

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE
PROJECTION FORCES SUBCOMMITTEE

STATEMENT OF
ADMIRAL VERN CLARK, U.S. NAVY
CHIEF OF NAVAL OPERATIONS
BEFORE THE
HOUSE ARMED SERVICES COMMITTEE
PROJECTION FORCES SUBCOMMITTEE

JULY 19th, 2005

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Mr. Chairman and members of the Committee, on behalf of the men and women of your Navy - now and in the future - thank you for holding these hearings on a singularly important subject, the Navy's DD(X) program. It is our duty to provide the men and women in your tremendous Navy with every advantage - especially regarding the ships they operate - so that they can do the good work of this great nation around the world, every day, providing the President options he would not otherwise have, and to fight and win when the nation calls.

I will soon be relieved as Chief of Naval Operations. Nonetheless, I am here today to unequivocally endorse the DD(X) program - it is that important. DD(X) is absolutely essential if the U.S. Navy is going to continue providing the President and this nation options around the world, with assured access, in the future. This ship is designed to fight in the most demanding combat environments, commanding the seas and assuring access into the 2030 timeframe and beyond.

The U.S. Navy needs DD(X)'s warfighting capabilities to fill identified gaps in our capabilities and as detailed in the Operational Requirements Document. This alone is justification enough to continue the DD(X) program as the Navy proposes and needs. DD(X) is important for many reasons but it is absolutely critical for its independent value in the Global War on Terror and the potential major conflicts we may face into the 2030 timeframe. Building DD(X) now is a U.S. Navy warfighting imperative, and it also has a strong shipbuilding case and is fiscally efficient - DD(X) is the right ship to build now to meet Navy requirements in air, surface, and subsurface warfare as well as also meeting U.S. Marine Corps and land combat fire support requirements ashore.

I. FUTURE STRATEGIC ENVIRONMENT

We will continue to face the requirement to meet traditional warfighting challenges on the high seas and ashore. We must also address the growing 21st century realities of increasing scope and scale of small-scale contingencies, such as stability operations and peacekeeping requirements, and the need to extend combat capability to deeper and longer ranges inland. The future will demand the ability to confront irregular,

catastrophic, and disruptive challenges that are being introduced today and will grow over time.

These developments are not just naval challenges. Our nation's ability to deter, and if necessary, fight and win future wars will depend directly on our ability to gain access to the battlespace. The United States Navy, including DD(X), will play a central role in this regard, even more so considering the large redeployment of U.S. troops from overseas bases back to the United States.

The advanced military anti-access systems, political access restrictions and constraints similar to those that we've experienced in the past will, in my opinion, arise again and curtail the full use of our military force. Your Navy can forestall the erosion of our access worldwide, deter aggression and provide stability, assuring access and providing persistence, significant warfighting capacity, and support for joint operations from the sea, especially with DD(X) in the Fleet.

To meet these challenges, we must first improve our strategic speed to move significant, joint combat power anywhere around the globe. U.S. military force must be immediately employable and rapidly deployable, seizing and maintaining the initiative in any fight, anywhere.

Second, we must continue to develop "precision." As precision weaponry becomes commonplace throughout the joint force, we must develop concepts of operation and doctrine to maximize these powerful capabilities.

Third, we must establish an "unblinking eye" above and throughout the battlespace. Technological leaps in miniaturization have begun to make possible an increasing array of unmanned sensors, along with the communications networks and command and control (C²) capacity to yield pervasive awareness of the battlespace.

We must also continue to develop the fullest measure of joint interdependence. We are more effective as a fighting force, and more efficient with taxpayer dollars, when

Strategic Challenges

- Generating Strategic Speed
- Leveraging Precision
- Establishing Persistent ISR
- Developing Joint Interdependence

Service missions and doctrine are designed from the start to be fully integrated.

II. DD(X) PROGRAM

The DD(X) program is a major part of our efforts to build a 21st century fleet to counter future threats in a deliberate and measured acquisition strategy that fully respects the taxpayer dollar. I believe that continuing DD(X) production and its associated technological elements as submitted is a critical and most prudent path to take. DD(X) is an immediate warfighting imperative in the near term, has a strong shipbuilding case, and is fiscally efficient.

