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HOUSE ARMED SERVICES COMMITTEE
PROJECTION FORCES SUBCOMMITTEE

STATEMENT OF

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BEFORE THE

PROJECTION FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

DD(X) SHIPBUILDING PROGRAM

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Chairman Bartlett, Ranking Member Taylor, and Members of the Committee, thank you for the opportunity to testify before you today. With your permission, I will make brief remarks, and submit my written statement for the record.

Good afternoon my name is Mike Hoeffler, and I am Raytheon's DD(X) Program Manager. I am pleased to be here today and to have this opportunity to present to the Members of this Committee the significant successes by Raytheon in its execution of the DD(X) program. I seek your continued support to deliver this overwhelming advantage to our nation's warfighters.

The men and women who compose Raytheon are proud to be leaders of the industry team that is providing our country and our Navy Marine Corp Team a revolutionary new generation surface combatant. The best and brightest of our nation's industry are fielding revolutionary capabilities for DD(X) that will keep the peace as well as win the war. As you heard yesterday from the Navy, DD(X) will have an incredible capability against Anti-Ship Cruise Missiles, a far superior ability to protect the Seabase, can operate in areas where other surface combatants will not go, and won't be seen on an enemy's radar until it's too late for them. DD(X) will do all of this with just 114 sailors. These vastly improved capabilities are directly tied to the technologies being developed by the men and women of Raytheon and our industry teammates. Our products form the core mission capability of DD(X) that will be used as the nucleus of future upgrades, both forward and backfit, across the Navy's fleet.

In my testimony today I will provide you the details of this program's demonstrated successes, and show you the progress that I believe the Congress has been looking for. As the Congress has noted in its past oversight of the program, including last year's National Defense Authorization Act conference report (report 108-767) language which stated, "The conferees have strongly supported both the DD(X) program and the

Navy's acquisition strategy, which uses the construction and test of engineering development models to mitigate technical risk. . . Program officials acknowledge the risks associated with the advanced technologies, but the conferees believe that taking such risks is warranted to ensure that the DD(X) technologies are not obsolete, and that the Navy has taken adequate steps to mitigate the risks before ship construction begins." Raytheon, along with our other industry partners have taken these challenges head on and are delivering.

Raytheon is the System Integrator for the DD(X) program, with our industry partners, including Lockheed Martin and BAE, and a robust consortium of small businesses. In our role as System Integrator, we are responsible for ensuring DD(X) mission success. We have developed system requirements with the US Navy, performed System Engineering, and developed five of the ten DD(X) Engineering Development Models (EDMs).

Technology management has been one of our greatest challenges. The Navy's goals for DD(X) as a survivable and stealthy multi-mission ship operating effectively with one-third the crew of today's surface combatants necessitated the use of advanced technologies. Early in the program we assessed technology maturity and readiness as part of our risk assessment and mitigation planning process. We tasked our subject matter experts working with risk leads to identify risks in all areas. Uniform criteria based on a proven, DoD validated process, were implemented to ensure consistent assessment of risks across all aspects of the program. To effectively manage advanced technologies Raytheon introduced a tailored combination of processes, tools and Engineering Development Models (EDMs) to validate the performance and producibility of key technologies prior to their deployment on DD(X). As part of the National Team, Raytheon implemented an extensive risk management process to identify potential

problem areas early and develop plans to mitigate these risks or, where necessary, develop fallback plans. The DD(X) Program implemented an innovative web-based risk management tool to track risks and their mitigation progress. This tool is accessible to all members of the DD(X) National team - including the Navy.

The first of the EDMs, the Total Ship Computing Environment (TSCE) is the heart of DD(X) and includes the Navy Standard Command and Control (NSC2). This software computing environment automates and integrates all the functions, modes, and missions and enables DD(X) to have dramatically reduced manning. TSCE also enables reduced total ownership and life cycle costs of the ship while significantly improving its warfighting capability. Raytheon's TSCE is on schedule and on budget. The first two deliveries have been accepted, certified and are running today in the Naval Open Architecture (OA) Test Facility at NSWC Dahlgren, Virginia. With our open architecture design, we can deliver newer and more advanced software applications without redesign of the underlying hardware; delivering new capabilities that are easily upgraded throughout the life of the ship. Our modular software approach ensures technology refresh, commonality of applications, and will save costs as new capabilities are introduced. This open architecture software meets the Navy's needs across the fleet and is planned for use forward and backfit, on the Family of Ships. Using TSCE across the fleet significantly reduces future life cycle software maintenance costs for the Navy.

