

**DEPARTMENT OF DEFENSE AUTHORIZATION FOR  
APPROPRIATIONS FOR FISCAL YEAR 2012 AND  
THE FUTURE YEARS DEFENSE PROGRAM**

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**HEARINGS**

BEFORE THE

**COMMITTEE ON ARMED SERVICES**

**UNITED STATES SENATE**

**ONE HUNDRED TWELFTH CONGRESS**

**FIRST SESSION**

**ON**

**S. 1253**

**TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2012 FOR MILITARY  
ACTIVITIES OF THE DEPARTMENT OF DEFENSE AND FOR MILITARY  
CONSTRUCTION, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS  
FOR FISCAL YEAR 2012, AND FOR OTHER PURPOSES**

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**PART 2**

**SEAPOWER**

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MAY 18, 25, AND JULY 13, 2011



**DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2012 AND THE FUTURE YEARS DEFENSE PROGRAM—Part 2  
SEAPOWER**

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**DEPARTMENT OF DEFENSE AUTHORIZATION  
FOR APPROPRIATIONS FOR FISCAL YEAR  
2012 AND THE FUTURE YEARS DEFENSE  
PROGRAM**

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**WEDNESDAY, MAY 18, 2011**

U.S. SENATE,  
SUBCOMMITTEE ON SEAPOWER,  
COMMITTEE ON ARMED SERVICES,  
*Washington, DC.*

**MARINE CORPS ACQUISITION PROGRAMS**

The subcommittee met, pursuant to notice, at 2:42 p.m. in room SR-232A, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed, Hagan, Blumenthal, Wicker, and Ayotte.

Majority staff members present: Creighton Greene, professional staff member; and Thomas K. McConnell, professional staff member.

Minority staff member present: David M. Morriss, minority staff director.

Staff assistants present: Kathleen A. Kulenkampff and Brian F. Sebold.

Committee members' assistants present: Carolyn Chuhta, assistant to Senator Reed; Gordon Peterson, assistant to Senator Webb; Roger Pena, assistant to Senator Hagan; Laurie Rubiner, assistant to Senator Blumenthal; Lenwood Landrum, assistant to Senator Sessions; Joseph Lai, assistant to Senator Wicker; and Brad Bowman, assistant to Senator Ayotte.

**OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN**

Senator REED. The subcommittee will come to order. Let me begin by once again thanking Senator Wicker for his great cooperation. I look forward to working with Senator Wicker for another year. We had, I think, a very productive and successful session last year.

I want to welcome Senator Ayotte from New Hampshire, who brings great insights and skill. Thank you very much, Kelly.

Senator AYOTTE. Thank you, Mr. Chairman.

Senator REED. We, I think, had a very successful fiscal year 2011, despite all the challenges, in terms of coming up with the necessary resources for the Marine Corps and for the Navy. I again am confident, working together, we can provide the resources nec-

essary for the mission of the Marine Corps and the Navy in very difficult times and, I emphasize, on a bipartisan basis.

This afternoon we're convening to hear the testimony concerning the Marine Corps acquisition programs. I want to welcome Secretary Sean Stackley, Vice Admiral John Blake, and Lieutenant General George Flynn back to the subcommittee. Welcome, gentlemen. We are grateful for all your service to the Nation and to the Navy. We certainly want to have you convey our best to the Navy and the Marine Corps, the men and women who do the real work and do it so well.

The Marine Corps has continued supporting the national interests around the world, including significant participation in Afghanistan. I want to express the committee's, indeed the Nation's, thanks for these outstanding efforts of the Marine Corps and others who are involved there.

Since last year, the Marine Corps completed a force structure review which recommended several actions. Among these was the following, and I'm paraphrasing: retain the capacity and capabilities to conduct amphibious operations with the assault echelons of two Marine Expeditionary Brigades, reinforced by one or more additional Marine Expeditionary Brigades aggregated from flying-in forces and equipment forward-positioned in maritime prepositioned ships.

I commend the Marine Corps for completing this review and reaching this conclusion. The uncertainties we face in the world make it even more imperative than before that we develop a vision of the world as we would hope to shape events in it.

Also since last year, we have seen the Marine Corps recommend cancellation of what was one of their premier modernization programs, the Expeditionary Fighting Vehicle (EFV). Since the mid-1980s the Marine Corps had focused on several programs that would enable what was then known as a ship-to-objective maneuver. These included the V-22, the Landing Craft-Air Cushion (LCAC) and the EFV.

We called this hearing to better understand the rationale behind making this change and to understand the path forward for maintaining that capability to conduct amphibious operations. However, this hearing is not solely about that issue. We need to understand what progress the Marine Corps is making in resetting the force and in modernizing other portions of its equipment inventory. We also need to understand how Navy investment is enabling the Marine Corps to exercise the capabilities that are inherent to the Marine Corps.

I believe that the world we face will continue to be one of uncertainty and unrest. Therefore, I continue to believe that great emphasis should be placed on lighter, more lethal forces and on the mobility of forces. But we must not let the outstanding performance of our Marine Corps distract attention from some of the real fiscal challenges that the Marine Corps faces. In 2002, Senator Kennedy, then the Seapower Subcommittee chairman, noted that the Navy needed to work diligently to address some of these very important problems, including improving fire support capability, including organic Marine Corps fire support and Navy shore fire support, enhancing our tactical mobility for Marine Corps forces, and

augmenting our mine countermeasures capability both for sea and land combat.

In each of these areas, we have made some progress, but progress has been slow. The Navy cancelled the DDG-1000 program, capping it at three ships. These ships would have provided a volume of fires to support marines until the time when they are able to establish organic fire support ashore.

We have been able to enhance tactical mobility in some respects, but now we see the end of the EFV with uncertainty about the system or systems that will replace that capability. We have seen the Navy begin to shift the mine countermeasures mission to the Littoral Combat Ships (LCS) and their mission packages. These ships should be much more deployable, but progress on completing the mine countermeasures systems that would be deployed from their mission modules has been subject to a number of setbacks.

There are other examples, but in the interest of time I will just stop there. I hope we can explore these and other issues with the witnesses today.

Before we begin with our opening statements by the panel, I would now like to recognize Senator Wicker for his comments.

#### **STATEMENT OF SENATOR ROGER F. WICKER**

Senator WICKER. Thank you, Mr. Chairman, for holding this important hearing, and thanks to our panelists. We certainly appreciate their service and don't want to pass up an opportunity to say that publicly.

The focus of today's hearing is Marine Corps procurement and the President's fiscal year 2012 budget request and Navy support to Marine Corps operations. In particular, we hope to focus on Secretary Gates' decision, announced in January, to end the Marine Corps EFV program after nearly 15 years in development and more than \$3 billion in sunk costs.

This decision has raised concerns among many supporters of the Marine Corps, and I count myself as one of those, because the ability to conduct an amphibious assault against a defended shoreline is the core competency that distinguishes our Marine Corps from other ground combat forces. It is a capability that has been honed to perfection over years of investment and development of doctrine, training, and specialized equipment, that has proven invaluable in countless missions.

Amphibious operations made possible by the legacy vehicles that have come before the EFV have been as large as the Inchon landing during the Korean War in 1950 and the feinted landings in Kuwait during Operation Desert Storm in 1991. Such operations have also been as small as the withdrawal of U.S. forces from Somalia in the mid-1990s and the ongoing contingency operations currently underway off North Africa. The ability to perform such complex operations is a force multiplier for the United States that must be taken into consideration by any adversary we might face.

Secretary Gates' decision to end the EFV program as part of the budget cuts sought in the fiscal year 2012 defense budget is supported by the Secretary of the Navy and the Commandant of the Marine Corps. They believe it will cost too much to continue EFV development, to purchase vehicles, and to operate them over the

long term. However, the Department of the Navy's cost projections for the EFV are being evaluated in comparison to the portion of the budget historically available to the Marine Corps to purchase and operate its ground combat vehicles.

Mr. Chairman, I question whether or not historical cost proportion should be the primary factor in determining the systems required for the Marine Corps to meet its mission requirements. As all of us recognize, the cost of even the most basic utility vehicle, the general purpose Humvee, drastically increased as requirements-driven modifications were implemented.

As such, I hope the witnesses will explain carefully the methodologies that were used to evaluate our current requirements for an amphibious vehicle and how that analysis led to their decision to abandon the EFV and start over with lesser requirements. I would specifically appreciate our witnesses addressing some specific questions regarding the proposed termination of EFV.

First, how are essential criteria like speed and the distance the vehicle will travel to the beach consistent with the Marine Corps' and the Navy's concept for ship-to-objective maneuver?

Second, if we lower the requirements how do we ensure that a vehicle other than the EFV is going to be any less expensive to buy or operate, or that an alternative vehicle fundamentally changes the budget crunch the Marine Corps faces in updating its total inventory of ground combat vehicles?

Third, how do we ensure that the new vehicle can be delivered to the Marine Corps in a timely manner if we start over again, given that we've been working on a replacement for the current Amphibious Assault Vehicle (AAV) since the mid-1990s?

The Navy-Marine Corps planning concept which underlays the requirement for the EFV has been that Navy ships should be over the horizon at 25 miles from shore when launching marines. The new concept of the amphibious combat vehicle (ACV) now being discussed to replace the EFV may be launched as close as 10 miles from shore. I'd like to hear from our witnesses about our current naval capabilities to protect marines and sailors from threats such as anti-ship cruise missile systems, anti-ship ballistic missile systems, sea mines, and hostile aircraft.

Given the Marine Corps' requirement for naval surface fire support that was intended to be met by the DDG-1000 Zumwalt destroyers, now capped at only three ships, as the chairman stated, I would like our witnesses to discuss whether only three DDG-1000 ships can meet the Marine Corps naval surface fire support requirement, or what will be done to upgrade the fire support capability of our other surface ships.

Gentlemen, there are a lot of issues for us to discuss and I look forward to the testimony of our witnesses.

Thank you, Mr. Chairman.

Senator REED. I wonder, Senator Ayotte, if you would have a comment?

Senator AYOTTE. I don't. Thank you very much.

Senator REED. Thank you.

Secretary Stackley, your testimony has been made part of the record, so feel free to summarize and abridge freely.

Mr. Secretary.

**STATEMENT OF SEAN J. STACKLEY, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION; ACCOMPANIED BY LT. GEN. GEORGE J. FLYNN, USMC, DEPUTY COMMANDANT FOR COMBAT DEVELOPMENT AND INTEGRATION/COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT COMMAND; AND VADM JOHN T. BLAKE, USN, DEPUTY CHIEF OF NAVAL OPERATIONS FOR INTEGRATION OF CAPABILITIES AND RESOURCES**

Mr. STACKLEY. Yes, sir. Chairman Reed, Senator Wicker, Senator Ayotte, thank you for the opportunity to appear before you today to address Marine Corps programs. I'll be testifying alongside Lieutenant General Flynn and Vice Admiral Blake, and if it's acceptable I will keep my opening remarks brief and submit a formal statement for the record.

Your Navy and Marine Corps serves as America's expeditionary force in readiness, a balanced air-ground-naval force, forward deployed and forward engaged. The deployment of *Kearsarge* Amphibious Readiness Group (ARG), which returned home to Norfolk 2 days ago, offers a great example of utility, flexibility, and responsiveness provided by a forward-deployed Marine Corps air-ground task force. The three ships of the *Kearsarge* ARG, the *Kearsarge*, *Ponce*, and *Carter Hall*, got underway in August of last year with 2,200 marines of the 26th Marine Expeditionary Unit (MEU) embarked. The group deployed 1 month ahead of schedule in response to a disaster relief call for flood-stricken victims in Pakistan. Upon completing its relief mission in January, elements of the 26th MEU, disembarked to conduct the fight in Afghanistan alongside 20,000 other marines in Helmand Province.

The balance of the MEU remained embarked on the *Kearsarge* group to conduct theater security cooperation engagements in Jordan, Kenya, Djibouti, and other countries in Sixth Fleet's area of operations. As the world's attention was drawn to events in northern Africa, the *Kearsarge* group was among the first to respond, conducting air operations in support of Operations Odyssey Dawn and Unified Protector. Then, when relieved by the *Bataan* ARG, which likewise got underway early in response to the crisis, *Kearsarge* returned home this week.

In all, in the course of their 8½ month deployment, the group and MEU conducted 1,500 air sorties, 150 well deck evolutions, covering 3 continents, and 8,000 miles of ocean. All the while, marines of the 31st and 15th MEUs embarked on *Boxer* and *Essex* amphib groups were doing likewise in operations stretching from Japan, the rim of the Pacific, Latin America, and Africa.

The success of these operations, built upon the spirit of innovation and flexibility, has been the bedrock of the Marine Corps in the post-Cold War era. To retain this amphibious capability, our ship-to-shore tactical mobility is a key priority as the Marine Corps shapes its future force. The transition from operations at sea to operations ashore necessitates a mix of lift and combat vehicles, and to this end, as you described, the Marine Corps initiated the development of a ground and combat tactical vehicle strategy in 2008 with the goals of fielding vehicles with the correct balance of performance, protection, payload, mobility, transportability, and fuel efficiency.

The challenge we've encountered, which will be an enduring and pervasive challenge, is that the lessons learned from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) bring increased performance requirements to our vehicle programs, requirements that translate to increased procurement and operating and support costs, threatening to make new vehicles exponentially more expensive than the systems they're replacing.

So with the focus on balancing mission needs, force structure constraints, and affordability, a four-phase review has been conducted, as you described, where the early phases have identified impacts associated with the increased requirements and later phases are intended to address impacts to the amphibious force, as well as vehicle requirements going forward.

An important outcome of this is as the Marine Corps has looked at their total vehicle inventory they made a decision that the 42,000 vehicles they currently operate will be reduced by a total of 10,000 in the course of executing the results of this review.

In conjunction with the formulation of this strategy and the conduct of the Marine Corps force structure review, two clear and important determinations were made. First, the Secretary of Defense, the Secretary of the Navy, and the Commandant of the Marine Corps have reaffirmed the necessity of the Nation to possess the full range of amphib operations, including forcible entry, which will require a self-deploying amphibious vehicle, able to project ready-to-fight marines from sea to land in permissive, uncertain, and hostile environments.

This capability is a key to building power ashore and overcoming access challenges posed by either lack of improved infrastructure or the threat of an adversary. The EFV has been the program of record to provide this capability. However, over time as the EFV unit cost and operating and support costs grew, as production costs entered the budget alongside increasing costs for other vehicle programs, driven largely by increased vehicle complexity and survivability requirements, and as affordability assessments have become tempered by more realistic projections of post-OIF, OEF budgets, it was also determined that the program of record, EFV, was not affordable based on either procurement or operating and support cost estimates.

Cost projections for the EFV procurement alone would consume the projected budget for all Marine Corps vehicles, while placing great pressure on the balance of Marine Corps procurement for the balance of this decade, including critical upgrades to C4I systems, radar systems, and logistics systems, all of which are necessary to replace obsolete systems of the expeditionary force, all of which offer improved capability while reducing operating and support costs for the future force.

Accordingly, we have concluded we must revise our approach for developing and future ACVs, with increased emphasis on affordability to ensure we're able to field this capability in the numbers that would be required for amphibious operations. To this end, we've commenced the front end effort leading to an analysis of alternatives (AoA) and technical demonstration of a new ACV, with the intent of mitigating cost, risk, and schedule associated with the new vehicle through an integrated portfolio approach: leveraging

investments made in the EFV; engaging with industry to foster a competition for ideas and innovation; weighing the vehicle performance requirements across the larger portfolio of capabilities required to ensure successful operations, including amphibious ship operations; and building upon the long history and force structure inherent to the legacy AAV.

We need to open the trade space for vehicle performance requirements and include cost as a requirement to drive affordability trades. Ultimately, we need to procure at a rate that brings healthy competition and efficient production.

Integrating the three separate programs that are in our program today, the Marine Personnel Carrier (MPC), the service life extension program (SLEP) and upgrades for a portion of the existing AAVs, and a new ACV would create greater opportunity to field this critical capability within the challenging resource constraints that we're facing.

We recognize the significance of this course change relative to the EFV program and, further, we recognize that the challenges to our ground and combat tactical vehicle programs in total cannot be solved through this single program change, but will require similar focus across the vehicle portfolio. We're committed to conducting this work with full transparency with Congress.

Mr. Chairman, thank you for the opportunity to appear before you today and we look forward to answering your questions.

[The joint prepared statement of Mr. Stackley, General Flynn, and Admiral Blake follows:]

JOINT PREPARED STATEMENT BY HON. SEAN J. STACKLEY, LT. GEN. GEORGE J. FLYNN, USMC, AND VADM JOHN TERENCE BLAKE, USN

#### INTRODUCTION

Chairman Reed, Senator Wicker, and distinguished members of this subcommittee, we are honored to appear here today. We want to thank you for your continued support to our sailors, marines, and their families, and we appreciate the opportunity to address our ground investment strategy.

As America's Expeditionary Force in Readiness our ground program investments support our ability to engage forward to build partners, assure allies and protect our interests; build access to a global economic system, deter aggression, and respond to crises; assist others when disasters strike; provide the only sustainable means to overcome access challenges; and, when required, defeat threats to our interests ashore. Key is the ability to deploy and employ from the sea in austere environments at a time and place of our choosing—a significant asymmetric, strategic, and operational advantage that has been used 137 times since 1990.

Our ground investments allow us to develop and sustain a ready, middleweight force that is easily deployable, energy efficient, and highly expeditionary. Complementary to our ground investment, we require parallel investments in amphibious ships, amphibious combat vehicles, connectors such as the landing craft air cushion and landing craft utility, naval surface fire support assets, mine counter measures, radars, command and control, vertical lift, and fixed-wing, short takeoff and vertical landing aircraft and many other programs critical to maintaining tactical and operational readiness. These investments are designed to provide a full range of complementary capabilities for our Nation's Expeditionary Force in Readiness.

#### THE OPERATING ENVIRONMENT

The adversaries we face and will likely continue to face are diverse and not easy to characterize into a monolithic threat. They learn and adapt quickly to counter our actions and target our vulnerabilities simultaneously across multiple domains. Surprise is a reality that cannot be eliminated; it must be mitigated by properly organizing, training, equipping, and employing our forces.

Access must be created and maintained during all phases of conflict against a wide range of adversaries. Today, we face a number of challenges to access that must be overcome. The American Association for the Advancement of Science concluded in 1995 that within 30 years “75 percent of humanity . . . will reside in coastal areas” (defined as 150 km inland). This prediction appears to be coming to fruition, as densely populated urban centers become increasingly common in the littorals—precisely where access is required.

Environmental challenges caused by major disasters not only inflict intense human suffering and loss of life, the resultant damage to roads, buildings, fresh water resources, communications systems, and electrical power distribution impede first responder actions and can quickly overwhelm local governments. Therefore, the execution of disaster relief operations and restoration of basic governmental services present a high degree of danger and uncertainty.

The military challenges we face span the full spectrum from improvised explosive devices (IEDs) through high-tech weaponry, to include precision munitions that target our vulnerabilities both on land and at sea.

Additionally, growing sensitivities to U.S. and coalition presence on, near, or in the air over sovereign boundaries present increasing political challenges.

In combination, these changes in the operating environment are having a profound impact of the complexity of combat and tactical vehicle designs.

The Nation needs an expeditionary force-in-readiness that can overcome impediments to access and immediately respond to a crisis anywhere in the world across the range of military operations.

#### POSTURING FOR THE FUTURE

While supporting operations in Afghanistan remains the Commandant’s top priority, the Marine Corps Service Campaign Plan directs the Marine Expeditionary Force commanders to continue to develop and maintain amphibious capabilities. In 2010, the Navy-Marine Corps team returned to conducting large-scale Marine Expeditionary Brigade/Expeditionary Strike Group exercises in order to hone these critical amphibious skills. On the west coast, I Marine Expeditionary Force and Expeditionary Strike Group-3 commenced its annual Marine Expeditionary Brigade-level amphibious exercises Dawn Blitz and Pacific Horizon. On the east coast, II Marine Expeditionary Force and Expeditionary Strike Group-2 conducted the first in a series of Marine Expeditionary Brigade-level exercises known as Bold Alligator. While these exercises are critical to enhancing our proficiency in large-scale amphibious operations, they also serve as a valuable platform from which new concepts can be tested that lead to the development of updated joint operating doctrine.

These exercises and our force development experiments inform future amphibious capability requirements in mobility, command and control, intelligence, fires, sea-based logistics, organization, doctrine, training, and education. The landing force of the future requires surface and vertical assault systems with the speed, range, precision location and navigational capabilities, protection, and firepower to launch from over-the-horizon positions, maneuver through tactical points of entry, and achieve the objective regardless of whether it is on the low- or high end of the spectrum of conflict. The technologies required to enhance these capabilities are under development, and the combat systems implementing these technologies are the highest priority in the Marine Corps.

Both the Secretary of Defense and the Secretary of the Navy have reaffirmed the necessity of the Marine Corps’ amphibious assault mission. Accordingly, we must develop an affordable and capable amphibious combat vehicle to project Marines from sea to land in permissive, uncertain, and hostile environments. This remains the Corps’ top priority. We ask for your continued support to reach this goal.

In order to adapt to the future operating environment and address access challenges, the Navy and Marine Corps are pursuing a number of other programs that leverage operational lessons learned and adopt acquisition best practices.

#### GROUND AND COMBAT TACTICAL VEHICLES

Over the next two decades the Marine Corps will replace or upgrade a large portion of the ground combat and tactical vehicle inventory. Unit costs for new vehicles have risen substantially, on the order of 300 to almost 500 percent, over their predecessors. The Marine Corps is facing increasing fiscal pressure across all investment categories. Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance capabilities, requirements and costs have increased significantly. Some programs that were initiated in response to urgent universal needs statements and joint urgent operational needs and initially funded with overseas

contingency operations funds are being integrated into standard force structure and will therefore need to be funded in the base budget.

The Marine Corps initiated its Ground and Combat Tactical Vehicle Strategy (GCTVS) in 2008 to provide a basis for planning, programming, and budgeting for balanced maneuver and mobility capabilities to our force. This effort is evolutionary in approach, and it includes combat vehicles such as the M1A1 Main Battle Tank, Amphibious Assault, and Light Armored Vehicles, as well as tactical vehicles such as the Medium Tactical Vehicle Replacement (MTVR), Mine Resistant Ambush Protected Vehicle, High Mobility Multipurpose Wheeled Vehicle (HMMWV), and Joint Light Tactical Vehicle (JLTV). The strategic goals of the GCTVS are to field vehicles with the correct balance of performance, protection, payload, mobility, transportability, and fuel efficiency. This balance will enable rapid concentration and dispersion of Marine Air-Ground Task Force (MAGTF) combat power, support strategic deployment concepts, and meet and sustain worldwide Marine Corps commitments.

Our end-state is to develop a more relevant and affordable portfolio of combat and tactical vehicles. Through procurement, recapitalization, and service-life extension, we will provide the capacity for Marine forces to conduct irregular warfare and sustained operations ashore, and, when necessary, conduct Marine Expeditionary Force-sized forcible entry operations from the sea. The enduring challenge to the strategy is that the cost to procure and sustain new vehicles is exponentially more expensive than their predecessors.

GCTVS is evolving in four phases. Phase I supported the 2010 Program Objective Memorandum, and identified the boundaries of our strategic lift capacity and assessed the negative impact that increased armor protection is having on our ability to remain a sea-based expeditionary force. During Phase II, which supported planning for the fiscal year 2012 Program Objective Memorandum, we assessed the capacity needed to meet operational requirements. As a result of this analysis, we will be able to reduce our overall inventory by about 10,000 vehicles across all vehicle types, resulting in savings in both procurement and long-term operations and maintenance costs.

We will continue to refine our vehicle inventory requirements as we move into Phase III as part of our reconstitution strategy to inform POM-13 planning, update our tables of equipment to reflect our reduced inventory, and plan to have the reductions fully implemented by the fourth quarter of fiscal year 2013. We will also continue to move into the engineering manufacturing and development phase of the JLTV program and examine the feasibility of a HMMWV recapitalization program to address critical performance and protection requirements in our light tactical vehicle fleet.

Subsequent to the decision to cancel the Expeditionary Fighting Vehicle (EFV) program, we broadened the strategy objectives to include a comprehensive cost-informed, systems engineering review of amphibious combat vehicle operational requirements. This ongoing review will analyze costs and requirements of water and land mobility, lethality and force protection in order to develop trade-space to drive down procurement and sustainment costs for future amphibious combat vehicles.

Phase IV of the strategy will inform POM-16, providing the fully cost-informed plan to modernize our vehicle fleet to support the Marine Corps' objective force which was developed during the Force Structure Review Group.

#### AMPHIBIOUS COMBAT VEHICLES

The high production and operating costs of the EFV were the principal factors leading to the recommendation to cancel the program. Based on Marine Corps cost projections, the EFV would have consumed 44–57 percent of the Marine Corps' projected procurement account during the years 2018–2025; consumed 90–100 percent of funding for all ground vehicles during the years 2018–2025; and consumed 91 percent of the Marine Corps' vehicle-related operations and maintenance account when fully fielded.

Following several years of theater operations, we are facing competing demands across all elements to reset war-weary equipment and to modernize capabilities. Funding identified for EFV will be used to address overall modernization and to pursue an integrated vehicle program crafted from inception to provide affordable capabilities and where possible leveraging the investment made in the EFV. We intend to balance capability with cost while mitigating the risks associated with a new vehicle program through the use of an integrated acquisition portfolio approach. This approach will initially examine three integrated efforts: a service life extension program and upgrades for a portion of the existing Amphibious Assault Vehicles upgrade, the development of a new Amphibious Combat Vehicle, and the procurement of Marine Personnel Carriers. Utilizing best practices in systems engineering, cost

estimating, and government/industry teaming during concept refinement and technology development, we intend to develop operationally relevant and technically achievable requirements that are affordable.

Our fiscal year 2012 budget request was based on early cost estimates for the initial development of these three vehicle programs. We have since refined our program management approach and our cost estimates, necessitating a shift in some budget categories while maintaining a zero-sum profile. This year we will begin an analysis of alternatives (AoA) of amphibious combat vehicles that will evaluate cost versus capability of several different vehicle configurations. This AoA will also consider the input we have received from industry in response to requests for information that we released earlier this year. We will also conduct a series of wargames in collaboration with the Navy to evaluate the operational impacts of closing the ship-to-shore distance from 25 nautical miles (nm) to 12 nm while also reducing the water speed of the vehicle.

In the wake of the cancellation of the EFV, we intend to pursue an aggressive and responsible acquisition timeline for new and upgraded amphibious vehicles. To meet these challenges, we will utilize a disciplined systems engineering process and sound cost analysis. Where possible, we will streamline acquisition activities to ensure capabilities and requirements are met. We look forward to working with this committee to help meet these objectives.

#### OTHER PROGRAMS SUPPORTING GROUND VEHICLES

To complement our future ground and amphibious vehicles, the Marine Corps is investing in other key support areas. For example, the Corps is leading the way to build a next generation medium-range radar called the Ground/Air Task-Oriented Radar. This system will replace five radars, and will be significantly more advanced in its capabilities. It will improve threat detection and be more deployable, able to be set up in a fraction of the time compared with current systems. In addition, we are investing in the Common Aviation Command and Control System, an ACAT I program which will help better network our communications, radars, intelligence, and ultimately our forces. To better protect the Marine on patrol, the Corps is also planning to replace its electronic jamming equipment to counter IED threats with the next-generation, open architecture JCREW 3.3 system.

#### CONCLUSION

In order to contribute to the stability of the global system and thrive in the 21st century, amphibious forces must: engage forward to forge partnerships, prevent crises, promote diplomatic access, reassure allies and friends of our commitment, build partner capacity, and facilitate the security and stability of our allies; respond rapidly and effectively to protect national interests, contain disruptions to global stability, overcome access challenges by operating from the sea base, reinforce U.S. credibility, solidify relationships with international partners and forge new ones; and project power in order to assure access allowing us to prevail when conflict arises by rapidly transitioning from the open hand of engagement to the closed fist of power projection that can impose our Nation's will and defeat our adversaries.

The sea is a vast maneuver space—one that can be used to our advantage provided we maintain the capability and capacity to conduct amphibious operations. Equally integral to overcoming access challenges from the sea is our ability to conduct a wide range of missions ashore against various threats. The mix of ground assets we are developing will provide the best flexibility for the Nation's Expeditionary Force in Readiness.

In this age of uncertainty, the demand for adaptable forces—capable of immediately responding to crises—is certain. It is true that all things are not equally important or affordable, and thus as the Nation resources its future national security, it will be forced to make tough choices between capabilities, capacities, and levels of readiness in and among the Services. Although it is impossible to know where the next flare-up will be, it is clear that well trained and equipped amphibious forces will be ready to respond and protect interests or prevent undesired effects. With the continued support of Congress and the American people, we will ensure amphibious forces are well prepared to secure our national interests in an uncertain future. Thank you for the opportunity to be here today and we look forward to answering further questions.

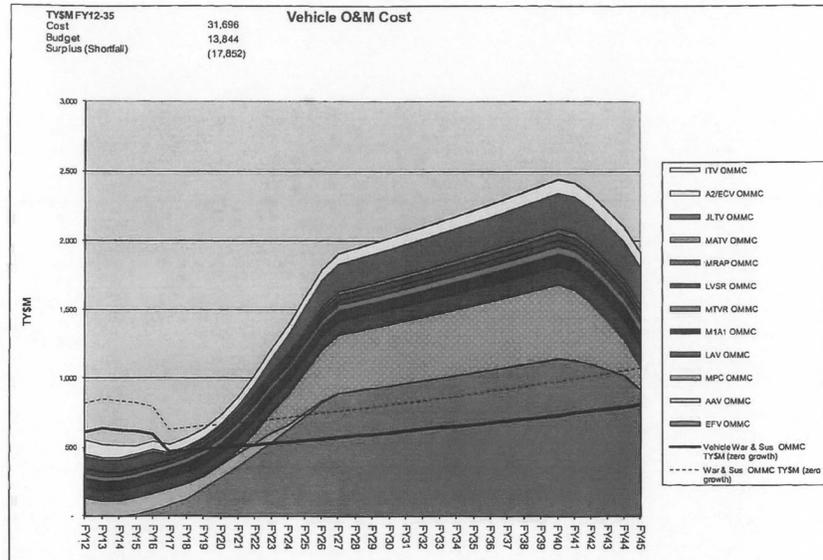
Senator REED. Thank you very much, Mr. Secretary. I presume that General Flynn and Admiral Blake have no statements.

We've included and provided everybody with two charts, and we've shared them with the panel. One is the basic procurement

course for Marine Corps combat ground vehicles, including the EFV for illustration purposes, and that is the operation and maintenance (O&M) costs.

[The information referred to follows:]

[Deleted.]



Senator REED. But the point really is, as we've talked about before, in a very few years we're looking at a huge bow wave, even if you factor out the EFV and assume you're getting a cheaper replacement, probably it's not that much cheaper. It might be more efficient, more effective.

As General Flynn and I discussed, this is not unique to the Marine Corps. The Navy has a similar challenge when it comes to trying to build ballistic missiles, ballistic submarines, attack submarines, carriers, et cetera.

It really has to focus our attention as to how are you going to deal with this issue. Even assuming the EFV is cancelled or a replacement comes on line, the cost of these other vehicles that are essential are also increasing. So, Secretary Stackley, please comment, and I'd like General Flynn to comment and Admiral Blake also from his perspective.

Mr. STACKLEY. Yes, sir. Let me start with the specific question on the vehicles and then there's a broader issue there that wraps around all of this. As I mentioned in my opening remarks, the decision to cancel the EFV to go to another ACV with a greater focus on affordability is not going to fix this problem. It's not going to fix the vehicle problem. It's one step of what needs to be a number of steps in each of the program areas to create a more affordable vehicle portfolio.

As I described, General Flynn led an effort looking at vehicle inventories. That's another important piece here, which is reducing

the total inventory of vehicles required, and I'll let him go into that in more detail.

But we have a significant looming challenge. When we look at our budget projections and we look at our recapitalization of many systems that we procured back in the 1980s and 1990s at higher rates of procurement, we can't look at the numbers and arrive at a one-for-one replacement knowing that the systems that we're fielding going forward are far more capable, far more complex, and therefore far more expensive.

So we are across the board looking at making tough decisions in terms of our investments; what are the priorities in terms of fielding new capabilities? Depending on what the capability is, we look at do we extend the service life of the legacy capability? Is that sufficient to meet the requirements? Do we buy new? When do we have to make that decision? We go system by system into the specific list of requirements and challenge the requirements, cut back where it's the right risk decision, where the risk is, can you afford the thing, and you put a risk even procuring the thing versus getting some measure of increased capability.

So there's no single silver bullet. There is no sacred cow. We know that there is no more money and we have to live within the resource constraints we have and make the right capability decisions. Hopefully, we have them correctly lined up against our overarching requirements. Then we have to deliver in accordance with what we estimate to be the right price for those things.

Senator REED. You mentioned that part of this complete analysis is looking at legacy systems and effectively extending their lives. Does that go to EFV too, in terms of a possible solution?

Mr. STACKLEY. That is not counted out. We're at the front end, as I described, of the analysis. We have over 1,000 AAVs. Part of the technology demonstration that we would like to get into is, using some of those AAVs as a hull form, let's talk about bringing off-the-shelf systems to that hull form and see what performance level we can get the existing AAV up to; and separately look at technology demonstration of an alternative hull form where we could potentially port those same systems over now to a separately developed hull form, and what does that point towards in terms of cost versus capability. In any AoA there's likely to be an alternative that says extend the existing vehicle, and we don't have cause to discount that on the AAV.

Senator REED. General Flynn, please.

General FLYNN. Mr. Chairman, it's always good to see one of your slides used at a hearing. This is the slide that keeps me up at night and this is the problem that keeps me up at night. This includes our vehicle challenges, and if you notice the mountains in the sand chart are all in the out years. So this problem is coming and we're not ignoring it.

Aircraft have gotten more expensive and ships have gotten more expensive. But on the ground side, because of our need for protection, whether it be in vehicles or individual protection, because of the battlefield that we're operating in right now, there's been an exponential increase in costs.

About 5 years ago, it cost us about \$1,500 to outfit an individual marine. Today that's \$7,500. The Humvee when we bought it in the

mid-1990s, about \$50,000. When I look at replacements for a light vehicle, what I get across my desk is in the range of \$300,000. So, there's an increased cost there.

The other part is I know we can't buy our way out of here. Over the past couple years the budget projections were more optimistic than we're seeing today. So we have to do more than just settle for the fact that it's more expensive. When we did the force structure review, we tried to design a force as part of Secretary Gates' and Secretary Mabus' guidance, was to tell us what the 21st expeditionary force in readiness was. That wasn't just about manpower. It was also how we are going to equip it.

Because you can't buy your way out of this, what should be the table of equipment for that force? The table of equipment for that force should be a crisis response TE, which would be lighter than what you see that force looking like in Afghanistan right now; and that you need to have the capability to heavy it up when you need it to be.

Very similar to what the Third Battalion, 8th Marines, did when they came off the 26th MEU. They deployed with a crisis response TE, but on their way to combat in Afghanistan they heaved up with mine resistant ambush protected (MRAP) vehicles and MRAP all terrain vehicles (MATV).

So we're going to look at ways to reduce our vehicle inventory, by going out light for the normal crisis response missions, and having the ability, either through prepositioning on the land or by operational use of the Maritime Prepositioning Force (MPF), to be able to heavy it up from using those assets as well. That's why it was critical that we operationalize the MPF to be able to do at-sea transfer of vehicles and selective offload.

The other thing is, as Mr. Stackley mentioned, we took a hard look at our vehicle inventory and we said, "Okay, to reduce costs we're going to reduce the vehicle inventory by about 10,000 vehicles." That's a significant savings in replacement costs and in operating costs, and that's going to happen over time.

We also have to fix the requirements-acquisition relationship. In other words, early on we have to be able to do those cost-capability tradeoffs early in our process. That's what we're going to do as we look for a solution to the EFV and our approach to the ACV.