Warfighting Imperative. When built, DD(X) will be the most advanced warship ever to put to sea, and it needs to be to meet emerging threats. It will be capable of sailing and completing its mission in the world's most dangerous

maritime environment. This is not simply an evolution of current shipbuilding and combat system design; it is a revolutionary platform whose technologies are absolutely essential to commanding the seas and assuring access in and through the littoral to the battlespace ashore.

DD(X) is specifically designed to operate in a new maritime battlespace, the contested littoral. Whereas the DDG-51 is optimized for employment on the high seas, the DD(X) has the

significantly higher survivability rates that are critically needed and mission success in the complex battlespace of the littoral.

With its dual-band radar suite, DD(X) will distribute area air surveillance, including over-land, throughout the extremely difficult and cluttered sea-land interface. The S-band Volume Search Radar (VSR) is a very important step

ADVANCED NAVY DESTROYER DD(X)

- **Warfighting Imperative**
 - Persistent with capacity
 - Long-range precision Strike
 - Quiet as a Submarine
 - RCS Small as a Fishing Boat
- **Strong Shipbuilding Case**
 - Risk mitigation for follow-on classes
 - Bridge to critical CG(X)
- **Fiscal Efficiency**
 - Technology for the Fleet
 - Costs in line

in meeting the threat I briefed previously in closed hearings. The X-band Multi-function Radar (MFR) will detect and support engagement of the most advanced anti-ship cruise missile threats. MFR also supports new ship-design requirement for reduced radar cross-section, significantly reduced manning, and total ownership cost reduction. The DDX dual-band radar suite is also planned for introduction in LHA(R) Flight 1 and next-generation CVN-21 aircraft carriers.

DD(X) possesses an tremendously effective self-defense system that will enable it to assure access, including active and passive elements as well as onboard weapon systems and unmanned vehicles. DD(X) is designed to defeat anti-access systems like advanced cruise missiles, sea mines, and quiet submarines, assuring access even against the most carefully planned and executed anti-access strategy. This advanced destroyer will have comprehensive signature control making it as quiet as a submarine and as small as a fishing boat on radar. DD(X) will be hard to find and harder to target.

DD(X) will deliver deep strike with Tactical Tomahawk cruise missiles launched from the 80-cell Advanced Vertical Launching System, an unmanned launching system capable of stowing, preparing, and launching a variety of missile types. DD(X) will also provide persistent, all weather, precision and volume fire support to troops as they maneuver with agility to their objectives, responsively answering 90% of calls for fire within five minutes, similar to organic USMC artillery. Each DD(X) is equipped with two Advanced Gun Systems, delivering ten rounds per minute each, or twenty rounds per minute per ship, of high explosive payload to ranges up to 83 nautical miles with unprecedented accuracy. The gun system can even deliver up to four rounds timed to arrive on target simultaneously. This can be coordinated between guns and ships, allowing two DD(X) to deliver approximately the same fire power as an artillery battalion.

DD(X) IMPROVEMENTS OVER CURRENT FORCE

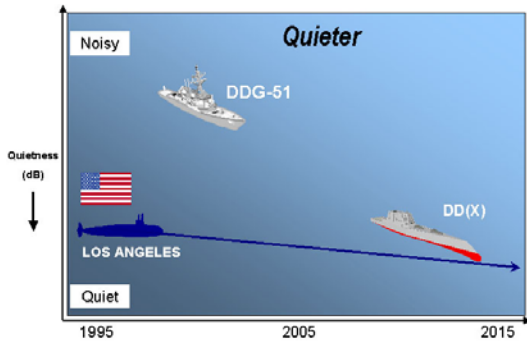
- **Strike Group Operations**
 - 10 times improvement in operating area against shallow water mines
 - 3 times improvement in strike group defense
 - 3 times naval surface fire support
- **Self-Defense**
 - 10-fold Improvement against ASCMs
 - 50-fold reduction in radar cross section
 - Survivability enhancements

Further, DD(X) is built to accommodate future growth. It is designed with an open architecture so information technology improvements can be economically incorporated as they develop; its integrated power system has energy to spare with the future potential to support speed-of-light directed energy weapons or electromagnetic rail guns able to strike targets at hundreds of miles with precision.