A key portion of the TSCE is the DD(X) combat system. Because of its broad application to other Navy ships, it has been named the Navy Standard Command and Control System (NSC2). This has become the Navy open architecture baseline and allows future software developments to be easily incorporated. By using NSC2 on future ships, the Navy will be able to save significant dollars by not needing to develop and maintain multiple combat system baselines.

The Dual Band Radar (DBR), comprised of the X-Band SPY-3 Radar and the S-Band Volume Search Radar (VSR), is a multi-frequency next generation radar that enables the warfighter to operate and target enemies in the high clutter of the littoral environment. The design reduces our own ship's radar signature, it significantly reduces manning, and it lowers total ownership costs. It will provide a multifunction capability that betters littoral Anti Air Warfare performance of any radar in the fleet. The SPY-3 has been operating for over a year at Wallops Island, Virginia and it's passed its tests.

During the first year of the DD(X) Phase 3 program the Navy decided to change the frequency of the VSR from the original L-Band design to the current S-Band design. Raytheon subcontracted to Lockheed Martin to design and build the S-Band radar array portion of the DBR. As identified in the 14 June 2005 GAO report on DD(X) provided to this Committee, "the individual radiating elements that are the essence of the volume search radar, encountered difficulties when a key component failed in testing." As the result of significant additional testing and recent design changes, the individual radiating elements are now working satisfactorily and the VSR EDM array has been released for production. Construction of the VSR EDM array is going forward and I am confident that the current design will support delivery of the VSR EDM array to Wallops Island for the start of Dual Band Radar land based testing in June of 2006.

Raytheon is also leading the development of the Integrated Undersea Warfare System (IUSW) designed to provide a significant improvement in Anti-Submarine Warfare and mine detection in the littoral environment. IUSW reduces shipboard manning through automation. This IUSW capability, coupled with the ship's low acoustic noise signature, allows DD(X) to successfully perform its Anti-Submarine Warfare mission. When DD(X) is executing its Mine Warfare mission, our IUSW capability allows it to detect and avoid mines "in-stride" as no other US Navy combatant

can. This system has completed sea based testing of both the medium and high frequency bow arrays to validate mine avoidance and submarine automated detection.

The MK 57 Vertical Launching System (VLS) is the US Navy's next generation missile launcher. The design handles the Navy's current missiles including SM-2, ESSM, Vertical Launch ASROC, and Tomahawk while providing the flexibility to quickly field new and more robust weapons for increased firepower in response to evolving threats. Additionally, Raytheon's MK 57 was designed to significantly reduce whole life support costs when compared to current fleet launchers. The Vertical Launch System EDM has met all its schedule milestones.

Raytheon is also responsible for the design of new communications apertures that vastly increase communications capabilities, improve survivability and performance, all while reducing ship detectability, manning and maintenance costs. Testing of our apertures at China Lake, California, has demonstrated that we have met our requirements.

The five EDMs (TSCE, DBR, IUSW, PVLS/AVLS, and Integrated Apertures) developed by the Raytheon System Integrator team demonstrate that DD(X) technology is currently at the appropriate level of maturity to support the ship build and installation schedule. In April of this year the Office of Naval Research (ONR) conducted an independent Technology Readiness Level Assessment (TRA) on all the DD(X) technologies. The Office of the Deputy Under-Secretary of Defense for Science and Technology validated the results of the TRA. The TRA noted satisfactory progress in all key technology areas, particularly those associated with the EDMs. The Milestone B Over-Arching Integrated Process Team (OIPT) accepted the TRA findings and approved readiness of the DD(X) program for Milestone B.

Raytheon's system integrator team has been working on the Phase III ship design contract for three years. We have designed, built, and successfully tested five Raytheon EDMS, including Critical Design Reviews of each with the Navy. We are on schedule and within 1% of cost and Raytheon expects to complete the contract without any cost over-run. We just completed the full ship level Critical Design Review on 29 June with outstanding results. It was four weeks ahead of schedule, and demonstrated we met all requirements. Upon completion of this portion of the review, the Navy stated that this is the best ship CDR ever. As a result of our success, the Navy has scheduled a Flag level review of these results for this September.