We'll also take a hard look at our table of equipment. The other thing we'll look at, sir, is we are exploring everywhere that we can for new ideas. You mentioned about the recapitalization of legacy equipment. We're looking at that for the Humvee. Is there a way we could do something, by either capsule technology that we talked about last year or structural blast challenge, also known as chimney, has a way of mitigating costs. So we're pursuing technology, we're pursuing new ideas, and we're pursuing new concepts, all as a way to try to drive this down and to take some of the peaks off those hills.

But when you look at this chart, the only thing on there is vehicles. Vehicles exceed our total procurement dollars. I know we're using historical norm, but that was 30 years of procurement history, when at the beginning of those 30 years we had over \$4 billion in procurement for the ground side and some parts in the middle we had less than \$1 billion a year.

What I tell my people is, "Okay, what makes us think that history is going to change?" Like I say to them, sometimes you can have anything you want; you just can't have everything.

Senator REED. Thank you.

Admiral, in the next round I'll ask if you have any comments. But let me recognize Senator Wicker for his questions.

Senator WICKER. Thank you.

General Flynn, let me ask you first about the 10 miles versus 25 miles that I mentioned in my opening statement. Has the requirement changed? Do you stand behind the requirement to conduct amphibious operations against a defended shoreline? Is the amphibious assault mission still relevant for the future, and what about the point I made about 10 miles versus 25?

General FLYNN. Senator, in context of that, it's not just about the amphibious assault. It's about amphibious operations across the range of military operations. When we did the recertification of the program in 2007, the launch distance that was used for the EFV was launched anywhere between 10 and 20 miles, and that was for the amphibious assault.

When we released the request for information (RFI) for the replacement for the EFV, what we had in the RFI was a launch distance of 12 to 18 miles. That 12-mile mark is not a static position. That is normally where the ships would come in for the high-speed launch. We think it's going to be dependent on a number of factors: our tactics, techniques, and procedures of using the sea as maneuver space.

If you're going to have to do a large amphibious assault, a two-brigade operation, there is no doubt that we'll have a significant amount of time to be able to do shaping operations, because it'll take us about 60 days to assemble the shipping to be able to do that. So there is going to be significant shaping operations that have to take place to knock down the threat as well.

Since we had the original requirement for the EFV, as Admiral Blake briefed last week, there have been significant improvements in the Navy's ability to deal with the threat. For the crisis that we're likely to respond to today, we're going to have to mitigate those risks, because you could have a high-end threat there, but it may not be the same volume that you would expect against a near-peer competitor. We're going to have to continue to go where they don't think we're going to go, to use improved tactics, techniques, and procedures, and also to rely on the new defensive systems or integrated defensive systems that the Navy's bringing to the fight.

Senator WICKER. Thank you for your answer. If I could break that down, would you explain in a little more layman's terms what happened between 2007 and 2011, or I guess 2010, and what the difference is? It seems to me that 10 to 20 miles is not that different from 12 to 18 miles. So what happened? What is the reason for the change between the recertification in Nunn-McCurdy, which favored continuing the EFV, and today?

General FLYNN. One of the key drivers of the EFV was the ability to come up on plane, sir, and be able to go above 17 knots. It was to be able to do that high-speed launch. The EFV on the water in a planing configuration could do in excess of 25 knots. That capability's pretty expensive and that was one of the key drivers,

to be able to hydraulically configure the vehicle, to be able to develop the engine thrust to be able to do it. That part of the capability was a key expensive piece of that.

What we're saying in the future is to make the vehicle affordable we have to look at all the mission sets that the vehicle's going to have to perform, and then we're going to have to try to make those tradeoffs. Part of that tradeoff is do we need that level of speed? If we don't need that level of speed to be able to do the operation, can you reconfigure the program to be more affordable?

The threat launch in the Nunn-McCurdy certification was 10 to 20 miles launch. It's the speed to be able to do that, but it's also the ability of the task force to be able to protect the ship when it comes in to do the launch. Now, they wouldn't stay there in a static position, but we're also launching aircraft, we're also launching other types of connectors at the same time.

Senator WICKER. Thank you, Mr. Chairman. We're going to have a second round?

Senator REED. Yes, sir.

Senator WICKER. I think I'll defer to others and then come back.

Senator REED. Thank you, Senator Wicker.

Senator Blumenthal.

Senator BLUMENTHAL. Thank you, Senator Reed.

Thank you for all of your great work and the extraordinary dedication of the men and women who work with you and under you.

As I've listened to some of the discussion today and read the testimony and other material to prepare, from a very simplistic standpoint some of the variants here, maybe the major variants, are weight, protective value, and cost. I know that the MRAP vehicles were once regarded as extraordinarily heavy vehicles and perhaps disregarded in their importance because of it.

I wonder if you could comment on whether vehicles with that kind of bulk, for protective value and other reasons, have become the new normal, whether there is almost inevitably an increase in weight, bulk, and whether that variant is inevitably tied to cost, or whether technology may enable us to reduce both?

General FLYNN. Sir, one of the key things on weight is weight is a factor in being able to mitigate under-belly blast. But in the end, explosives tend to always win. You can always pack more explosives to do that. So the combination of the technology that you saw in the MRAP vehicle was not only weight. It also had a new hull shaping form, the single-V hull; your standoff distance from the blast. All contribute to your ability to mitigate blast and protect the servicemen and women inside the vehicles.

What we've learned over time is, though, with weight comes a tremendous lack of mobility and transportability. We had to field an MATV in Afghanistan because the MRAP vehicles couldn't go everywhere because of the road structure and the ability to get around where you needed to go.

We also found in some areas of the country that our light armored vehicles worked very well, because they could go anywhere, and you can't put improvised explosive devices (IED) everywhere. So there's a degree of protection that comes with mobility.

What we've realized is, if we continue on this trend as an expeditionary force we may not be able to load ships any more with that

much weight. So that's why we're looking for technology, and we've learned more in I think the last 5 to 10 years about blast than we've learned over maybe 2 or 3 decades. That's why in the future the single-V hull may not be the solution. A double-V may be the solution, and in some cases a rigid flat hull could actually be the solution.

That's why we're continuing to pursue alternative technologies to see if we can find that sweet spot, if you will, between transportability, mobility, and protection.

But you're right; on the basis of where we are now, sir, the more weight you have, the more expensive it is, but the lesser mobility and transportability you have on the battlefield.

Senator BLUMENTHAL. Are you satisfied, General, that the Nation is investing in the technology in sufficient amount and timeliness to do whatever it can to improve the Joint Light Tactical Vehicle and all the other vehicles under development to take advantage not only of what we've learned in the last 5 years, which has been impressive, but also what we need to learn going forward about the threats that may be in our future that haven't been in our past?

General FLYNN. Sir, everything I see, down working on the requirements aspect for the Marine Corps, is we don't discount any idea. We've gotten help from Mr. Stackley and we've gotten help from the Defense Advanced Research Projects Agency. We go out to this one company that was working on structural blast channel, technology which is known as chimney. That could have applications to a lot of different things. The double-V hull. All of that has a tendency to take weight off the vehicle. We've also seen some advances in material science as well.

But we haven't found the silver bullet, so we're still looking. We're still discovering. But when we find something, sir, we see if it's going to work and we try to take advantage. I think we're at the stage of maybe seeing some successes in the not too distant future, but I don't see anything tomorrow.

Senator BLUMENTHAL. Thank you, General.

Mr. STACKLEY. Weight is just one part of the solution, and really on our learning curve what we're focusing on is a total system design that provides the best solution. So there is a shaping of the hull. The element of weight itself provides a benefit. There's the degree of armor protection. But then, as General Flynn described, things like the double-V and the structural blast channel, there's an element of stiffness associated with the vehicle that's starting to emerge as this is an important characteristic that we need to consider in the design of the vehicles.

Ultimately, what you're trying to do is protect the marines or soldiers inside the vehicle. So now you're starting to deal with designs of floors, designs of seats, and you're starting to get down to a certain level of detail. I believe we still have a significant amount of learning to do as we put together optimal system designs. When you start to talk now about an AAV, weight's a huge penalty.

When we're looking at speed and range, when weight starts arriving as a requirement for protection, now you're really trading off total system performance. So we need to look at the entire design, where the ultimate goal is protecting the marine inside the vehicle and not go first to weight. There are a lot of ways to add stiffness

without adding weight. There are armor solutions that are lighter in weight. In fact, we have some armor solutions that float. Those are more costly, so there's a cost element that we wrestle with.

This front-end design work that we're doing for the ACV, we're trying to bring all of that innovation to the table and look at a total system approach to that protection thing, which does drive costs and does trade off in performance in other areas of the vehicle.

Senator BLUMENTHAL. Thank you very much.

Thank you, Mr. Chairman.

Admiral BLAKE. Sir, if I could just add to that, when we look at the issue from the Navy perspective, you have ships with expected service lives anywhere from 25 to 40 years, and so when we build a ship and we're going to build it for a period of 25 to 40 years, what I have to do is I have to sit down with General Flynn and we have to look at it and say, all right, we have to have give and take here, because the displacement of that vehicle is what it is and weight is a critical factor.

So when we have to sit down and look at it, if a vehicle increases in weight then we have to figure out where our tradeoffs are, because we still have to get that composite force of marines ashore and get them ashore safely.

Senator REED. Thank you, Admiral Blake.

Senator Ayotte.

Senator AYOTTE. Thank you, Mr. Chairman. I want to thank all of our witnesses for what they do for our country.

I wanted to follow up, Secretary Stackley, on a question about the EFV program termination. As part of it, we know that we invested approximately \$3 billion. Then part of it is this \$185 million that we have to pay to terminate the program. I wanted to understand that piece of it and understand it from the perspective of going forward what is it that we need to do to inform our acquisition process?

Was it something in our terms that we need to be conscious of in terms of how we're contracting for these types of vehicle, obviously acquisition overall, where we can put ourselves in a better position to deal with the cost issue, but also to have more favorable terms for our country, so that we're not put in a position where we actually have to pay money to terminate a program.

So if you can help me with that, I'd really appreciate it.

Mr. STACKLEY. I want to help you 100 percent here. My view is termination costs should be approximately zero.

Senator AYOTTE. Thank you.

Mr. STACKLEY. Particularly in this program, with, I'll call it, knowledge upfront. There are termination costs associated with a major program if you slam the door shut. You have a large workforce and the company has responsibilities to that workforce in terms of everything from relocation, they might owe them severance, or they might have 2 months pay they have to pay out. So there are definite costs associated with termination if it's not managed.

What we've attempted to do here is to manage the termination. So we've done a couple of things. We've taken a look at the workforce. We've taken a look at things like tooling and material. Those have to be disposed of at the end of the contract. So we've put a

plan together on what do we want to do with these things, and we work our way out of the EFV by getting value out of the dollars that are otherwise considered to be termination dollars.

So the workforce, for example; I've given a Warren Act notice. General Dynamics would have to provide 2 months notice to folks that they're going to be laid off. There's a bill, and if they're not being gainfully employed then we get nothing for that cost. So we took a look at the workforce. We took a look at where we are in the EFV program, and we want to harvest as much of the learning and technology that we invested in that program as possible to help us to transition to the ACV.

So we put together a plan that matches the rolloff of staff at General Dynamics with harvesting of technologies from the EFV, which includes everything from subsystems on the EFV that might apply to the ACV, to taking the vehicles that are in piece parts and finishing their testing, so we actually get the test results that will inform the ACV.

So you could call it a termination cost, but we're calling it a smart termination as we exit the program, so that we get the maximum value out of the program as we exit, and we don't incur unnecessary costs associated with terminating.

I don't know if that answers your question or not.

Senator AYOTTE. It does. I think what we're all trying to figure out is how we can avoid this. What are the lessons learned from this experience, because we're not picking on the Marine Corps in all of this because we've seen this in other weapons systems across the Services. Whether it's putting more of the burden on the contractor in terms of if they don't produce the product that we want that they bear more of the risk, just in terms of, obviously we've been talking about the acquisition process, but what are some of the lessons learned overall so that we can make sure that we avoid these situations again?

Mr. STACKLEY. Yes, ma'am. First, there are different types of termination. I'll just be frank. In the case of the decision to terminate the EFV program, as discussed, in 2007 we had the Nunn-McCurdy. At that point in time we decided we're going to continue with the program. We restructured it, and since 2007 General Dynamics has been performing in accordance with the plan.

So this isn't in 2010 their performance has led us to terminating the program. This is DOD looking at the future costs of the program and saying, we can't get there from here. So there's not fault on the contractor here. What he's been doing is he's staffed up to ramp into production, so he does have tooling. He has infrastructure. He has people on the program.

If you try to close the program immediately, there's a lot of work in process. He has subcontractors throughout the country who are going to be invoicing for the work that they're doing, all allowable costs on the contract that would have to be paid. So that's just a practical matter of we are terminating, we're limiting our exposure in that termination, but we do have liabilities for this work that was started before the decision to terminate.

Senator AYOTTE. I appreciate that. I guess at the end of the day really where I'd like to be is, how do we avoid this from happening again? I know we've been talking about it, but when we look at the

fiscal state of our country and the need that our Armed Forces have; I think this is just one example across. We've seen this on multiple areas at DOD.

Mr. STACKLEY. Depending on the contract type, we have clauses and terms and conditions that protect the government's liability. Typically, for example, for our cost-plus contract, which development contracts are, the clause would describe that there's a limitation of funds. So the government's liability is limited to the amount of funds that are put onto a contract. That causes the contractor to have to measure, gauge, and ensure that he doesn't go spending money beyond the limitations that are imposed in that case.

On a fixed-price contract, he owes us the deliverable. We owe him the amount of money we signed up to; he owes us the deliverable. Typically, on a fixed-price contract we're fully obligated at the front end. If we terminate while all that work is in place, then we're stuck with a legal review in terms of what his actual costs are versus what he's billed and the differences inside the termination.

But we do not encumber Congress, for example. We don't encumber future Congresses on things like termination or cancellation without notifying you and telling you what the amount of that liability is in advance.

Senator AYOTTE. I appreciate your answer, Mr. Secretary.

My time is up, but I still don't have a clear picture on when you have a situation like this you have to take the lessons learned. We need to take the lessons learned from this, all of us, and I think we need to do it across the Services. So I don't have a clear picture in my own mind how we avoid this again.

General FLYNN. Ma'am, I think one of the key lessons learned is we have to do the cost tradeoffs early on in the requirements process, not in the acquisition process. So as we're looking for the capability, those cost tradeoffs have to be done in requirements development early, so that you're not in acquisition, so that you know what technology you're asking for and you're not overreaching, and that you understand the costs.

That's what's going to be different about how we're approaching the ACV, is that we've set up the method and the methodology right now to inform the requirements process, with cost as an independent variable.

Senator AYOTTE. Thank you, General.

Senator REED. Thank you, Senator Ayotte.

Senator Hagan.

Senator HAGAN. Thank you, Mr. Chairman.

General Flynn, Secretary Stackley, and Admiral Blake, thank you for your work and being here today.

I wanted to talk about the amphibious ship requirement. I know that the Marine Corps' stated amphibious ship requirement remains 38, and the Nation currently has an amphibious fleet of less than 30, despite an agreement within the Navy to maintain a minimum of 33.

Amphibious ships should not be decommissioned earlier than their expected service life spans, obviously, without replacements. I'm concerned that the Marine Corps will not have sufficient am-

phibious capabilities to fully support the combatant commanders' requirements within an acceptable level of risk.

I'm also concerned that the Marine Corps will not have sufficient amphibious capabilities to meet its demands for operational deployments. Maintaining a sufficient amphibious capability I believe is critical in order to project power, to evacuate essential and non-essential U.S. personnel stationed overseas, and engage in crisis response and humanitarian relief operations.

General Flynn, can you share your thoughts regarding the impact of not having the minimum amphibious ship requirement and how does it affect the Marine Corps' ability to respond to crises, such as what we've seen recently in Libya and in Japan?

General FLYNN. Ma'am, we've agreed within the Navy on the 38-ship requirement, and that is both for what we would need to be able to do amphibious assault operations at the high end, but it's also that inventory of ships that is needed to do what we're actually doing today. So it's not based on desires or needs. It's actually what's being employed today.

With a 33-ship inventory, you could meet both your day-to-day needs and your larger requirements. When you get below that, obviously you take on additional risk in terms of availability, especially as you heard from the operations that are going on now, when you're surging.

So where are you going to pay the bills? You're going to pay a bill in maintenance. Ships need to have time to be maintained, and if they don't have the time to be maintained we could have a challenge in getting them to their 40-year service life. The other place you pay the bill is in training; training of the ship and the crews together. So there is the ability to happen there. What we're going to see for the first time in recent memory when the 11th MEU deploys this summer is all ships will be together when they deploy. That's the additional risk that you take.

So 38 was the requirement, 33 was an acceptable level of risk, and the further you get away from that the more risk you assume in being able to meet your day-to-day requirements, and where you pay the bill is in maintenance and in training.

Senator HAGAN. Where are we right now?

General FLYNN. I think we're at 30 right now in the inventory, ma'am.

Senator HAGAN. I'm concerned about the number. In last year's National Defense Authorization Act, Senator Webb and I included report language mandating a report on the expeditionary amphibious warfare ship force structure. The report directs the Secretary of Defense to complete an operational capabilities-based assessment that reviews and reconciles the amphibious requirements, the ship retirement schedules, as you mentioned, and the 30-year ship-building plan. Can you give me, Secretary Stackley, the status of that report?

Mr. STACKLEY. Ma'am, I'm going to have to take that one for the record.

[The information referred to follows:]

The Expeditionary Amphibious Warfare Ship Force Structure Report to Congress was provided to the congressional defense committees on June 3, 2011 by the Deputy Secretary of Defense.

Senator HAGAN. Okay.

Mr. STACKLEY. Let me assure you, though, I'll take it for the record and we'll pull this thing forward and make sure it gets back to you in a timely manner.

Senator HAGAN. Any comments on why we have fewer than the minimum required, and why the Navy has continued to decommission vessels from the amphibious fleet despite the shortage?

Mr. STACKLEY. Yes, ma'am. A couple pieces there. One, we're balancing across the ship portfolio in total. The commonly referred to number is a 313-ship Navy, which dates back about 5 years when that total force structure requirement was established. At that time, we were at about 280 ships. Today we're at 287 ships. So in total we're far below what we've established as a requirement class by class.

Inside of the amphibs themselves, we have two specific amphibious shipbuilding programs ongoing, and we've had challenges in terms of schedule on those programs. So part of the shortfall is associated with delays in delivering amphibious ships.

Senator HAGAN. The schedule problems being what?

Mr. STACKLEY. Ship delivery schedules. Frankly, there have been some performance issues at the shipyards that have driven delays on the LPD and LHA class ships. It's also been a long-term impact associated with Hurricane Katrina. All of our amphibious ships today are built at Ingalls and Avondale on the Gulf Coast. There's been a long-term impact associated with Hurricane Katrina on everything from schedules to productivity, and we're still working our way back from those impacts.

The third element is the new construction side. Then there is the decommissioning side. We spend a lot of time reviewing decom schedules, and each decision in terms of decom is, I would say, made on its own merits or otherwise in terms of how many deployments does that ship have left in it, does it require another service life upgrade to get another deployment, so what's the balance of investment required to keep the amphib on line versus what's the useful service we would get out of it.

I can only assure you that there's a lot of tough discussion and debate with each of those, because we're below the 33 number, and we're not going to be able to quickly get back to 33 just through new construction. So we have to look at the existing amphib ships in the fleet, and do what we can to make sure that we get the service life that's required out of them.

Senator HAGAN. Thank you.

Admiral BLAKE. Senator, one of the issues that we have taken up is because of the fact that we recognize that there are delays in the delivery of, say, the big-deck amphibs. We have already looked at and are putting in place funding so that we can extend ships that are currently on service and not decommission them, delay their decommissionings, if you will.

But that comes at a cost and that's what we work. We recognize that we need to meet the commitment to put the number of amphibs out there in order to meet the requirement. We also recognize that, because of the level of operational tempo that we've had over the past several years, that we have now made a concerted effort to make sure that not only do we have to look at extended

service lives, we have to get the ships to their expected service lives.

One of the best programs I can give you is the LSD-41s with their mid-life program. We've actually put a tailored package together in order to ensure that we get those ships to the end of their service lives. We've actually tailored it for each of those ships to get them out there, so that they can meet the end of their service.

In addition, we're also looking at ships as they're coming up at the end of their service and seeing if we can work it that we can get additional life out of them. But again, that comes at a cost and we have to do the tradeoffs.

Senator HAGAN. Thank you.

Let me ask about the Humvees. The use of the Humvees is limited in theater due to the survivability and the crew protection concerns. Obviously, with the mine blast and the IEDs, the Humvees have been exposed to these underbody attacks, which really concerns me greatly. The current Humvee underbody protection levels are inadequate in meeting the current and emerging threats that our troops are seeing.

I'm very supportive of anything that we can do that can increase the survivability, the mobility, and the operational utility of our Humvees. In last year's authorization bill, I inserted language requesting the Army and the Marine Corps to report their Humvee acquisition and recapitalization plan. In the Marine Corps the report mentions that an armored capsule system was evaluated as a possible survivability upgrade for the Humvee, and the report goes on to say that, despite doing well in blast testing, challenges were discovered integrating it onto the current Humvee chassis, including the automotive and performance issues.

General Flynn, can you describe some of the challenges in integrating the capsule onto the Humvees?

General FLYNN. Yes, Senator. We're trying to look at a cost-effective way of making our light tactical vehicle fleet last longer and be able to perform in the current threat environment. We looked at the capsule. The idea was to build a survivable capsule that could fit on an existing frame, using the existing drive train and power plant. What we found is when we married the two up we did significant frame damage when we took it out and tested it out in the field.

It did well in blast testing. So now we have to look at what would be the cost of redoing the frame and would we have to redesign a frame?

A similar effort is what we're looking at in structural blast channel, the chimney, that is again taking a look at an existing frame, an existing power plant and a power train, and seeing if we could recapitalize that way. Where we're at in that, it is doing well in its blast testing. Recently we took it out to the Nevada Automotive Test Center and we're seeing how its frame has done. In some cases we've seen some frame damage.

Now, we have to analyze and say, okay, what's causing the frame to be damaged? Is it weight? Is it how we're marrying it up? Is it how the frame was manufactured? Was it manufactured to the right tolerances? So we're all in the information-gathering, information analysis part. But we definitely are trying to pursue some

way of recapitalizing the light vehicle fleet at an affordable cost and getting us an acceptable level of protection.

Senator HAGAN. Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Hagan.

I think one of the obvious impressions in the questioning of everyone is that these are a series of very critical decisions that are interrelated in so many different ways; the Navy shipbuilding program in terms of accommodating whatever you decide to build as an ACV, et cetera.

There's another aspect of this. The Nunn-McCurdy breach, at that point there was the decision to reduce the total number of EFVs and to complement them with the MPC, and you face a milestone B decision next year, basically. That raises the issue again of what is the relationship between the new ACV and the MPC? Is that part of the analysis?

Then there is a whole set of issues. One, if you can reduce the speed and increase the armor of the ACV, does that mean it can act in some respects as a replacement for in certain cases the MPC, that you can reduce the total there?

I know General Flynn has been extraordinarily, I think, thoughtful about systems engineering and making decisions early. But there's a whole set of decisions that go not just to the replacement EFV, but to the MPC, LCACs, and a host of other things.

General Flynn?

General FLYNN. Sir, when we cancelled the EFV the best option at the time that we had was to simultaneously pursue potentially three alternatives or three programs together. One was the new ACV, one was the MPC, and one was service life extension to the AAV.

I don't have the final answer for you as to say in the future are we going to be pursuing all three, two, or one. We're working through the data right now. We're working through the AoA to do that. The MPC was added to the mix as a way of trying to get cost back then under control for the EFV. It was a less expensive vehicle, and we were trying to meet the cost requirements back then by doing a mixed fleet.

That's back on the table now and we have to do that quickly, because I know in the current program there is a milestone B decision, I think in fiscal year 2014. So we need to get to those answers quickly, and that's one of the reasons why as we pursue our way forward on this we need to be able to do an AoA faster than we have traditionally or historically done. In the past it's taken 18 months to do an AoA. We need to do that in about 9 months. At the same time, we need to be able to be pursuing some type of technology demonstrator so we can determine what the real requirement is going to be, because right now I wouldn't commit to all three and say we're definitely going to do all three. I don't think that would be wise at this time because I don't have the data to back up a decision like that, sir.

Senator REED. Mr. Secretary, you have \$12 million in the budget for the AoA. Is that enough, given the complexity of evaluating several moving parts?

Mr. STACKLEY. Yes, sir. The budget that you're looking at today was best estimates put together in a pretty constrained period of

time, and I can guarantee you we have adjustments coming. An AoA by itself doesn't require a whole lot of money.

Senator REED. Right.

Mr. STACKLEY. So I don't think the AoA is going to be the issue. It's going to be some of the other costs. We have a lot of talent from the EFV program that we don't want to lose. So what we have to do is get productive work for them consistent with the time line that General Flynn described for technology demonstrator. I think that's really where we want to be investing dollars, is on identifying those mature technologies that would apply to a future amphibious vehicle.

The 9-month timeline for an AoA is more aggressive than most, but we're not starting standing still. We're not starting with a clean sheet of paper, and the last thing we want to do is disband the corporate knowledge that we have and have to bring brand new folks in and climb the learning curve for the AoA. So we want to leverage the hot operation that we have from the EFV as we transition.

Then the question on the MPC and its role. We're bringing all three of these—the AAV SLEP, the MPC, and the ACV—together, same room, same group of people managing the capability, recognizing that we have one pot of money that's going to have to manage both the development and ultimately procurement of the vehicles and the necessary upgrades.

So do we have an MPC plus ACV fleet? We're going to look real hard at whether or not that makes sense.

Senator REED. Another aspect here is LCAC is something you're looking at with a new ship-to-shore connector program. Is that group going to be in the room, too? That begs the question, too, and then obviously the Navy in terms of the amphib fleet, the basic delivery vessels, they'll be in the room, too? Are we looking outside the proverbial box at all these interrelated issues to make a comprehensive presentation?

Mr. STACKLEY. Yes, sir. Let me describe a couple things there. The LCAC SLEP is wrapping up now and we're going out very shortly here with a request for proposal for the ship-to-shore connector. Its set of requirements are set and the things that the ship-to-shore connector would be carrying are well set. So we don't see the ship-to-shore connector's performance requirements changing as a result of the discussion with regards to the amphibious vehicle. But it might impact the quantity that we end up procuring.

Senator REED. Thank you.

Just one other question, then I'll recognize the ranking member. As General Flynn said, we'd like to think that all of these decisions are driven by threats and doctrine, but we know there's a budget lurking around every corner that has to be met, too. But part of your conclusion is going to be based on can the Navy neutralize the opposition on the shore, successfully get the marines either 25 nautical miles or 10 nautical miles from the launch point in a changing environment, air threats, cyber threats, et cetera.

So just if you could comment briefly on that, Admiral Blake. Then specifically, both you and Secretary Stackley about the mine countermeasure module, because some areas which we would anticipate a potential use of amphibious forces the most significant

threat would be mines. So Admiral Blake, then Secretary Stackley, and then I'll recognize Senator Wicker.

Admiral BLAKE. Sir, I think what you're referring to in general terms is anti-access. I think the Navy has put in place a number of programs. I'll only hit a couple of the highlights. We won't go delving down into every detail. But I think we've put together a family of systems. We've bundled them together and we've said this is how we think we can engage, if you will, in the anti-access environment.

One of the premier ones would be Naval Integrated Fires Counter-Air. That program is, as I said, a family of systems. It comes in two varieties, if you will, from the air and from the sea. There are key components within that, everything from the E-2D, the aircraft, to the SM-6 missile. Then you're going down, of course, to the Aegis ships, Aegis cruisers and destroyers. I think that's how you sort of look at it, and we are evolving that.

The second one I would mention is the Surface Electronic Warfare Improvement Program. We recognize that we have to make advances there because of the proliferation of systems, and that is one of the areas where we will have three levels, and each one builds on the other so that we put it as the potential adversary evolves so do we evolve.

You mentioned mine warfare briefly. We recognize that the LCS module for the mine warfare is a key component and we have to get it out there. We have to get it out there because we have to get the man or the woman out of the minefield. Right now the way we deal with it is the individual has to go into the minefield in order to clear it. We've recognized that.

One of the key components of that program for the LCS is that we get that individual out of the minefield. If we don't, then we are going to have to look at the current capability we have, which is in programs like the Avenger class, which keeps a man in the minefield. Then we recognize we'll have to extend that program. We do not want to do that. We want to get the LCS modules out there.

Indications are now that we are going to get that module out there on time. So we believe we have a way ahead and that we will address the issue, as you put it.

Senator REED. Just for the record, Secretary Stackley, on time?

Mr. STACKLEY. Yes, sir. Let me add on to what Admiral Blake said. The mine countermeasures (MCM) mission package actually gets delivered in phases. So we have a four-phased approach. It's incremental capability, and so the first increment initial operational capability (IOC) is in 2013. The key pieces we have there, we have the remote mine-hunting system (RMS), which has gone through Nunn-McCurdy and has been rebaselined, restructured to improve its reliability, but all the other performance parameters have been met for the RMS.

The other elements are: a sensor system, where we have a sensor system today that's operated off of an aircraft, that provides orders of magnitude greater capability than what the current MCM fleet provides. What we're working on is we fall short of the key performance parameters (KPP) by about 5 percent. So we have a system that's order of magnitude more capable, doesn't meet the full

KPP. So we're looking at, okay, let's test it with what we have, let's field it with what we have, and let's figure out is it worth the added investment to get the other 5 percent.

So the first increment, right now we're still holding to a 2013 date. Then the subsequent increments provide added capability. As I described, the first increment will provide a capability equivalent to your MCM fleet. The added capability, what it will do is increase your sweep rates. so basically you can cover a greater area over less amount of time, and also allow us to retire the MH-53, the airborne mine countermeasure program that we have today.

So many piece parts that have to be integrated together. One of the things that we've done there is we've taken the piece parts and put them all inside of one program executive officer for a LCS. So we're bringing the mission packages, the ship, the test and evaluation team, and the in-service team all together in one organization, and we have to ensure it's robustly funded.

The history of these systems is when these ships were struggling the funding was cut on the mission package side. Now we have the ships up in production, we have this lag that we have to overcome on the development side, and we're focused on that because it is a priority.

Senator REED. Thank you.

Senator WICKER.

Senator WICKER. Secretary Stackley, the decision to cancel the EFV, how close of a call was that?

Mr. STACKLEY. Sir, to be honest, I wasn't part of that decision.

Senator WICKER. Okay, that's a fair answer.

If we had proceeded on with the EFV, when would the first vehicles have been available for our troops?

Mr. STACKLEY. In 2016. We had about another year, this year plus a year in terms of development, and then we go through the operational testing, to lead to IOC. The full operational capability would be about a decade later.

Senator WICKER. So what is the answer?

Mr. STACKLEY. It would have been 2016 for the IOC.

Senator WICKER. Available for the troops.

General FLYNN. Sir, to make that clear, in 2016 we would have had one set for a battalion, but it would have taken us to 2026 to buy the whole 570-some odd vehicles.

Senator WICKER. Okay. Best guess, if we instead moved to the ACV concept, when will they be available for the troops?

Mr. STACKLEY. Let me describe that. I talked about the three different capabilities that we're looking at between the MPC, the AAV SLEP, and the ACV.

Senator WICKER. Right.

Mr. STACKLEY. We're looking at tradeoffs between those three capabilities. So for example, what we'd like to do is move forward on a technology demonstrator for the ACV, about a 2-year effort, to take a vehicle and demonstrate its capability, and see if we can go from there into the completion of development, where you'd have that same IOC that was 2016 for an EFV, could be in the 2017, 2018 timeframe.

So you're really in the same ballpark in terms of time that we had with the EFV program, and what we would do is as we look

at this, do we want to go forward with the MPC as a stand-alone program, that would slide left or slide right depending on what we decided on the ACV.

Senator WICKER. The prime contractor of the EFV very vigorously disagrees with the decision of DOD, and they have an estimate saying let's finish what we've started with 200. They estimate that doing so would cost \$4.6 billion, and that would be less than the combined cost of termination and replacement, which all told would be \$6.1 billion. What do you say to that?

General FLYNN. Sir, first of all, 200 vehicles doesn't meet the requirement. Two hundred vehicles does not give us the capability to do a two-brigade operation. It falls short in the number of vehicles.

The other part is the O&M cost of those vehicles. It's not just the procurement cost of the vehicles; it's also the O&M cost of the individual vehicles, which was another reason why the decision was made to cancel the program.

Then we'd also have the challenge of having to have a mixed vehicle fleet with different capabilities. So 200 vehicles does not meet the requirement and it gives us a mixed vehicle fleet.

Senator WICKER. You might have that under this three-pronged approach.

General FLYNN. No, sir. The three-pronged approach, the AAV SLEP would have been designed to give us the time. Even if we were fielding the EFV, we would have had to have invested in extending the life of the AAV because of the time limit that it would take us to go from IOC in 2016 to full operational capability in 2026. So we would have to do an AAV SLEP along the way to bridge the gap.

Senator WICKER. So there's not much difference, in your judgment, in the cost of the AAV SLEP based on the termination of the EFV? You would have had to do that in either scenario.

General FLYNN. We would have had to have done some type of SLEP in survivability, mobility, and communications to get the vehicle mix, because we would have only been purchasing 50 vehicles a year.

Senator WICKER. Gentlemen, I'm learning a lot today, and I guess that's the point of these hearings. It occurs to me that we really don't know how much we're going to save because of this decision to cancel the EFV because we don't know what we're going to replace it with.

I think, General, your testimony is that of the three-pronged approach to where we go from here, we're not sure which ones we're going to do; is that correct?

General FLYNN. That would be correct, sir. I'm not ready to tell you what the specific vehicle mix would be until I got a better idea of the cost-capability trades that we could get and the capabilities of each of those individual programs.

Senator WICKER. Mr. Secretary, what's your most informed estimate for this subcommittee of how much we're saving because of the cancellation of the EFV program?

Mr. STACKLEY. Yes, sir. We're going to do these all in constant year dollars. Today the estimate for the EFV at 573—not 200, at 573—is north of \$17 million. It's approaching \$18 million per vehicle. Now, we're going to put requirements on the table and do some

trades to get to a more affordable vehicle. You're not going to get the same capability at any significant cost reduction. So we have to trade off capability.

Senator WICKER. Yes, we're going to get a slower vehicle and a less capable vehicle for sure.

Mr. STACKLEY. Yes, sir. What we're going to do is, as General Flynn described, get requirements and acquisition in the room at the same time, open up, unlock the requirements, and price out a more affordable vehicle, where you take those KPPs on things like speed, range, level of protection, and number of marines that you're carrying, and instead of saying it will be the following, we create a range. So there's a range of speed, for example, that we're going to put on the table and that will influence everything from the size of the engine to endurance and things of that nature.

So in doing that, we've gone one time through in terms of just a rough idea to figure out no-less-than values, what would it cost. While we are talking about an \$8 to \$10 million vehicle, the first cut going around is more like a \$10 to \$12 million vehicle. So there's that. Today if you asked me a best-informed estimate, I would tell you that we're going to be going from an \$18 million vehicle to a \$2 million vehicle based on what we know today, but we're very, very early in the process with the focus on figuring out, okay, how do we get that cost down further.

But we're going to trade off capability to do that. We're going to trade off speed, and we're looking at things like a mix of ACV vessels, for example, where they don't all have to have the same level of capability when it comes to things like command and control, communications package, or maybe even lethality when you get to the gun system that's embarked on board.

General FLYNN. Senator, one area where we've learned a lot is in the area of protection. So there is an opportunity right now to take advantage of everything we've learned on protection in the next hull design, because if we have three big areas that we're looking at right now as to how to make this affordable in terms of capability, obviously it's performance over the whole mission set, not just the ship-to-shore transit, which is water speed, but also the performance on land and the protection that's needed.

By some of the other discussions we've had today, hull design could change significantly in this, and that's why it's important that we pursue a technology demonstrator to see if that protection's going to be different, because that's one thing that's changed a lot over the last 10 years, is our approach to protection and the different technologies available to do it.