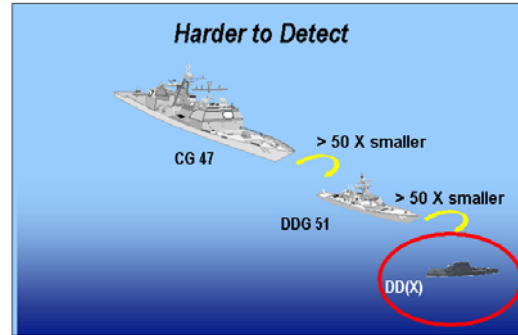
Many of these technologies are true "firsts" and have associated technological risk. Navy has, however, mitigated this risk by development and extensive testing of ten Engineering Development Models (EDMs). Nine of the ten EDMs have successfully completed Critical Design Review (CDR), and the tenth is scheduled to complete CDR later this summer. All ten will complete testing of critical parameters by completion of ship CDR in September. The knowledge gained has matured the ship's detail design and greatly reduced the overall technological risk of delivering this warship to the fleet.

Overall, DD(X) will have a **ten-fold better capability against anti-ship cruise missiles** than the current force, improve strike group defense three-fold, have a **50-fold radar cross section reduction** compared to current destroyers (reducing total numbers of missiles required in an engagement by half), **ten times the operating area in shallow water regions against mines**, and **improve naval surface fires coverage by a factor of three**. DD(X) will have enhanced survivability featuring reduced signatures, strong self-defense, and survivability design features such as the Autonomic Fire Suppression System and the Peripheral Vertical Launch System. As shown in Figure 1, DD(X) has the warfighting capabilities that the U.S. Navy requires to support U.S. Marine Corps fires support requirements now and to prevail against advanced threats in the future. Delays in the program incur significant strategic risk for the Navy and tactical risk for both the Sailors at sea and the Marines ashore.

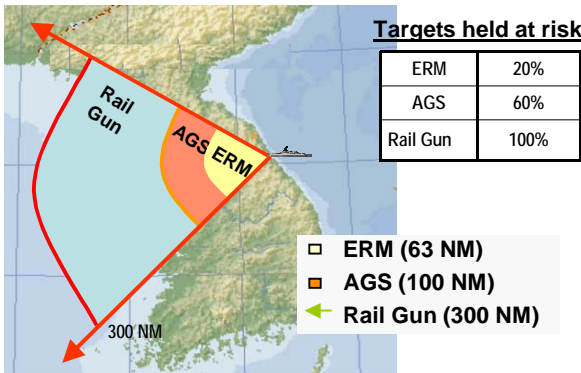
Warfighting Characteristics to Prevail in Littoral



As Quiet as LOS ANGELES Submarine



Radar Cross Section of a Fishing Boat



Advanced Guns Expand the Battlespace Over 300%

DD(X) vs DDG Warfighting Capabilities

- Anti-Air Warfare: DD(X) has advantage over DDG
 - DD(X) radar optimized for near-land clutter environment
- Surface Warfare: DD(X) has advantage over DDG
 - DD(X) ~15% more effective against group attack
- Naval Surface Fires: DD(X) has advantage over DDG
 - 90% of calls for fire within 5 minutes...not DDG
 - 65% reduction in USMC artillery with DD(X), DDG is 0%
- Undersea Warfare: DD(X) is comparable to DDG
- Growth: DD(X) power plant can support High Energy Lasers and Rail Gun...DDG is max'd out

Capability to Defeat Future Threats

Media Roundtable: DD(X) Technology 30 Jun 05

Figure 1

Shipbuilding Case. Building DD(X) now is essential. In addition to being the **only ship able to meet the Marine Corps' stated fire requirements**, and with the **tremendous combat capabilities that DD(X) brings to the fight**, it also delivers tremendous technological advances to the future fleet. Fleet commanders want and need the DD(X) destroyer.

DD(X) improvements are transferable across the force, enabling current AEGIS class ships to remain viable against many future threats, and providing new combat system technologies, cost avoidance, and risk mitigation for LHA(R) and CVN-21.