The DD(X) program has met every milestone to date, and every EDM has passed its Preliminary Design Review (PDR), and we are well on our way to completing Critical Design Review (CDR). The attached table, compiled by Raytheon, is illustrative of our DD(X) performance to date:

Table 1 - Major Events and Milestones (Since Inception of DD(X) Program)

Event/Milestone	Plan Date	Actual Date	Comment
Navy awards $2.9 billion 4-year contract to Northrop Grumman with Raytheon as systems integrator.	April 19 2002	August 19 2002	Delayed due to Protest
Navy completes DD(X) operational requirements document (ORD)	Dec 2002		
July 2003: System Requirements Review (SRR) held and passed on schedule.	27 July 2003	27 July 2003	On schedule, despite protest
Dedication of Open Architecture Test Facility (OATF), Dahlgren.	2 July 2003:	2 July 2003	On Schedule
Successful completion of DD(X) System Requirements Review (SRR) for the Navy	27 July 2003:	27 July 2003	On Schedule
Successful PDR for DD(X) Total Ship Computing Environment (TSCE) EDM	29 Aug 2003	29 Aug 2003	On Schedule
Successful completion of PDR for MK 57 Vertical Launch System (VLS) EDM	4 Sept 2003	5 Sept 2003	On Schedule
Integrate Undersea Warfare (IUSW) System PDR	20 Nov 2003	20 Nov 2003	On Schedule
Software Release 1	19 Dec 2003	19 Dec 2003	On Schedule
First Segment (Engage) PDR	28 Jan 2004	28 Jan 2004	On Schedule
System PDR	17 Mar 2004	17 Mar 2004	On Schedule
Integrate Undersea Warfare (IUSW) System CDR	25 Mar 2004	25 Mar 2004	On Schedule
Successful completion of PDR for MK 57 Vertical Launch System (VLS) EDM	30 Apr 2004	28 Apr 2004	On Schedule
Successful test of DD(X) Ship Self Defense System (SSDS) software completed at OATF, Dahlgren, Va.	20 May 2004:	20 May 2004	On Schedule
Successful PDR for DD(X) Dual Band Radar (DBR) EDM completed	28 May 2004:	28 May 2004	On Schedule
Successful CDR for DD(X) TSCE EDM completed	5 May 2004:	5 May 2004	On Schedule
Successful first Interim Technical Assessment (ITA) of entire DD(X) program	Nov 2004:	15 Oct 2004	On Schedule
Successful land-based test of AN/SPY-3 Multi Function Radar EDM at Navy's Wallops Island, Va.	Nov 2004:	29 Oct 2004	On Schedule
Successful CDR of Software Release 3 for the TSCE	7 Dec 2004:	7 Dec 2004	On Schedule
Successful second ITA of entire DD(X) program	Dec 2004:	Dec 2004	On Schedule
Successful CDR Dual Band Radar (DBR) EDM	19 Nov 2004	19 Nov 2004	On Schedule
Successful test of Integrated Undersea Warfare System (IUSW) at Navy's Seneca Lake, New York engineering test range	21 Dec 2004	13 Dec 2004	1 week early
Software Release 2	18 Mar 2005	31 Mar 2005	2 weeks late
Successful factory acceptance test of DD(X) MK 57 Vertical Launching System	25 Apr 2005	31 Mar 2005	1 week early
Successful third (and final) Incremental Technical Assessment (ITA) of DD(X) program.	April 2005:	April 2005	On Schedule
System CDR	29 Jul 2005	29 June 2005	Ahead of Schedule
MK 57 Vertical Launcher Restrained Firing with Tactical Tomahawk	30 Jul 2005	30 Jun3 2005	4 weeks early
Software Release 3	28 Sept 2005		On Schedule

We have met all of our milestones on schedule, with the exception of one event completed two weeks late. This is a significant and notable accomplishment for a program of this magnitude and complexity.

The Navy recently awarded the DD(X) Detail Design and Integration (DDI) contract to Raytheon. Under this contract Raytheon will continue to serve as the Systems Integrator for the Navy including subcontracts to our large industry partners Lockheed Martin, BAE (previously UDLP), and IBM, as well as a consortium of small businesses. The new DDI contract utilizes a "best of breed" approach to deliver to the Navy a blend of the best of the defense and commercial sectors. For example, in the defense sector Lockheed Martin, utilizing the Raytheon TSCE already in place for DD(X), is designing the DD(X) command and control system taking advantage of their long experience in AEGIS. From the commercial sector IBM is providing the Total Ship Computing Environment hardware.

In summary, Chairman Bartlett, Ranking Member Taylor, and Members of the Committee, the men and women of Raytheon are committed to the Navy, and to our Armed Forces, and the Nation. The Raytheon System Integrator team is providing DD(X) with transformational war fighting capabilities while developing advanced technologies to drastically reduce manpower needs that will ultimately reduce long-term costs to the Navy and the American taxpayers. And finally, Raytheon is a proven and trusted partner to the Navy delivering an overwhelming DD(X) advantage to our warfighters.

I want to thank you for this opportunity to appear before you today to discuss the DD(X) program, and I look forward to your questions.