-60R/Ss helicopters; new tactical UAVs for the LCS; the MV-22 Osprey; and the CH-53K heavy-lift helicopter—all while it continues to build more F/A-18 E/Fs and rebuilds the Marine Corps' Huey/Cobra fleets. Given the wide range and scope of these disparate aviation programs, it is unlikely that the Navy will be able to contain costs on all of them simultaneously. As a result, its seems just as likely that the aviation procurement will steal money from shipbuilding accounts as it does that it will provide procurement relief for shipbuilding.

As can be seen, then, every one of the plan's five major assumptions are debatable. The probability that all five will simultaneously prove to be true appears to be close to zero. One way to describe this plan is bold; another way to describe the plan is risky. Either way, the likelihood that it can be executed as planned appears to be low.

DESIGN AND INDUSTRIAL BASE CONCERNS

In addition to the plan's high costs and questionable assumptions, the plan seems likely to have a negative long-term impact on the shipbuilding design and industrial base.

There are currently very few US ships or submarines in detailed design. The happy news associated with this circumstance is there is a lull in the global design competition, caused, in no small part, by the formidable degree of maritime superiority the United States now enjoys. The bad news is that the absence of a competitive driver presents a serious challenge to the US design base. For example, this is the first time in over 50 years that there has not been an ongoing submarine design effort. Without initiating any new submarine designs, there is a real danger that the US submarine design knowledge base might gradually whither and die, putting the battle forces' long-term prospects for maintaining undersea superiority in grave doubt.[4]

The British nuclear submarine industry faced a similar problem as the size of their submarine fleet was reduced after the end of the Cold War. In the event, the industry did not maintain an adequate design capability during the submarine force drawdown. As a result, once the Admiralty began to design the new *Astute*-class submarine—the replacement for its Cold War designs—it found the England's shipbuilding industry had lost the indigenous capability to do so. As a result, British submarine builders had to turn to US submarine designers for help.[5]

The British experience with the *Astute* emphasizes how important it is for the United States to maintain its design experience in all types of submarines and combatants—especially when faced with the prospect of a potential maritime competition with an economically powerful naval competitor (i.e., China). The British found that making trade-offs between retaining *industrial capacity* and *design expertise* to be an especially difficult one. In the end, however, top British officials concluded that:

> We must not become fully pre-occupied by the industrial base at the expense of our intellectual capital in submarine design. One only has to look at the UK's automotive and aerospace industries to see that it is the high-value design and intellectual capabilities that have been retained while most manufacture has gone

[4] Jesse Leavenworth, "Panel Hears Navy Chiefs," Hartford Courant, June 14, 2005.

[5] Richard Scott, "UK Faces Decisions on Submarine Design Base," Jane's Defense Weekly, March 9, 2005, p. 30.

> overseas. And while the UK is likely to want to retain an indigenous submarine manufacture capability, *we must protect the design resource that ultimately underpins the industrial activity* (emphasis added).[6]

In other words, the British concluded that when stacking priorities, maintaining the design knowledge base was more important in the long run than maintaining the industrial base. This should also give the Subcommittee some pause. As the *Virginia*-class SSN and *Lewis and Clark* T-AKE continue production, and the CVN-21, DD(X), and LCS near production, the only ongoing design effort is for the CG(X)—itself a derivative of the DD(X). This is simply not enough to sustain any deep ship or submarine design expertise over the long haul.

Given growing concerns over a possible maritime competition with China, this circumstance is especially troubling. As capable as the DD(X) is, the fact is that its original design lineage required a ship that could loiter close to a defended coast and provide gun and missile fire in support of joint forces operating ashore. Is the DD(X) the right ship for a maritime fight with China? Would we ever intend to operate a 14,000-ton surface combatant within gun range of mainland China? Similar arguments can be made with the *Virginia* submarine. Perhaps this is the time to maintain design expertise by building prototypes or having design competitions for both surface combatants and submarines instead of shifting to serial production of ships that merely extend the current lead enjoyed by the most powerful Navy in the world.