The DD(X) has the additional benefit of serving as the bridge that puts CG(X) to sea soonest with the least risk. I believe that it is imperative to develop and field CG(X) as soon as technically feasible. I have previously testified in closed hearings on my specific concerns and what we're doing. DD(X) is the necessary bridge to CG(X). There will assuredly be modifications to the DD(X) hull-form -- similar to what we experienced with the *Spruance*-class destroyer to *Ticonderoga*-class cruiser effort -- but DD(X) is designed to accept this mission growth, and significant cost avoidance will be realized as we build CG(X) based on the DD(X) hull.

A new hull form is needed to support the capabilities we need in the fleet. The fact is, **significantly modifying the current DDG design would be almost as expensive as the DD(X), fall far short in a number of critical warfighting**

DD(X) Capability Improvements



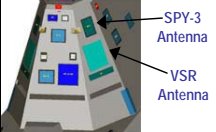
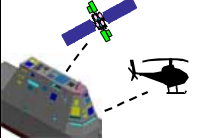


	Requirement	Technology	Capability Improvement
	Persistent presence in the littorals, survivability	Hull Form and Structures	Reduced signatures and vulnerability 50 Fold Reduction
	Improved acoustic signature, reduced O&S costs, 30 kt sustained speed, survivability	Integrated Power System	Signatures, fuel efficiency, power continuity and quality, future growth 10 X Power Available
	Cruise missile and small boat defense, periscope and floating mine detection in littorals	Dual Band Radar	Firm track range against stealthy targets in clutter environment 3 X Survivability Rate
	Interoperability, low Radar Cross Section (RCS), optimal manning, reach-back	Command, Control and Communications	Fully integrated Command & Control, increased bandwidth, enables FORCEnet, Open Architecture based 5 X Throughput
	Increased rate of fire, improved lethality, and reduced manned	Advanced Gun System	Triples Fire Support Coverage
	Precision strike and volume fires	Long Range Land Attack Projectile	GPS Accuracy 6 X Range 155mm sized warhead 3 X Lethality

Figure 2

elements, and delay fleet introduction by up to three years. A DDG hull will only accommodate one, partial AGS magazine, has insufficient power and stability to accommodate the dual band radar, and does not meet DD(X) stealth requirements. The new DD(X) wave piercing tumblehome hull-form is required to meet our strict signature control requirements designed to defeat future threats. Consequently, the right choice is to transition to a new hull-form - the DD(X) hull-form - with an integrated systems design in order to efficiently produce ships and, more importantly, to ensure that they can sail in harm's way with the confidence that the men and women aboard have the means to defeat the enemy (Figure 2).

Fiscal Efficiency. The cost of the lead DD(X) ship has been in the media headlines recently and it is an important issue. Our current procurement cost estimate for the lead DD(X) is \$3.3 billion and includes detail design and ship construction costs. In comparison, the lead DDG-51 cost \$1.2 billion in 1985, or \$2.4 billion in 2007 dollars. DDG-51 was, however, a traditional design built with an existing hull form and gas turbine propulsion system, and the already-proven Aegis weapon system. DD(X), on the other hand, has a substantially lower radar and acoustic signature; a vastly improved S- and X-band radar (vs. S-band only on DDGs); a new integrated power system improving ship survivability by reducing signatures and allowing for future enhancements such as directed energy weapons or electromagnetic rail guns; and two large caliber guns capable of unprecedented precision fire power, range and accuracy - all need to meet the near term emerging threat.

DD(X) follow ship costs are projected to be less than the \$3.3 billion lead ship cost. The Navy estimates that each subsequent ship will decline in cost, with the cost estimate for the second ship at \$3.1 billion and the fifth ship in FY11 at \$2.2 billion.

Additionally, DD(X) is automated to reduce crew size from 360 to 114. In addition to enabling the U. S. Navy to fight and win against future threats and reducing the combat risk to the men and women serving in our nation's Navy, the DD(X) manning reduction achieves operational cost savings of \$13 million per year per ship compared to a DDG. Over a projected 35-year service life and 10-ship class, this results in operational cost savings of \$4.6 billion,

or future savings equivalent to the procurement cost of two ships.

Considering the enhanced warfighting capability provided, the ability to leverage DD(X) technology across other platforms, and the operational cost savings from DD(X) manning reductions, the DD(X) provides excellent return on investment.