The third factor that we have to look at is habitability, which also affects how the marines do in the back of the vehicle. That's one of the reasons as the program cancellation is proceeding one of the key things we're going to do with the technology demonstrators or the system demonstrator vehicles this summer is we're going to do some habitability experimentation to see how the marines embarked on the vehicles do in different lengths of time in the back of the vehicle. Air quality, air temperature, all of that affects your ability to fight when you get out of the vehicle.

So we're going to take a look at that, and that's going to inform some of these tradeoffs that we're going to have to make, so that

we can get from an \$18 million vehicle somewhere down to a \$10 to \$12 million vehicle.

The other point about the 200 vehicles, sir, is the cost would have grown from \$18 million to well over \$20 million a vehicle. That was one of the other reasons why we didn't think that was affordable.

Senator WICKER. You heard Secretary Stackley's answer to my question about whether this was a close call. He said he was not really involved at that level. How close of a call was it in your estimation?

General FLYNN. Sir, I don't know how close of a call it was, but I would tell you it was difficult. All these decisions are difficult. It was a difficult decision because we realized how much we had invested in the program. But there was also a realism that, could this be affordable. The graphs that we have here, we were facing a pretty stark budget reality. So the reality was when you look at where we were on budget, whether we could afford the capability, and what had changed over time in terms of threat, and in terms of the Navy's ability to do it.

Although it was a difficult decision, I believe it was the right decision to do it, sir.

Senator WICKER. If it turns out it was a \$15 million vehicle instead of \$12 million vehicle, it becomes a dicier choice, doesn't it? That's not outside the realm of possibility.

Mr. STACKLEY. It's not outside the realm of possibility, but I don't see us heading on that course. Affordability is going to be a heavy factor in determining the design of the ACV. So if we find ourselves ending up in the \$15 million per vehicle range, we're going back into the requirements to figure out how do we get that cost back down so we can get the quantity that's needed to perform the mission.

But today we don't have information that is looking at a \$15 million a copy vehicle.

Senator WICKER. Thank you, Mr. Chairman. This has been most informative and it does occur to me that we're well served by these gentlemen in front of us.

Mr. STACKLEY. Can I take one more piece on? This discussion today, this is beyond just a hearing and beyond just a briefing. What we're serious about is doing this work as transparently as possible. We set up a war room just for having discussion across the table, sometimes government to government, and potentially down the road with industry. But this story is going to continue to unfold with time and we intend to make ourselves available as your questions continue. I know it's been a hard spot in the past and we want to get to a better place in that regard.

Senator REED. Let me associate myself with the thoughtful comment of my colleague that this was a very productive hearing, as a result of your questions particularly.

I want to thank you, gentlemen, not only for your testimony, but for your service. Also, there may be other colleagues that have written questions which will be submitted, and I would ask everyone to get those questions in, let's say before next Wednesday for your prompt response. I know you're taking one for the record for Senator Hagan already.

Mr. STACKLEY. Yes, sir.

Senator REED. Gentlemen, thank you very much for your service and for your testimony.

With that, the hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

NAVAL SURFACE FIRE SUPPORT REQUIREMENTS

1. Senator REED. Vice Admiral Blake and General Flynn, in my opening statement I mentioned the long-term efforts to address some very important problems, including the need to improve fire support capability, both organic Marine Corps fire support and Navy shore fire support. I also referred to the mixed results we have achieved to date addressing that problem. Please describe what your efforts have achieved to date in improving fire support capability for sustaining Marine Corps forces in a conflict.

Admiral BLAKE. In 2005, the “Joint Fires in Support of Expeditionary Operations in the Littorals” Initial Capabilities Document (ICD) documented four gaps in our fires capabilities:

- (1) The ability to transmit/receive targeting information from Intelligence, Surveillance and Reconnaissance (ISR) sources to Command and Control systems assets;
- (2) The ability to engage moving targets in adverse weather;
- (3) The ability to engage known targets when friendly forces are in close contact or when collateral damage is a concern; and
- (4) The ability to provide volume fires to suppress targets.

For Gap (1), the Navy-Marine Corps team focused on three areas: Unmanned Air Systems (UAS), Target Processing Systems, and Counter-fire Radar. Unmanned air systems provide expanding warfighting options and are frequently employed in conjunction with ground spotters to improve targeting. For target processing systems, the Naval Fire Control System (NFCS) automates shipboard naval fires planning and coordination for DDG-81 and following hulls (currently fielded). The Supporting Arms Coordination Center-Automated (SACC-A), integrates the capability to plan and coordinate supporting arms fires on LHA/LHDs (currently fielded). The Distributed Common Ground Station-Navy (DCGS-N) will employ common geopositioning services capable of deriving aim points for precision coordinate seeking weapons (Initial Operational Capability (IOC) planned for 2011). POM 12 investments to address Gap (1) include: Intelligence Carry-on Program (ICOP) and Multi-Function Radar (MFR). ICOP will provide critical ISR capabilities to unit level platforms and forces ashore (IOC planned for 2015). MFR will provide a sea-based counter-fire capability to the DDG-1000 (IOC planned for 2016).

Gaps (2) and (3) are addressed by a number of systems including tactical aircraft (TACAIR) delivering weaponry specific to the threat. Over the last 20 years, Navy-Marine Corps aviation has significantly increased its target prosecution capability through use of improved aircraft-to-weapon connectivity that enables in-flight target updates to data link equipped weapons. Today a single aircraft can attack multiple targets. Additionally, there are a number of currently, or soon to be, fielded weapons that are critical to “mitigating” these gaps including:

- Tactical Tomahawk (currently fielded)
- Low Collateral Damage Bomb (currently fielded)
- Joint Stand Off Weapon (currently fielded)
- Direct Attack Moving Target Capability (IOC planned for 2011).
- Advanced Precision Kill Weapon System (IOC planned for 2011)
- Harvest Hawk Airborne Weapon Mission Kit (currently fielded)

POM 12 investments to address Gaps (2 & 3) include: The Joint Air-to-Ground Missile (JAGM) and Small Diameter Bomb (SDB) Increment II. Both improve our ability to deliver precision fires and address moving targets in adverse weather (IOC planned for 2016).

To address Gap (4), the ability to mass aircraft, missiles, and NSFS can under most scenarios provide volume fires when needed. There are over one hundred 5” guns in the CG/DDG fleet today, all with a 13nm range and most of which have a fire control system that has much improved accuracy over previous systems. Additionally, the TACAIR leg of our “Fires Triad” (TACAIR, sea-based fires, ground-based fires) provides a significant improvement in the volume of fires as compared to past generations of aircraft and munitions. POM 12 investments to address Gap

(4) include: DDG-1000's Advanced Gun System (AGS) with its Long Range Land Attack Projectile (LRLAP), and Electro-Magnetic Rail Gun (EMRG). LRLAP will have the capability to deliver precision and volume fires (IOC planned for 2016). In future years, EMRG may offer a system that could launch projectiles at ranges over 100nm. The Office of Naval Research's EMRG Innovative Naval Prototype (INP) effort is underway and the system could IOC in the 2025 timeframe.

General FLYNN. The character of future operations in the littorals has been professed in several key Marine Corps and Naval documents, to include Operational Maneuver From The Sea and Ship-to-Objective Maneuver (STOM). These future visions call for an increased capability with regard to fire support, especially during the critical transition of combat power ashore. We have made great strides in improving the aviation and ground-based fires but much work still is needed with naval surface fires. The STOM concept of operations identifies the need for fires throughout the littoral battlespace in order to support both the vertical and surface assault elements of the amphibious force. Effective fire support is provided by a combination of tactical aviation, naval surface fires, and ground-based indirect fires. This triad will ensure that the supported commander has fires available when and where he needs them. The complementary nature of the triad is essential.

DoN/USMC Aviation are investing in two weapon systems for air-to-ground employment that will help mitigate fire support gaps.

1. The JAGM will be the replacement air-to-ground missile for current Hellfire, TOW, and Maverick missile systems. It has a tri-mode seeker (millimeter wave (MMW), Semi-active Laser (SAL), and Imaging Infrared (IIR)) and is an all-weather, forward-firing, low collateral damage weapon for both moving and stationary targets. IOC for use on AH-1Z aircraft is 2016.
2. The SDB II is the second iteration (first for USMC/DoN) of the miniature munition weapon system family. It uses a tri-mode seeker (mmW, SAL, IIR) and will provide the F-35B increased standoff against defended targets. It is a 250 lb. weapon, that will give the JSF the advantage of increased kills per sortie compared to current families of 500, 1000, and 2000 lb weapons. It has day and night capability against fixed and moving targets in all weather conditions. IOC for use on F-35B is 2018.

The Marine Corps has made considerable investments in fire support programs over the last two decades resulting in significant improvements in organic, ground-based fires support. The principal programs are:

1. High-Mobility Artillery Rocket System
2. M777A2 Light Weight 155mm Howitzer
3. Expeditionary Fire Support System includes weapon system and development of Precision Extended Range Munitions
4. Improved 81mm and 60mm mortars
5. Family of Artillery Munitions (Dual-Purpose Improved Conventional Munition replacement and munitions modernization)
6. Rocket Assisted Projectile replacement
7. Infrared 155mm Illumination
8. BiSpectral Smoke
9. Non-incendiary smoke
10. Advanced Field Artillery Tactical Data System

2. Senator REED. Vice Admiral Blake and Lieutenant General Flynn, what plans are represented in the budget and the Future Years Defense Program (FYDP) to address this problem?

Admiral BLAKE. In 2005, the "Joint Fires in Support of Expeditionary Operations in the Littorals" ICD documented four gaps in our fires capabilities:

- (1) The ability to transmit/receive targeting information from ISR sources to Command and Control systems assets;
- (2) The ability to engage moving targets in adverse weather;
- (3) The ability to engage known targets when friendly forces are in close contact or when collateral damage is a concern; and
- (4) The ability to provide volume fires to suppress targets.

For Gap (1), the Navy-Marine Corps team focused on three areas: Unmanned Air Systems (UAS), Target Processing Systems, and Counter-fire Radar. Unmanned air systems provide expanding warfighting options and are frequently employed in conjunction with ground spotters to improve targeting. For target processing systems, the NFCS automates shipboard naval fires planning and coordination for DDG 81 and following hulls (currently fielded). The SACC-A, integrates the capability to plan and coordinate supporting arms fires on LHA/LHDs (currently fielded). The DCGS-N will employ common geopositioning services capable of deriving aim points

for precision coordinate seeking weapons (Initial Operational Capability (IOC) planned for 2011). POM 12 investments to address Gap (1) include: ICOP and MFR. ICOP will provide critical ISR capabilities to unit level platforms and forces ashore (IOC planned for 2015). MFR will provide a sea-based counter-fire capability to the DDG-1000 (IOC planned for 2016).

Gaps (2) and (3) are addressed by a number of systems including TACAIR delivering weaponry specific to the threat. Over the last 20 years, Navy-Marine Corps aviation has significantly increased its target prosecution capability through investment in precision munitions with advanced guidance capabilities and data linked weapons, both of which contribute to the ability of TACAIR assets to prosecute targets in challenging weather conditions and in close proximity to friendly forces. Additionally, there are a number of currently, or soon to be, fielded weapons that are critical to “mitigating” these gaps including:

- Low Collateral Damage Bomb (currently fielded)
- Joint Stand Off Weapon (currently fielded)
- Direct Attack Moving Target Capability (IOC planned for 2011).
- Advanced Precision Kill Weapons System (IOC Planned for late fiscal year 2011)
- Harvest Hawk Airborne Weapons Mission Kit (Initial kits fielded)

POM 12 investments to address Gaps (2 & 3) include: The JAGM and SDB Increment II. Both improve our ability to deliver precision fires and address moving targets in adverse weather (IOC planned for 2016).

To address Gap (4), the ability to mass aircraft, missiles, and NSFS can under most scenarios provide volume fires when needed. There are over 100 5” guns in the CG/DDG fleet today, all with a 13nm range and most of which have a fire control system that has much improved accuracy over previous systems. Additionally, the TACAIR leg of our “Fires Triad” (TACAIR, sea-based fires, ground-based fires) provides a significant improvement in the volume of fires as compared to past generations of aircraft and munitions. POM 12 investments to address Gap (4) include: DDG-1000’s AGS with its LRLAP, and EMRG. LRLAP will have the capability to deliver precision and volume fires (IOC planned for 2016). In future years, EMRG may offer a system that could launch projectiles at ranges over 100nm. The Office of Naval Research’s EMRG INP effort is underway and the system could IOC in the 2025 timeframe.

General FLYNN. The Marine Corps does not plan or budget for NSFS capabilities. The DDG-1000 is the Navy’s only funded Program of Record for NSFS.

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#### QUESTIONS SUBMITTED BY SENATOR ROGER F. WICKER

##### EXPEDITIONARY FIGHTING VEHICLE

3. Senator WICKER. Secretary Stackley, the Expeditionary Fighting Vehicle (EFV) program went through a Nunn-McCurdy breach and recertification in 2007 during which the Department of Defense (DOD) certified to Congress that requirements for an amphibious assault capability were still operationally necessary and that the most cost-effective means to achieve that capability was the EFV. Not much has changed in terms of the need for the Marine Corps to have the capability to carry out an amphibious assault. If anything, the area denial capabilities of our adversaries that would oppose Navy-Marine Corps amphibious operations have increased. What leads DOD and the Navy to believe that lesser requirements for a vehicle like the EFV are adequate to accomplish the amphibious assault mission?

Secretary STACKLEY. Based on the assessment conducted in support of Nunn-McCurdy certification requirements, the Vice Chairman of the Joint Chiefs of Staff validated that “The Amphibious Joint Forcible Entry Operations capabilities defined by the EFV Capabilities Production Document remain essential to national security.” The most essential of those capabilities were:

- the ability to self-deploy from over-the-horizon, thus reducing the reliance on surface connectors whose limit of advance was the beach or a port;
- the ability to carry a reinforced squad of marines in a single lift to facilitate the rapid buildup and projection of combat power;
- the inherent protection against most likely threats encountered during the early phases of projection ashore (ballistic threats from enemy combatant direct-fire weapons).

While the tactical advantages of at-sea speed capability provided by the EFV were not dismissed, the principal driving factor leading to the EFV’s water speed requirement was the assumption that Marines would not be combat ready after spending more than a hour in the vehicle at sea—a legacy of the current amphibious assault

vehicle (AAV). Testing conducted during the EFV's development indicated that improvements in habitability (air conditioning and improved vehicle exhaust) may permitted Marines to ride in the vehicle longer without suffering ill effects associated with the legacy AAV. Confirmation testing is currently planned to occur in the Aug/Sept timeframe. At-sea speed requirements were a significant system complexity and cost driver. With information gained from EFV testing, we are reevaluating at-sea speed requirement.

Our requirement remains to be able to deploy from amphibious shipping from over-the-visual-horizon but at ranges less than 25 nm. The Navy has supported campaign analysis and a war game, examining scenarios requiring power projection from the sea using the EFV as well as the legacy AAV and our current and projected suite of air assault connectors. The analysis used official threat assessments and modeled battlespace preparation in order to define threats to landings. The analysis assessed concurrent and separate landings from 25 nm with one force using EFV and another force using AAVs delivered by Landing Craft Air Cushion (LCAC). The analysis did not specifically compare EFV and AAV, in that the forces landed were in different locations and facing different opposition. While both missions were accomplished, suggesting that the EFV may not be required, higher risk was incurred using the LCAC/AAV as a result of a slower build-up of combat power ashore.

Using fielded and planned capabilities to conduct pre-assault battlespace preparation, the Navy assessed that U.S. weapons and sensors will allow amphibious ships to operate at 12 nm from the coast with acceptable risk against any residual threats. In March 2010, the Office of Program Appraisal "Assuring Operational Access" Wargame conducted three separate and distinct excursions using the then Program of Record (EFV), the current capability set (AAV) and alternative capabilities (Marine Expeditionary Maneuver Vehicle (MEMV) (notional), and Ultra Heavy-lift Amphibious Connector (UHAC) (experimental)). The results indicated that each option with its CONOPs has slightly different risks, but similar successful outcomes.

As part of our ongoing systems engineering analysis and in the analysis of alternatives to be conducted in support of the EFV's replacement, we intend to evaluate the costs and operational effectiveness of high vs. lower water speeds as well as distance requirements.

4. Senator WICKER. Secretary Stackley, do the Navy and the Marine Corps stand behind the requirement to conduct amphibious operations against a defended shoreline, or can requirements and costs be reduced to support landings in only uncontested areas? In other words, is the amphibious assault mission still relevant for the future?

Secretary STACKLEY. Yes, the amphibious assault mission is relevant now and in the future, as it has been throughout recorded history.

An amphibious assault, as defined by the Department of Defense, "involves establishing a force on a hostile or potentially hostile shore." As that definition implies, an amphibious assault is not necessarily against a defended shoreline. In fact, Marine Corps maneuver warfare doctrine specifically espouses avoiding fixed defenses if at all possible. This doctrine reflects both common sense and operational experience. In 1943 General A.A. Vandegrift, who was awarded the Medal of Honor for his command of the 1st Marine Division at Guadalcanal, summarized his experience in the Solomon Islands campaign. "A comparison of the several landings" he said, "leads to the inescapable conclusion that landings should not be attempted in the face of organized resistance if, by any combination of march or maneuver, it is possible to land unopposed within striking distance of the objective." That is exactly what the Marine Corps is advocating in the ship-to-objective maneuver concept.

What General Vandegrift clearly understood was that in war the enemy gets a vote. While it is always preferable to avoid a contested landing, that option is not always available. Thus, when conducting amphibious operations in a hostile or uncertain environment, the Navy-Marine Corps team must do so from a ready-to-fight posture.

We are in an era of great uncertainty. The Secretary of Defense himself has acknowledged that the United States has been ineffective at predicting the next conflict. In order to protect U.S. citizens and interests overseas when crises erupt, we must maintain our capability to project power—and that includes projecting power in the face of armed opposition. Amphibious power is the only sustainable means of doing so.

5. Senator WICKER. Secretary Stackley, fundamentally, what has changed since the Nunn-McCurdy certification in 2007 that favored continuing the EFV as the most cost-effective way to meet the amphibious assault requirement?

Secretary STACKLEY. The requirement has not changed. As stated by the Secretary of Defense, we are firm in the requirement for a Marine Corps amphibious combat vehicle (ACV). It is the key to allowing ship-to-shore operations in permissive, uncertain, and hostile environments; assuring access where infrastructure is destroyed or nonexistent; and creating joint access in defended areas.

What has changed, however, is that since 2007 unit costs for all other vehicles have risen substantially, on the order of 300 to almost 500 percent, over their predecessors. The enhanced threat environment in Iraq and Afghanistan has pushed increased counter improvised explosive device and location requirements onto all future combat and tactical vehicles. At the same time, C4/ISR capabilities, requirements and costs have increased significantly. These fiscal pressures combined with fiscal pressure across all other investment categories have forced the Marine Corps to develop a top-to-bottom approach that affected the EFV program.

6. Senator WICKER. Secretary Stackley, when the Marine Corps provided information to Congress in January supporting the decision to end the EFV program, the case for termination was made by citing the affordability of the EFV, not whether the EFV would be reliable and capable of meeting mission requirements. The Marine Corps said that continuing with the EFV would: consume about half the Marine Corps total procurement budget for 2018–2025; consume all of the budget that was projected to be available for procurement of ground combat vehicles over that period; and consume about 90 percent of the operation and maintenance (O&M) budget for Marine Corps ground vehicles when the EFV was fully fielded. These cost projections were made against historical cost averages. The affordability concerns raised by the Marine Corps are significant, but should we allow comparisons to historical costs drive an assessment of what is required to do the mission?

Secretary STACKLEY. The Marine Corps provides the Nation with a comprehensive capability that is neither defined by nor limited by a single vehicle platform. In order to maintain that capability and to improve it to meet future challenges and threats, we must consider affordability. In the case of EFV as with all of our other programs, the Marine Corps did not measure costs of future systems strictly against those of legacy systems.

Over the next two decades the Marine Corps will replace or upgrade a large portion of the ground combat and tactical vehicle inventory. The Corps assessed the affordability of EFV along with other key elements of its ground combat and tactical vehicles against several affordability metrics, one of which was based on historical vehicle investments projected into the future. EFV was unaffordable by every metric but it is just as important to note that even without EFV, the potential required investment in vehicle modernization and sustainment is also unaffordable when measured against the same metrics which means that our fiscal trade-space within the vehicle portfolio is very limited, even for a capability as important as that provided by an ACV.

7. Senator WICKER. Secretary Stackley, since almost all new procurement programs are more technically sophisticated than the equipment they replace, is the historical cost of legacy programs relevant to the requirements needed to execute the mission today?

Secretary STACKLEY. The Marine Corps assessed the affordability of EFV along with other key elements of its ground combat and tactical vehicles against several affordability metrics, one of which was based on historical vehicle investments projected into the future. EFV was unaffordable by every metric, but it is just as important to note that even without EFV the potential required investment in vehicle modernization and sustainment is also unaffordable when measured against the same metrics. This effectively means that our fiscal trade-space within the vehicle portfolio is very limited, even for a capability as important as that provided by an ACV.

Over the next two decades the Marine Corps will replace or upgrade a large portion of the ground combat and tactical vehicle inventory. Unit costs for new vehicles have risen substantially, on the order of 300 to almost 500 percent, over their predecessors. At the same time the Marine Corps is facing increasing fiscal pressure across all investment categories.

Previously we have stated that procurement and sustainment of 573 EFVs would have:

- consumed on average 49 percent of the Marine Corps total procurement account during the years 2018–2025 (Based on historical average procurement);
- consumed more than 100 percent of what is projected to be available for all procurement of ground vehicles during the years 2018–25;

- consumed more than 90 percent of the Marine Corps' vehicle-related operations and maintenance account when fully fielded.

Our supporting analysis was based on the fact that in recent history the Marine Corps has committed about a third of its baseline ground procurement budget to ground vehicle programs. Examining the Marine Corps budget historically from fiscal year 1982–2015, and projecting forward based on historical averages, we project a total future vehicle procurement budget of \$5.9 billion (\$TY) during the fiscal year 2018–2025 timeframe, which is a third of the total ground procurement budget projection of \$17.7 billion (TY\$). The programmed vehicle procurement cost for EFV during the same timeframe was \$8.6 billion PMC, which equates to 49 percent of the projected total procurement budget and 146 percent of our projected vehicle procurement budget.

Our supporting analysis also projected available ground equipment O&M funding against the O&M requirements for ground vehicles. Since Marine Corps O&M funding is a large account, this analysis focused only on baseline O&M dollars that supported:

- organizational, intermediate, and depot level maintenance;
- acquisition and program support costs to include life-cycle management and logistics and technical support;
- sustainment programs associated with current equipment sets, such as funding for secondary repairables and corrosion prevention.

To determine O&M costs and affordability for the EFV, the annual O&M would be about 6 percent of the average unit cost of the vehicle, based on the program manager's estimate (analogous to other vehicles). By fiscal year 2027, when the EFV was to be fully fielded, we projected that the annual O&M cost for the EFV program would be about \$750 million, or about 97 percent of the USMC O&M budget allocated to vehicles. While this projection is very coarse, based on historical vehicle O&M costs, and the Department would aggressively attack these costs had we pursued procurement of the EFV; without question, the complexity of this vehicle would have significantly impacted all other Marine Corps O&M accounts.

8. Senator WICKER. Secretary Stackley, what sort of methodology or analysis of the operational requirements went into making the decision to end the EFV other than concern about its cost?

Secretary STACKLEY. The Marine Corps assessed multiple options to reduce EFV program costs balanced against operational (capability, readiness, strategic depth and training) risk including:

- Reduced procurement. We looked at various reductions ranging from 37–48 percent of the Approved Acquisition Objective (AAO) of 573 vehicles. Each AAO reduction assessed increased our operational risk. Each reduction option decreased or removed EFV from the operating forces, the Reserve component, the training support establishment, prepositioned equipment, and the Depot Maintenance allowance.
- Capability Modifications. 16 modifications were identified and considered; however, only 2 carried acceptable operational risk.
- Compressed procurement cycle. This would have required an additional \$1.4 billion within the FYDP.
- Sustainment of current AAV in current configuration.

#### CONCEPT OF SHIP-TO-SHORE MANEUVER

9. Senator WICKER. Vice Admiral Blake, the concept of ship-to-shore maneuver supporting the EFV considered anti-ship threats from land-based mobile cruise missiles, air-to-surface weapons, and mines sufficiently serious that amphibious assaults were planned to be launched from over-the-horizon to minimize the chances of loss or damage to Navy ships. In the years since the EFV program was started in 1996, anti-ship ballistic missile capabilities have been added as a potential threat to large Navy ships, including the large-deck amphibious ships, and the sophistication of the other threats has increased. What has changed about the Navy-Marine Corps concept of ship-to-shore maneuver that makes the Navy more willing to bring marines closer to shore to launch the assault phase?

Admiral BLAKE. In the 20 years since the EFV Cost and Operational Effectiveness Analysis, the threat in the littorals has indeed evolved in new and challenging ways. These changes are characterized by the proliferation of anti-ship cruise missiles, guided rockets, artillery, mortar and missiles, advanced diesel submarines and

mines. The threat has also changed with the emergence and evolution of coordinated small boat tactics and “anti-access” doctrine.

The Navy’s area and self defense capabilities have also evolved to pace this threat. Key to countering the threat is improved ISR capabilities, and the ability to share a common operational picture. The proliferation of Aegis combatants, the evolution of AN/SPY-1 radars and the ongoing fielding of the Cooperative Engagement Capability (CEC) in those combatants represents a significant enhancement in both area and self defense capabilities. Additionally, the Naval Integrated Fire Control-Counter Air (NIFC-CA) Project Office was established to ensure that the Navy and Joint component programs of record (Aegis modernization, CEC, Standard Missile-6, and E-2D) are aligned from a systems engineering, integration, and test perspective. NIFC-CA expands on the CEC sensor netting capability to provide Engage on Remote Over-The-Horizon air defense capability to engage threats at the maximum kinematic range of the missile. For a significant amphibious operation involving a high threat environment, there will also be significant shaping operations that occur to reduce risks associated with the threat prior to commencing amphibious operations.

Amphibious ships have also improved and will continue to improve self defense systems. Lower radar cross section (RCS), and the Rolling Airframe Missile improve survivability. New gun systems including the Mk 38 MOD 2 25mm gun, the Close In Weapons System) Block 1B with anti-surface capability has been mounted on LHD and LSD Class ships, and the LPD-17 employs the highly capable and extremely lethal Mk 46 30mm gun.

Enhanced naval capabilities are also being fielded to address the submarine threat. An improved Anti-Submarine Warfare (ASW) combat system suite as well as advanced versions of existing torpedoes greatly enhance our capability to detect, track, and engage submarines operating in the littorals.

The mine threat remains a challenge, but systems such as Littoral Combat Ship with Mine Countermeasures Mission Module are being developed to help counter this threat from deep water through the surf zone.

A viable standoff range will provide sufficient reaction time to counter the expected threat with a reasonable amount of risk. Acceptable operational risk is determined by considering the mission, the nature of the threats that can potentially oppose that mission, and the capabilities of friendly forces to counter those threats. The final decision to conduct amphibious operations is based on mission requirements and risk, regardless of standoff range.

10. Senator WICKER. Vice Admiral Blake, if a 25 knot water speed is no longer required to launch from about 25 miles from the shore, what range of speed and distance from shore are being considered for the EFV’s replacement?

Admiral BLAKE. Projected speed of the EFV replacement, the ACV, is currently 8–10 knots. The speed of the amphibious vehicle, the distance traveled, along with temperature, sea-state, and cabin atmosphere have a direct impact on a marine’s combat effectiveness once ashore. Past studies have indicated that an individual combat effectiveness diminishes after an hour of transit of time. In order to ensure optimal combat effectiveness, stay-time for the marine within the vehicle is targeted at one hour or less. Launch distance therefore is a function of the speed of the vehicle and the other factors listed above.

The Marine Corps continues to evaluate these requirements, and will do Human Affects Testing (HAT) to determine transit time versus combat effectiveness, a key factor in the determination of speed and distance to shore.

The Navy is working to support the Marine Corps in the development of the requirements for the ACV and its associated doctrine. Further detail with regard to ACV requirements would be more appropriately addressed by the Deputy Commandant Combat Development and Integration & Commanding General, Marine Corps Combat Development Command.

11. Senator WICKER. Vice Admiral Blake, what drives the speed and distance requirement in terms of how long marines can stay in an amphibious vehicle and be effective when they reach shore?

Admiral BLAKE. The intent of the requirement is to deliver combat ready marines ashore regardless of the distance traveled. The speed of the amphibious vehicle and the distance it travels will yield a direct relationship to the amount of time that a marine spends inside the vehicle. In addition to the time spent in the vehicle, there are several other factors known to affect human performance, including: temperature, sea-state, and cabin atmosphere. The Marine Corps will be conducting testing to further refine our understanding of human physiology as it relates to sustained travel aboard amphibious vehicles.

The Navy is working to support the Marine Corps in the development of the requirements for the ACV and its associated doctrine. Further detail with regard to ACV requirements would be more appropriately addressed by the Deputy Commandant Combat Development and Integration and Commanding General, Marine Corps Combat Development Command.

12. Senator WICKER. Vice Admiral Blake, can this be improved?

Admiral BLAKE. The Marine Corps will be conducting studies in August 2011 to determine the relationship between time spent in the amphibious vehicle and combat effectiveness and identify potential improvements.

The Navy is working to support the Marine Corps in the development of the requirements for the ACV and its associated doctrine. Further detail with regard to ACV requirements would be more appropriately addressed by the Deputy Commandant Combat Development and Integration and Commanding General, Marine Corps Combat Development Command.

#### MARINE CORPS RESPONSE TO THE EXPEDITIONARY FIGHTING VEHICLE TERMINATION

13. Senator WICKER. Lieutenant General Flynn, the Marine Corps proposes responding to the EFV termination through a three-phased acquisition policy. It will upgrade a portion of the legacy AAV inventory through a Service Life Extension Program (SLEP) that will extend their life and add capability. It will accelerate the Marine Personnel Carrier (MPC) program designed to complement the EFV, AAV, or the replacement for the EFV known as ACV. The MPC would not be designed to swim ashore, but would be a fighting vehicle on land. Design requirements are being developed. It will also develop the new ACV building on the lessons learned from the EFV. The wind up of the EFV is focused on harvesting relevant technology from the EFV program to transfer to the new ACV. How many of the legacy AAVs now in service will undergo a SLEP?

General FLYNN. We estimate that approximately 400 of our legacy AAV will be required to undergo SLEP in order to the required operational availability of vehicles as a bridge until we field the ACV.

14. Senator WICKER. Lieutenant General Flynn, what capabilities will be added to the AAV?

General FLYNN. The initial priority is to make survivability and force protection improvements while restoring land and water performance lost through previous survivability improvements. This will likely require modifications and improvements to power-train and suspension components to mitigate the effects of weight growth and component obsolescence.

15. Senator WICKER. Lieutenant General Flynn, how old are the AAVs and how much additional life will the SLEP provide?

General FLYNN. Today's AAV are built upon the LVT-7 family of vehicles which began fielding in 1971. Over the past 40 years these systems have been service life extended, product improved, rebuilt to standard, upgraded and continuously maintained at all echelons. Depending on the extent of the SLEP, it may be possible to extend the service life by up to 20 years. Our current plan is limited to those survivability-related upgrades to improve the capability until we can field the ACV.

16. Senator WICKER. Lieutenant General Flynn, how much funding does the Marine Corps estimate will be required, or how much is available, for a SLEP?

General FLYNN. The funding available in PB-12 is sufficient to begin work on AAV SLEP. The detailed cost estimates necessary to determine total program costs will be developed as part of acquisition strategy. We estimate that we will need to SLEP approximately 400 of our legacy AAVs to address force protection, survivability, durability and obsolescence modifications and improvements.

17. Senator WICKER. Lieutenant General Flynn, given budget constraints, how confident is the Marine Corps that improvement of the amphibious assault capability may not be limited to a SLEP of the AAV?

General FLYNN. Development and procurement of the ACV will remain a high investment priority; however, we are assessing AAV affordability options and risks. In the absence of a modern replacement for the AAV, the limitations and risks associated with relying solely on the legacy system will be assessed and mitigated where possible.

18. Senator WICKER. Lieutenant General Flynn, in terms of the MPC, how expensive is this vehicle estimated to be in comparison to the EFV or its proposed replacement the ACV?

General FLYNN. In order to better distribute combat power for sustained operations ashore, two MPCs are required to lift the same reinforced rifle squad that is concentrated in a single EFV or single ACV. Based on responses we have received from industry, the cost to lift a reinforced rifle squad in comparison to EFV was approximately half. Given current ACV cost targets, the comparative costs to lift a reinforced rifle squad are estimated to be approximately two thirds that of the ACV's targeted cost.

19. Senator WICKER. Lieutenant General Flynn, how much money will actually be saved by cancellation of the EFV if the Marine Corps must extend the life of the AAVs, and design and build two new vehicles, the ACV and the MPC?

General FLYNN. The plan to procure MPC and to upgrade AAVs is independent of the decision to cancel EFV as the AAV upgrade was a necessary activity to bridge to EFV and MPC was a complementary capability to EFV to address overall tactical lift capacity. Both initiatives pre-dated the cancellation of the EFV program. The principal cost avoidance will be attained by developing an ACV that costs less to procure than the EFV would have. We have set a cost target of approximately \$12 million for the ACV.

20. Senator WICKER. Lieutenant General Flynn, what is the timeline for designing and building the MPC?

General FLYNN. We are working to fully develop an integrated acquisition plan in support of ACV, MPC, and AAV SLEP. Early returns in this process point to a required initial operational capability of 2018.

21. Senator WICKER. Lieutenant General Flynn, won't an improved AAV that will be in service for a long time together with the new ACV leave the Marine Corps with two different sets of amphibious vehicles and the associated higher costs of a mixed inventory?

General FLYNN. Improvements to the AAV are intended to enable the Marine Corps to sustain its amphibious capability until the ACV is fielded. As with other equipment replacement programs, the transition period between the initial fielding of a new capability and attainment of full operational capability will result in a mixed fleet of vehicles. During this transition period, the AAV inventory will be disposed as the ACV inventory increases.

22. Senator WICKER. Lieutenant General Flynn, how will the MPC get ashore if it doesn't swim as the EFV and APC would?

General FLYNN. Introduction of the MPC into theater is planned as part of a Maritime Prepositioning Force deployment. MPC is a reinforcing capability relative to the self-deploying ACV. MPC will transit to the beach or port via connectors such as the LCAC, conventional landing craft, the Improved Navy Lighterage System or via pier-side offload. The ACV will be optimized to support ship-to-objective water and land mobility as the main effort of an amphibious assault, while the MPC is optimized to provide a combat vehicle capable of protected land mobility in support of sustained operations ashore.

23. Senator WICKER. Lieutenant General Flynn, does this mean that the Marine Corps will be operating two different combat vehicles during the land phase of the amphibious assault, the ACV, and the MPC?

General FLYNN. The Marine Corps operates multiple combat and tactical vehicles including AAVs, Light Armored Reconnaissance Vehicles, and tanks as well several tactical vehicles. The role of providing tactical mobility in armored personnel carriers would have been fulfilled by a combination of the EFV and the MPC. The ACV will fulfill the role intended for the EFV and it will be complemented by the MPC to achieve the required mobility capacity.

24. Senator WICKER. Lieutenant General Flynn, won't protection from improvised explosive devices and other threats necessarily be different in the two vehicles?

General FLYNN. Yes. Each system will need to be designed to counter and mitigate the effects of the IED threat. The ACV design will be driven, in part, by its strenuous amphibious requirements which will likely mean a different survivability and force protection approach than for the MPC which will be designed for superior land mobility. However, common materials and approaches will be evaluated in order to reduce life cycle costs. ACV protection methodologies, performance and pay-

load protection trade-space assessments and capability level estimates will be a critical part of early technology demonstration and development efforts just they were for the MPC.

[Whereupon, at 4:09 p.m., the subcommittee adjourned.]