With regard to industrial base stability, there are seven primary stakeholders behind the building and maintaining of a strong battle force—the Executive Branch, Legislative Branch, OSD, the Office of the Secretary of the Navy, the Navy, Marine Corps, and industry. Maintaining the proper balance between an efficient industrial base capable of producing ships for the absolute minimum cost and an industrial base with the spare capacity to respond to a concerted maritime challenge has always been a source of friction among the stakeholders, and it will continue to be one.

For example, a former Secretary of the Navy and several top admirals recently announced that if future budgets are so tight that shipbuilders are forced to look at closing some shipyards, the decision to do so would be a business decision made solely by them:

> [The decision to close a shipyard]...is up to industry. We don't define the industrial base. It's up to the market to arrive at these conclusions…So, it's a commercial world, and they make commercial decisions.[7]

Faced with the prospect of being challenged by a possible disruptive naval competitor with a large industrial capacity, this is an astounding assertion. One would think that the decision to close US shipyards would be an issue of concern for all seven stakeholders, and not one to be dictated solely by "commercial decisions." But this thinking appears not to be part of the Navy's long-term competitive concerns. Indeed, the current shipbuilding plan provides little in the way of industrial stability, unless one accepts the Navy's definition, which appears to be: coming up with a shipbuilding plan and sticking to it. However, if one defines industrial stability as providing a solid foundation for maintaining a robust

---

[6] Scott, "UK Faces Decisions on Submarine Design Base," p. 30.

[7] Dave Ahearn, "England, Admirals Say Industry Decides If, Where Shipyards Close," Defense Today, January 14, 2005, p. 1.

and vibrant shipbuilding industry, the only battle force component with a measure of industrial base stability is the aircraft carrier fleet. The 30-year plan outlines a reasonable building rate for carriers given the requirement for 11, with a new CVN-21 being built on an average of every 4.5 years.

After that, however, the CEOs and stockholders of our national shipbuilding companies must be wondering what's in store for them. For example, the plan pushes the year in which the DoN shifts to two submarines per year to the end of the current FYDP—as it has repeatedly done since the turn of the century. Why believe that the Navy will ever get there? The number of large surface combatants bounces between one and two ships a year between now and 2016 before reaching a steady-state build rate of only two major surface combatants a year after 2017—a reflection of the high costs of the DD(X) and CG(X)s. The LCSs will be built at an average rate of six per year through 2016, and then construction on small combatants stops completely until 2030. Presumably, the three yards building LCSs will divert their attention elsewhere during the construction hiatus. This pattern is repeated elsewhere: no new combat logistics force ships stops are authorized for a period of seven years; no new medium-sized landing ships are authorized for eight years—and possibly ten if the tenth LPD-17 is not reinserted into the plan; and all construction on big-deck amphibious landing ships halts for about a decade.

With these building profiles, how can any shipbuilder expect to retain their workforce or industrial plant? The answer is: they can't—as suggested by the extreme difficulty Newport News had when restarting submarine production after a construction hiatus during the 1990s. Indeed, Newport News' experience provides ample evidence that this shipbuilding plan is not likely to be executable by our shipbuilding industrial base. At a minimum, it suggests the lead ship costs found in the plan for ships in the late 2010s and throughout the 2020s are simply hopeful guesses.

Building a Balanced Fleet

The 313-ship Navy outlined in the recent 30-year shipbuilding plan appears to be a salvo fleet optimized to pound land targets with aviation and guided missile strikes. The drop in carrier requirements from 12 to 11 is insignificant in terms of the fleet's overall combat capability. Both a 12 and 11-carrier fleet kick out the same number of carriers within 30 days (six), and the 11-ship fleet surges only one less carrier over a 90-day period (seven as opposed to eight in a 12-carrier fleet). Moreover, by 2010-11, the carrier air wings on the first six surge carriers will be able to hit the same number of targets per day as could the air wings found on ***40*** carriers in 1989. If this were not enough, the current plan indicates that the Navy intends to retain 12 carriers in the fleet after 2019, meaning that it will willingly pay the significant O&S costs associated with maintaining an "active spare"—even though it has no intention of standing up an additional air wing.