The DD(X) program is the technology engine for the future navy in general and is the single largest investment ever made in surface navy capabilities. As the first completely integrated surface combatant in history, DD(X) is the delivery vehicle for full realization of optimal manning, performance based logistics, open architecture, and reductions in operations and support costs. The advances made in DD(X) will result in significant cost savings and risk mitigation to CG(X), CVN-21, LHA(R), and the Cruiser and DDG modernization programs.

The DD(X) approach will leverage these critical warfighting capabilities across platforms in a cost effective manner, reducing implementation costs to the Navy enterprise. Maintaining DD(X)'s coherent and active management of these many technological elements -- as it is currently structured -- is fiscally responsible and important to enable these critical technologies to be delivered to the Fleet in advance of the threat.

DD(X) Research & Development. The Navy's investment in R&D for DD(X) is significant and the largest ever for a surface combatant, delivering for the first time a new combat system, a new hull form, and a new propulsion system concurrently in a new ship class. In comparison to aviation R&D investments, surface ship R&D has historically been much lower than aviation programs. In the case of DD(X), where we are investing a significant amount in R&D, it is still only about a third of the R&D spent on the B-2 bomber, a quarter of the R&D spent on the F-22, and just over a fifth of the R&D planned for the JSF (Figure 3).

Major Program R&D Investments Total Program (Unclassified) R&D Investment

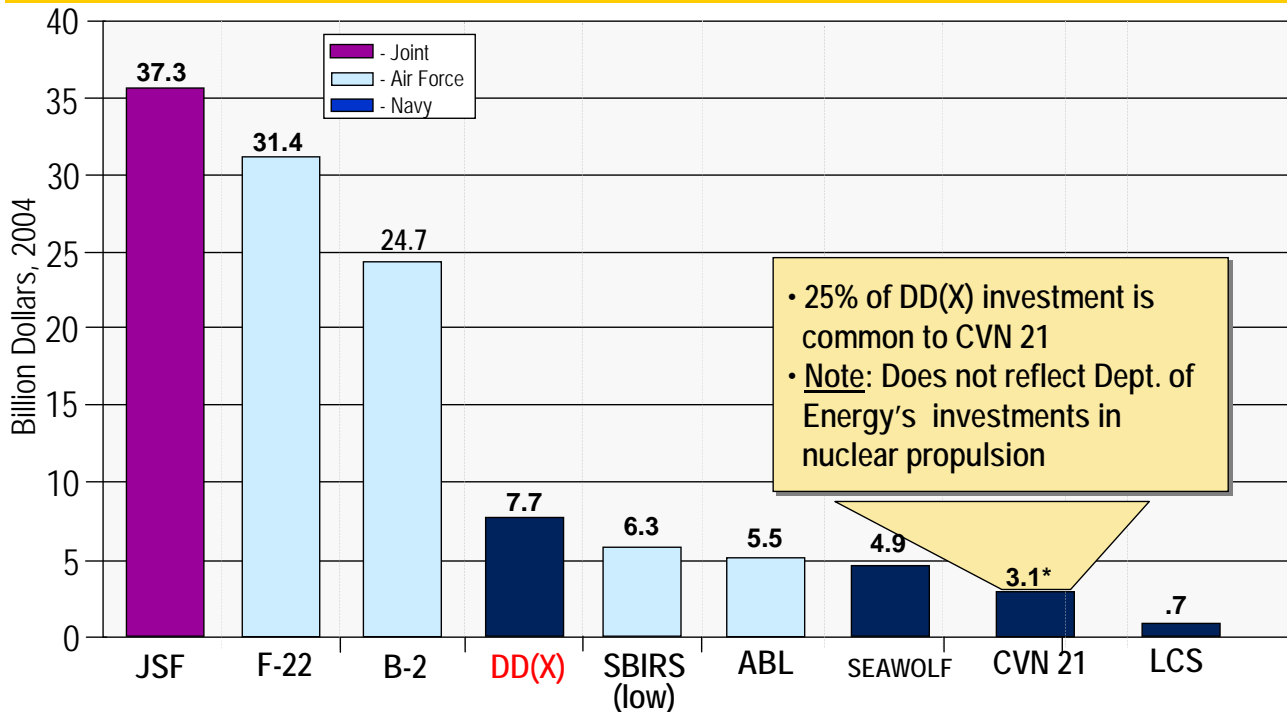


Figure 3

A significant portion of the DD(X) R&D funding is procuring systems for use on multiple platforms. **About 25% of DD(X) R&D investment is common and directly applicable to CVN-21 and LHA(R).** With the exception of nuclear propulsion technology, little research and development funding for aircraft carriers has been funded since the inception of the NIMITZ-class carrier almost forty years ago. Consequently, DD(X) is the principal technology driver for CVN-21's radars, computing environment, deckhouse construction and other command and control systems. Without DD(X), CVN-21 will likely be delayed by one year and R&D costs alone will grow by \$1.3 billion, not including the cost of the schedule delay.

More importantly, as I testified in closed hearings, Navy must build CG(X) to meet future threats that are being more rapidly developed than originally assessed and may be fielded within a decade. The DD(X) hull and propulsion plant will be spiraled into the CG(X) platform with about

80% design overlap, representing a tremendous cost avoidance in the CG(X) program. Without DD(X), CG(X) will be behind schedule and therefore unavailable to counter critical threats and will also require up to four billion dollars (representing a net additional billion dollars of taxpayer money) for non-recurring engineering costs.

We have also already learned the significant cost of unduly delaying programs mid-stride. I believe we must continue DD(X) procurement on schedule to meet validated warfighting requirements and gaps now and procure CG(X) on schedule to meet warfighting requirements in the future. For example, DD(X) delays could force the layoff of over 1,000 detail designers over the next several years, increase overhead, disrupt production workforce stability and cost in the hundreds of millions of dollars.