**DEPARTMENT OF DEFENSE AUTHORIZATION  
FOR APPROPRIATIONS FOR FISCAL YEAR  
2012 AND THE FUTURE YEARS DEFENSE  
PROGRAM**

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**WEDNESDAY, MAY 25, 2011**

U.S. SENATE,  
SUBCOMMITTEE ON SEAPOWER,  
COMMITTEE ON ARMED SERVICES,  
*Washington, DC.*

**NAVY SHIPBUILDING PROGRAMS**

The subcommittee met, pursuant to notice, at 2:27 p.m. in room SR-232A, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed, Blumenthal, Wicker, and Ayotte.

Majority staff member present: Creighton Greene, professional staff member.

Minority staff member present: Christopher J. Paul, professional staff member.

Staff assistants present: Jennifer R. Knowles and Brian F. Sebold.

Committee members' assistants present: Carolyn Chuhta, assistant to Senator Reed; Gordon Peterson, assistant to Senator Webb; Jeremy Bratt, assistant to Senator Blumenthal; Lenwood Landrum, assistant to Senator Sessions; Joseph Lai, assistant to Senator Wicker; and Brad Bowman, assistant to Senator Ayotte.

**OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN**

Senator REED. Let me call the hearing to order. I want to welcome our witnesses to the hearing this afternoon. We're honored to have: Sean Stackley, Assistant Secretary of the Navy, Research, Development, and Acquisition; Vice Admiral Kevin M. McCoy, Commander, Naval Sea Systems Command (NAVSEA); and Captain William J. Galinis, Supervisor of Shipbuilding (SUPSHIP) for the Gulf Coast. Thank you, gentlemen. We're grateful for your service to the Nation and certainly grateful for the service of your fellow naval personnel and marines who do so much to assure our safety and our freedom. Thank you.

The Navy continues to be faced with a number of critical issues as it tries to balance its modernization needs and procurement needs against the costs of current operations. The shipbuilding

budget remains at a level where it will be difficult at best to field the Navy we want, and indeed even the Navy that we need.

With that in mind, we need to ensure that we are getting good value for every shipbuilding dollar that we spend. We were very pleased to see the Department's decision to continue budgeting for two *Virginia*-class submarines per year. We believe that what the Navy and the contractor team have been achieving in driving down costs and reducing construction should be a model for other Navy programs.

We support the Navy's efforts to drive costs out of the *Ohio* replacement ballistic missile submarine (SSBN) program. SSBNs will remain a vital leg of the nuclear triad for the foreseeable future. Achieving cost reduction goals in these two programs will yield significant stability to our Navy's submarine industrial base and provide the Navy with a modern, capable submarine fleet for many years to come. As we have been told on numerous occasions, stability is a very important factor in achieving quality and affordability.

We now have the prospect of achieving some stability in the Littoral Combat Ship (LCS) program. Since last year, after conducting a winner-take-all competition, the Navy decided that by awarding 10 ships to each shipbuilder the Navy could save \$2.9 billion, or \$1 billion more than the program of record, and could purchase an additional LCS vessel during the same period of the Future Years Defense Program (FYDP), 20 ships rather than 19.

We understand that each builder has been making much better progress on the second ship in terms of cost, quality, and schedule. Stability in the program should permit the contractors to make further improvements.

On a somewhat less happy note, there have been lingering problems in some shipbuilding programs. The highest profile among these has been the LPD-17 program. We have had a host of problems on these ships, not the least of which has been cost growth, schedule delays, and construction problems, particularly on the earlier ships in the program.

The Navy took delivery of the first and second ships while they were still in an incomplete form and has subsequently identified numerous construction problems on the first two ships. We also know that the Navy has had problems with the later ships in the class as well. There have been welding problems, pipe hanger installation problems, lube oil contamination problems, and others.

Now, the goal here is not to single out a particular shipyard. In fact, you can look at every naval program over the last several decades and find significant problems. When I was first elected in 1991, the *Seawolf* was suffering from cost overruns, from quality control, et cetera. So our purpose is not singling out shipyards. It's really to find out systemically what we have to do to ensure that all the shipbuilding programs of the Navy are operating on budget, on time, and with high quality. That's the challenge we all face. If we understand these systemic issues, we can help the Navy deal with them, and that is our intention.

Secretary Stackley, we talked last week about the bow wave in procurement costs and bow wave of operating and support (O&S) costs facing Navy and Marine Corps ground systems. I suspect that

we could have a similar discussion today about Navy ships. Later in this decade we will need to ramp up surface ship construction to meet missile defense and fleet air defense requirements, and we'll have to begin construction of an *Ohio*-class replacement submarine. The 30-year shipbuilding plan lays out all of these programs along with the resources necessary to execute the plan.

However, in our country's current fiscal environment it is very unlikely that we will have as much money to spend on the 30-year shipbuilding plan as that plan assumes. Fundamentally that is why this hearing is so important.

We need to focus on harvesting the savings from quality improvements and efficiency improvements in the shipyards across the entire shipbuilding program without exceptions. We need to do this not only because of the direct savings, but also because we need to demonstrate to the taxpayer that we are using defense dollars wisely.

There are significant challenges and we fear they have the potential to add a great deal of instability to the Navy shipbuilding budget even in the near term. If the Navy is not able to control its acquisition program and drive our cost growth down while still getting quality ships, the Navy will not be able to afford the 313-ship fleet the Chief of Naval Operations (CNO) says he needs to meet the requirements identified by the Quadrennial Defense Review.

We look forward to hearing your testimony this afternoon on these and other issues facing the Navy.

With that, I will recognize my colleague Senator Wicker, then Senator Ayotte if she has any comments.

Senator Wicker.

#### **STATEMENT OF SENATOR ROGER F. WICKER**

Senator WICKER. Mr. Chairman, thank you very much for holding this very important hearing today.

I'd like to thank our witnesses for their attendance today as well as their selfless service to our Nation, and also thank all the attendees in the hearing room today for their interest.

I'm sure I speak for all subcommittee members when I say that our thoughts and prayers are with all our deployed sailors at sea and ashore, including those expeditionary sailors from Mississippi, our Seabees, explosive ordnance disposal teams, and riverine and maritime security forces, particularly those who are currently engaged in combat. Their hard work and dedication reflect the very finest traditions of the Navy, and of course their sacrifices are matched only by those of their families, who have supported these men and women in the service of their country.

There are many issues for us to discuss today. I know our esteemed witnesses as well as the tens of thousands of dedicated naval shipyard workers throughout our country share a joint commitment to providing our sailors and marines with the finest ships in the world on time and on budget. I look forward to the testimony of our witnesses in this regard.

The Navy's 30-year shipbuilding plan sets a course to build from the current battle force inventory of only 286 ships to a goal of a minimum of 313. Over the next decade, the Navy will begin to ramp up its production of destroyers, amphibious landing and sup-

port ships, submarines, LCSs, oil tankers, and Joint High Speed Vessels (JHSV).

I'm concerned about the amount of funding needed for ship construction going forward. The *Ohio*-class replacement SSBNs run about \$6 to \$7 billion each and the *Virginia*-class submarines cost about \$2 billion each. With more than half of the construction and development cost dollars being needed to build extraordinarily expensive nuclear submarines, I am concerned that our commitment to submarines may be crowding out funding needed to build large surface ships and to modernize the fleet. I hope the witnesses can tell us what they are doing to reduce the cost of building these submarines and give us their views on the impact of submarine construction costs on surface shipbuilding, including amphibious ships, and how it may impact the shipbuilding industrial base.

In addition, there are concerns that continued design problems and the Navy's recent decision to continue a dual sole source LCS strategy may increase cost risks in these and other complex acquisitions. From the first ship in its class, the LPD-17 *San Antonio*-class amphibious ship program has displayed chronic problems in terms of safety, engineering, design, and oversight. These problems have been so significant that they give rise to broader concerns about a widespread readiness problem afflicting our surface fleet.

I'm pleased with the leadership of the Atlantic Fleet Commander, Admiral Harvey, in starting to turn these problems around. But I'm troubled by how we got to this point. As to the LPD-17 class of ships, for example, how, with five already delivered and four under construction, have we been left with an entire class of ships that, according to the Pentagon's chief independent weapons tester, is "not effective, suitable, and not survivable in combat."

With Northrop Grumman's sale of its shipyards, I'd like to know what the Navy's plans are for the construction of the last LPD-17 ship.

In addition to these points, I would also like the Gulf Coast SUPSHIP and the NAVSEA Commander to address the apparent downward trend in funding for maintenance, with the negative impact falling more heavily on surface combatants than on carriers and submarines.

Now let me say a quick word about the F-35 Joint Strike Fighter (JSF) program, which has a couple of important test events coming up this year that relate to the shipbuilding portfolio, in particular shipboard testing on a carrier and on the L-class ship for the Navy's F-35C and the Marine Corps' F-35B respectively.

Given the well-deserved focus on the JSF program recently, I'd like to know from our witnesses what challenges do they see in having each of those F-35 variants effectively integrated to the ships from which they are supposed to operate.

The Navy faces many difficult challenges. That said, the performance of our sailors and marines has never been more gratifying to watch. They make us proud every day.

I look forward to hearing from the witnesses on these and other tough but important issues which go squarely to how we arm and equip those men and women who serve their Nation so selflessly at home and abroad.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Wicker.

Senator Ayotte, do you have any comments?

Senator AYOTTE. Thank you, Mr. Chairman. I would just again welcome the witnesses and thank you for your service. I do want to give a special welcome to Vice Admiral McCoy, who is a former Commander of the Portsmouth Naval Shipyard, and we're very honored to have him since I'm very proud of our shipyard.

Senator REED. Thank you very much, Senator.

Secretary Stackley.

**STATEMENT OF HON. SEAN J. STACKLEY, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION**

Mr. STACKLEY. Yes, sir. Mr. Chairman, Senator Wicker, Senator Ayotte, thank you for the opportunity for Vice Admiral McCoy, Captain Galinis, and myself to appear before you today to address Navy shipbuilding. Thank you, of course, for your steadfast support to our sailors and marines as you provide and maintain our Navy.

With your permission, I propose to keep my opening remarks brief and to submit a formal more detailed statement for the record.

Senator REED. Thank you.

Mr. STACKLEY. Today's Navy is a battle force of 286 ships, as many as half of which are under way on any given day, providing presence and maintaining readiness to respond to crisis or conflict wherever our Nation's interests are challenged. Our Navy's ability to reliably meet the demands that come with global presence and readiness rely upon certain enduring qualities: the size of the force, measured in numbers of ships; the capabilities designed and built into these ships, the skills and productivity of our government and industry workforce responsible for building and maintaining these ships; and the skill, dedication, and resourcefulness of our sailors and marines who put to sea in them.

The CNO and the Commandant have defined the 313-ship Navy as the force necessary to meet our naval requirements. In fact, the CNO has emphasized that 313 ships is the floor. So to this end, the 2012 budget request includes funding for 10 ships and over the 5-year FYDP includes 55 ships, an increase of 5 ships over the plan of a year ago.

This increase reflects a priority placed on shipbuilding and reflects efforts to improve affordability within our shipbuilding program, efforts which must prove effective if we are to succeed in recapitalizing ship classes which were constructed during the buildup of the 600-ship Navy.

Our budget request includes continued funding for CVN-78, advanced procurement for CVN-79, and funding for the refueling overhaul of CVN-72, all necessary to sustain an 11-carrier force over the next 3 decades.

We continue *Virginia*-class construction at two boats per year, a build rate essential to recapitalizing our submarine force, essential to affordability, and essential to ramping up our industrial base as we approach construction of our next fleet SSBN.

We sustain DDG-51 production, adding capability and capacity to our sea-based missile defense, and to our plan of a year ago we

have added a second destroyer in 2014 which, with the planned proposal for a multi-year procurement in 2013, will leverage the stability of this mature program, improve build rates for our two combatant shipbuilders, and improve affordability.

Our Aegis modernization efforts are equally critical, serving to increase the number of missile defense platforms from 21 today to 41 by the end of the FYDP, while also improving their material condition to meet readiness demands in the second half of their service lives.

We increase LCS construction to four ships per year. Efforts to stabilize design, improve production planning, invest in shipbuilder improvements, build at efficient rates, and leverage long-term vendor agreements, all within the framework of competitive fixed price contracts, have markedly improved affordability for this 55-ship program.

We increase our amphibious lift capacity and capability with procurement of the 11th LPD-17 class ship and our extending the service of the USS *Peleliu* to maintain 9 operationally available big decks while awaiting delivery of the lead ship of the *America*-class, LHA-6.

We're also increasing our logistics lift capability with procurement of the third Mobile Landing Platform (MLP) and a JHSV. Actions by Congress and the Navy to accelerate the MLP program significantly improve affordability while also addressing a critical work load valley confronting that shipbuilder.

In the second half of this decade, we will need to proceed with recapitalization of three major ship programs. We're accelerating introduction of our next fleet oiler, T-AOX, beginning in 2014. T-AOX will bring modern commercial design to our refueling at sea capabilities while also providing critical stability to an important sector of our industrial base.

We plan to commence replacement of the LSD-41 class amphibious ships in 2017 following definition of lift requirements for this new ship class. Most significantly, we will procure the lead ship of the *Ohio*-class replacement in 2019. It is vital that we sustain development activities for this submarine with sufficient lead times to ensure our ability to produce this highly complex, uniquely capable ship on schedule. But it's equally vital that we address cost risk on this program or we place other ship programs at risk. So we've carefully defined capabilities necessary to ensure the ship's ability to meet its requirements while embarking on a focused design for affordability effort to capitalize on lessons learned in the *Virginia* program at a much earlier stage in the *Ohio* replacement program.

In the most pragmatic terms, in balancing requirements, risk, and realistic budgets, affordability does control our numbers. So to this end we're focused on bringing stability to the shipbuilding program, finding the affordable 80 percent solution, strengthening our acquisition workforce, imposing cost discipline as we define our requirements, clamping down on contract design changes, placing greater emphasis on O&S costs in our designs, and placing greater emphasis on competition and fixed price contracts.

Modernizing today's force and recapitalizing the fleet affordably cannot be accomplished without strong performance by industry. So we are working with industry to benchmark performance, to iden-

tify where improvements are necessary, to provide proper incentives for capital investments where warranted, and to reward sustained strong performance.

As well, we're working with industry to improve quality in construction and reliability and readiness in service. LPD-17 reliability, Aegis wholeness, completion levels of new construction carriers, and isolated quality issues on even our most reliable construction program, the submarine, have caused us to methodically and aggressively attack root causes in design, construction standards, workforce training and qualifications, oversight and compliance, ship's force manning and training, documentation, software maintenance, and logistics support.

Much progress has been made in these areas. Quality of delivered ships continues to improve. Readiness measures are improving. Underlying issues that have affected readiness are being identified. But much work remains. We need to sustain these efforts to improve quality and readiness while also ensuring the higher standard becomes the standard practice.

In sum, the Navy is committed to building the fleet required to support the National Defense Strategy, to which the 2012 budget request addresses near-term capability needs, while also laying the foundation for long-term requirements. Ultimately, we recognize that as we balance requirements, affordability, and industrial base considerations, it is vital that we, Navy and industry, improve affordability within our programs in order to build the Navy needed by the future force.

Mr. Chairman, thank you for the opportunity to appear before you today and we look forward to your questions.

[The joint prepared statement of Mr. Stackley, Admiral McCoy, and Captain Galinis follows:]

JOINT PREPARED STATEMENT BY HON. SEAN J. STACKLEY, VADM KEVIN M. MCCOY, USN, AND CAPT WILLIAM J. GALINIS, USN

Mr. Chairman, Senator Wicker, and distinguished members of the subcommittee, thank you for the opportunity to appear before you today to address Navy shipbuilding. The Department is committed to the effort to build an affordable fleet which supports the National Defense Strategy, the Maritime Strategy, and the 2010 Quadrennial Defense Review (QDR). The Department's fiscal year 2012 budget will provide platforms that are capable, agile, and able to respond to the dynamic nature of current and future threats. The fiscal year 2012 shipbuilding budget funds 10 ships, including 2 *Virginia*-class attack submarines, 1 Navy Joint High Speed Vessel (JHSV), 1 LPD-17-class amphibious transport dock, 1 Mobile Landing Platform (MLP), 1 DDG-51-class destroyer, and 4 Littoral Combat Ships (LCS). In addition, the Navy will procure an oceanographic ship and the Army has funded one JHSV which the Navy will procure. Our budget also funds advance procurement for CVN 79, the second increment of full funding for LHA-7, and advance procurement for the two fiscal year 2013 DDG-51s and *Virginia*-class submarines.

The Navy continues to ensure our shipbuilding plan is affordable, stable, and increases capacity and capability as needed to meet the most likely evolving threats. In 2010, six ships were placed in commission; two *Virginia*-class submarines, three *Arleigh Burke* destroyers, and one LCS. In addition, two T-AKEs were delivered.

Today, our sailors and marines are conducting combat operations in Afghanistan. In addition, our aircraft carriers are providing about 30 percent of combat air support for troops on the ground in Afghanistan, with more sorties being provided by AV-8B Harriers flying from amphibious assault ships. While the drawdown in Iraq continues, we still have more than 24,000 sailors and 22,000 marines ashore or afloat in the Central Command Area of Responsibility.

Because our national interests extend beyond Iraq and Afghanistan, so do our sailors and marines. More than 40 percent of our ships are underway daily, globally present and persistently engaged. Recently, U.S. naval forces supported efforts in

Japan. Last year, U.S. naval forces provided deterrence against North Korea, conducted counter-piracy operations in the Indian Ocean with a coalition of several nations, trained local forces in maritime security as part of our Global Maritime Partnership initiatives in Africa and the Pacific, responded with humanitarian assistance and disaster relief to the earthquake in Haiti and flood in Pakistan, and conducted the world's largest maritime exercise, our biannual Rim of the Pacific (RIMPAC) multi-national training exercise. RIMPAC brought together 14 nations and more than 20,000 military personnel, including 25 of our Navy ships and submarines, a Coast Guard cutter, and elements of the III Marine Expeditionary Force. Through RIMPAC and follow-on exercises, our forward-deployed forces, in partnerships with naval forces from the Republic of Korea, demonstrated a strong, credible deterrent against continued North Korean aggression. Off the coast of Africa, as part of an international coalition of more than 20 other nations, U.S. naval forces continue to provide deterrence and maritime security in the form of counter-piracy. Specifically, our Navy-Marine Corps team successfully intervened and freed the crew of the German merchant vessel M/V Magellan Star after pirates captured the vessel in the Gulf of Aden last September and during that same deployment rescued 62 Somali and Ethiopian persons. We are also continuing to partner with U.S. Coast Guard law enforcement teams in the Caribbean to conduct counter-narcotics and anti-trafficking operations and deny traffickers use of the sea for profit and exploitation.

Our USS *Kearsarge* (LHD-3) Amphibious Ready Group (ARG), and U.S. marines assigned to the 26th Marine Expeditionary Unit (MEU), deployed early to reinforce the *Peleliu* ARG/15th MEU in providing humanitarian assistance to Pakistan after a flood placed almost one-fifth of the Nation underwater, devastating the population and the land. Our disaster relief effort also continued in Haiti with 15 ships including the USNS *Comfort* (T-AH-20), USS *Carl Vinson* (CVN-70), USS *Nassau* (LHA-4) ARG with the 24th MEU, USS *Bataan* (LHD-5) ARG with the 22d MEU, and the maritime prepositioning ship USNS *1st Lt Jack Lummus* (T-AK-3011), as part of Operation Unified Response. In Central and South America, the medical staff and Seabees embarked aboard the multi-purpose amphibious assault ship USS *Iwo Jima* (LHD-7), working with partner nations, provided medical, dental, veterinary, and engineering assistance to Colombia, Costa Rica, Guatemala, Guyana, Haiti, Nicaragua, Panama, and Suriname during Continuing Promise 2010. During the deployment, Continuing Promise 10 personnel provided medical, dental, and optometry services to more than 161,000 patients. Operation Pacific Partnership, led by the Commander, Destroyer Squadron 21 aboard the USNS *Mercy*, provided treatment to 109,754 patients. In addition, they completed 22 engineering projects and treated more than 2,800 veterinary patients in Vietnam, Cambodia, Indonesia, Palau, Timor-Leste, and Papua New Guinea.

Our sailors and marines remain on point throughout the world, projecting U.S. influence, responding to contingencies, and building international relationships that will keep the maritime commons safe and secure. This is critical to the free flow of commerce, a foundation of our economic prosperity.

Our ballistic missile submarines are providing nuclear deterrence year-round, while our Aegis cruisers and destroyers are providing conventional deterrence in the form of ballistic missile defense (BMD) of our allies and partners in Europe, the Mediterranean, and the Western Pacific. Our Carrier Strike Groups and ARGs continue to prevent conflict and deter aggression in the Western Pacific, Arabian Gulf and Indian Ocean, while their forward deployments afford the United States the ability to influence events abroad and the opportunity to rapidly respond to crisis.

Global demand for naval forces remains high and continues to rise because of the ability of our maritime forces to overcome diplomatic, geographic, and military impediments to access while bringing the persistence, flexibility and agility to conduct operations at sea. Our fiscal year 2012 budget submission properly balances our naval forces to support this demand and includes five more ships than our fiscal year 2011 plan, which were achieved through competitive contracting, reduced overhead and increased efficiencies. We continue to pursue steps to buy smarter, streamline our organizations and operations, realign manpower, and pursue energy efficiencies.

The Department has conducted a Force Structure Analysis based upon the minimum 313 ship force needed for our Navy-Marine Corps team. The plan is designed to provide the global reach; strategic deterrence; persistent presence; and strategic, operational and tactical effects expected of naval forces within reasonable levels of funding. The plan balances the combatant commanders' demand for naval forces with expected future resources, and takes into account the importance of maintaining an adequate national shipbuilding design and industrial base and using realistic cost estimates.

The global proliferation of land-attack ballistic missiles and the anticipated proliferation of anti-ship ballistic missiles, and the challenges associated with gaining and sustaining access for shore-based BMD systems worldwide suggest the demand for BMD-capable surface combatants will continue to increase beyond 2024 even with the introduction of Aegis Ashore.

Over the next decade (fiscal year 2012 to fiscal year 2021), the Department of the Navy begins to ramp up production of ships necessary to support strategic deterrence, persistent presence, maritime security, irregular warfare, intra-theater sea-lift, humanitarian assistance, disaster relief, and partnership building missions; namely the LCS, JHSV and Fleet Oiler Replacement programs. At the same time, the Department continues production of large surface combatants and attack submarines, as well as amphibious landing and support ships. Yearly new construction shipbuilding spending during this period is projected to average \$15 billion (fiscal year 2011\$). Beyond fiscal year 2021, Navy investments at a sustainable average of \$15.7 billion (fiscal year 2011\$) a year in new ship construction, which is roughly the 30-year average. The overall size of the battle force begins a steady climb, reaching 324 ships by fiscal year 2021.

In the second decade (fiscal year 2022 to fiscal year 2031), the recapitalization plan for the current Fleet Ballistic Missile Submarine (SSBN) inventory is realigned. Current plans call for 12 new *Ohio*-class replacement submarines (SSBN(X)) with life-of-the-ship nuclear reactor cores to replace the existing 14 *Ohio*-class SSBNs. Advance Procurement funds for detail design for the first SSBN(X) begin in fiscal year 2015 with funds following in fiscal year 2017 to support procurement of long lead time material for the lead ship of the class scheduled to begin construction in fiscal year 2019 ensuring that 12 operational ballistic missile submarines will be available to perform the vital strategic deterrent mission. Since SSBNs have not been procured since the early 1990s, shipbuilding expenditures have not included funds for this class of ships in over 20 years. To support the recapitalization of the seaborne leg of the Nation's strategic deterrent, yearly shipbuilding expenditures during the second decade are projected to average about \$17.5 billion (fiscal year 2011\$) per year, or about \$2 billion more than the steady-state 30-year average. Even at this elevated funding level the total number of ships built per year will inevitably fall because of the percentage of the shipbuilding account which must be allocated for the procurement of the SSBN(X). Recognizing these impacts, we have already embarked on a program of aggressively challenging capability improvements and design and construction practices to identify means to deliver this important capability at least cost, including leveraging technology and lessons learned from the highly successful *Virginia* SSN shipbuilding program.

In the last decade (fiscal year 2032 to fiscal year 2041), average new construction shipbuilding expenditures are projected to fall back to a more sustainable level of about \$14.5 billion (fiscal year 2011\$) per year. Moreover, after the production run of *Ohio* replacement SSBNs comes to an end in fiscal year 2034, the average number of ships built per year begins to rebound.

#### AIRCRAFT CARRIERS

Our aircraft carriers are best known for their unmistakable forward presence, ability to deter potential adversaries and assure our allies, and capacity to project power at sea and ashore; however, they are equally capable of providing our other core capabilities of sea control, maritime security, and humanitarian assistance and disaster response. Our carriers provide our Nation the ability to rapidly and decisively respond globally to crises with a small footprint that does not impose unnecessary political or logistic burdens upon our allies or potential partners.

#### CVN-78

The *Gerald R. Ford* is the lead ship of our first new class of aircraft carrier in nearly 40 years. *Gerald R. Ford*-class carriers will be the premier forward deployed asset for crisis response and early decisive striking power in a major combat operation. They incorporate the latest technology, including an innovative new flight deck designed to provide greater operational flexibility, reduced manning requirements, and the ability to operate all current and future naval aircraft. Among the new technologies being integrated is the Electromagnetic Aircraft Launch System (EMALS) which will support *Ford's* increased sortie generation rates. EMALS is moving from a promising technology to a proven operational capability, which will deliver the warfighting enhancement needed in the future. Recently, the program successfully demonstrated a controlled launch sequence with the full-scale EMALS production representative unit and a successful aircraft launch demonstration. While land-based testing is ongoing and identifying engineering issues that will

allow us to retire risk prior to ship operations, EMALS' production schedule supports the planned delivery of CVN-78 in September 2015.

#### THE SUBMARINE FLEET

Our attack and guided missile submarines have a unique capability for stealth and persistent operation in an access-denied environment and to act as a force multiplier by providing high-quality intelligence, surveillance, and reconnaissance (ISR) as well as indication and warning of potential hostile action. In addition, attack submarines are effective in anti-surface ship warfare and anti-submarine warfare in almost every environment, thus eliminating any safe-haven that an adversary might pursue with access-denial systems. As such, they represent a significant conventional deterrent. While our attack submarine fleet provides considerable strike capacity already, our guided missile submarines provide significantly more strike capacity and a more robust capability to covertly deploy Special Operations Force personnel. Today, the Navy requires 48 attack submarines and 4 guided missile submarines (SSGN) to sustain our capabilities in these areas. The Navy is studying alternatives to sustain the capability that our SSGNs bring to the battle force when these ships begin to retire in 2026.

#### VIRGINIA-CLASS SSN

The *Virginia*-class submarine is a multi-mission submarine that dominates in the littorals and open oceans. Now in its 14th year of construction, the *Virginia* program is demonstrating that this critical undersea capability can be delivered affordably and on time. The Navy is mitigating the impending attack submarine force structure gap in the 2020s through three parallel efforts: reducing the construction span of *Virginia*-class submarines, extending the service lives of selected attack submarines, and extending the length of selected attack submarine deployments.

#### BALLISTIC MISSILE SUBMARINES

Our ballistic missile submarines are the most survivable leg of the Nation's strategic arsenal and provide the Nation's only day-to-day assured nuclear response capability. They provide survivable nuclear strike capabilities to assure allies, deter potential adversaries, and, if needed, respond in kind. The number of these submarines was delineated by the Nuclear Posture Review 2001 which established the requirement of a force comprised of 12 operational SSBNs (with 2 additional in overhaul at any time). Because the *Ohio* SSBNs will begin retiring in fiscal year 2027, their recapitalization must start in fiscal year 2019 to ensure operational submarines will be available to replace these vital assets as they leave operational service. In addition, because of a life-of-ship reactor plant, the replacement SSBN program inventory will be 12 ships to support the seaborne leg of the nuclear triad. To maintain an at-sea presence for the long term, the United States must continue development of the follow-on to the *Ohio*-class submarine. Throughout the past year, and throughout the program, all aspects of the *Ohio* replacement program continue to be thoroughly reviewed and aggressively challenged to drive down engineering and construction costs.

#### SUBMARINE MODERNIZATION

As threats evolve, it is vital to continue to modernize existing submarines with updated capabilities. The submarine modernization program includes advances in weapons, integrated combat control systems, sensors, open architecture, and necessary hull, mechanical and electrical upgrades. These upgrades are necessary to retain credible capabilities for the future conflicts and current peacetime ISR and Indication and Warning missions and to continue them on the path of reaching their full service life. Maintaining the stability of the modernization program is critical to our future Navy capability and capacity.

#### SURFACE COMBATANTS

As in the past, cruisers and destroyers will continue to deploy with strike groups to fulfill their traditional roles. Many will be required to assume additional roles within the complex BMD arena. Ships that provide BMD will sometimes be stationed in remote locations, away from strike groups, in a role as theater BMD assets. The changes necessary to meet demands for forward presence, strike group operations, and BMD place additional pressure on the existing inventory of surface combatants. The current baseline for number of ships in the surface combatant inventory is 88. While future force structure analyses may require the Navy to procure a greater number of these ships, we will also have to consider redistributing

assets currently being employed for missions of lesser priority for these new missions as a result of the 2010 QDR and the President's commitment to supporting the missile defense of our European allies.

## DDG-51

To address the rapid proliferation of ballistic and anti-ship missiles along with deep-water submarine threats, we have restarted production of the *Arleigh Burke*-class DDG-51 Flight IIA series. The Flight IIA ships will incorporate Integrated Air and Missile Defense (IAMD), providing much-needed BMD capacity to the Fleet. These ships will also be the first flight of Aegis ships to be built with the Open Architecture Advanced Capability Build (ACB) 12 Aegis Combat System. ACB 12 will allow these surface combatants to be updated and maintained with commercial off-the-shelf technology, yielding reduced Total Ownership Cost and enhancing the ability to adapt to future military threats. The approach for the Flight IIA restart leverages the cost-savings of existing production lines; reduces the potential for cost overruns and delays through the incremental approach of developing new technologies; and strengthens and stabilizes the industrial base to more efficiently and cost effectively produce ships to meet our national needs. This budget request procures one ship in 2012.

We intend to deliver highly capable, multi-mission ships tailored for IAMD by advancing the DDG-51 design into the next future destroyer, DDG Flight III. This approach will develop and install the Air and Missile Defense Radar on a DDG-51 hull with the necessary hull, power, cooling, and combat systems upgrades. Additionally, in support of the Navy's energy goals, a hybrid electric drive system is in development for the DDG-51-class and land-based testing of this system is expected this summer. Our fiscal year 2012 budget requests funding for a total of eight DDG-51 ships, including funding for an additional DDG-51 Flight IIA ship in fiscal year 2014 and the first Flight III ship in fiscal year 2016. The Navy intends to pursue multiyear authority in fiscal year 2013 for fiscal year 2013-2017 procurements. The MYP would generate significant cost savings, and provide a long-term commitment to the shipbuilding industrial base that stabilizes shipyard employment levels.

## LCS

The Navy remains committed to procuring 55 LCS. These ships expand the battle space by complementing our inherent blue water capability and filling warfighting gaps in the littorals and strategic choke points around the world. LCS design characteristics (speed, agility, shallow draft, payload capacity, reconfigurable mission spaces, air/water craft capabilities) combined with its core Command, Control, Communications, Computers and Intelligence, sensors, and weapons systems, make it an ideal platform for engaging in Irregular Warfare and Maritime Security Operations.

LCS capabilities address specific and validated capability gaps in Surface Warfare, Mine Countermeasures, and Anti-Submarine Warfare. The concept of operations and design specifications for LCS were developed to meet these gaps with focused mission packages that deploy manned and unmanned vehicles to execute a variety of missions. In 2010, the Navy deployed USS *Freedom* (LCS-1) with Surface Warfare (SUW) mission package capabilities (MH-60S helicopter, two 30mm guns, two 11m Rigid Hull Inflatable Boats, Maritime Security Module, a Surface Warfare DET and an Aviation Detachment in support of counter-illicit trafficking operations). By 2018, 11 Mine Countermeasures (MCM) mission packages will be delivered, supporting the decommissioning plan for the USS *Avenger* (MCM-1)-class ships. The core capability of the Anti-Submarine Warfare mission package will be provided by a Variable Depth Sonar (VDS) and Navy will begin at-sea testing in 2012 with a VDS Advanced Design Model (ADM).

Affordability remains the key factor in acquiring the needed future capacity of this highly flexible and capable ship. To stay on path to deliver this ship in the quantities needed, the Navy announced this past December that we awarded 2 competitive contracts for 10 ships of each version of the LCS under a dual award strategy. Each ship brings unique strengths and capabilities to the mission and each has been designed in accordance with overarching objectives for reducing total ownership cost. Our 2012 budget funds 4 ships in fiscal year 2012, with a buy of 19 across the Future Years Defense Program (FYDP). We request your continued support as we take the measures necessary to deliver this much needed capability at the capacity we need to meet future demands.

## DDG-1000

The DDG-1000 Zumwalt guided missile destroyer will be an optimally crewed, multi-mission surface combatant designed to provide long-range, precision naval

surface fire support to marines conducting littoral maneuver and subsequent operations ashore. The DDG-1000 features two 155mm Advanced Gun Systems capable of engaging targets with the Long-Range Land Attack Projectile at a range of over 63 nautical miles. In addition to providing offensive, distributed and precision fires in support of marines, it will provide valuable lessons in advanced technology such as signature reduction, active and passive self-defense systems, and enhanced survivability features. The first DDG-1000 is approximately 50 percent complete and is scheduled to deliver in fiscal year 2014 with initial operating capability planned in 2016.

#### MODERNIZATION

To counter emerging threats, we continue to make significant investments in cruiser and destroyer modernization to sustain our combat effectiveness and to achieve the 35 year service life of our earlier Aegis fleet. Our destroyer and cruiser modernization program includes Hull, Mechanical, and Electrical (HM&E) upgrades, as well as advances in warfighting capability and open architecture to reduce total ownership costs and expand mission capability for current and future combat capabilities.

USS *Arleigh Burke* (DDG-51) and USS *John Paul Jones* (DDG-53) are the first two DDGs to undergo the HM&E phase of this comprehensive modernization. Due to the scope of the design changes, we extended these availabilities by 2 months to allow for adequate execution and system testing. The lessons learned from these first two modernization efforts will be included in subsequent upgrades. The second phase of the modernization will be conducted 2 years after the initial yard period and provide DDGs with an improved processing capability in their SPY-1D radars and an open architecture combat computing environment that will also be adapted to DDG-113 and following ships. Focusing on Flight I and II DDG-51 ships (hulls 51-78), the modernization process will also include the addition of BMD capability, installation of the Evolved Sea Sparrow Missile (ESSM), an upgraded SQQ-89A (V)15 anti-submarine warfare system, integration of the SM-6 missile, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. In fiscal year 2012, USS *John Paul Jones* (DDG-53) will be the first destroyer to be modernized with ACB 12.

Through December 2010, Navy has completed the modernization of two additional cruisers, USS *Mobile Bay* (CG-53) and USS *Philippine Sea* (CG-58). Combat System upgrades to USS *Antietam* (CG-54) and USS *San Jacinto* (CG-56) are in progress. Hull, Mechanical, and Electrical (HM&E) upgrades to USS *Hue City* (CG-66) are also in progress. The key aspects of the CG modernization program include an upgrade to the Aegis weapons system to include an open architecture computing environment, installation of the AN/SPQ-9B radar, addition of the ESSM, an upgrade to Close In Weapon System Block 1B, an upgraded SQQ-89A (V)15 anti-submarine warfare system, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. Nine Baseline 4 cruisers will receive the BMD upgrade beginning in fiscal year 2014.

Our budget for fiscal year 2012 requests funding for the modernization of four cruisers (three Combat Systems and one HM&E) and three destroyers (one Combat System and two HM&E).