Similarly, the 84 programmed AEGIS/VLS combatants that will be in active commission in 2011 will carry among them 8,468 VLS "strike-length" VLS cells and an additional 400 *Harpoon* anti-ship cruise missiles—a total of nearly 9,000 "battle force" missiles—a missile capacity far greater than that found in the 1989 "600-ship Navy," and one that exceeds the missile capacity on the 366 major surface combatants found in the world's next 17 largest navies. These VLS cells will soon be augmented by an additional 1,000+ covert VLS cells found on SSGNs and SSNs—resulting in a "10,000 cell fleet." So, what's the plan? To further increase the number of VLS cells through FY 2021 by commissioning seven DD(X)s (560 additional VLS cells) and three CG(X)s (384 additional VLS cells) *before* retiring the first of the 22 *Ticonderoga*-class guided missile cruisers.

In contrast, the 313-ship plan dramatically reduces the battle fleet's ability to support naval combined arms maneuver, to sustain operations in contested theaters, and to sustain the US's lead in undersea warfare. With regard to naval combined arms maneuver, the amphibious lift requirement recommended by both Navy and Marine planners at the end of the Cold War was for 3.0 MEBs worth of lift. This requirement subsequently was reduced to a "fiscally constrained goal" of 2.5 MEBs by the Secretary of the Navy. This reduction was made long before the 1997 National Defense Panel and the National Commission on National Security for the 21st Century warned that political and operational access in distant theaters would be more problematic than at any time since World War II. It was also before the 1996 Defense Science Board Task Force on Strategic Mobility suggested that being able to inject *ready-to-fight* combat forces into a distant theater would be an emerging requirement in the 21st century; or the 2003 DSB Task Force on Seabasing also suggested that forcible entry from the sea would be an emerging requirement in the 21st century; or the Army After Next Project suggested that the Army should once again consider seabased "operational maneuver from strategic distances;" or the Marines started thinking about "operational maneuver from the sea;" or a growing number of western nations concluded that amphibious landing capabilities were an absolute requirement for expeditionary operations in the 21st century.

As mentioned earlier, the DoN response to this emerging era of uncertain political and operational access in distant theaters has been to reduce the overall lift capability of the battle fleet by one-third. Worse, the Department is moving to replace purpose-built amphibious warships with an untried and untested "seabasing" concept built around the 12-ship MPF(F) squadron. The design of this squadron and the entire seabasing concept is based more on Navy antipathy toward allocating resources to amphibious ships, institutional biases found on both Navy and Marine Corps staffs, erroneous assumptions, and industrial base considerations than on operational precedent or experimentation.

Time precludes me from laying out the full case against the current seabasing plan, which is well captured in a recent report produced by the Center for Strategic and Budgetary Assessments for the Office of Force Transformation, and which can be made available to the Subcommittee, if desired. Suffice to say here that it took 20 years of war gaming, technological and operational experimentation, and operational analysis before carrier aviation was fully integrated into fleet operations. There is no reason to believe that "seabasing"—which seems every bit as complicated as flying aircraft off of a carrier—will take any less time to perfect. The bottom line is that the DoN's aggressive pursuit of an MPF(F) squadron and the impending move to truncate the LPD-17 buy at nine or ten ships should be halted until a thorough "zero baseline review" of seabasing initiatives is conducted by an independent joint organization.