DD(X) R&D investments also open the door to significantly lower operations and sustainment costs. Increased automation and enhanced sustainability decrease annual cost and, over time, these savings add significantly, representing billions of dollars in savings over the life of the ship class. Many of these advances are transferable to much of the Fleet, especially during Cruiser and DDG upgrades.

In the net assessment, DD(X)'s costs are indeed reasonable, and the return on investment - both warfighting and technological - is excellent. We must continue to fully fund this program and deliver DD(X) to the Fleet with its tremendous warfighting capabilities and advanced technologies.

DD(X) Force Structure & Capabilities. Extensive analysis has been conducted on the class size of the DD(X) destroyer. The submitted construction profile reflects specific requirements finalized during the DD(X) ORD validation. Building on a body of analysis conducted since the 1990's, three separate options for DD(X) were considered to meet USMC fire support requirements. The smallest of these included a single 155MM Advanced Gun System and required a class size of approximately 24 ships, while the larger two designs included two gun mounts and substantially larger gun magazines resulting in a ship class of approximately twelve ships.

Recent Navy force structure analysis determined that a DD(X) class size of eight to twelve ships is needed to provide one DD(X) per Expeditionary Strike Group in support of smaller scale distributed operations. Analysis of projected Major Combat Operations using OSD approved scenarios indicates that eight to twelve DD(X)s are also adequate to surge sufficient ships to the theater of conflict to meet Naval Surface Fires Support requirements in support of one or two Marine Expeditionary Brigade-size amphibious assaults.

III. CONCLUSION

In summary, I would like first to thank you for holding this important hearing. The DD(X) program is critically important not just to the Surface Navy, but to the entire Navy, the U.S. Marine Corps and, in the future, the Joint Force. The ship fills a critical mission need and is the only ship able to meet the Marine Corps' stated fire requirements. The DD(X) technologies that we are developing and fielding are critical to every new major class of surface ship we expect to build in the future, and provides a critical bridge to the rapid development of CG(X).

I recommend that Congress:

- **Fully fund DD(X)'s current program to meet Navy and U.S. Marine Corps requirements in the near term and deliver important warfighting technology for the future fleet**
- **Strongly consider funding lead ships of technologically advanced ship classes with Research & Development funds**
- **Continue the dialogue on shipbuilding to reach a national consensus on the form and structure of the future U.S. Navy**

Thank you for this opportunity to address my personal concerns regarding the DD(X) program. Thank you also for your strong and enduring support of the men and women serving our nation in the United States Navy. They are deserving of our very best efforts to build a U.S. Navy that will remain the world's finest navy.