#### AMPHIBIOUS SHIPS

Amphibious ships are multi-capable, agile, and responsive to the dynamic nature of the security era. In an era of declining access and strategic uncertainty, the geographic combatant commanders' have an increased demand for forward-postured amphibious forces capable of conducting security cooperation, regional deterrence, and crisis response. For example, their cumulative fiscal year 2010 request for amphibious forces equates to 3.4 ARGs/MEUs plus 4 smaller, task-organized amphibious formations like Global Fleet Stations. These demand signals reflect the operational flexibility and value of amphibious forces for missions across the range of military operations. This value is well-illustrated by the 2010 deployment of the Peleliu ARG/15th MEU, which concurrently conducted humanitarian assistance and disaster response operations in Pakistan, strike operations in Afghanistan, and the recovery of the M/V *Magellan Star* from pirates in the Gulf of Aden. During the same deployment, they also conducted a wide variety of cooperative activities with forces from Australia, Indonesia, the Maldives, New Zealand, Sri Lanka, Timor-Leste, Turkey, and Pakistan, in addition to supporting to the U.S. Secret Service during the Presidential visit to India. As articulated by the Secretary of the Navy, the Navy's amphibious ships are the fleet's most "flexible" asset.

There are two main drivers of the amphibious ship requirement: maintaining the persistent forward presence, the largest driver, which enables both engagement and crisis response, and the episodic aggregation of sufficient numbers to deliver the assault echelons of up to two Marine expeditionary brigades for major operations and campaigns.

The Chief of Naval Operations and Commandant of the Marine Corps have determined that the force structure requirement is 38 amphibious ships. Understanding this requirement, and in light of the fiscal constraints, the Department of the Navy will accept risk by sustaining a minimum of 33 total amphibious ships in the active fleet. The Department has 30 amphibious ships in the inventory now and will reach 33 ships by fiscal year 2017. Once 33 is attained the Department will retain 33 amphibious ships through the maintenance of current assets and the planned procurement of amphibious vessels.

#### LSD/LSD(X)

A fully funded LSD mid-life program, to include repairs, will ensure these ships meet their expected service life. Material readiness in regards to LSD's readiness for tasking will be enhanced by a fully funded program. LSD(X) will replace 12 of the aging LSD-41/49 *Whidbey Island/Harpers Ferry*-class vessels and will perform an array of amphibious missions. Eleven LSD(X) platforms will provide one third of the total amphibious lift necessary to meet USMC mission requirements. LSD(X) Initial Capabilities Document is currently under review, the Analysis of Alternatives will be conducted in fiscal year 2012 with a planned fiscal year 2017 lead ship procurement. Affordability remains the key factor in acquiring the needed future capacity and operational capabilities of this highly flexible multifaceted ship.

#### LPD-17

The *San Antonio*-class LPD (LPD-17) has a 40-year expected service life and serves as the replacement for four classes of older ships: the LKA, LST, LSD-36, and the LPD-4. Lessons learned from the effort to resolve material reliability concerns identified in the early ships of the class are being applied to ships currently under construction. Quality continues to improve with each ship delivered as the Navy continues to work closely with the shipbuilder to address cost, schedule, and performance issues. Five ships have been delivered, and four more ships are under construction. The construction contract for the 10th ship was recently awarded and the 11th and final LPD is planned for procurement in fiscal year 2012.

Ships of the class have deployed seven times including two ships that are currently on deployment. USS *San Antonio* (LPD-17) has deployed once (2008), USS *New Orleans* (LPD-18) has completed two successful overseas deployments (2009 and 2010). USS *Mesa Verde* (LPD-19) has also completed two successful overseas deployments. Today, LPD-19 is again deployed overseas; and USS *Green Bay* (LPD-20) is in the middle of her first overseas deployment. LPD-18 and USS *New York* (LPD-21) are fully operational, conducting local operations in their homeport areas. LPD-17 is completing her major post-deployment repair availability prior to next sea trials.

In February of this year, LPD-21 successfully passed an inspection by the Navy's Board of Inspection and Survey (INSURV) to support the Final Contract Trials. The President of INSURV remarked that LPD-21 was the best LPD-17-class ship they had seen and that lessons learned from the first ships of the class were clearly being implemented.

The Navy and Industry have made significant progress in correcting early class design and construction issues on the LPD-17-class. Early ships of the LPD-17-class were delivered to the Navy with pipe welding quality, engine alignment problems, inadequate lube oil cleanliness and bearing wear which led to unplanned engine repairs and overhauls. These material issues, combined with an optimized sized crew and a reliance on computer-based vice classroom training, led to decreased reliability and operational availability of the class.

The above issues, as well as inadequate initial reliability of the ships computer network and some of the engine and ship control systems led the Navy and DOD independent operational testing organizations to rate the ships as not operationally suitable during the initial operational testing conducted in 2007-2008. Follow-on Test and Evaluation, which commenced in July 2010 and runs through fiscal year 2012, is being conducted by the Navy's Commander, Operational Test & Evaluation Force and the Marine Corps Operational Test and Evaluation Activity to confirm adequate corrective actions have been taken.

Over the last couple of years, the shipbuilder (Northrop Grumman Shipbuilding, now Huntington Ingalls Industries, (HII)) has implemented several initiatives to address the quality issues associated with ship construction and delivery.

The shipbuilder significantly revised their welding, quality and production processes to improve quality and ensure consistency across all of their shipbuilding facilities. Their workforce was retrained and recertified to the updated process. The Navy and HII have improved the oil flushing procedures to get all the contaminants out of the ship's lube oil system and improvements to the lube oil filters and strainers have been developed to better remove any contaminants that might be introduced through normal operation of the engines. These more stringent flushing procedures are being used on all ships in the class and the improved filters and strainers are planned for installation on all ships in the class. Additionally, the shipyard has taken several steps to ensure pipe sections are maintained in a clean condition from fabrication in the pipe shop to installation on the ship including a new cleaning process in the pipe shop and improved pipe capping procedures to prevent contaminants from entering the pipe during shipping and installation onboard the ship. The Navy has also significantly improved its lube oil sampling and analysis process. This process has been incorporated into the ship construction process. The shipbuilder is responsible for the overall quality of the ship. To manage quality, the shipbuilder utilizes a Quality Management System comprising of Quality Control (ensuring the correct product requirements, manufacturing processes, et cetera) and Quality Assurance (focused on end product quality and conformance).

The Ship Wide Area Network (SWAN) design, which was based upon 1990's Asynchronous Transfer Mode (ATM) technology, experienced multiple failures resulting in failover monitoring, maintainability, and supportability issues. The ATM-based SWAN is being replaced by current Gigabit Ethernet technology hardware and software. Today, this "Gig-E" SWAN is installed on LPD-17, -18, and -21 with no reported failures to date. LPD-19 and -20 will receive this upgrade in fiscal year 2012; and the baseline for LPD-22 and follow ships has been updated to include the Gig-E SWAN. Initial system reliability issues with the engine controls, ship controls, and interior communications systems have been addressed through major software upgrades to each system, as well as the replacement of critical obsolete parts with more rugged, current technology hardware.

Government oversight by the Navy's Supervisor of Shipbuilding, Gulf Coast (SSGC) has been revamped with an increase in overall SSGC manning by 21 percent from 2005 through the end of 2010, including an intensive focus on critical waterfront Quality Assurance (QA) billets. All Government QA weld inspectors were required to undergo retraining and recertification in critical process areas, and QA oversight was increased across all phases of production. Within the last 18 months, the QA organization has been restructured to include more surveillance of in process work and compliance with formal ship construction procedures. A revamped training program has been implemented, providing an "apprentice to subject matter expert" career roadmap for QA specialists. SSGC has implemented a process of "critical process pulse audits" to ensure HII maintains production quality across the critical shipbuilding areas of structure, pipe, electrical, and coatings. Navy critical process metrics have been aligned with the shipbuilder to better assess performance trends leading to earlier identification of issues when they arise.

In addition, Commander, Naval Sea Systems Command (NAVSEA) sent teams of QA experts to assess SSGC ability to provide QA oversight and HII's production quality in spring 2009, July 2010, and January 2011. The NAVSEA audits confirmed initial improvement by both SSGC and HII. The focus going forward, and a key element of the critical process pulse audits, is ensuring sustainment of that performance.

The Navy is also strengthening the LPD-17-class crew training by establishing more traditional shore-based schoolhouses for critical systems that will result in a blended philosophy of classroom, on-ship, and computer-based training rather than solely relying on the previously emphasized computer-based shipboard training.

The Ship Manning Document was recently approved, increasing the LPD-17-class crew size to 381 from the original "optimized" manning level of 360.

The LPD-17-Class System Sustainability Strike Team, made up of personnel from the Fleet, the Navy regional maintenance centers, the shipbuilder, the Supervisor of Shipbuilding, the class planning yard, and the Navy Warfare Centers was established in fiscal year 2009. The Strike Team has focused resources on developing and prioritizing correction plans addressing system design, production/quality, operations and maintenance issues identified in recent test/evaluation reports, as well as those discovered during normal shipboard operations. Lessons learned from this effort are being incorporated in the ship construction process.

Quality and reliability problems seen on the early ships of the class are being systematically addressed by the shipbuilder and the Navy. Additionally, the Fleet has recognized the need for additional manning for each ship and training for the crews, which is being implemented. The above-listed corrections and improvements are already being realized in the later ships of the class, as evidenced by LPD-21's recent success during Final Contract Trials. The Navy recently discovered quality problems with repairs on various ships during Fleet maintenance availabilities. We are addressing these issues by providing additional government oversight to ensure strict compliance with all required maintenance and repair specifications and holding the contractor accountable to provide quality.

#### LHD/LHA/LHA REPLACEMENT (LHA(R))

The LHA(R) will provide flexible, multi-mission amphibious capabilities that span the range of military operations from forcible entry to humanitarian and disaster relief. LHA(R) will replace our *Tarawa*-class ships that reach the end of their already extended service life between 2011 and 2015 for the remaining ship of the class. The *America* (LHA-6) is now more than 30 percent complete and is scheduled for delivery in fiscal year 2014. The decommissioning of USS *Peleliu* (LHA-5) has been tied to the delivery of the *America* in order to mitigate any possible gaps in future deployment cycles. In support of the Navy's commitment to advancing our energy security, the hybrid propulsion drive in use on USS *Makin Island* (LHD-8) is being installed on LHA-6. Beginning with LHA-8, the Navy will reintegrate the well deck onto the large deck amphibious assault ships. Our budget for fiscal year 2012 requests funding for research and development to support reintegration of the well deck into the design of the large deck amphibious ship and the construction of LHA-8 in fiscal year 2016. Funding has been added to install a critical self defense capability for LHD-2-6 during the fiscal year 2016 Mid-Life Upgrade program. The Capstone Ships Self Defense System is essential to ensure ships survivability in any environment.

#### MARITIME PREPOSITIONING FORCE

The MPF(F) concept envisioned a forward-deployed squadron of ships to enable rapid closure to areas of interest, at-sea assembly, and tactical employment of forces to areas of interest in the event of crisis. Although useful across the range of military operations, this squadron was primarily designed for use in major combat operations. Due to refocusing of priorities and cost, this program has been deferred until the 2025 timeframe. The Secretary of the Navy stated that he was especially interested in enhancements that would give the legacy MPS squadrons additional capabilities and illuminate capabilities that would guide the development of MPF(F). Ships previously discussed in the context of the MPF(F) have been moved to the Command and Support section for battle force accounting. As noted in PB11, the Department has determined the large-deck aviation ships previously designated for the MPF(F) would better serve the Navy and Marine Corps in the amphibious ship inventory—hence the LHA(R)-class ships described previously.

In support of this enhanced Maritime Prepositioning Squadrons (MPSRON) concept of employment, three T-AKE auxiliary dry cargo ships were added to the program to provide persistent logistic support to Marine Corps units afloat and ashore. Further, the Navy recognizes the need to provide for at-sea transfer of personnel and equipment from a cargo ship and to provide an interface with Landing Craft Air-Cushioned (LCAC) vessels, both key capabilities the MPF(F) program was to provide. To fulfill this capability, the Navy will procure three MLPs. The third MLP is included in the PB12 budget. Operationally, the three current MPSRONs will add an MLP, a T-AKE, and a Large Medium-Speed Roll-on/Roll-off (LMSR) cargo ship. Future MPF capabilities will increase capacity attributed to new ship designs along with seabasing enabling capabilities such as at-sea arrival and assembly, employment, persistent sustainment and reconstitution.

#### JOINT HIGH SPEED VESSEL

The JHSV provides high-speed support vessels for the combatant commanders who clearly communicated to the Navy their desire for the unique capability to move assets throughout marginally developed theaters of operation while requiring a less well developed port facility. In addition, the JHSV's relatively shallow draft permits operation in a greater number of port facilities around the globe. The combination of these attributes permits rapid transport of medium size payloads over intra-theater distances to austere ports, and load/offload without reliance on a well developed, heavy port infrastructure. A Memorandum of Agreement with the Army transferring programmatic oversight and mission responsibility for the entire JHSV pro-

gram, including operations and maintenance, to the Navy was signed by the Secretary of the Army and the Secretary of the Navy on May 2, 2011. All delivered JHSVs will be operated by the Navy's Military Sealift Command and manned by civilian or contract mariners. The budget request for fiscal year 2012 includes funding for construction of the one Navy JHSV. Army has funded its final JHSV in fiscal year 2012. Army funded JHSVs will be considered part of the Navy's ship inventory.

#### FLEET OILER REPLACEMENT (T-AO(X))

The Navy plans to procure the lead ship for the replacement T-AO fleet oiler in fiscal year 2014 with follow-on production at one ship every year until 2032. Ultimately, this will likely result in a complete recapitalization of the existing T-AO and T-AOE-classes and will include a total of 19 ships procured. Legacy fleet oilers will begin retiring in fiscal year 2017. The new oilers will have a double-hull design to ensure compliance with the environmental protection requirement for this type of ship. The T-AOX AoA will also consider the business case of recapitalization of the four T-AOE fast combat support ships that begin retiring in fiscal year 2032.

#### SHIPBUILDING INDUSTRIAL BASE

Beyond balancing requirements and resources, the fiscal year 2012 President's budget submission for shipbuilding also weighs the shipbuilding industrial base, achieving a balanced and executable shipbuilding program which provides additional capability while striving for efficiency. Our goal is to build from the current (fiscal year 2011) battle force inventory of 286 ships to a battle force inventory goal of a minimum of 313 ships. This budget submission includes increases in large surface combatant capability and capacity and both new construction and modernization to support the President's directive to meet the growing ballistic missile threat to the United States and its allies. It also continues the Navy's long-term plan for small surface combatants by awarding competitive contracts for 10 ships of each version of the LCS.

We will continue to closely monitor our shipbuilding industrial base and especially the planned closure of Avondale shipyard by 2013. Northrop Grumman completed the divestiture of its shipbuilding segment by distributing shares in Huntington Ingalls Industries Inc. to its shareholders on March 31, 2011. After months of discussions and evaluation, the Navy did not object to NGC's spin-off of its shipbuilding business. The Navy's position on the spin-off was based on its conduct of due diligence with respect to proprietary forward-looking projections, including key financial assumptions.

Robust competitive opportunities do exist across our industrial base as evidenced by shipbuilding contract awards for MLP, LCS, and JHSV. A stable shipbuilding industrial base, underpinned by level loading and predictable ship procurement, is critical to meet the Navy's requirements for an affordable and capable future force.

#### ACQUISITION WORKFORCE

The Department has embarked on a deliberate plan to increase the size of the Department of Navy's (DoN) acquisition workforce (AWF) over the FYDP. The Navy's position is to continue its current plan as stated in the DON AWF Strategic Plan, to rebuild the (DON) civilian AWF. In fiscal year 2010, the DON AWF grew by approximately 3,000 people (DAWDF - 499, In-sourcing - 759). The remainder of the growth was in the Warfare Centers (NWCF organizations).

We started last year and aggressively increased our AWF based upon bottom-up requirements from our program executive officers (PEOs), Systems Commands, and Warfare Centers. In fiscal year 2010, we have added approximately 1000 acquisition personnel (122 DAWDF, 325 In-sourcing, and 600 other growth) to support shipbuilding programs at NAVSEA. Approximately 70 percent of these new acquisition positions were added to our warfare centers across the country. These warfare centers provide critical engineering, integration support, testing, and contracting oversight to all of our sea, air, land, space acquisition programs. These personnel are critical since they represent a part of the pipeline of future Program Managers and Senior Systems Engineers.

We have also taken advantage of the Defense Acquisition Workforce Development Fund (DAWDF), initiated by Congress, and added nearly 400 acquisition interns this past year. We are on target to bring aboard an additional 500 this year and next. About 30 percent of our DAWDF AWF hires are now in shipbuilding organizations. We have also improved our education and training programs in two critical areas of need: shipbuilding program management and contracting.

We have used DAWDF funds to pilot a shipbuilding program manager's course that was successful enough that we are moving it permanently to our Defense Ac-

quisition University program. Other training initiatives include the integration of a “Navy Day” into the current PMT-401 course that introduces all Program Managers to DoN’s S&E infrastructure (Warfare Centers/Labs/FFRDCs/UARCs) and the development of an Acquisition War Room focused on shipbuilding programs and acquisition lessons learned. In addition, because of the difficulty in hiring experienced contracting officers, we have implemented an intense accelerated contracting training program at NAVSEA to increase the number of qualified contracting officers as well as increase retention rates among this important group. It will take several years to rebuild and rebalance the DON’s AWF, but these measures and continuing them with this budget is an important step.

The Navy continues to emphasize the significant value added by having a professional cadre of onsite Supervisor of Shipbuilding (SUPSHIP) personnel colocated with our Nation’s shipbuilding industrial base in an oversight role. Over the last year, the number of onboard SUPSHIP staff reached 1,100. This marks a continued growth trend of SUPSHIP staffing from approximately 900 onboard in fiscal year 2007 and marks another successful year of achieving hiring targets, as SUPSHIPS have done every year from fiscal year 2007-fiscal year 2011. Leadership will work to continue to align resource needs and staffing requirements.

#### SUMMARY

The Navy’s shipbuilding submission for fiscal year 2012 President’s budget and fiscal year 2012–2016 FYDP supports the requirements addressed in the National Defense Strategy, the Maritime Strategy, and the 2010 QDR. The plan sustains an 11 CVN force from 2015 through 2045; sustains *Virginia*-class build rates at two submarines per year through the FYDP; increases Air and Missile Defense capability with increased DDG-51 construction and Aegis modernization; increases amphibious lift capability with the 11th LPD-17; sustains intra-theater lift capability with JHSV procurement; leverages strong competition in the LCS program to buy additional ships; accelerates procurement of fleet oilers; and continues *Ohio*-class replacement design and development by funding Research and Development efforts within the FYDP as well as Advance Procurement funds for detail design in fiscal year 2015. In the near years, this plan relies heavily on your support for our fiscal year 2012 budget.

Through the long range plan for naval vessels, the Navy instills affordability, stability, and capacity into the shipbuilding plan and advances capabilities to meet the most likely evolving threats. The plan continues DDG-51 construction to leverage a stable design and mature infrastructure to achieve affordable capabilities. DDG-1000 technologies will provide long-range, precision naval surface fire support to marines conducting littoral maneuver and subsequent operations ashore. LCS will address specific and validated capability gaps in Mine Countermeasures, Surface Warfare, and Anti-Submarine Warfare, and our selection of both LCS designs leverages the unique capability delivered by each platform while providing stability to the shipbuilding infrastructure. Restructuring of our Maritime Prepositioning Force to augment our current MPS squadron with a T-AKE, MLP, and an existing LMSR will enhance the existing capabilities of the MPSs. The Navy has also increased the emphasis for meeting and extending service lives of in-service ships. We are sustaining the CG/DDG Modernization while also providing critical mid-life overhauls of LSDs. We have deferred command ship replacement and intend to sustain the current command ships until 2039.

The Department of the Navy has addressed realism in our shipbuilding plan by incorporating realistic budget projections. The Department has addressed the industrial base in leveraging stable designs to minimize disruption experience with first of class constructions and provides stable production rates within the constraints of requirements and budget. Finally, the Department of the Navy’s plan supports the Secretary of Defense’s guidance to significantly reduce excess overhead costs and apply the savings to warfighting capability and capacity.

Senator REED. Well, thank you, Mr. Secretary. I presume that Admiral McCoy and Captain Galinis do not have statements; or do you, sir?

#### **STATEMENT OF VADM KEVIN M. McCOY, USN, COMMANDER, NAVAL SEA SYSTEMS COMMAND**

Admiral McCOY. I have a short statement, sir.

Senator REED. Excellent. Please go ahead.

Admiral MCCOY. Mr. Chairman, Ranking Member, and distinguished subcommittee members, thank you very much for the opportunity to testify on shipbuilding initiatives and the material readiness of our Navy. As the Commander of NAVSEA, I have been actively engaged with senior Navy leadership, the shipbuilders, and the NAVSEA organization to improve the quality of ships delivered to the fleet and ensure that our ships retain their warfighting effectiveness and achieve their full service lives.

Let me speak up front to the LPD-17 class program. Similar to previous shipbuilding programs, the LPD-17 class continues to improve and mature as lessons learned on early ships are rolled into follow ships and each successive hull completes the building process. NAVSEA and SUPSHIP Gulf Coast are working closely with the shipbuilder to incorporate lessons learned from the lead ship into follow ships.

Relative to this class, NAVSEA's focus has been in three areas: One, addressing the shortcomings of government oversight at the SUPSHIP. SUPSHIP Gulf Coast has hired over 284 new employees in the past 6 years, resulting in a 21 percent increase in manning, including having a second Navy captain assigned as the deputy supervisor for operations.

SUPSHIP has already conducted quality audits and made improvements in the shipbuilding process, including better foreign material exclusion from piping and increased quality assurance compliance inspections, with particular focus on working with the shipbuilder to assess and improve the compliance with critical ship construction processes. These efforts are independently validated by my staff on a regular basis, including an annual comprehensive quality assurance audit conducted by outside experts focusing on both the SUPSHIP and the shipbuilder.

Two, ensuring shipbuilder compliance in all areas of construction and having the metrics and situational awareness of deckplate performance to catch trends early as possible in the shipbuilding process.

Three, implementing strike team modifications to make the ships more reliable in service. We have created a cross-functional strike team that includes engineers and fleet representatives to address issues associated with this new class of ship. Significant focus areas include: redesigning the filtering elements of the diesel engine and steering systems; improving the reliability of electrical generation and distribution systems; and updating the software in the engineering and ship control systems.

The LPD-17 class brings tremendous warfighting capability to the Navy and the Marine Corps and it's imperative that we continue to ensure that our warships are available for tasking now and in the future. Moving forward, we are committed to leveraging lessons learned during the fleet introduction of LPD-17 class into our initiatives to improve overall service readiness.

I will add that last week we had all five delivered LPD-17 class ships underway, two on deployment, two on local operations, and one is just back from successful sea trials.

I think we're over the big hurdles on that class, sir. In fact, *San Antonio*, which has been off line for about 18 months during a

major rebuild from some earlier construction issues, is back at sea, having been at sea over a week on sea trials, and so far doing well.

With respect to surface force readiness in general and the findings and recommendations of the fleet review panel in 2010, at NAVSEA we fully embrace our responsibility to: one, define with rigor the processes and methods of ensuring our ships meet their full service lives; and two, ensure that maintenance and modernization are executed in a formal, deliberate, and efficient manner to ensure the operational readiness, reliability, safety, and effectiveness of our ships.

We're working hard to address these issues in order to keep America's Navy number one in the world.

I'd be happy to take any of your questions, sir.

Senator REED. Thank you very much, Admiral, for that excellent testimony.

Captain Galinis, do you have a statement?

**STATEMENT OF CAPTAIN WILLIAM J. GALINIS, USN,  
SUPERVISOR OF SHIPBUILDING, GULF COAST**

Captain GALINIS. Sir, I do have a short statement.

Senator REED. We'd like to hear that. Thank you.

Captain GALINIS. Mr. Chairman, Senator Wicker, Senator Ayotte, thank you very much for this opportunity to testify on Navy shipbuilding and the quality issues affecting some of our ship construction programs. I have been the SUPSHIP Gulf Coast since September 2009 and before that served as the LPD-17 class program manager.

As the SUPSHIP, I serve as the Navy's on-site or waterfront representative responsible for the day-to-day administration of Navy shipbuilding contracts with private shipyards under my area of responsibility. At SUPSHIP Gulf Coast my team currently oversees ship construction work across the Gulf Coast from Alabama to Louisiana and as far north as Wisconsin. The shipyards we oversee are currently constructing the DDG-51 class, LHA-6, and LPD-17 class ships at the Ingalls Yards in Mississippi and Louisiana, the LCS class *Freedom* variant LCSs in Marinette Marine, WI, oceanographic and special purpose ships at VT Halter Marine in Mississippi, and several smaller yards, including foreign military sales work at many of the yards in Alabama, Mississippi, and Louisiana.

As the Navy's waterfront representative for these contracts, I am responsible for overseeing shipbuilder quality compliance and ensuring that the ships delivered for Navy service meet all of our requirements. My team works on a daily basis with the shipyards to ensure that contractors satisfy their contractual obligations. It's no secret that we have struggled with quality of some recently delivered ships from Gulf Coast shipyards. We, my organization and the shipbuilders that we work with, have done a lot of work in this area over the last 2 years implementing many improvements to improve quality.

In some cases, this is simply getting back to the basics, namely reinstating a culture of quality and a culture of compliance with well-engineered written processes and procedures, monitoring deckplate execution, and then measuring our performance against these requirements. Both the supervisor and the shipbuilders are

heavily focused on process compliance and are continually assessing our performance in this area.

We are not done yet. Namely, we are executing quality work, but the near-term additional oversight measures are causing cost increases. We need to continue to improve our first-time quality and reduce rework. My team and the shipbuilders building these ships are committed to improving overall ship construction quality, building these ships as affordably and on schedule and delivering ships that are safe and reliable. I believe that our sailors and marines deserve nothing less, and I look forward to discussing these efforts with you.

Thank you.

Senator REED. Thank you very much.

Gentlemen, thank you for the very insightful testimony. Let me begin with Secretary Stackley. Both Senator Wicker and I have commented on the LPD-17 and both Admiral McCoy and Captain Galinis also. Just a preliminary question. We took delivery of these ships and found there were significant shortcomings, at least the initial ships. Were we obligated to take delivery? As someone who did not have the benefit of an Annapolis education, Mr. Secretary, I assumed that we'd only take delivery if everything was okay.

Mr. STACKLEY. Yes, sir. In the case of LPD-17 we were not compelled to take delivery. The ship delivered in the summer of 2005. She did receive an acceptance trial. There was a unique circumstance with regards to funding and completion of the ship. A decision was made that work would be deferred, to be completed in post-delivery, that deferred work would be documented by the Board of Inspection and Survey (INSURV) and they would actually come back and do a final acceptance trial after that post-delivery period.

Literally days after that event, Hurricane Katrina hit the Gulf Coast and all good intentions were abandoned. The ship basically stayed at the shipyard for the amount of time necessary to get it ready to get under way and all the deferred work moved with it to its home port in Norfolk, where it was contracted out under a competitive bid process.

So there was a confluence of events there. The Navy was not required to take delivery by any means. It was a conscious decision, but the planning went awry when Katrina basically overturned events.

Senator REED. But when you took delivery, was it contemplated that the Navy would pay the additional costs for the rework, or is that somehow still the responsibility of the yard?

Mr. STACKLEY. The reality is that the first four ships were awarded back in about the 1996 timeframe under a single cost-plus contract. Within the terms of a cost-plus contract, the government is responsible for paying the cost of the work and then industry basically puts at risk fee. But if there are allowable and allocable costs incurred on the contract, then the government is responsible for paying those. That does include rework so long as there isn't any fraud or mischarging or things of that nature.

Senator REED. Just to be clear in my mind, because of the nature of that cost-plus contract taking delivery of the ship did not shift costs to the government or the contractor?

Mr. STACKLEY. Not at all, no, sir.

Senator REED. My presumption is that we're not contracting like that in the future.

Mr. STACKLEY. In fact, the fifth ship of the class was also cost-plus, and what we did several years ago was convert that to a fixed price to basically stop the bleeding. In general, we have contracted lead ships of a class inside of a cost-plus contract because of all the parallel development that takes place with the lead ship, and then we look to move to a fixed price environment as quickly as possible after that.

In this case, a single contract awarded the first four as cost-plus.

Senator REED. I think what Admiral McCoy indicated was that the recent ships that have delivered have much fewer problems. Your sense is that the trend line is now in the right direction, that they're leaving the yard basically ready for sea trial?

Mr. STACKLEY. Absolutely. I'll let the two gentlemen on either side of me add to that, but there are several aspects of that. First, the program is just far more mature now. So the design deficiencies have been corrected, the build plans associated with the shipbuilder and how he builds the ship have matured. The vendor base has matured.

Equally important is the government's oversight has matured. Admiral McCoy mentioned the strengthening of the SUPSHIP. A complete audit and review of processes and procedures is in place to ensure compliance.

The challenge that we have is going after the first-time quality, as opposed to the inspected-in quality. So we're working side by side with the shipbuilder, because it's impacting them as well inside of this. They're in a fixed price environment now, so they're paying for their cost of rework. We're both working to get it right the first time, so that we're not incurring costs late in a ship's build cycle correcting deficiencies.

Senator REED. Admiral McCoy?

Admiral MCCOY. Mr. Chairman, let me add. Fundamental completion and fundamental quality improved on 21, for example, the last one that we took delivery of. We did have, I would say, two lingering problems that were late in discovery for the class, that did affect the 21, and that is grit in the lube oil system, so we had some rebearing and flushing to do to the engines; and insufficient socket weld length of material, and so we had a significant number of welds to go back and redo.

But all the other stuff greatly improved from the first. In fact, we had a highly successful final contract trial just earlier this spring on *New York* and received lots of praise from INSURV during that trial.

Senator REED. Admiral, you've made the very explicit point that you've beefed up dramatically your supervisory staff. I think that quite clearly implies that one of the defects was a lack of Navy supervision. I think that's the case, correct?

Admiral MCCOY. Yes, sir. First let me just say, though, the fundamental responsibility for constructing the ship right lies with the contractor. However, as a backstop we have a SUPSHIP in place that we expect to monitor the contractor's quality performance and

be able to pull the penalty flag out of the back pocket when necessary. That did not effectively happen here.

I'll let Captain Galinis talk about some of the things that he's done to get us much more in a compliance mode and looking at the same metrics the shipbuilder is looking at to backstop the shipbuilder effectively. But I would say yes, that is a fundamental responsibility of the government and that did not happen here, sir.

Senator REED. One follow-on question before I recognize Captain Galinis. You have learned a great deal. We've all learned a great deal. I presume that you're operationalizing these lessons, not just along the Gulf Coast, but in every aspect of shipbuilding.

Admiral MCCOY. Yes, sir.

Senator REED. Also, you're taking this and you're trying with Secretary Stackley to plug it into the design phase and the build phase of future vessels, so that we don't have to relearn this lesson every time we have a new class of ship. Can you just comment briefly on that?

Admiral MCCOY. Yes. Let me just address the first part first. As part of what we learned coming out of the Gulf Coast issues, we instituted across the four SUPSHIPs what we call back to basics. It's heavily focused on compliance, as well as contract oversight and training.

We have increased the staffing across all four SUPSHIPs by over 200 just in terms of gross numbers. We were at about 900 across the force SUPSHIPs. We're now at about 1,100. So we recognized that across the board, particularly with this ramp-up of shipbuilding—two LCS classes, JHSV, two *Virginias*—that we weren't postured the way we needed to be and we needed to get back down to the fundamentals; and that we also had in many cases a green workforce that needed significantly more training.

So we went off on that direction across the board, across the corporation. I can let Captain Galinis talk about some of the things that he's done.

Senator REED. Before he does that, just a final point about how you, Mr. Secretary, have taken these lessons learned and put them into the development of new ships or new classes of ships?

Mr. STACKLEY. I would say if you look at the LPD-17 class of ships, fundamentally it's a great class of ship. The Marine Corps loves it. The Navy operators love it. The Achilles heel has been some of these nagging reliability issues, like the grit in the lube oil, which has been kind of a mission kill from a propulsion standpoint. But yes, we have been looking at those issues across the board and looking at our other classes and saying, okay, where could we have the same problem?

For example, welding. We have beefed up welding oversight and compliance at every one of our four SUPSHIPs because we know that is one of those critical processes that if it gets away from you it's very difficult to recover from. Critical coatings is another one, in terms of paint and things like that. So we're looking at that across the board, Senator.

Senator REED. Let me do this. Because my colleagues have been very indulgent and I've taken a lot of time and I want to recognize Senator Wicker. I'm going to come back with the second round and ask you sort of the same question, which is how are you working

to take these lessons, incorporate them, not just in shipbuilding supervision but in design, in decisions about what ship classes you can build on the force. So you can think about that.

But one reason I requested that Captain Galinis be here is that Admiral McCoy is a great commander and he probably reaches out every day, in fact several times a day, to you, Captain, and says, what's going on on that waterfront, what are we doing, et cetera? I wanted to be able to get the benefit of the kind of advice that Admiral McCoy, because of his leadership skills, gets. So can you give us, as Admiral McCoy suggested, some sort of feel of what you think the problems are and how we've addressed them and where we have to do more?

Captain GALINIS. Yes, sir. Fundamentally what I've seen since I've been down there, the basic root cause of this really comes down to process compliance. We look at it at four functional areas in shipbuilding: piping systems, electrical, coatings, and structure. Across those four major processes that it takes to build a ship, fundamentally the work items and the processes are sound. What we found—and this is on both the Navy side and the shipbuilder—we have gotten away from or deviated from following those written processes.

Collectively there has been a renewed focus to look at the work processes that are in place, and ensure that we're following those, and then measure our compliance to those processes.

What did we do at SUPSHIP Gulf Coast specifically for our workforce? In addition to the increased hiring that we've been able to do over the last several years, training has been a big factor in our quality organization. Essentially, we've restructured our quality organization and we've provided a career path now where a person can enter the quality workforce at an entry level and work his way all the way to essentially a subject matter expert as a quality assurance specialist.

That was not there before. That training comprises two aspects of it. There's formal training, classroom, schoolhouse type training, as well as experience that needs to be documented and logged. For example, a nondestructive tester who would inspect welds, he goes through a formal training course and then he's required to incur so much time on the job performance, that essentially gets documented and he works under the supervision of a more qualified welder.

The second thing that we've done working with the shipyard is we have aligned our inspection attributes and the things that we look at, so that we know when we get reports from the shipbuilder that we understand what they're looking at and they understand what we're looking at, so our metrics, if you will, are somewhat aligned. That was a tremendous process. It sounds fairly basic, but it was something that over time we had gotten away from.

Once we aligned those metrics, what we started doing is what we call critical process pulse audits. Across those four areas that I mentioned—electrical, piping, structure, and coatings—we've been doing this every other month now, a joint inspection using the common attributes that we've developed. That has allowed us to realize and understand where our risk areas are, where the crafts are deviating from the processes that are in place.

We've been doing this for probably about 14 or 16 months, since the early part of 2010. We have a pretty good track record now that we can go back and we can see where our risk areas are. So where in the past we didn't know what we didn't know, now we know where our risk areas are.

Then the results of those processes are fed directly back to the operations, the craft leadership, and I meet on a monthly basis with the craft directors and we literally go through these metrics. Then from that they either adjust the shipyard training for the craftsmen or we adjust training for the quality inspectors if we need to do that. In some cases maybe we do make changes to the processes.

So that in a nutshell is kind of the process that we've been through over the last almost 20 months or so.

Senator REED. Thank you very much.

Senator WICKER.

Senator WICKER. Let me just observe that the chairman, with neither an Annapolis education or a fine Reserve Officers' Training Corps education, seems to have been able to drill down on some very good points here.

Let me see if I can summarize in layman's terms. Things are better now with the LPD-17 because the program has matured, and that stands to reason. Admiral McCoy says that actually things are going pretty well there now and the people love it. Yet, as late as the winter 2010, we did have this independent weapons tester saying that the ship is not effective, suitable, and is not survivable in combat.