The Navy's plans for its combat and mobile logistics force fleets should also be thoroughly reviewed. The Navy has given up on pursuing the ability to rearm VLS cells at sea, while at the same time cutting the number of tenders to two. This will require ships to enter a port to rearm once they have expended their missile loads. Similarly, the LCS concept depends on "swapping out" mission modules in forward theaters, but has no dedicated tenders to accomplish this task, requiring this mission to take place in foreign ports. Moreover, although the surface combatant fleet now includes 55 very fast (and thirsty) LCSs, and the seabasing concept envisions providing fuel to joint forces operating ashore from ships operating offshore, the 2006 QDR combat logistics force has only two more tankers the number found in the 1997 QDR force. Similarly, the number of fleet tugs and salvage ships has been cut to a mere eight vessels, which will make the job of removing or aiding battle damaged ships from or in a contested forward operating area a difficult one. The practical impact of all of these plans is that the battle force is

becoming heavily dependent on forward access to land bases or ports; if these bases and ports are denied to US forces, the salvo fleet will find it very difficult to sustain operations forward.

Finally, although a "tactical" submarine fleet of four SSGNs and 48 SSNs now appears more than sufficient to ensure US undersea superiority over the short-term, the nature of the undersea competition is changing. Battle networks are being erected underwater, unmanned underwater vehicles (UUVs) are becoming more capable, and offshore energy and telecommunications infrastructure is proliferating. All three circumstances are helping to change both the character of the undersea domain as well as the nature of undersea warfare. Given the changing nature of the undersea competition, the lack of attention being paid to preserving our submarine design base and the unwillingness to explore new undersea warfighting platforms and operational prototypes while the Navy pays for a dramatic expansion of the number one surface combatant fleet in the world is troubling.

An alternative competitive approach might be to accept the crushing superiority now enjoyed by the surface combatant fleet—a superiority that can be readily extended by pursuing a more robust CG and DDG modernization program—and reorder fleet priorities in a fundamentally different way to achieve a more balanced fleet. Indeed, it seems that one of the primary drivers behind the current shipbuilding plan is a fear within the Navy's surface warfare community that a failure to produce the DD(X) and CG(X) after the demise of the Arsenal Ship and DD-21 would somehow lead to a fundamental decline in the battle line's combat capability. This fear is misplaced. The Flight IIa version of the *Arleigh Burke* remains among the finest combatants being built today, and improvements to the ship would make it even better. Moreover, as network centric theorists point out, naval battle networks are much more than the sum of their parts. In this regard, no other navy being built today will soon challenge US surface superiority. It will be quite some time before any potential adversary will be able to remotely match the scale and power of the 84 AEGIS/VLS combatants once they all transition to open combat architectures, are supported by advanced airborne sensors such as the Advanced Hawkeye, MMA, and BAMS, and are thoroughly interconnected via the Cooperative Engagement Capability. In the meantime, the Navy can watch, calculate, and wait for the proper time to introduce a new generation of "large battle network combatants." There are some important improvements to fleet combat capability to be made, for sure. But these improvements hardly seem to argue for an immediate move toward 14,000-ton surface combatants that might average as much as $2.5-3 billion dollars apiece and which have such a disproportionate impact on the shipbuilding plan and the overall battle fleet.

Perhaps, then, it would be more prudent to scale back the ambitious surface combatant plans in order to accelerate the pursuit of naval capabilities necessary to fight the "Long War," such as riverine squadrons, patrol boats, LCSs, SSGNs, amphibious landing ships, and irregular warfare support bases. Several DD(X) prototypes might initiate the pursuit of a new "large battle network combatant" based on the modular design principles associated with the LCS. This would work to maintain the surface combatant design base. At the same time, to maintain the industrial base, new DDG-79s might be built at a low sustaining rate, replacing earlier Flight I DDGs on a one-for-one basis in order to minimize both personnel and O&S costs. A similar scheme might be developed for the submarine fleet, with further SSGN conversions providing the initial design work, followed by a new SSN design, followed by the replacement design for the SSBN force. At the same time, a new Joint Seabasing Office would review and explore all potential seabasing alternatives, and make recommendations on which seabasing platforms and capabilities would provide the highest joint payoff. These moves would help to reduce the overall cost of the shipbuilding plan, and better position the US to respond to a concerted maritime challenge if one materializes in the future.