Admiral McCoy, do you take issue with that? Was it correct at the time it was made and in a short time that's been rectified, or what can you tell the committee?

Admiral MCCOY. Senator, I think if you look at the issues that they identify, I don't take issue with the issues. We were having mobility issues, no doubt about that. We were in the middle of grit and lube oil on just about all our ships that we were dealing with, so that was a mobility issue.

Senator WICKER. When was the grit solved?

Admiral MCCOY. I'd say right now with *San Antonio* going to sea and doing well I think we can say the grit is behind us now.

Senator WICKER. Just behind us?

Admiral MCCOY. Yes, sir. We've had to flush, we've had to change system design, and we've had to prove with a significant number of hours on the engines that these ships are reliable. I hate to knock on wood, but I'll knock on wood here and say, with two deployed and last week three others out at sea doing well, and I think a good understanding of the issues both at the shipbuilder and how we get the grit out, flush, service, and some of the system design changes, that I think that one's behind us.

There were also issues with the Ship-Wide Area Network (SWAN). On the earlier ship, you had the less reliable, outdated, obsolete, almost the ATM version, and we're now putting the Gig E version. Two of the ships have it and we have a program to put that on the others.

We had issues with interior communications that we've been dealing with. So we have been systematically going through some

of these issues and I think we're in a much better place. We have answered this question before and I'm happy to give an update to the committee, sir. We'll take that one for the record in terms of the status of each one of those items.

[The information referred to follows:]

The LPD-17 Class of ships has met or exceeded all Key Performance Parameter objectives outlined in the LPD-17 Class Operational Requirements Document with the exception of one information exchange requirement that still needs to be validated.

Director, Operational Test and Evaluation (DOT&E) found the LPD-17 Class "not operationally effective, suitable, or survivable in a hostile environment" during testing in 2007-2009; and its report identified 68 deficiencies grouped under 3 major issues—reliability, self defense, and recoverability. The Navy has completed its review of operational test reports by DOT&E, developed corrective active action plans, and has substantially resolved or is in process of resolving the deficiencies cited.

The LPD-17 Class operational evaluation was conducted with a legacy asynchronous transfer mode (ATM) version of the Ship Wide Area Network (SWAN) and an early version of the Engineering Control System (ECS). The first two ships of the class have received the upgraded GIG-E SWAN; and no issues have been cited since installation. Upgrades to LPDs-19 and -20 are scheduled for completion by the end of 2012. All remaining LPD-17 Class ships in construction will include the GIG-E SWAN upgrade. New ECS software to improve performance and provide additional built-in test/monitoring capabilities has been installed on all LPD-17 Class ships.

Main engine reliability issues have been observed on four of the first five LPD-17 Class ships. The root cause of those issues can be traced back to lube oil cleanliness. Poor initial system cleanliness led to steering reliability issues. A major redesign of the lube oil filtration system was completed in early 2010. Damaged bearings and lube oil piping segments have been replaced on all affected ships. New filters and/or modified strainers have been or will be installed on all delivered ships. New flushing procedures have been developed and implemented; LPD-22 and follow ships will all be delivered with the new designs and components.

Interior/Exterior Communications (IVCS) components demonstrated unreliability and could not support high volume traffic capability beyond existing amphibious ships; and the Uninterruptible Power Supply (UPS) batteries failed prematurely resulting in total power loss for some components. The IVCS software has been upgraded; and new batteries, along with revised preventive maintenance procedures, have been installed on all LPD-17 Class ships. Additionally, a new UPS monitoring system is being implemented across the class.

Recoverability refers to the ability of a ship and its crew to prevent loss and restore mission essential functions given a casualty from accidents or threat weapon effects. Systems that directly impact recoverability include UPS, SWAN, ECS, damage control equipment, shipboard damage control features and crew training. Ship system issues and associated resolutions have been identified in the preceding paragraphs. Additional isolation valves in the chill water system are planned for installation on all LPD-17 Class ships; and fire detection system software deficiencies have been identified and corrected across the class to improve the ship's recoverability.

Follow-on Operational Test and Evaluation, which commenced in July 2010, is being conducted by the Navy's Commander Operational Test and Evaluation Force and the Marine Corps Operational Test and Evaluation Activity under DOT&E oversight to confirm these corrective actions resolve the problems noted by DOT&E. The evaluation is scheduled to run through the end of fiscal year 2012.

The first three ships of the class have successfully completed their maiden deployments, meeting not only their anticipated operational requirements but also responding to emergent missions requests. Today, USS *Mesa Verde* (LPD-19) and USS *Green Bay* (LPD-20) are deployed overseas; and the other three commissioned ships in the class are conducting local operations.

A classified brief providing the status of DOT&E deficiencies and associated corrective actions was presented to the Senate Armed Services Committee professional staff on August 6, 2010; and the Navy can present an updated classified level brief with additional clarification and detail of each deficiency, if desired.

Senator WICKER. Okay. Do you think the independent tester went a little overboard late last year in stating, as I have quoted,

not effective, not survivable in combat? Went a little too far in your judgment?

Admiral MCCOY. I certainly don't want to second guess the inspector. I will tell you that in my mind I had serious issues a year ago on reliability of the propulsion plant because we were still coming through it, and I think we're through that. So I don't want to take issue with the tester, sir.

Senator WICKER. Okay. Secretary Stackley, are you trying to jump in?

Mr. STACKLEY. I was going to add to that. We did a thorough review of the findings from the test and evaluation (T&E) community coming out of operational T&E and three basic categories emerged. One was a reliability issue associated with the propulsion plant, which Admiral McCoy has highlighted and the efforts that have gone into identifying things from the low boil system to engine alignment. Those issues technically understood; fixes are either in place or being completed throughout the class.

The second category was reliability associated with, the Admiral mentioned, the SWAN and the obsolete technology. That technology is being refreshed. This touches everything from the propulsion system to interior communications to motor-operated valves.

Senator WICKER. Was that a design defect or a manufacturing failure?

Mr. STACKLEY. Actually, at the time that was state-of-the-art. This mid-90s technology was state-of-the-art for basically passing signals from one end of the ship to the other. You get to a decade later and it's obsolete technology. It has been far surpassed by this gigabit ethernet approach which we're incorporating throughout the class.

The third category is the combat systems. On LPD-17, the combat systems—I will call them Navy standard systems are the same systems that you'll find on other Navy ships. There are some deficiencies associated with those systems against certain threats that are known throughout the Navy, that are being addressed Navy-wide in terms of upgrades to those systems, and when we have the Navy-wide solution that will be back-fit on the LPD-17 class.

So the findings we found to be generally accurate and the final determination, that's the Director of Operational Test and Evaluation's call.

Senator WICKER. Let me try to boil this down with regard to the LPD-17. We had gotten away from a culture of quality, and I take it from the testimony that the shipyard itself had gotten away from the culture of quality.

Number two, the Navy didn't follow the process closely enough. Number three, part of that was not enough Navy personnel were assigned to this task to make sure we stayed with this culture of quality.

Then number four, getting down to specifics, there were written instructions as far as the process that simply were not followed.

Captain Galinis, I'll let you take the first stab at this. Have I summarized at least four important parts there correctly? If not, what did I miss? I think the chairman is asking the exact right question. This program has matured and it's going to be fine and folks like it now, but it sure has been a mess.

Are we learning lessons, not just for this system, but for the next system, so that it can be avoided again?

Captain GALINIS. Yes, sir. First of all, I believe you did characterize the points correctly there. Again, the written processes that we have I think are good processes. As I said, what we have in place now, I believe, the inspections that we have, working with the shipyard, give us the ability to measure compliance with those processes. I believe that probably in the past we were not as effective in that area collectively, both the Navy and the shipbuilder, as we should have been or certainly could have been. I think that's what led to some of the issues that we're seeing.

The pipe weld issue that Admiral McCoy referred to. The mil standard that's in place to measure weld quality has about 18 different attributes, and I'll say over time our inspectors both on the Navy and the shipbuilder side maybe were only looking at 6 of those, as an example. We were not catching all of the particular attributes that would lead to a quality weld.

That's just one example that over time we've atrophied how we look at particular issues. I think through the training processes now that we've put in place both on the Navy side and the shipbuilder side, one of the things that Admiral McCoy referred to, his teams that have come down, since I have been down there, in almost 20 months we've had eight different quality or technical authority type-based assessments done between the shipbuilder and the SUPSHIP, as well as a number of other informal audits.

So one of the things that came out of that early on was the training of the craftsmen on the deckplate, not knowing exactly what process they should be using. In the Ingalls yard that we work with, they have three different contracts in place at the same time. So there are different requirements across those different contracts. For the craftsman on the deckplate, to do the job correctly he had to understand what the requirements were for the ship that he was working on and the processes he should follow.

A lot of times that information wasn't being flowed down to the craftsman. I'll tell you that's one thing that the shipyard has corrected, and within the last year they have a very robust training program in place now, not just for new hires, but also for people in the workforce to go back and refresh those skills.

Just 2 months ago I had the opportunity to go through that school myself and we walked through what they're doing for the welders, how they're training the electricians and the pipefitters. There is a very good effort in that place, and I think that gets us to that process compliance piece that we're striving for.

Senator WICKER. Thank you very much. I'll stick around for a second round, but I know Senator Ayotte has been very patient, so I'll let her take a turn.

Senator REED. Senator Ayotte.

Senator AYOTTE. Thank you, Mr. Chairman. Thank you so much, Senator Wicker.

Secretary Stackley, I wanted to ask you about the issue of modernization of our shipyards. In your written testimony you cite the impending attack submarine force structure gap that you anticipate coming in the 2020s. You've also stated that you plan to address this impending attack submarine force structure gap by re-

ducing the construction span of the *Virginia*-class submarines and extending the service life of selected attack submarines and extending the length of selected attack submarine deployments.

The Portsmouth Naval Shipyard is a very important public shipyard in our country. There is a gap in the modernization of our shipyards in terms of the backlog there. I'm sure that the other shipyards have backlogs as well, but the backlog at Portsmouth is approximately \$500 million in modernization.

What steps do we plan to take to address that, given if we're going to focus on extending the life and the maintenance? A shipyard like Portsmouth is very critical in having the ability and modernization to be able to do that in the most efficient and appropriate manner to meet your goals.

Secretary Stackley, what steps do you think we should be taking to prepare for an increased workload, as I would see it actually, in what we do at the shipyard?

Then also, Admiral McCoy, if you could comment, based on your previous experience as the commander at the Portsmouth Naval Shipyard, how you think the Navy's plan to address the attack submarine forces structure gap will impact Portsmouth, and also what steps we can be taking now and what steps you anticipate taking to address this backlog so that we can be prepared to meet what your proposal is.

Mr. STACKLEY. Yes, ma'am. Let me start by describing first the mitigation efforts that you highlighted from our written statement. Those are mitigation only. They don't close the gap. If you look at the force structure tables, in fact our submarine force structure drops down to a low of about 39 submarines in about 20 years.

That's of deep concern to us. When we look at what that potentially means with regards to operational cycle and turnaround times, turnaround ratios, it means that we have to stay right on top of the maintenance plan for the *Virginia*-class. Historically, submarine and carrier maintenance has been funded to about 100 percent. It's at the top of the priority list when it comes to our Operation and Maintenance account and so we ensure that we do fully fund the maintenance that's planned.

You're getting at the flip side, which is, how about the infrastructure that's going to be responsible for executing the maintenance? We have a couple of benchmarks that we look at. The investment in terms of infrastructure for our depots, we're required and we do meet the requirement to ensure that at least 6 percent of our maintenance budget would be going through those depots, into the infrastructure. We carefully ensure that we meet that benchmark.

The backlog is the delta between that benchmark and then the long potential list of things that we'd like to do to upgrade or modernize our facilities. That comes back to the rest of the budget process. After we hit our benchmarks in terms of ensuring that we've fully funded the maintenance and the modernization and that we've met the benchmarks for taking care of the infrastructure, this remaining list of work has to compete inside of the budget process based on priority.

We're looking across the board in terms of our depot investments and the projects that either are a higher priority or return the greatest bang for the buck. Looking at the future requirements for

those depots is how it plays out. Each of the depots are looking at that type of a backlog and it simply comes down to the budget that's available, prioritizing the requirements inside of the budget, and ensuring that we meet the maintenance demands for the force today and for the foreseeable future.

Senator AYOTTE. Just as a brief follow-up, you said you are deeply concerned about the 39-submarine structure, and then also the purpose of the modernization would be to make sure that we can most efficiently use our shipyards. In terms of your deep concern about that, please tell me a little bit more.

Mr. STACKLEY. It's both maintenance and modernization. One of the other things that we've done with *Virginia*, the latter half of the *LA* class, *Seawolf*, and for the replacement, is gone towards the ARC-E concept, which is basically modernizing as you go. In other words, rather than bring submarines in to deep modernization periods to upgrade their capability to pace the threat, we've gone towards a more open systems approach, so that the impact associated with modernization periods is less dramatic.

But the other aspect of it then is just class maintenance plan, doing the periodic maintenance and the condition-based maintenance on a regular cycle. That's the two parts. It's ensuring the maintenance is funded, which it has been and foreseeably will continue to be; and the other is to ensure that the infrastructure is there to conduct the maintenance.

I haven't reviewed the backlog list at Portsmouth. I suspect that Admiral McCoy has. But I'm not aware of an issue at Portsmouth regarding the backlog of upgrading that facility that directly places at risk our ability to maintain the submarine force that will be relying on Portsmouth as a depot.

Senator AYOTTE. Admiral, I know you're quite familiar with the shipyard. I wanted to get your thoughts on this.

Admiral MCCOY. If you did know, I'm one of the fiercest defenders of the four naval shipyards within DOD, because they are so critical to sailing in the Navy. As a matter of fact, I tell people every single man-day at least for the next 5 years has already been accounted for in the four naval shipyards with known work. It's that critical to the fleet.

I watch and evaluate the military construction (MILCON) and the sustainment and restoration money that goes into the four naval shipyards. I am satisfied, and we argue vehemently inside the Navy rack and stack process, that the critical maintenance, piers and drydocks, the things we need to do to execute our mission every single day, is in fact done, and the critical replacements that we need to do.

After that, as Secretary Stackley said, it becomes where in the budget in terms of this thing or that thing. Maintenance, MILCON, modernization, equipment buys, hiring people, apprentice training, and things like that where in the priority is the best expenditure of our dollars at any given time. But we are very conscious to make sure that our four naval shipyards get the critical maintenance that they need and MILCON that they need to execute their mission.

Now, I'd like to address the attack submarine backlog. That's an issue that all of us are working on within the Navy. There are

things that we can do that I will just point out that the folks up in Portsmouth are intimately involved with. We have the SUBMET folks, about 250 people up there at the Portsmouth Naval Shipyard, colocated along with the shipyard, and in fact we're looking at ways to collapse the maintenance cycle down. Can we do less maintenance with good engineering, the track record, and the trending that we've been doing over the years?

For example, a year ago we signed out a change to the second half of the 688 class life where, instead of doing 4-year on-center selected restricted availabilities, we're now doing 6-year on centers. That one change just between 2010 and 2016 gave us 12 submarine years back.

I think there's a tremendous opportunity for the submarine repair industrial base that Portsmouth is deep in the middle of to look at how on the repair side we can reduce the amount of maintenance required to give more operational time to the fleet.

We're looking at right now how do we get engineered overhauls from about 20 months down to 18 months? That gives us 2 more months of submarine time. There's a huge role for our public shipyards in helping that submarine gap out there in the future, as the Secretary said.

Senator AYOTTE. Thank you very much for your answers. I appreciate it.

My time is up.

Senator REED. Thank you very much, Senator.

Let me go back to the question that both Senator Wicker and I alluded to, Mr. Secretary.

That is, we've learned a lot through not just the LPD-17 program, but so many programs that you've all spoken about. How are we capturing these lessons, not just in terms of oversight of the shipyards, but in the design and the contractual arrangements that we are going to see in the future to ensure the ships come in on time, on budget, and at high quality?

Just as a footnote, I think one of the lessons we have learned is you have to have the Navy personnel on the shipyard. My sense was in the 90s that presence was a billpayer for a lot of things we did. With the tough budget ahead of us, we can't do the same thing again or we'll squander these lessons.

With that as a prelude, Mr. Secretary, your comments please. Admiral McCoy, if you have comments I'd appreciate it; and Captain Galinis also.

Mr. STACKLEY. Yes, sir. Let me start at the very front end of the process, which is requirements. If you get the requirements wrong, you can't fix them downstream. What we've spent a lot of time and effort on more recently is requirements definition, looking at risk, how much development is being required to meet the capabilities that are being lined up with the requirements, and what's it going to cost.

I can tell you that with the LPD-17 program cost realism was approximately nonexistent at the front end. LCS had a similar problem getting out of the starting blocks. If you don't understand the cost and if in defining the requirements you bring a lot of risk associated with developing new capabilities, then downstream when you're trying to actually execute what was planned on the

front end you're going to run into cost problems. You're going to run into schedule problems when you have concurrent development, design, and construction going on.

So we've been focusing on the front end, bringing cost realism, looking for that 80 percent solution to achieve the requirements, reduce the risk, and reduce the cost as we get into the design and construction phase. The *Ohio* replacement program is a good example. We spent a year unlocking those requirements and looking at trades inside of capabilities to figure out how we get the cost of this large program down so that later in 5 to 10 years report that we are not breaking other shipbuilding programs to meet that national strategic requirement.

There's the requirements piece and there's the cost realism piece. To go with that is design for affordability. It's really bringing lessons learned from other shipbuilding programs into the front end. We're in a much better position to do that today with the design tools that we have. We're away from vellums, we're away from paper. We're going into standard computer-aided design tools that allow us to design a ship many times before we build it.

We can catch and capture design deficiencies and interferences. We can bring standard practices. We can have more people reviewing the design, and then look at producibility in that process. So it's get the requirements right, it's leveraging some of the lessons learned in the design tools that we have.

The other key piece is to get the design done before you build so you're not carrying concurrency into the construction cycle. One example is something like a product ion readiness review; before you go cutting steel on this new ship program, you certify that the design is done, it's mature, so that we're not incurring concurrency in the construction process.

Those are probably the three key things on the front end. Then a lot of the discussion today has been about compliance and oversight. I can tell you that the focus on that today is where it needs to be, from the top, the Secretary, CNO, on down, to ensure that we're investing in terms of putting the right people, right skills, and right location to perform that oversight function, and also reviewing, as we talked about all the procedures and processes so that we don't have disparity, relying on judgment at the deckplate level, but in fact we have certified processes and procedures in place driving that compliance.

Then it's ensuring that you have a contract vehicle that enforces what you've tried to set up through the requirements, design, and specs and standards piece. I can tell you we need to continue to work on that. There's a lot of experience that's required to write a good contract, and we've lost a lot. Not only are SUPSHIPS attriting, but also at our headquarters.

Those folks who are extremely experienced, that have the 30 years school of hard knocks on what the right terms and conditions are and how to structure a good contract, they're small in number. We're going towards things like peer review process, where we bring in the larger acquisition workforce to review contracts to try to harden up everything from terms and conditions, incentives, and contract type.

You see a lot of this coming through in the discussion with Dr. Carter and the better buying power initiatives. That is largely about how we buy what we buy, to write a good strong contract to enforce the intention that was on the front end.

So there are a lot of parallel efforts. They need to be sustained. There is a lot of training of the workforce that goes with that. I think we're seeing early returns. We're seeing early good trends. But it really is a long-haul effort, and as we get into the challenges ahead with regard to the budget and new ship programs, we really have to carry this discipline further forward to ensure that we don't have breakage at a period when the budget is potentially coming down and major programs are trying to rise.

Senator REED. Admiral McCoy or Captain Galinis, any comment?

Admiral MCCOY. I agree with everything that the Secretary said relative to getting the requirements right and flowing that into the design. I would say probably 90 percent of my problems over the last almost 3 years now with the LPD-17 class have not been design or requirements. They have really been fundamental compliance with known requirements that were not built into the ship, either welding or foreign material exclusion from critical fluid systems, that kind of thing.

What we've been trying to do is across the four SUPSHIPs hire up to adequate staff, proper staff, get the training, and then focus really on a compliance mentality and oversight with the shipbuilder.

Senator REED. Thank you.

Captain Galinis, any comments?

Captain GALINIS. Sir, I would take it to a little bit more of a tactical level. What we're doing day-to-day on LPD-22, which is our next LPD to deliver and is going to deliver this year, the program office and the program executive officer several years back stood up the strike team. This is an organization with input from the fleet, from the builders, and from the program side, to kind of capture lessons learned across the class.

They have developed a pretty good database of issues. They've solved a great deal of those. What we have done is we've leveraged off of that database and put together what I'll call focus groups to go and look at high-risk areas for this class, many of the things that Admiral McCoy and Secretary Stackley talked about: main propulsion; electrical; the mission systems area, which is your hydraulic ramps; the stern gates; some of the big heavy equipment on board the ship; ventilation systems; and coating systems. Those are the high-risk areas that we've had problems on the ship.

We've put together focus teams that include resident experts from the warfare centers, from the fleet, from the program office, and the SUPSHIP's office, to work with the shipbuilder to ensure that we have those captured. Where we can get design changes in, we're doing that. Where some of the other fixes are really just performing the work correctly the first time, we're ensuring that. So there's a laser focus on those issues for LPD-22 as we go forward.

Senator REED. Thank you.

I have some questions that I'll submit in writing, and we'll recognize Senator Wicker.

Senator WICKER. I want to thank the panel for being willing to go in depth with us on this issue.

Let me ask about the cost of the 2011 30-year shipbuilding plan. The Navy says it's going to cost \$16 billion per year. The Congressional Budget Office (CBO) says it will cost \$19 billion per year. What can we make of that?

Mr. STACKLEY. We tend to take the 30-year plan and break it down into three windows: first 10, second 10, and third 10, recognizing that in the first 10 years of the 30-year plan we have a lot of fidelity, better accuracy, and better understanding of the ships in the plan, what the requirements are, and what their costs are.

So we believe we have fairly high fidelity in our cost estimates for the first 10 years of the plan, and that's \$14 to \$15 billion per year, maybe just a tad north of that.

The second 10 years, you start to lose some of that fidelity, and that's a critical 10-year window because that's also where you're into heavy construction of the *Ohio* replacement program and other new ship programs are starting to emerge.

Senator WICKER. Let me interject. Does CBO approach it with three windows of 10 years each also? If so, are they closer in the first 10 years?

Mr. STACKLEY. Yes, sir. I was going to wrap around to that. I will cut to the punch line in terms of the difference between CBO and the Navy. Dr. Labs and I have had this conversation on a number of occasions. We have a difference in terms of how we escalate and then de-escalate the price of ships in the out years. It's a difference between the way the Navy cost estimators account for inflation versus the way CBO accounts for inflation. That difference makes up the majority of the difference between CBO's estimates and the Navy's estimates.

What happens between that 10-, 20-, and 30-year window is the further out you go obviously the greater the impact the inflation will have, and that's where it tends to exacerbate the difference between the Navy and CBO.

Going back to the 10-, 20-, 30-year look, in the first 10 years I think we're fairly close in our estimates. We start to diverge in that second window, which is a combination of that escalation difference and also some assumptions regarding largely the *Ohio* replacement program. Then when you get out to the third window, the last 10 years of the 30-year plan, we're fairly far apart, again driven by difference in escalations, but now you're also starting to get into programs that don't exist and what assumptions are you going to make, for example, regarding a DDG-X out 30 years from now.

That's why I break it down to those three windows. We're very much focused on the first 10-year window. We're very concerned about the second because that *Ohio* replacement program is so dominating. The third window we look at for long-range planning and consideration, but we don't do a whole lot in the near term to try to affect that last decade of the 30-year plan.

Senator WICKER. That makes sense. Let me ask in conclusion about the industrial base. We want our shipyards to do right and to get this right, but also we want to keep them viable. There are concerns that the relatively low orders for new ships in the 2011

plan may jeopardize the administration's plans to support the shipbuilding industrial base over the intermediate to long term.

Tell us what you can to reassure us in that regard, Mr. Secretary.

Mr. STACKLEY. Yes, sir. We talked about adding five ships to the FYDP. If you look at the ships we've added, there was a very heavy focus on, one, it's a valid requirement, but two, the industrial base. So we've added a 2014 destroyer, for example. We have two surface combatant builders. We have a sawtooth profile, which is marginal to support two surface combatant builders. What we would really like to do is get that build rate up to a more stable flow of work that helps our affordability, helps their viability, and meets the force structure requirement.

Senator WICKER. We'd like to help you on that.

Mr. STACKLEY. Yes, sir.

So there's the surface combatant piece. We've added a destroyer in the FYDP. I believe we have further to go and we need to continue to work on that.

We also added the T-AOXs and we pulled the MLP to the left. Today we have two auxiliary builders and we need to pull that work into the FYDP to keep the auxiliary sector of our shipbuilding industrial base viable, recognizing that by itself is not going to be able to support two auxiliary shipbuilders or we are at risk of losing both.

That was critical to the sector, but if the shipyards were side by side with me they would describe that as not sufficient to support both of the auxiliary builders today.

The other aspects of our shipbuilding plan, submarines are going to two per year. In fact, in some years in the out years when *Ohio* starts up we're at three. I think that sector is very healthy compared to the past 10 to 15 years. For carriers, we are very stable between new construction and refueling and complex overhauls, so that sector is healthy. Then the last piece is amphibs and between our big deck build plan and the LPD-17 winding down, we have in fact pulled the LSD-X, which was originally going to be out in the 2020s, in to the 2017 timeframe and are going to be kicking off that analysis of alternatives, again with concerns for the industrial base.

So we keep a close eye on the industrial base when we build the shipbuilding plan. We are in a \$15, \$16 billion rate over that 30-year window. Some people would argue that we're going to be challenged to meet that budget plan. But in the near term we're doing everything we can to address the rise in the budget and the types of ships that we build with an eye on the industrial base.

Senator WICKER. Thank you very much.

Mr. Chairman, this is going to do it for me today. I really appreciate this panel working with us to help us increase our understanding of these very large, expensive, and complex issues.

Senator REED. Thank you, Senator. I want to join you in thanking the panel for very insightful and very, very helpful, constructive testimony this afternoon. We look forward to working with you, because this is a long-term ongoing, mutually involved exercise. So thank you very much.

Admiral, thank you for your service. Mr. Secretary and Captain, thank you, because you brought a real from-the-dockside view of the process and we appreciate it very, very much.

With that, there will be some written questions provided to you within the week and we hope you respond as quickly as possible; and we'll now adjourn the hearing. Thank you.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

LITTORAL COMBAT SHIPS

1. Senator SESSIONS. Secretary Stackley, a May 12, 2011, Congressional Research Service (CRS) Littoral Combat Ship (LCS) report stated that the Navy lacks an Economic Order Quantity (EOQ) authority for executing the two block-buy contracts for the LCS class ships. According to CRS, the provision that granted the Navy authority did not include wording explicitly permitting the Navy to use EOQ purchasing in procuring the 20 LCSs covered under the two 10-ship LCS block-buy contracts. The CRS report states that EOQ purchasing would shift the procurement of certain LCS seaframe components from later years of the two block-buy contracts to earlier years, funding these EOQ purchases would increase LCS seaframe procurement funding requirements in the earlier years of the two block-buy contracts, and reduce (by an even larger amount) LCS seaframe procurement funding requirements in the later years of the two LCS block-buy contracts. Does the Navy support authorizing language that would provide EOQ authority?

Secretary STACKLEY. The Navy plans to use EOQ authority for the LCS program and would support additional statutory language authorizing EOQ for the program. However, the Navy believes that Congress has already authorized the Navy to make EOQ purchases under the two Block Buy contracts that were awarded on December 29, 2010. This statutory authority is granted by section 121 of the National Defense Authorization Act (NDAA) for Fiscal Year 2010, Pub. L. 111-84 (section 121); as amended by Section 150 of the Continuing Appropriations and Surface Transportation Extensions Act, 2011, Pub. L. 111-322 (section 150).

Subsequently, the Navy sought authorization from Congress to award 10-ship construction contracts to both LCS shipbuilders, thereby enabling the Navy to construct a total of 20 LCS vessels (acquiring 10 each of both designs) for less than it had budgeted to acquire only 15 ships of one design under its original acquisition strategy.

In response, Congress enacted section 150 providing that "... the Secretary of the Navy may award a contract or contracts for up to 20 LCSs." Section 150 does not repeal or amend other portions of the prior authorization in section 121, including authorization to acquire "material and equipment in economic order quantities when cost savings are achievable." This position is supported by the fact that Congress subsequently included \$190,351,000 of EOQ funding for the LCS Program in the Department of Defense and Full-Year Continuing Appropriations Act, 2011, Pub. L. 112-10.

2. Senator SESSIONS. Secretary Stackley, do you agree or disagree with CRS's characterization of how EOQ authority would affect the cost of future LCS ships? Please explain your position.

Secretary STACKLEY. The Navy plans to use EOQ authority for the LCS program, and would support additional statutory language authorizing EOQ for the Program. However, the Navy believes that Congress has already authorized the Navy to make EOQ purchases under the two Block Buy contracts that were awarded on December 29, 2010. This statutory authority is granted by section 121 of the NDAA for Fiscal Year 2010, Pub. L. 111-84 (section 121); as amended by section 150 of the Continuing Appropriations and Surface Transportation Extensions Act, 2011, Pub. L. 111-322 (section 150).

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when cost savings are achievable.” This position is supported by the fact that Congress subsequently included \$190,351,000 of EOQ funding for the LCS Program in the Department of Defense and Full-Year Continuing Appropriations Act, 2011, Pub. L. 112–10.

With respect to how EOQ authority would affect the cost of future LCS or Navy ships in general, the Navy agrees with the CRS characterization. EOQ purchasing shifts procurements from later years to earlier years, increasing earlier year funding requirements but reducing by a larger amount funding requirements in later years as industry is able to negotiate with suppliers lower prices for items purchased in greater quantities. The Navy had projected more significant EOQ savings based on a combination of Government Furnished Equipment and ship component purchases prior to House Appropriations Committee rescission of those funds.

#### REPAIR FACILITIES

3. Senator SESSIONS. Secretary Stackley, as we discuss the Navy’s shipbuilding plans and fleet size, I want to recognize the important role that high-quality ship repair activities play in all of this. For decades, open competition has provided the Navy with a reliable and capable private sector workforce made of both large and small businesses. In non-nuclear ship repair this open competition was encouraged by the Competiveness Demonstration (Comp Demo) program that began in 1988. However, at the end of last Congress this successful program was unfortunately repealed. Since that time, more than 30 government vessels have been set-aside, thereby eliminating numerous shipyards from competing to work on them. I know the negative impact this has on shipyards in Alabama and their skilled workers. In your opinion, should the Comp Demo program be reinstated for non-nuclear ship repair?

Secretary STACKLEY. The purpose of the Comp Demo Program was to evaluate the ability of small businesses to compete without the use of general small business set-asides. The DOD Office of Acquisition, Technology, and Logistics, specified in their memo of June 16, 2010 that set-asides could only be implemented if small business received less than 40 percent of the awarded dollars for industries covered under the Comp Demo Program. In fiscal year 2010, for the industry code that governs non-nuclear ship construction and repair, according to the Federal Procurement Data System, small businesses received over 55 percent of the Navy’s awards thus exceeding the minimum required by DOD.

The DON Office of Small Business Programs is presently conducting an analysis covering the past 5 years to fully evaluate and understand the participation small business has had in this and other areas formerly covered by the Comp Demo Program to fully assess the impact of the repeal. Upon completion of this review DON will evaluate an appropriate action.

In the meantime, prior to approving any acquisition strategy the DON will continue to perform comprehensive market research analysis to determine the availability and capability of small business, the depth of potential competition, the present health of the industry and the appropriateness of applying set-asides in accordance with the Federal Acquisition Regulations.

4. Senator SESSIONS. Secretary Stackley, if it is not done soon, then what impact do you think this decrease in competition will have in the ship repair area?

Secretary STACKLEY. The purpose of the Comp Demo Program was to evaluate the ability of small businesses to compete without the use of general small business set-asides. Elimination of the Comp Demo program may impact the level of competition for all Navy and Military Sealift Command (MSC) operated vessels, although competition would exist under small business set-asides.

For non-nuclear repair of U.S. Navy ships, the repeal of the Comp Demo program may require that future Multi-Ship/Multi-Option (MSMO) contracts be set aside as appropriate per Federal Acquisition Regulations (FAR). For non-nuclear ship repair of MSC-operated vessels, while it is reasonable to expect that the majority of MSC non-nuclear ship repair contracts on the east coast will be set-aside, recent industry consolidation of some small business yards on the west coast makes the impact there less certain. The extent of set-asides will depend on the capabilities and availabilities of small business qualified yards which will be determined on an individual procurement basis.

In the meantime, prior to approving any acquisition strategy the DON will continue to perform comprehensive market research analysis to determine the availability and capability of small business, the depth of potential competition, the

present health of the industry and the appropriateness of applying set-asides in accordance with the FAR.

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QUESTIONS SUBMITTED BY SENATOR ROGER F. WICKER

INDUSTRIAL BASE

5. Senator WICKER. Secretary Stackley, the Navy's current 30-Year Shipbuilding Plan (2011 Plan) indicates that we will be building ships at minimum sustaining rates. Many observe that this could pose challenges to fulfilling the amphibious force requirement and possibly give rise to a sea-lift capability gap and aviation-lift gap in 2015. Let's set aside the operational implications of those issues for a moment. Many worry that the relatively low orders for new ships proposed in the 2011 Plan may jeopardize the administration's plans to support the shipbuilding industrial base over the intermediate- to long-term. The reductions in vendors to provide equipment for the shipbuilding industry may also make it difficult to realize desired efficiencies. Is the number of ships currently planned for enough to keep the Navy's six major shipyards in business?

Secretary STACKLEY. The 30-year plan aligns with decisions made by the Secretary of Defense in fiscal year 2012 President's budget as well as priorities and guidance from the 2010 Quadrennial Defense Review (QDR). The shipbuilding program invests where necessary to ensure the Navy's battle force remains equal to the challenges of today as well as those it may face in the future. The program represents a balance between the expected demands upon the battle force for presence, partnership building, humanitarian assistance, disaster relief, deterrence and warfighting as well as expected future resources.

As discussed in the fiscal year 2011 Shipbuilding Report to Congress, the Chief of Naval Operations and Commandant of the Marine Corps have agreed that 38 amphibious ships are necessary to ensure full lift capability for a 2.0 Marine Expeditionary Brigade (MEB) assault. Further they have determined that this force can be sourced in the Assault Echelon (AE) with 33 ships, with acceptable risk. In keeping with this agreement, the Navy is reviewing options to increase the AE to reflect a minimum of 33 amphibious ships in the AE, evenly balanced at 11 aviation-capable ships, 11 LPD-17-class ships, and 11 LSD-41-class ships. The 33 ship force accepts risk in the arrival of combat support and combat service support elements of the MEB but has been judged to be adequate in meeting the needs of all parties within the limits of today's fiscal realities. The fiscal year 2012 President's budget achieves the minimum of 33 AE ships beginning in fiscal year 2017.

The Navy recognizes that level loading of ship procurement to help sustain minimum employment levels and skill retention promotes a healthy U.S. shipbuilding industrial base and this was considered in the development of our shipbuilding plan.

6. Senator WICKER. Secretary Stackley, what is your sense about the shipbuilding industry's support for the proposed plan?

Secretary STACKLEY. The Navy is the primary customer for all of the first tier shipyards. Additionally, fleet maintenance and modernization workload provides further workload stabilization. The Navy recognizes that level loading of ship procurement to help sustain minimum employment levels and skill retention promotes a healthy U.S. shipbuilding industrial base. The Navy has made a series of key shipbuilding investment decisions, each of which have contributed to meeting the Department's requirements while also serving to strengthen the industrial base. These adjustments to the shipbuilding plan have been well supported by the shipbuilding industry, including:

- accelerating increased *Virginia*-class submarine construction to two boats per year, commencing in fiscal year 2011;
- realigning DDG-1000 construction to a single shipyard (BIW) while re-starting DDG-51 construction;
- accelerating Mobile Landing Platform construction to three ships over 3 years;
- accelerating start of the future fleet oiler, T-AO(X), construction from fiscal year 2020 to fiscal year 2014;
- accelerating construction of the LSD(X) to fiscal year 2017;
- increasing construction of DDG-51 destroyers with the addition of a second DDG in fiscal year 2014; and
- dual award of LCS contracts in fiscal year 2010.

Further, the Navy is supporting the industrial base by leveraging stable designs to minimize disruption experienced with first-of-class constructions and providing stable production rates within the constraints of requirements and budget.

7. Senator WICKER. Secretary Stackley, in your view, can industry withstand the minimum sustaining rate at which the Navy is building (and intends to continue building) many of its ships?

Secretary STACKLEY. The Navy recognizes that building the required force structure will largely depend on controlling shipbuilding costs (including combat systems) within an affordable range. We are committed to maintaining stability in requirements, funding and profiles in an effort to control costs. This will require the combined efforts of the Navy, the shipbuilding industry and combat systems industry. Working in conjunction with Congress, the Navy will procure and sustain force structure necessary to deliver the naval capabilities needed to support national interests.

The Navy has and continues initiatives to support the shipbuilding industrial base including:

1. In Title II of Public Law 109–234, section 2203, Congress directed that at least \$140 million be made available for infrastructure improvements at Gulf Coast shipyards that have existing Navy shipbuilding contracts and that were damaged by Hurricane Katrina in calendar year 2005. In 2010, the Department awarded an additional \$39.5 million in infrastructure improvement projects to Gulf Coast shipyards that support the Navy shipbuilding industrial base. These projects focus on expediting recovery of shipbuilding capability, increasing efficiency, and preventing further hurricane damage to Gulf Coast shipyards.
2. The Department of the Navy’s new ship construction procurement and funding plans for fiscal year 2012 and the Future Years Defense Program as reflected in the President’s budget 2012 submission, reflects the Navy’s commitment to support and add stability to the industrial base by taking into account industrial base implications, as acquisition strategies and contracting strategies are developed. Specifically the Navy has:
  - a. Accelerated production of the double-hulled fleet oiler T-AO(X) from 2017 to 2014 in the fiscal year 2012 budget submission. This allows the Navy to acquire this important capability 3 years earlier while bringing greater stability and promoting competition in the shipbuilding industry.
  - b. Accelerated the procurement schedule for Mobile Landing Platform (MLP) to one ship per year in fiscal years 2011–2013 from procurement in fiscal year 2011, fiscal year 2013, and fiscal year 2015.
  - c. Executed an acquisition strategy for the LCS where Lockheed Martin and Austal USA were each awarded a fixed-price incentive contract for the design and construction of a 10-ship block buy from fiscal year 2010–2015. This LCS strategy supports the industrial base for shipbuilding by keeping workers employed at two shipyards along with workers at their various sub-contractors and vendors.
  - d. Developed a plan which most affordably meets the requirements for Navy surface combatants, commences the transition to improved missile defense capability in new construction, and provides significant stability for the industrial base. The plan allocates construction responsibilities for DDGs–1000–1002 and DDGs–113–115 (fiscal year 2010–2011 ships) between Bath Iron Works (BIW) and Ingalls HII. The workload agreement should ensure workload stability at both yards, efficiently restart DDG–51 construction, facilitate performance improvement opportunities at both shipyards, and maintain two sources of supply for future Navy surface combatant shipbuilding programs. To further stabilize the combatant industrial base, the Navy added a second DDG–51 Flight IIA in fiscal year 2014 and plans to request MYP authorization in fiscal years 2013–2017.
  - e. Increased procurement of *Virginia*-class attack submarines to two per year starting in fiscal year 2011. The Navy plans to continue procurement of the *Virginia*-class attack submarines at two ships per year when possible.
3. Of the Big Six shipyards, only General Dynamics NASSCO has recently competed in the commercial shipbuilding industry. However, NASSCO currently has only U.S. Navy shipbuilding and repair contract work at the shipyard. In 2010, the Navy signed an Shipbuilding Capabilities Preservation Act (SCPA) agreement with NASSCO and the company is pursuing commercial contracts. The Navy is also prepared to provide an agreement, in accordance with the SCPA, that would assist in making HII more competitive for commercial ship-

building work. The purpose/benefits of an SCPA is to facilitate a shipbuilder's entry into private sector work and reduce that shipbuilder's reliance on the Department of Defense industrial base.

The ships brought into service during the 1980s, some procured at a yearly rate of four to five ships of a single class, are projected to retire during the next 15–20 years. With the need for multi-mission platforms vice single mission platforms, and recognizing the significantly increased capabilities of current new construction ships, the navy cannot recapitalize legacy ships at the same rate at which they were originally procured and maintain an affordable balanced procurement plan. The Navy is working to stabilize the shipbuilding plan but industry must move to right size and strive for efficiencies to enable an affordable shipbuilding plan.

8. Senator WICKER. Secretary Stackley, in both the current budget request and in terms of a more general policy, what, if anything, is the Navy doing, or will it do, to support the shipbuilding industrial base? Are there any plans, for example, such as helping to convert existing shipyards into ship-repair yards?

Secretary STACKLEY. The Department of Defense and Navy face the challenge of ensuring that the defense industrial base can meet the current and future requirements for systems and support while maintaining cost effectiveness, competition, and the necessary skills and technology base. To help meet this challenge, the Assistant Secretary of the Navy (Research, Development and Acquisition) has engaged an outside entity to develop and provide a publicly available, comprehensive, and independent assessment of the Navy shipbuilding industrial base.

The Navy seeks an industrial base analysis that focuses on the essential capabilities and capacities needed to support Navy ship construction. The objective of the study is to identify the industrial base challenges facing the Navy and the strategies for mitigating the effects of those challenges, across a variety of issue areas such as cost, schedule, technical, infrastructure, and workforce capability. This may include recommendations to change/improve policies, standards, contract elements, performance benchmarks, government and industry practices, and oversight that define the effective delivery of quality products, platforms, and systems (including combat systems).

Recent examples of what the Navy has done to support the industrial base include:

1. In Title II of Public Law 109–234, section 2203, Congress directed that at least \$140 million be made available for infrastructure improvements at Gulf Coast shipyards that have existing Navy shipbuilding contracts and that were damaged by Hurricane Katrina in calendar year 2005. In 2010, the Department awarded an additional \$39.5 million in infrastructure improvement projects to Gulf Coast shipyards that support the Navy shipbuilding industrial base. These projects focus on expediting recovery of shipbuilding capability, increasing efficiency, and preventing further hurricane damage to Gulf Coast shipyards.
2. A recent adjustment in the shipbuilding industrial base is the Northrop Grumman Corporation (NGC) decision to spin-off/sell its shipbuilding sector. Navy evaluated this complex corporate transaction and negotiated with NGC to ensure that the reorganized entity, Huntington Ingalls Industries (HII), would remain a financially viable company capable of performing current and future Navy shipbuilding programs. This reorganization is now complete, after Navy completed its evaluation and announced its position supporting this reorganization and finding HII to be a responsible contractor. The Navy is also prepared to provide an agreement, in accordance with the Shipbuilding Capabilities Preservation Act (SCPA), that would assist in making HII more competitive for commercial shipbuilding work. The purpose/benefits of an SCPA is to facilitate a shipbuilder's entry into private sector work and reduce that shipbuilder's reliance on the DOD industrial base. U.S. commercial shipbuilding accounts for approximately 1 percent of world commercial shipbuilding output; 80 percent of this comes from the mid-tier sector.
3. The Department of the Navy's new ship construction procurement and funding plans for fiscal year 2012 and the Future Years Defense Program as reflected in the PB2012 submission reflects the Navy's commitment to support and add stability to the industrial base by taking into account industrial base implications as acquisition strategies and contracting strategies are developed. Specifically the Navy has:
  - a. Accelerated production of the double-hulled fleet oiler T-AO(X) from 2017 to 2014 in the fiscal year 2012 budget submission. This allows the Navy to

- acquire this important capability 3 years earlier while bringing greater stability and promoting competition in the shipbuilding industry.
- b. Accelerated the procurement schedule for MLP to one ship per year in fiscal year 2011, fiscal year 2012, and fiscal year 2013 from procurement in fiscal year 2011, fiscal year 2013, and fiscal year 2015.
  - c. Executed an acquisition strategy for the LCS where Lockheed Martin and Austal USA were each awarded a fixed-price incentive contract for the design and construction of a 10-ship block buy from fiscal year 2010 through 2015. This LCS strategy supports the industrial base for shipbuilding by keeping workers employed at two shipyards along with workers at their various subcontractors and vendors.
  - d. Developed a plan which most affordably meets the requirements for Navy surface combatants, commences the transition to improved missile defense capability in new construction, and provides significant stability for the industrial base. The plan allocates construction responsibilities for DDG-1000-1002 and DDG-113-115 (fiscal year 2010-2011 ships) between BIW and Ingalls HII. The workload agreement should ensure workload stability at both yards, efficiently restart DDG-51 construction, facilitate performance improvement opportunities at both shipyards, and maintain two sources of supply for future Navy surface combatant shipbuilding programs. To further stabilize the combatant industrial base, the Navy added a second DDG-51 Flight IIA in fiscal year 2014 and plans to request MYP authorization in fiscal year 2013-2017.
  - e. Increased procurement of *Virginia*-class attack submarines to two per year starting in fiscal year 2011. The Navy plans to continue procurement of the *Virginia*-class attack submarines at two ships per year when possible.
4. Of the Big Six shipyards, only General Dynamics NASSCO has recently competed in the commercial shipbuilding industry. However, NASSCO currently has only U.S. Navy shipbuilding and repair contract work at the shipyard. In 2010, the Navy signed an SCPA agreement with NASSCO and the company is pursuing commercial contracts.
  5. Government shipbuilding contracts are routinely structured with incentive fees on fixed price type contracts. Incentives are tools or mechanisms through which the government encourages specific behavior or performance. The Navy has implemented a number of different shipbuilding facilities investment incentives. By setting aside ship construction funds to be allocated based on business case justification, these special incentives allow shipbuilders the potential to earn additional fees toward capital and process improvements when proven to be mutually beneficial to both contract parties.
  6. Both the Federal Acquisition Regulation (FAR Subpart 32.5) and specific Navy regulations address how progress payments are to be distributed for shipbuilding contracts. In general, contractors are paid upon demonstration of physical completion and costs incurred, while the Navy retains some remainder of funding (i.e., retentions) to ensure completion of contract deliverables and expectations. However, in certain circumstances, the Navy has authorized the early release of contract retentions. Contract retentions are meant as monetary leverage over the shipbuilder to obtain a fully compliant ship delivery, but for purposes of providing cash flow to support shipyard investment, early release of contract retentions can be a timely, real stimulus from a corporate perspective. Several shipbuilders have benefited from investments supported in part or wholly through the early release of contract retentions. This approach was used through the DDG-51 Program at General Dynamics' Bath Iron Works. Two projects that have utilized this mechanism are the Land Level Transfer Facility and the Ultra Hall Facilities.

There are no plans to help convert existing shipyards to repair yards as they have the capability to perform repair work. There is currently excess capacity in the private ship repair industry. Navy must also balance public/private capacity for ship repair. Additional private capacity would put undue pressure on that public/private balance.

9. Senator WICKER. Secretary Stackley, what level of cost risk is created by increasing reliance on sole-source contracts?

Secretary STACKLEY. Where possible, the Navy is moving away from sole source contracting. But where that is unavoidable, the Navy strives to create a strong negotiation posture using in-depth cost analysis of actual costs, component breakouts, and incentives to focus industry on reducing costs.

A sole source contract in itself does not automatically result in an elevated cost risk. The degree of contract cost risk is a function of Government and industry joint understanding of the contract requirements and an understanding of the business and technical factors that drive cost behavior. In September 2010, the Navy implemented an internal management tool coined should-cost management. The goal for this initiative is to ensure that program managers articulate only those contract requirements necessary to deliver warfighting capability; understand the factors that influence cost behavior; and drive productivity improvements into their programs during contract negotiations through effective contract type, terms, and conditions, and throughout program execution. This policy applies to all contract types.

Ultimately, one of the Navy's biggest negotiation leverages is competition. I have challenged the acquisition community to seek every opportunity to compete at all levels of a program.

10. Senator WICKER. Secretary Stackley, are there any unrealized opportunities to increase cost controls?

Secretary STACKLEY. The Department recognizes that building the required force structure will largely depend on controlling shipbuilding costs (including combat systems). The Navy is addressing this in three ways.

First, the Navy continues to look for further affordability and efficiency opportunities as we go forward with the shipbuilding plan, such as revising the acquisition strategy for the LCS program to maximize the advantage of the competitive pricing we received and enable us to gain an additional ship or seeking to employ multi-year contracts for *Virginia*-class submarines and future DDG-51 destroyers.

Second, the Navy is continuing to emphasize the use of fixed price contracts as a cost control mechanism, when technical risk is low and when a ship's design is mature. The contract for T-AKEs-12-14 was recently converted to Firm Fixed Price.

Third, the Navy is placing increased emphasis on affordable requirements and stable designs. Prior to Milestone A approval for the *Ohio* Replacement submarine, the Department evaluated numerous capability trades to reduce costs. As a result, the Navy made trades in the number of ballistic missile tubes, the diameter of those tubes, the number of torpedoes to be carried, acoustic sensors, and other defensive features throughout the design. These trades made the submarine more affordable while maintaining the necessary level of capability. Additionally, the Navy worked with General Dynamics NASSCO to develop a more affordable design of the Mobile Landing Platform (MLP). The alternative solution resulted in approximately \$2 billion of cost avoidance. The MLP will improve throughput capabilities for the Maritime Prepositioning Squadron (MPSRON) though float-on/float-off (FLO-FLO) technology from a large reconfigurable mission deck.

11. Senator WICKER. Secretary Stackley, I understand that an outside study on the health of the Navy's shipbuilding industrial base that was done for you is complete. Please share its preliminary findings and recommendations.

Secretary STACKLEY. In April 2010, the Navy initiated a Shipbuilding Industrial Base Study to review capabilities/capacities of the shipyards including design and production, the health of the vendor base, and trends in rates and overhead, productivity, and investment strategies. The information exchange between industry and government has been extensive and informative. The study is due to complete shortly and is currently being staffed for review by senior leadership. Findings/recommendations of this study will be made available upon completion of the Navy review.

#### AMPHIBIOUS SHIP GAP

12. Senator WICKER. Secretary Stackley, it has been suggested that we are decommissioning amphibious ships too early in their lives and at a rate that cannot be sustained by new construction ships without dipping below a level that would negatively impact our amphibious capability requirements. However, ships such as the *Austin*-class amphibious transport docks (LPDs) began reaching the end of their designed service lives more than 20 years ago. A Service Life Extension Program (SLEP), which would have modernized the ships for another 10 to 15 years of service, was not authorized by Congress when requested in 1987. As a result, these ships which many consider ill-equipped to defend themselves against modern threats have remained in service far longer than intended. Of the recently decommissioned amphibious ships, how many—if any—were decommissioned earlier than their planned end of service life?

Secretary STACKLEY. Since 2005, there have been four LHA-1-class Amphibious Assault Ships that have been decommissioned earlier than their expected service life (ESL). The ESL is the number of years a naval ship is expected to be in service. It is used as a planning estimate to facilitate the development of ship recapitalization plans. However, the LHA-1-class ships were built to a design service life (DSL) objective of 20 years, which they exceeded. The LHA-1-class did receive mid-life modernization availabilities that enabled them to exceed their DSL but were not part of a SLEP.

Ship	ESL (years)	DSL (years)	Age at Decom. (years)
Ex-Tarawa (LHA-1) .....	35	20	32.8
Ex-Saipan (LHA-2) .....	35	20	29.5
Ex-Belleau Wood (LHA-3) .....	35	20	27.1
Ex-Nassau (LHA-4) .....	35	20	31.7

13. Senator WICKER. Secretary Stackley, how many of those ships had their service lives extended beyond what was intended when they were built?

Secretary STACKLEY. Since 2005, there have been eight Amphibious Warfare ships that have been decommissioned whose services lives extended beyond their ESL. The ESL is the number of years a naval ship is expected to be in service. It is used as a planning estimate to facilitate the development of ship recapitalization plans.

Ship	ESL (years)	Age at Decom. (years)
Ex-Austin (LPD-4) .....	35	41.6
Ex-Ogden (LPD-5) .....	35	41.7
Ex-Duluth (LPD-6) .....	35	39.8
Ex-Dubuque (LPD-8) .....	35	43.8
Ex-Juneau (LPD-10) .....	35	39.3
Ex-Shreveport (LPD-12) .....	35	36.8
Ex-Nashville (LPD-13) .....	35	39.6
Ex-Trenton (LPD-14) .....	35	35.9

The LHA-1-class ships were built to a design service life (DSL) objective of 20 years. The four LHA-1-class ships that have been decommissioned since 2005 exceeded their DSL.

Ship	DSL (years)	Age at Decom. (years)
Ex-Tarawa (LHA-1) .....	20	32.8
Ex-Saipan (LHA-2) .....	20	29.5
Ex-Belleau Wood (LHA-3) .....	20	27.1
Ex-Nassau (LHA-4) .....	20	31.7

14. Senator WICKER. Secretary Stackley, were those service life extensions through planned SLEPs or through an ad-hoc process?

Secretary STACKLEY. Since 2005, there have been eight LPD-4-class Amphibious Transport ships that have been decommissioned whose services lives extended beyond their ESL, and four LHA-1-class Amphibious Assault ships that have been decommissioned whose service lives extended beyond their Designed Service Life (DSL).

SLEPs can be accomplished on a Navy vessel that is approaching its ESL. None of the service lives of the aforementioned ships were extended through planned SLEPs.

The LHA-1-class ships did receive mid-life modernization availabilities that enabled them to exceed their DSL. Five of the LPD-4-class ships had an Extended Sustainability (ES) availability that enabled them to exceed their ESL. (Note: LPDs-7, -8, -9, -13, and -15 received an ES availability.)

15. Senator WICKER. Secretary Stackley, of our currently serving amphibious ships, how many are already beyond their planned service lives?

Secretary STACKLEY. There are four existing ships from the LPD-4 *Austin*-class, specifically USS *Dubuque* (LPD-8), USS *Cleveland* (LPD-7), USS *Ponce* (LPD-15)

and the USS *Denver* (LPD-9) that have exceeded their 35 year ESL. *Dubuque* and *Cleveland* both are 44 years old and will decommission in fiscal year 2011. *Ponce* will be 41 years old at her planned decommissioning in fiscal year 2012. *Denver* will be 45 years old at her planned decommissioning in fiscal year 2013.

16. Senator WICKER. Secretary Stackley, if the *San Antonio*-class of ships had remained on schedule for delivery would we be experiencing this amphibious ship gap that raises so many concerns today?

Secretary STACKLEY. If the *San Antonio*-class of ships had remained on schedule for delivery, it is less likely that we would be experiencing this amphibious ship gap. Specifically, it is less likely that the number of active, in-commission LPDs would dip below the requirement of eleven. This is because the lead-time required for adjusting the decommission dates of the legacy *Austin*-class LPDs is longer than the advanced warning associated with delivery delays of the *San Antonio*-class LPDs.

#### LITTORAL COMBAT SHIPS

17. Senator WICKER. Secretary Stackley, if last year's authority to implement the dual sole-source award strategy for the LCS program were amended to give the Navy the explicit authority to use EOQ purchases as part of the block-buy contracts that it awarded to the two LCS builders, would the Navy use this additional EOQ authority, and if so, how much might it reduce the cost of the 20 LCSs to be procured under these two contracts?

Secretary STACKLEY. The Navy plans to use EOQ authority for the LCS program, and would support additional statutory language authorizing EOQ for the Program. However, the Navy believes that Congress has already authorized the Navy to make EOQ purchases under the two Block Buy contracts that were awarded on December 29, 2010. This statutory authority is granted by section 121 of the NDAA for Fiscal Year 2010, Pub. L. 111-84 (section 121); as amended by section 150 of the Continuing Appropriations and Surface Transportation Extensions Act, 2011, Pub. L. 111-322 (section 150).

Subsequently, the Navy sought authorization from Congress to award 10-ship construction contracts to both LCS shipbuilders, thereby enabling the Navy to construct a total of 20 LCS vessels (acquiring 10 each of both designs) for less than it had budgeted to acquire only 15 ships of one design under its original acquisition strategy.

In response, Congress enacted section 150 providing that "... the Secretary of the Navy may award a contract or contracts for up to 20 LCSs." Section 150 does not repeal or amend portions of the prior authorization in section 121, including authorization to acquire "material and equipment in economic order quantities when cost savings are achievable." This position is supported by the fact that Congress subsequently included \$190,351,000 of EOQ funding for the LCS Program in the Department of Defense and Full-Year Continuing Appropriations Act, 2011, Pub. L. 112-10.

The Navy had projected more significant EOQ savings of up to 10 percent based on a combination of government-furnished equipment and ship component purchases prior to the House Appropriations Committee rescission of those funds.

18. Senator WICKER. Secretary Stackley, the Navy has announced some changes or potential changes to the composition of LCS mission modules. Regarding the surface warfare module, it is not clear from press reports whether the Navy plans to replace the canceled non-line-of-sight (NLOS) missile with the Griffin missile. Is the Griffin missile the Navy's replacement for the NLOS, or not?

Secretary STACKLEY. In April 2010, the Army cancelled the Non-Line-of-Sight Launch System (NLOS-LS) program. The Navy had planned to use NLOS-LS in the LCS Surface Warfare (SUW) Mission Package to counter the small boat threat. The Army planned production quantities accounted for nearly 90 percent of the total NLOS production, and the Army program's cancellation resulted in a significant and unacceptable increase to the projected unit cost for the Navy.

The Navy reviewed over 50 missile systems and gun improvements for their ability to meet the LCS SUW requirements in a cost effective manner. The review led to a strategy to address all layers of LCS SUW defense including potential gun ammunition improvements and a phased plan to deploy an anti-small boat missile capability on LCS.

The Griffin Missile, already in production by Raytheon Missile Systems, is planned for integration into the LCS Surface-to-Surface Missile Module to provide an initial SUW missile capability. The long-term solution, one that will provide in-

creased range and autonomous engagement capability to increase battlespace and engage multiple targets simultaneously, will be determined through competition to identify the most cost-effective option.

The initial capability is planned to be in operation on LCS by 2015, matching the previously planned introduction of NLOS capability. The long-term missile solution is planned to be in operation in 2017.

19. Senator WICKER. Secretary Stackley, the Navy has also announced a possible change to the mine warfare (MCM) module. When will the Navy announce whether this change will be implemented?

Secretary STACKLEY. The Navy is continuing to investigate modifications of the Airborne Mine Neutralization System and the Joint Assault Breaching System programs to replace surface/near-surface mine neutralization capability due to the loss of the Rapid Airborne Mine Clearance System. The Navy will evaluate the outcome of these ongoing assessments upon completion, planned for fiscal year 2012.

20. Senator WICKER. Secretary Stackley, the Navy has announced a change to the antisubmarine warfare (ASW) module. How will this change affect the cost of the ASW module?

Secretary STACKLEY. The announced change to the ASW mission module will result in a decrease of the cost of this module, when compared to the cost of the previous configuration.

The findings of a periodic warfighting assessment led the Navy to change the ASW Mission Package approach to better address operational requirements. The resulting Increment 2 ASW Mission Module is inherently less complex and is technically more mature, resulting in a less expensive ASW Mission Module.

21. Senator WICKER. Secretary Stackley, concerns have been expressed in some quarters about the combat survivability of the LCS. Please give your perspective on the combat survivability of this ship.

Secretary STACKLEY. The LCS Ships meet the Joint Requirements Oversight Council-approved survivability requirements and the designs incorporate OPNAVINST 9070.1 Level 1 Survivability standards as well as tailored survivability enhancements (“Level 1+”). LCS survivability depends on a combination of ship design, ship quantity, and the Concept of Operations (CONOPS) which says LCS will:

- Operate as part of a networked battle force
  - Independent operations only in low-to medium-threat scenarios
  - Part of a networked battle force ops in high threat environments
- Create Battle Space/Avoid being hit
  - Reliance on networked battle force for threat attrition
  - Reliance on overboard systems
- Fight and survive if hit
  - Ship design: Accept ship mission kill; keep ship afloat and protect crew after hit
  - Battle force design: Maintain battle force fight—through capability, through LCS numbers, and mission flexibility
- Withdraw/reposition if hit
  - Campaign Measure Of Effectiveness (MOE)

LCS is designed to maintain essential mobility after a hit allowing the ship to exit the battle area under its own power. The LCS survivability features enable the ship to perform required missions in the littorals with an emphasis on crew survival.

22. Senator WICKER. Secretary Stackley, the first LCS has experienced hull cracking. Please discuss the Navy’s actions to address this problem, and whether it has any implications for follow-on ships in the program.

Secretary STACKLEY. In order to validate the service life of the LCS–1-class design the industry team was required to conduct a Spectral Fatigue Analysis (SFA) in accordance with the Naval Vessel Rules (NVR). This analysis was conducted against the LCS operating profiles, to include stressing sea environments, and resulted in the identification of several high-stress areas in the design. These analysis findings were used to develop a full ship instrumentation plan and a detailed post delivery test and trials event schedule to include analysis verification and hull performance monitoring.

NAVSEA, American Bureau of Shipping (ABS), and Industry have conducted a detailed analysis and review of the workmanship and design to determine the root

cause of the hull and superstructure cracks in USS *Freedom*. Non-Destructive Testing (NDT) indicated that a contributing factor for the single hull crack was likely a weld defect. Another contributing factor is undersized backing chocks, which expose that area to higher-than-expected stresses. These chocks will be replaced during a Post Shakedown Availability (PSA) this summer.

To address these issues in follow-on ships, Navy and Industry identified and implemented design changes in LCS-3 to ease accessibility and production of the spray rail (location of the hull crack of USS *Freedom*). LCS-5 and follow ships incorporate additional design changes throughout the spray rail. To confirm that there are not widespread weld spray rail quality issues, additional NDT is planned at PSA for LCS-1. Navy is also conducting an ongoing assessment to review the consistency of design and construction documentation for follow-on ship construction.

With regard to the superstructure cracks, the investigation found 11 of the 16 cracks coincide with high stress areas discovered in subsequent detailed structural modeling and analysis. Six of the 16 cracks were attributed to some form of workmanship issue. All 16 cracks have been repaired.

Based on additional analysis, the LCS-3 design was modified to lower the stresses in the superstructure via the installation of gussets and increased material thickness. Design modifications from LCS-3 will be incorporated into LCS-1 and no further design related superstructure cracking risk is expected for the LCS-1 design.

#### JOINT STRIKE FIGHTER

23. Senator WICKER. Secretary Stackley, the F-35 Joint Strike Fighter (JSF) program has several important test events coming up this year that relate to the shipbuilding portfolio—in particular, shipboard testing on a carrier and an L-class ship for the Navy's F-35C and the Marine Corps' F-35B, respectively. At this point, what challenges do you see to the effective integration of each of those F-35 variants to the ships from which they are supposed to operate? Please speak to, for example, thermal footprint from the main engine exhaust, shipboard noise levels, and information technology-related challenges to integration.

Secretary STACKLEY.

*JSF Short Takeoff and Vertical Landing (STOVL) Variant (F-35B) Integration Aboard L-Class Ships (LHA and LHD):*

- Eight modifications required to support F-35B integration on LHA/LHD-class ships that are incorporated into a package of ship change documents known as “cornerstone” alterations. These modifications provide necessary electrical servicing upgrades, expanded weapons handling and storage, provisioning for the JSF Autonomic Logistics Information System (ALIS), construction of secure access facilities, mission rehearsal training, and relocation of the flight deck tramline for safety concerns.
- The thermal stresses imparted to the deck steel by the F-35B have been characterized by sub-scale modeling and a representative deck coupon tested at Lockheed's hover pit in January 2010. Initial results show that the ship's structure will handle the thermal footprint for a single landing, but further evaluation is required to determine if operationally representative scenarios may prompt future ship alterations. F-35B Developmental Testing (DT) on board USS *Wasp* (LHD-1) will include measurements for thermal footprint, pressure, deflection, and strains caused by F-35B operations in the shipboard environment. Shipboard DT is planned to occur in fall 2011.
- The “cornerstone” ship alterations have commenced on USS *Bonhomme Richard* (LHD-6) and USS *Wasp* (LHD-1). Follow-on design changes to install External Environment (EE) modifications will occur once informed by shipboard DT. These modifications will be installed on USS *Wasp* prior to the Operational Test (OT) period currently scheduled for the summer/fall of 2013. Subsequent ship alterations for the LHD-1-class will occur at a rate of one hull per year starting in fiscal year 2015.

*JSF Carrier Variant (F-35C) Integration Aboard CVNs:*

- Eight modifications required for F-35C (JSF Carrier variant) integration on CVNs are actively being developed to maturity or being installed. These modifications provide for necessary electrical servicing upgrades, expanded weapons handling, construction of secure access facilities, mission rehearsal training, ALIS, Joint Precision Approach and Landing System, thermal effect mitigation, Lithium Ion battery storage and noise abatement.

- F-35C thermal impacts on CVNs are currently being studied by modeling exhaust impacts on Jet Blast Deflector (JBD) and Flight Deck systems. Land-based testing of the F-35C exhaust plume on a JBD started June 29, 2011. It is necessary to validate the modeling analysis and determine the scope of JBD and shipboard modifications.
- Required CVN modifications will continue to be incorporated into CVN 68 (*Nimitz*)-class aircraft carriers during planned maintenance availabilities in advance of F-35C arrival. Required modifications that are not part of the CVN-78 (*Ford*)-class design will be incorporated into the ship prior to F-35C deployment.

#### *Common CVN/L-Class Air Ship Integration Topics*

##### *Noise:*

The F-35 program has taken a proactive approach to address noise concerns on-board Naval Ships. Protecting the hearing of maintainers and ship board personnel has been a program focus and new Hearing Protection Devices (HPD) were developed to support personnel working in close proximity to F-35 and other jets at high power engine settings during launch/recovery operations. The HPD devices will allow service personnel to work more effectively and longer at tasks in extreme noise environments before reaching their total daily exposure (TDE) limit to high noise.

Many F-35A noise characterization tests have been completed. Tests have shown F-35A is in the same noise class as other Department of Defense aircraft (e.g. F-22 and F/A-18E/F aircraft). F-35B Ground Test Plans are in development, with data collection planned for the third/fourth quarter of calendar year 2011 timeframe. The objectives of these tests are to capture near-field personnel noise environments with a focus on capturing noise exposure data during Short Take-Off (STO) and Vertical Landings (VL). The data from these tests will be used to support noise assessments for flight deck personnel and further assist aircraft integration aboard L-class Ships. Ground Test Plans for the F-35C have been developed and testing commenced in conjunction with JBD testing on June 29, 2011. Like F-35B, the data to be captured from this testing will be used to support maintainer noise exposure assessments, personal hearing protection requirements, and flight deck CONOPS.

The Department of the Navy has also established hazardous noise exposure mitigation working groups that bring together scientists, engineers, and medical professionals to work toward further protecting our sailors and marines from the risks to prolonged exposure to noise from all sources (above deck, below deck, and ashore). These groups will collaborate on common issues affecting noise sources and exposure management and will work with the Department's System Safety Advisory Board for integration of recommendations into the Department's long-term noise risk mitigation plans.

##### *Information Technology:*

Issues associated with shipboard special access program space accreditation have been resolved. Interoperability with legacy Naval Aviation Enterprise information systems remains in-work. Towards resolving this topic, we have identified all affected systems via a joint risk review; identified data exchange requirements with DoN legacy systems; and agreed on a plan to build the necessary interfaces between the F-35 ALIS system and legacy aviation maintenance systems.

#### QUALITY CONTROL PROBLEMS

24. Senator WICKER. Vice Admiral McCoy, from the first ship in its class, the LPD-17 *San Antonio*-class amphibious ship program has displayed chronic problems in terms of safety, engineering, design, and oversight. These problems have been so significant that they give rise to broader concerns about a widespread readiness problem afflicting our surface fleet. As to the LPD-17-class of ships, we have been left with an entire class of ships that, according to the Pentagon's chief independent weapons tester, is "not effective, suitable and not survivable in combat". With Northrop Grumman's sale of its shipyards, what are the Navy's plans for the construction of the last LPD-17 ship?

Admiral MCCOY. A new LPD-17-class build plan, which rolls in lessons learned from the initial ships of the class and focuses on increased pre-outfitting, increased first-time quality, and higher completion levels at launch, has been developed and incorporated on the ships currently in construction. The design is mature; and the program requirements and schedule are stabilizing as production trends continue to

show improvement. The last LPD-17-class ship (LPD-27) is planned to be awarded to Huntington Ingalls Industries.

25. Senator WICKER. Vice Admiral McCoy and Captain Galinis, please address the apparent downward trend in funding for maintenance, with the negative impact falling more heavily on surface combatants than on carriers and submarines.

Admiral MCCOY and Captain GALINIS. Even though the percentage of the Ship Maintenance requirement funded has fallen, the baseline maintenance budget request has actually increased from \$4.3 billion in fiscal year 2010 to \$4.9 billion in fiscal year 2012. This increase is a reflection of the Navy's commitment to funding the surface ship maintenance requirement. Additionally, investments being made in the Surface Maintenance Engineering Planning Program and enhanced assessments of our surface ships provides us with more insight on how to best manage risk and ensures that deferred work will be properly documented and tracked for completion in future availabilities. Navy remains committed to sustaining the force structure required to implement the Maritime Strategy.

The Navy's total budget submission reflects the best balance of risk and available resources across the Navy portfolio.

#### SHIP REPAIR ISSUES

26. Senator WICKER. Vice Admiral McCoy, earlier this month, the Navy terminated a large ship-maintenance contract with Earl Industries, citing problems it found with Earl's earlier work and its lack of proper documentation related to repair work. The Navy also reported to us recently that its investigation into engine repairs on the amphibious warship USS *San Antonio* and other ships similarly found that key maintenance reports were missing and several other important anomalies with documentation. However, 3 weeks before it terminated a \$75 million, 5-year maintenance contract with Earl Industries, the Navy defended the company's work in a letter to the Government Accountability Office (GAO) in a bid protest. What is going on here?

Admiral MCCOY. The termination of Earl Industries, LLC's (Earl's) MSMO contract for the repair of LPD-17-class ships was based on serious documentation and recordkeeping problems, and other quality-assurance issues, discovered during Earl's ongoing Continuous Maintenance Availability (CMAV) on USS *San Antonio* (LPD-17). These problems generated significant concerns about the company's ability to perform successfully on LPD-17-class ships under the 5-year MSMO contract.

There is no inconsistency between the Navy's defense of the bid protest and its decision to terminate the maintenance contract with Earl Industries. In its submission to GAO on April 18, 2011, concerning the January 2011 award to Earl, the Navy emphasized that the deficiencies in Earl's documentation on the CMAV contract were unknown to the Navy at the time of the MSMO award, and, therefore, not relevant to the protest. In that filing, the Navy noted that its investigation of Earl's documentation under the CMAV contract was ongoing. The escalation in performance problems during the course of the CMAV contract, however—including, but not limited to, issues related to documentation—raised concerns about the efficacy of Earl's quality-assurance program in connection with LPD-17-class repair work. The Navy terminated the MSMO contract on May 6, 2011, based upon the gradual accumulation of information, subsequent to the award of that contract, regarding Earl's difficulties under the CMAV contract.

27. Senator WICKER. Vice Admiral McCoy, what should this subcommittee make of these developments?

Admiral MCCOY. The termination of Earl Industries, LLC's (Earl's) MSMO contract for the repair of LPD-17-class ships was based on serious documentation and recordkeeping problems, and other quality-assurance issues, discovered during Earl's ongoing CMAV on USS *San Antonio* (LPD-17). These problems generated significant concerns about the company's ability to perform successfully on LPD-17-class ships under the 5-year MSMO contract.