ALTERNATIVE FUNDING APPROACHES

A key aspect of such a competitive strategy—which my colleague at CSBA, Dr. Andrew Krepinevich, refers to as a "strategy of the second move"—would be to settle on a sustainable average shipbuilding budget, to minimize the range around this average, and to make a concerted effort to minimize the cost of an "average ship equivalent."

Depending on the projection, the average annual cost for Navy shipbuilding plans is somewhere between $15 and $20 billion for the next 30 years. This range seems to be quite optimistic. A target of $12 to $13 billion would be more conservative; a target between $10 and $12 billion more conservative still. The point is that Congress and the DoN need to settle on a shipbuilding target that is likely to be executable under the widest range of planning assumptions.

Settling on an average is only a first step, however. Minimizing the range around the average will make it more likely the plan can be executed and that Congress will be able to authorize and appropriate the monies necessary to provide a stable long-term funding plan. The best way to minimize the range around the average shipbuilding budget is to moderate the impact that complex aviation ships have in the years in which they are built. As you well know, Congress prefers to fund the construction of US Navy war ships by appropriating enough money to pay for the entire construction project in the initial year of construction. While I am not an advocate of split funding for most warships, the steadily increasing cost of aircraft carriers has led to the practice of spacing the cost of the ships over several years through "advance appropriations" and "split-year appropriations."[8] In order to moderate the impact of these ships further still, one approach might be to establish an Aviation Platform Capital Account. This account would pay for the construction of nuclear-powered aircraft carriers as well as big-deck amphibious assault ships, refueling and complex overhauls (RCOHs) of nuclear carriers, and nuclear and conventional aircraft carrier decommissionings. It would be funded by a yearly, steady-state contribution from the total shipbuilding and conversion budget. Because such an account would be subject to "raiding" by DoD and the DoN, strict legislative limits would have to be put in place for such a scheme to work.[9]

Once a stable average shipbuilding budget is set and the range around the average limited, a key goal of the Department would be to reduce the cost of an "average shipbuilding equivalent," or ASE, defined herein as the average cost for an attack submarine, a major surface combatant, and a medium size amphibious landing ship. In FY05/06, the average cost of an ASE stood at approximately $1.8 billion. Minimizing the cost of an ASE would increase the total number of ships a given shipbuilding budget could buy. Obviously, building ships that cost substantially more than an ASE would lead to a smaller fleet over time; conversely, building ships that cost substantially less would lead to a larger fleet. Following this common sense approach—which would require a serious rethinking of moving toward surface combatants that cost between $2.5-3 billion a copy—would serve two key purposes: it would help to maintain US submarine and ship design expertise during the current lull in the naval design

---

[8] See Christopher J. Castelli, "Pentagon Seeks Authority on Carl Vinson, LHA(R), Prepositioning Ships," Inside the Navy, May 2, 2005.

[9] A Carrier Capital Account is one of several carrier funding options analyzed by John Birkler, et al, Options for Funding Aircraft Carriers (Santa Monica, CA: RAND, 2002).

competition; and it would better posture the battle force to respond to increased competitive pressures or to exploit quickly bold disruptive design moves.

Minimizing the ASE would require that cost control become an enterprise-wide goal—from the development of ship requirements, to the development of designs, to industry construction practices. To minimize average ship production costs *for warships that cost three or more times than one average ship equivalent*, consolidating production in a *single yard*, seeking stable class production runs, and using efficient multi-year procurement contracts whenever possible is the first preference. However, in cases where Congress is concerned over the industry's ability to respond to sharp spikes in the future naval competition, a second yard would be retained, and an associated shipbuilding "competition premium" might be added to the shipbuilding budget. To minimize average ship production costs *for warships and fleet auxiliaries that cost less than one average ship equivalent*, the first preference would be to shift production to smaller Tier II yards, maintain competition, and ruthlessly enforce cost control at all times.

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.