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28. Senator WICKER. Vice Admiral McCoy, like the Earl Industries fiasco, similar problems are affecting other shipyards and ship repair facilities outside the Gulf Coast. For example, Navy frigates, such as the USS *Elrod*, USS *Klakring*, USS *Taylor*, and USS *Nicholas* have had shipyard maintenance periods extended because of work that was not done correctly the first time and poor Navy oversight. The repair problems don’t just end with surface ships; submarines USS *Helena*, USS *Virginia*, and USS *San Juan* have extended their shipyard periods because of a lack of materials and a lack of shipyard resources, all which impact ship and submarine sailing and deployment schedules. Is there a systemic problem here that needs more direct attention by Navy leadership or congressional action?

Admiral MCCOY. The Navy’s assessment is that there is not a systemic problem with how ship maintenance is done. Likewise, while there have been some issues with recent ship maintenance efforts, the Navy does not see a common root cause that spans the different availabilities. The Navy has rigorous processes for its ships to meet their expected service lives and methods to verify that the necessary maintenance and modernization are executed in a formal, deliberate and efficient manner. The Navy assesses the efficacy of the ship repair yards, works with them to correct identified problems, and changes contractors when needed, thereby providing the necessary oversight to ensure the operational readiness, reliability, safety, and effectiveness of the Navy’s ships and submarines.

Several issues can impact the duration of ship availabilities. Availabilities may be extended or delayed as emergent repair work on other ships arises and is given priority. New work identified during an availability may also lead to the availability’s extension. Furthermore, availabilities may be adjusted to support revised Fleet operational priorities. Adjustments to availabilities are appropriately managed by the Fleet Maintenance Officers and the Naval Sea Systems Command (NAVSEA).

Regarding the allocation of shipyard resources, NAVSEA is involved in the management of all ship and submarine availabilities in execution at public and private shipyards and those at the regional maintenance centers. Availability workload is reviewed monthly by NAVSEA and quarterly with the Fleet customers. The Naval Shipyards’ current fiscal year capacity is set to the execution guidance workload. These Shipyards, along with the two private-sector nuclear repair yards, use the One Shipyard concept to focus on cost, schedule and quality through standardizing processes, sharing resources among public shipyards and within Regional Maintenance Centers, and partnering with private shipyards to meet their resource requirements. Workload/workforce forecasting for Naval Shipyards is accomplished monthly to allow for the hire of specific skills based on the forecast and attrition history. For surface ship repairs executed by private contractors, the workload/workforce forecasting is determined during contract negotiations and monitored by the Navy’s Supervisory Authority during execution of the contract.

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#### QUESTIONS SUBMITTED BY SENATOR KELLY AYOTTE

##### MARITIME PREPOSITIONING FORCE

29. Senator AYOTTE. Secretary Stackley, you state that the three current Maritime Prepositioning Ship Squadrons will add a Mobile Landing Platform (MLP), an Auxiliary Cargo (K) and Ammunition (E) Ship (T-AKE), and Large Medium-Speed, Roll-on/Roll-off (LMSR) cargo ship. I also note that the Navy has added three Auxiliary Cargo (K) and Ammunition (E) Ships to the fiscal year program. I interpret these Navy decisions as a reaffirmation and a validation of the importance of the Maritime Prepositioning Force (MPF). Based on the importance of the MPF, I was surprised to learn that the Navy plans to place 6 ships of the 3-squadron, 16-ship total MPF for the Marine Corps into reduced operating status beginning in fiscal year 2013. General Panter of the U.S. Marine Corps has stated in testimony that this decision needs additional analysis. When I asked General Panter last week about this decision, he said that placing portions of Squadron 1 in the Mediterranean on a reduced-operating-status would “translate to potentially a slower response time in support of the combatant commands (COCOM).”

During our Readiness and Management Subcommittee hearing last week, I understood Admiral Burke to essentially say that the decision to place Squadron 1 in the

Mediterranean on reduced operating status was a calculated risk in order to save money. Does it make sense to you to reduce the readiness of our MPS in the Mediterranean in light of the turmoil in that region?

Secretary STACKLEY. Yes. The MPSRONS were acquired primarily to support major combat operations. The timing required to support those major operations has changed since the squadrons were formed 25 years ago, permitting the Mediterranean squadron to be placed in Reduced Operating Status (ROS) 5-day status with acceptable risk. Response time includes 5 days to activate in addition to the transit time from the U.S. East Coast (USEC). For example, USEC to Mediterranean and the west coast of Africa is typically 7 to 12 transit days. It should be noted that none of the ships have been used to support current operations to date.

30. Senator AYOTTE. Secretary Stackley, if the MPS is important enough for your office to invest additional and finite acquisition funds, why isn't it important enough to maintain them at full operating status?

Secretary STACKLEY. We have many strategic sealift capabilities maintained in reduced operating status (~60 ships). Their capacity is required to meet wartime requirements, but wartime requirements do not mandate retention in full operating status. This is the same case for the Mediterranean MPS squadron.

#### ADVANCED GUN SYSTEM

31. Senator AYOTTE. Secretary Stackley and Vice Admiral McCoy, given the investment in DDG-1000, the Advanced Gun System (AGS), and the Long-Range Land Attack Projectile (LRLAP), would it increase efficiency and lower costs by leveraging this technology for the DDG-51 Flight III?

Secretary STACKLEY and Admiral MCCOY. Where practicable, Navy will seek to leverage existing technologies for DDG-51 Flight III. However, DDG-51 Flight III's primary mission will be Integrated Air and Missile Defense rather than DDG-1000's emphasis on Naval Surface Fire Support (NSFS). Therefore, DDG-51 Flight III's Naval Gun Fire Support requirements align most closely with current DDG-51 requirements that are filled by the 5" gun system.

32. Senator AYOTTE. Secretary Stackley and Vice Admiral McCoy, if a modified AGS was deemed compatible with the planned DDG-51 Flight III general arrangement, would it be technically and programmatically feasible to make the necessary modifications and be production ready for the first planned DDG-51 Flight III?

Secretary STACKLEY and Admiral MCCOY. DDG-51 Flight III's primary mission will be Integrated Air and Missile Defense rather than DDG-1000's emphasis on NSFS. While technically feasible to modify DDG-51 Flight III to support AGS, such installations in DDG-51 Flight III ships would result in cost and schedule impacts that may not be acceptable. Furthermore, DDG-51 Flight III's Naval Gun Fire Support requirements align most closely with current DDG-51 requirements that are filled by the 5" gun system.

33. Senator AYOTTE. Secretary Stackley and Vice Admiral McCoy, in your opinion, would the capabilities of the AGS and the LRLAP developed for DDG-1000 complement current weapons such as the Tomahawk Land Attack Missile? Please explain why or why not.

Secretary STACKLEY and Admiral MCCOY. The LRLAP fired from the DDG-1000 AGS is a natural complement to tactical aircraft-delivered precision munitions as well as the Tomahawk Land Attack Missile. Together, these weapons provide combatant commanders with persistent, all-weather strike capability including precision and volume fires in support of forces ashore.

[Whereupon, at 3:52 p.m., the subcommittee adjourned.]



**DEPARTMENT OF DEFENSE AUTHORIZATION  
FOR APPROPRIATIONS FOR FISCAL YEAR  
2012 AND THE FUTURE YEARS DEFENSE  
PROGRAM**

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**WEDNESDAY, JULY 13, 2011**

U.S. SENATE,  
SUBCOMMITTEE ON SEAPOWER,  
COMMITTEE ON ARMED SERVICES,  
*Washington, DC.*

**THE REQUIRED FORCE LEVEL OF STRATEGIC AIRLIFT  
AIRCRAFT MANDATED BY TITLE 10, UNITED STATES  
CODE, AND THE ADMINISTRATION'S REQUEST TO  
ELIMINATE THAT REQUIREMENT**

The subcommittee met, pursuant to notice, at 2:33 p.m., in room SR-232A, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed, Wicker, and Ayotte.

Committee staff members present: Leah C. Brewer, nominations and hearings clerk; and Jennifer L. Stoker, security clerk.

Majority staff member present: Creighton Greene, professional staff member.

Minority staff member present: Christopher J. Paul, professional staff member.

Staff assistants present: Brian F. Sebold and Breon N. Wells.

Committee members' assistants present: Carolyn Chuhta, assistant to Senator Reed; Joseph Lai, assistant to Senator Wicker; and Brad Bowman, assistant to Senator Ayotte.

**OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN**

Senator REED. The subcommittee will come to order.

I want to extend a welcome to our witnesses and thank each of you for appearing before the Seapower Subcommittee today.

The subcommittee will hear from the Honorable Christine Fox, Director of the Office of Cost Assessment and Program Evaluation (CAPE); General Duncan McNabb, Commander of the U.S. Transportation Command (TRANSCOM); and General Raymond Johns, Commander of the Air Force's Air Mobility Command (AMC). We welcome you all and thank you for your service.

I would note that this hearing is principally the result of the excellent work that Senator Ayotte has done, together with her staff, to call to the attention of the subcommittee the issue of the inventory of strategic lift, which is a vital topic to this subcommittee.

Her work has caused us to, I think, take a very close look at what you are proposing, what the administration is proposing, and be prepared, we hope, appropriately for the authorization bill when it comes to the floor.

But I would be remiss if I did not very strongly, and with great appreciation express my thanks to Senator Ayotte and her staff for her excellent work.

Senator AYOTTE. Thank you very much, Mr. Chairman.

Senator REED. Thank you.

Today, we would like to hear about the Department of Defense's (DOD) request to eliminate the provisions of section 8062 of title 10, U.S.C., which require that DOD maintain at least 316 strategic airlift aircraft in the inventory.

For these purposes, the term "strategic airlift aircraft" is defined essentially as C-5s and C-17s. Congress established that requirements based on previous assessments of strategic airlift requirements for supporting wartime operations.

It is appropriate that we consider this change very carefully. We need to be sure to get this decision right since we could be incurring large expenses if we get the decision wrong in either direction, either maintaining too many aircraft or too few, given the potential contingencies going forward.

If we keep more aircraft than we really need, we have to pay operating and support costs. If, on the other hand, we retire more aircraft than is prudent, we may face the need to reactivate retired aircraft—and that is always an iffy proposition, both in terms of cost and in terms of the availability and the condition of these aircraft—or, more likely, consider buying new strategic airlift aircraft.

I suspect that either one of these options would be very expensive to the point that it would quickly wipe out any planned near-term savings in operating and support costs achieved by retiring too many aircraft. So getting the number right is absolutely important.

I think also it is important—and again, I hope the value of this hearing is so that we understand the logic, the analyses, and that we also are able to feel comfortable about whatever proposal is adopted.

We are in a situation of retiring aircraft not because the C-5A aircraft are worn out—I think there is a lot of serviceable life left in these aircraft—but Congress bought essentially 43 more C-17 aircraft than the Air Force said it needed a few years ago. Had we stopped production at 180 C-17 aircraft, we would not be in the position of retiring any C-5A aircraft currently slated for retirement under the Air Force's plans.

Unlike other parts of our aircraft forces, the C-5A aircraft we retired have not expended all of their useful service lives. The reason that it is suggested to retire these aircraft would be to save operating and support costs, not because they are worn out. Frankly, there are some classes of aircraft in our inventory that are closer to the wear-out situation than the C-5A.

So I suspect that many other aspects of the Air Force would love the luxury of being able to retire aircraft that still have useful life. In fact, General Johns, I think in a previous position, you identified potential fighter Air Force structure shortfall of some 800 aircraft

in the next decade because they were wearing out, not because we just didn't need them.

So over the years since the late 1970s, assessments of our wartime requirements have fluctuated, generally increasing, except in the past few years. To my knowledge, previous analyses have never explicitly addressed requirements for a strategic airlift to support peacetime operations.

Last year, despite operating fewer aircraft than the current requirement for 316 aircraft, we were told that strategic airlift forces were flying harder than ever before. To that specific point, because of a lack of availability of strategic airlift aircraft to support peacetime operations, TRANSCOM had to hire former Soviet strategic airlift aircraft to carry mine-resistant ambush protected (MRAP) vehicles to the theater to support combat operations in Iraq and Afghanistan.

So it raises a host of questions about the Civil Reserve Air Fleet, leasing other nationality aircraft, how many C-17s, how many C-5s? I must say I have looked at the testimony, and I will just initially say how thoughtful I believe you have considered this issue. So thank you for that thoughtfulness.

I look forward to the testimony, and I also look forward to a good round of questioning because, like any serious issue, you have raised many questions with your thoughtful analyses. We would like to answer them today.

With that, let me recognize Senator Wicker. I would certainly like to recognize Senator Ayotte, if she would have comments.

#### **STATEMENT OF SENATOR ROGER F. WICKER**

Senator WICKER. Thank you, Mr. Chairman, and thank you for holding this important hearing today.

I want to thank our witnesses for their attendance and for their valuable service to our Nation.

I will be relatively brief, and I appreciate the chair and his willingness to allow Senator Ayotte also to make an opening statement.

The National Military Strategy (NMS) has continued to evolve since 2005, when DOD conducted its last study to determine the right mix of aircraft, ships, personnel, and facilities to move cargo and passengers for military operations. Although the ability to prosecute two nearly simultaneous conventional campaigns remains a cornerstone of U.S. defense policy, the current strategy places increased emphasis on irregular warfare, stabilization operations, and support to Homeland defense.

Furthermore, defense planning recognizes the reality of long-term U.S. involvement in globally dispersed operations, which may include commitments to major campaigns.

In order to provide an updated comprehensive assessment of DOD's mobility system, TRANSCOM last year completed the Mobility Capabilities and Requirements Study-2016 (MCRS-16). In its fifth comprehensive mobility study—it is the fifth comprehensive mobility study conducted by DOD and the second mobility study conducted since September 11.

The objectives of MCRS-16 were to determine the mobility capabilities and requirements needed to deploy, employ, sustain, and

redeploy joint military forces in support of NMS in the 2016 timeframe. Also, to determine capability gaps and overlaps associated with the programmed mobility force structure and to provide insights and recommendations to support the Quadrennial Defense Review (QDR).

MCRS-16 assessed the military's strategic airlift, large cargo aircraft; intra-theater airlift, small cargo aircraft; sealift; aerial refueling; ashore and afloat prepositioning; surface transportation; and infrastructure. This was done by assessing whether the military has the right type of equipment against a set of operational metrics to determine whether available forces met warfighter objectives within desired timelines.

MCRS-16 found DOD's planned mobility capabilities are sufficient to support the most demanding projected requirements. Some specific findings are, number one, large cargo aircraft airlift capacity exceeds the peak demand in all the scenarios considered, which covered a broad spectrum of military operations. Based on the study's findings, the military needs only 264 to 300 large cargo aircraft.

Number two, lack of foreign infrastructure or access to foreign infrastructure to support major force deployments remains the fundamental constraint when attempting to reduce deployment timeliness in support of U.S. objectives.

Number three, sealift is the primary means for delivering large ground forces.

Number four, DOD relies on the Civil Reserve Air Fleet (CRAF), with commercial air carriers as the primary means of delivering passengers. Projected passenger airlift capacity greatly exceeds the requirement in all scenarios considered.

Number five, intra-theater airlift using the Air Force's programmed amount of C-130s exceeds the peak demand, covering a broad spectrum of military operations. Those are the findings.

In his prepared testimony for this subcommittee, one of our witnesses today, General McNabb, says, "With the MCRS-16 complete, we now have the analytical justification to recommend repeal of the 316 strategic airlift floor."

I agree. Eliminating the 316 large cargo aircraft floor restriction would allow the Air Force to retire an additional 15 C-5As and provide substantial savings by freeing up billions in taxpayers' dollars over the next few years. Given the current climate of fiscal austerity, which requires that we look to all corners of the defense enterprise to determine how DOD can conduct itself more efficiently, this is a move in the right direction.

Mr. Chairman, I look forward to the testimony of our distinguished witnesses. I can only say one other thing. I have heard a wild rumor that General McNabb may be in the process of retiring in October.

Surely this couldn't possibly be true. But if it is, we will miss his services, and he is doubly due the praise and the admiration of this committee and this Congress.

Thank you very much, Mr. Chairman.  
 Senator REED. Thank you, Senator Wicker.  
 Senator Ayotte.

Senator AYOTTE. Thank you, Mr. Chairman. I very much appreciate your holding this hearing.

I also want to thank Ranking Member Wicker for holding this hearing today.

During the markup process for the National Defense Authorization Act, I brought forward an amendment that would have changed the strategic airlift requirement, allowing DOD to reduce that number from 316 to 299.

I did that because, in looking at this issue, it came to my attention that DOD and the Air Force had done very careful analyses when the proposal was submitted through the President's budget to the Armed Services Committees for consideration. That is why I was going to bring forward that in the markup.

I very much appreciate the chairman and ranking member having this hearing. When this issue was brought up in the markup, they realized how important it was and decided to have this hearing today. I am very appreciative of their work on this issue.

I want to thank all of the witnesses for being here, for your thoughtful analyses. Because what has been done by the Air Force on this issue, there was an extensive study done in 2010 to identify the peak of demand for airlift capacity, which has already been referenced, and that that airlift capacity would be 32.7 million tons per day. We would be able to meet that capacity with reducing to 299 strategic airlift aircraft.

Why is that important? It is very important, as the chairman and the ranking member have already mentioned, because all of us want to ensure that our military can meet our strategic airlift requirements. I know the witnesses share that concern, and that is why you undertook such careful analyses in coming to this conclusion.

But we also want to make sure that, in these difficult fiscal times for our country, and for DOD, that we aren't spending money that we don't need to maintain aircraft that we no longer have a capacity or need for. If we were to change the strategic airlift requirements in a way that I hope will happen as we go forward from this hearing, we could—in retiring the unneeded C-5A models, save up to \$1.2 billion in taxpayers' dollars across the Future Years Defense Program (FYDP) over the next 4 years.

Those, of course, are resources that could be better used, either to upgrade our C-17s for other uses within the military, given the difficult choices that we are going to have to be making going forward. We, as you all know and appreciate, with \$14 trillion in debt and with Admiral Mullen, I think, rightfully identifying the national debt as the greatest threat to our national security, all of us, when we find that we have too much of something that we need, it is very important for us to act on, in my view, your recommendations. That is what prompted me to raise this issue in the committee.

I am looking forward to hearing each of the witnesses' testimony today. Just to follow up on something that the chairman said, one of the reasons that we had too many C-17s is because Members of Congress, rather than what you asked us to produce, actually, through the earmark process, had more of those aircraft produced than the Air Force had requested.

So we, in part, in Congress have created this situation. So, I am hopeful that we will heed your careful analyses and advice going forward so that we can right-size and still meet our strategic airlift requirements.

So thank you very much.

Senator REED. Thank you, Senator Ayotte.

All of your testimony has been submitted and will be made part of the record. You may be free to summarize your testimony.

We will begin, I believe, with Director Fox and then General Johns or General McNabb, whoever wants to go next.

Director Fox, please.

**STATEMENT OF HON. CHRISTINE H. FOX, DIRECTOR, COST ASSESSMENT AND PROGRAM EVALUATION, DEPARTMENT OF DEFENSE**

Ms. FOX. Mr. Chairman, Senator Wicker, and distinguished members of the subcommittee, thank you for the opportunity to appear before you to discuss DOD requirements for strategic airlift.

The Office of CAPE has extensively studied strategic airlift requirements through a series of studies, beginning in the early 1990s.

Last year, we completed the MCRS, which assessed peacetime and wartime demands on our airlift system. We conducted this study in conjunction with TRANSCOM. It serves as the analytic underpinning of the Air Force's current fleet management plan and supports retirement of 32 C-5 aircraft.

Here, I will briefly summarize the results of that study. As you said, sir, we have submitted a more detailed written statement.

The study assessed steady-state and surge requirements for airlift, sealift, and prepositioned assets for various scenarios, providing DOD with a comprehensive understanding of our mobility system in time of peace and time of war.

An understanding of the steady-state demand is important because it quantifies the level of effort needed to support daily operations without mobilization. It also sets the conditions for the location of forces and mobility assets at the commencement of the surge events.

For our analysis of steady-state demand, we evaluated both historical support to global logistics and, through modeling, the deployment, employment, redeployment, and sustainment of forces supporting globally dispersed operations. Historical data included missions flown in support of combatant commanders, such as cargo and passenger missions, exercise missions, and special assignment airlift missions conducted over the past 7 years.

The special assignment airlift missions include movement of nuclear means and related material, presidential support, special operations support, and other time-sensitive, high-priority missions.

For our analysis of the surge requirements, we developed three different cases to evaluate peak airlift demands. Each case included Homeland defense and major campaigns.

The results of our study showed that it is the surge events that drive the size of the strategic airlift fleet. These events are periods of finite, but extremely high levels of demand for strategic airlift. In comparison, steady-state demands represent prolonged require-

ments, but with significantly lower peaks. While these requirements contribute to the surge demand, they do not drive the size of the airlift fleet.

So based on the study findings, DOD needs a military airlift fleet capacity between 29.1 and 32.7 million ton-miles per day (MTM/D), which can be met with 264 to 300 aircraft. These results support the Air Force desire to retire 32 C-5 aircraft. It is our assessment that the retirement of these aircraft will not increase operational risk.

Without this change, DOD would be required to maintain a strategic airlift fleet in excess of what is required, costing DOD billions of dollars over the life of the aircraft.

Thank you again for the opportunity to appear before you, and I look forward to your questions.

[The prepared statement of Ms. Fox follows:]

PREPARED STATEMENT BY HON. CHRISTINE H. FOX

Mr. Chairman, Senator Wicker, and distinguished members of the subcommittee, thank you for the opportunity to appear before you to discuss the Department of Defense requirements for strategic airlift.

The Office of Cost Assessment and Program Evaluation has extensively studied strategic airlift requirements through a series of studies beginning in the early 1990s. Last year we completed the Mobility Capabilities Requirements Study (MCRS), which assessed peacetime and wartime demands on our airlift system. We conducted this study in conjunction with U.S. Transportation Command (TRANSCOM). It serves as the analytic underpinning of the U.S. Air Force's current fleet management plan and supports retirement of 32 C-5 aircraft. Here I will briefly summarize the results of that study.

The MCRS was an 18-month, department-level assessment of a broad spectrum of mobility capabilities, which included strategic airlift, intra-theater airlift, sealift, aerial refueling, ashore and afloat prepositioning, surface transportation, and infrastructure. As with past mobility studies, MCRS assessed the mix of military (organic) and commercial lift capabilities needed to support the National Defense Strategy. The analysis was based on illustrative conventional and irregular military operations conducted over a notional 7-year timeframe.

It is important to keep in mind the distinction between the resources the department uses for planned wartime capability and those it uses in steady-state operations. When operating at full wartime capability (surge demand), the department mobilizes Guard and Reserve Forces and employs them along with active forces at wartime utilization rates. Additionally, the President has the authority to activate the Civil Reserve Air Fleet (CRAF) which can contribute as many as 900 aircraft. When not operating at full wartime capability (i.e., steady-state sustainment), Guard and Reserve Forces are not mobilized, and CRAF is not activated. This is why the department sometimes relies on commercial/foreign source airlift like the Russian-built IL-76 and AN-124 to support current operations. Accommodating a short-term surge with use of commercial assets is more cost-effective than maintaining additional force structure that is not required full time.

MCRS assessed steady-state requirements by evaluating historical support to global logistics and by modeling the deployment, employment, redeployment, and sustainment of forces supporting globally dispersed operations. Steady-state analysis is important for two primary reasons. First, it quantifies the level of effort needed from the mobility system to support daily operations without mobilization. Second, it sets the initial conditions for the location of forces that need to be relocated by the mobility system to support the commencement of surge events.

TRANSCOM analysts examined 7 years of mission data from the Global Decision Support System database to identify historical support requirements for global logistics. Global logistic missions include routine channel missions, exercise missions, and Special Assignment Airlift Missions (SAAMs) that fly daily support for Combatant Commands (COCOMs). Channel missions consist of cargo and passenger missions—organic and commercial—flown in support of COCOMs. The study assumed that exercises other than Joint Chiefs of Staff/COCOM exercises would be canceled or curtailed when U.S. forces were engaged in one warfight and that all exercises would be cancelled when engaged in two overlapping warfights. SAAMs include

movement of nuclear weapons and nuclear weapons-related material, presidential logistics support, special operations support, and other time-sensitive, high priority airlift requirements. The study assumed some SAAM requirements would continue even during overlapping campaigns.

As part of the steady-state assessment, the study analyzed two different Department-approved strategic environments consisting of representative vignettes arranged over a 7 year timeline. The “Global Insurgency” strategic environment included 64 distinct operations and reflected an increased level of effort for irregular warfare representing an expansion and intensification of global operations. The strategic environment developed during the most recent Quadrennial Defense Review included 69 vignettes which had a similar irregular warfare emphasis.

For our analysis of surge requirements, we developed three different cases to evaluate peak airlift demands. Each case included Homeland defense and major campaigns. The cases involved demanding operational assumptions. The model used in the analysis accounts for the fact that many aircraft are not loaded to their maximum weight capacity due to load size, scheduling constraints, and route structure. The MCRS cases were defined as follows:

Case 1 evaluated two overlapping large-scale land campaigns occurring in different theaters of operation, concurrent with three nearly-simultaneous homeland defense consequence management events, plus support to ongoing steady-state operations, to include Operation Enduring Freedom (OEF). This case required a military strategic airlift fleet with a capacity of 32.7 million ton-miles per day (MTM/D), which can be met with a fleet of 300 aircraft (222 C-17s, 52 C-5Ms, and 26 C-5As).

Case 2 evaluated a large scale air/naval campaign immediately followed by a major campaign in a different theater of operation, plus one large-scale homeland defense consequence management event, plus support to ongoing steady-state operations, to include OEF. This case required a military strategic airlift fleet with a capacity of 30.7 MTM/D, which can be met with a fleet of 277 aircraft (222 C-17s, 52 C-5Ms, and 3 C-5As).

Case 3 evaluated U.S. forces surging to conduct a large-scale land campaign against the backdrop of an ongoing long-term irregular warfare campaign of a size and scale similar to the 2007 Operation Iraqi Freedom (OIF) surge force. Case 3 also included three near-simultaneous homeland defense consequence management events, plus support to ongoing steady-state operations, to include OEF. This case required a military strategic airlift fleet with a capacity of 29.1 MTM/D, which can be met with a fleet of 264 aircraft (222 C-17s, 42 C-5Ms, 0 C-5As).

The results of our study showed that it is the surge events that drive the size of the strategic airlift fleet. These events are periods of finite, but extremely high levels of demand for strategic airlift. In comparison, steady-state demands represent prolonged requirements, but with significantly lower peaks. While these requirements contribute to the surge demand, they do not drive the size of the organic airlift fleet. Based on the MCRS findings, the department needs a military fleet capacity between 29.1 and 32.7 MTM/D which can be met with 264 to 300 aircraft.

These results support the Air Force desire to retire 32 C-5A aircraft. It is our assessment that the retirement of these aircraft will not increase operational risk. Without this change, the department would be required to maintain a strategic airlift fleet in excess of what is required, costing the department billions of dollars over the life of the aircraft.

Thank you again for the opportunity to appear before you, and I look forward to your questions.

Senator REED. Thank you, Director Fox. Once again, thank you for your very thoughtful written testimony.

Since I don't know date of ranks—okay, General Johns. General McNabb, you are recognized because General Johns does know date of ranks. [Laughter.]

**STATEMENT OF GEN. DUNCAN J. McNABB, USAF,  
COMMANDER, U.S. TRANSPORTATION COMMAND**

General McNABB. Chairman Reed, Senator Wicker, and distinguished members of this subcommittee, I would like to express my gratitude to this committee for your support to TRANSCOM and to the men and women who strive every day to protect our Nation and its freedom.

It is my distinct honor to be with you today, representing the more than 145,000 soldiers, sailors, marines, airmen, coast guardsmen, and civilians that are TRANSCOM. Daily, our total force team provides the warfighters the force and sustainment they need to win.

I am also privileged today to be joined by two of my good friends and colleagues, General Ray Johns and Ms. Christine Fox. Great to be up here with you all.

Rapid global mobility is among our Nation's greatest asymmetric advantages. And the ability to mobilize forces and materials within hours, rather than days or weeks, depends on the right-sized fleet of versatile, ready, and effective air mobility forces.

I fully support the administration's proposal to repeal the statutory requirement for the Air Force to maintain a strategic cargo fleet of 316 aircraft. The congressionally-directed floor of 316 strategic airlifters was established before the MCRS-16 determined the strategic airlift requirement to be 32.7 MTM per day. Our analysis confirms this capacity can be met with approximately 300 strategic airlift aircraft.

Additionally, a strategic airlift aircraft reduction allows the Air Force to retire an additional 15 C-5As and, as the Senator mentioned, with a substantial saving of over \$1.2 billion in taxpayers' dollars across the FYDP and, most importantly, focus our critical infrastructure, aerial port, and aircrew personnel and resources on a right-sized fleet.

The current program fleet of 222 C-17s, 52 C-5Ms, and 27 C-5As satisfies this requirement and is far more modern and capable than any strategic airlift fleet in our history. To underscore this point, our strategic airlift fleet of approximately 350 aircraft in 1999 provided about 26 MTM per day capacity. Yet today, a fleet of only 300 aircraft will provide over 32 MTM per day.

This also allows us to meet our peacetime requirements. Indeed, in 2010, while supporting both the troop withdrawal from Iraq and the surge into Afghanistan, our busiest day in AMC was on March 23, when we performed 16.6 MTM per day of lift. For comparison, prior to September 11, the busiest day in 2001 for AMC was 5.5 MTM per day.

When these numbers are compared with our projected capacity, the Air Force program fleet can meet all readiness and peacetime requirements, as well as be surged to meet wartime needs.

In addition to a more modern and capable fleet, we also continuously improve the efficiency of air mobility operations. For example, with the use of multimodal operations, we move large volumes of cargo by sea to locations in close proximity to the area of operations, then by truck from the seaports to the nearby airfields, and finally by air to its destination.

This concept has been used with great success throughout 2010 and 2011 as we moved almost 7,000 mine-resistant attack platforms and M-ATVs to Afghanistan. Utilizing the combination of air, land, and sea modes of transportation, we increased velocity, employed aircraft more efficiently, and ultimately reduced transportation costs by almost \$400 million in 2010 alone.

Multipurpose aircraft will also improve the efficiency and capacity of our airlift fleet. The KC-46 fleet, the new tanker—and thank

you for your support of that—will be sized based on war plan tanker requirements. In those plans, when not at aerial refueling peak demand periods, the KC-46 can supplement the heavy airlift fleet by conducting a variety of airlift and air medical evacuation missions.

Not only will it dramatically change our air refueling concept of operations, but it will also allow us to make the whole air mobility system that much more efficient.

Our commercial partners also provide superb modernized and cost-effective airlift support in peace and in war. Their ability to move bulk cargo and passengers around the world complements our organic capabilities. I depend on them in wartime.

The CRAF program's ability to augment our organic airlift fleet helps to reduce the operational burden on our military assets and allows us to deal with short-term surges without having to mobilize total force assets. Based on all these factors, I reiterate my full support to repeal the 316 statutory floor.

At TRANSCOM, we view our success through the eyes of the warfighter. We know that combatant commanders around the world absolutely depend on us to deliver the forces and their sustainment day in and day out.

We are committed to deliver to the warfighter, while also being responsible stewards of the taxpayers' trust and dollars. The men and women of TRANSCOM, our components, and industry partners are proud to provide world-class support to those who put themselves on the line every day. We want them to absolutely know that we will always, always deliver.

Chairman Reed, Senator Wicker, and all members of this subcommittee, thank you for your continued superb support of TRANSCOM and of all of our men and women in uniform.

Thank you for including my written statement for the record, and I look forward to your questions.

[The prepared statement of General McNabb follows:]

PREPARED STATEMENT BY GEN. DUNCAN J. MCNABB, USAF

Chairman Reed, Senator Wicker, and distinguished members of this subcommittee, I would like to begin by expressing my appreciation to this committee for your support to the U.S. Transportation Command (TRANSCOM) and to the men and women who strive every day to protect our Nation and its interests.

Rapid global mobility is among our Nation's greatest asymmetric advantages, and the ability to mobilize forces and materiel within hours, rather than days or weeks, depends on the right-sized fleet of versatile, ready and effective air mobility forces.

This year, the administration proposed a repeal of the statutory requirement for the Air Force to maintain a strategic cargo fleet of 316 aircraft. I fully agree with the administration's proposal. The congressionally-directed 316 strategic airlift requirement was established before the Mobility Capabilities and Requirements Study 2016 determined the strategic airlift requirement to be 32.7 million ton-miles per day (MTM/D), based on the most challenging wartime airlift scenario. Our analysis confirms 32.7 MTM/D capacity exceeds the peacetime requirement and can be met with approximately 300 strategic airlift aircraft.

With the Mobility Capabilities and Requirements Study 2016 complete, we now have the analytical justification to recommend repeal of the 316 strategic airlift floor. As I and others have previously stated or testified, it was necessary to wait for the results of the study before making any recommendation to change the size of the strategic airlift fleet. I do so confidently today. The strategic airlift aircraft reduction will allow the Air Force to retire an additional 15 C-5As and provides a substantial savings by freeing up over \$1.2 billion in taxpayer dollars across the FYDP.

The current programmed fleet of 222 C-17s, 52 C-5Ms and 27 C-5As is far more modern and capable than any strategic airlift fleet in our history. To underscore this point, our strategic airlift fleet of approximately 350 aircraft in 1999 provided about 26 MTM/D capacity, yet, today, a fleet of only 300 aircraft provides 32.7 MTM/D. The dramatic improvement in strategic airlift capability provided by C-17s and modernized C-5s has enabled a reduced fleet size to meet our warfighter requirements.

C-17s will continue to meet TRANSCOM's future requirements through currently funded purchases, upgrade programs and fleet rotation. New C-17s arrive with improvements that increase the reliability of the weapon system. Older aircraft enter into the Global Reach Improvement Program to increase their sustainability and reliability. Furthermore, aircraft located in corrosive and training environments are monitored and analyzed for stress and rotated to maintain structural integrity of the fleet.

The C-5 is critical to our oversized and outsized air cargo capability. C-5 fleet management has two main focus areas: C-5 reliability and C-5A retirements. The Reliability Enhancement and Re-Engining Program (RERP) is on track to increase the mission capable rate (MCR) of the C-5 fleet by at least 25 percent over the current C-5A and at least 15 percent over the current C-5B ... increasing the utilization rate for these aircraft and allowing us to operate into more austere locations. All C-5 B and C models and one C-5A model aircraft will undergo RERP resulting in a total of 52 C-5Ms in the inventory. Additionally, the new maintenance processes changed our focus from "fly to fail" on major components to preventative replacement. This has reduced the number of C-5s stranded off-station awaiting parts and will result in a 7-percent increase in MCR. Finally, C-5A retirements will improve aircraft availability by removing maintenance intensive jets from the fleet and will allow us to focus our critical maintenance, aerial port, and aircrew personnel and resources on a right-sized fleet.

In addition to a more modern and capable fleet, we also continuously improve the efficiency of air mobility operations. This efficiency allows a smaller strategic airlift fleet to handle wartime and peacetime mobility requirements. For example, with the use of multi-modal operations, we move large volumes of cargo by sea to locations in closer proximity to the area of operations, then by truck from the seaports to the nearby airfields and finally by air to its destination. This concept has been used with great success throughout 2010 and 2011 as we moved almost 7,000 MRAP and MRAP all-terrain vehicles to Afghanistan. Utilizing the combination of air, land and sea modes of transportation, we increased velocity, employed aircraft more efficiently and ultimately reduced costs by almost \$400 million in 2010.

Multi-purpose aircraft will also improve the efficiency and capacity of our airlift fleet. The KC-46 fleet, for example, will be sized based on war plan tanker requirements. In those plans, as the need for aerial refueling diminishes, the KC-46 can supplement the heavy airlift fleet by conducting a variety of airlift and aeromedical evacuation missions. Not only will it dramatically change our air refueling concept of operations, it will also allow us to make the whole air mobility system much more efficient.

Our commercial partners provide superb, cost-effective airlift support in peace and in war. Their ability to move bulk cargo around the world complements our organic capabilities. The Civil Reserve Air Fleet (CRAF) program's ability to augment our organic airlift fleet helps to reduce the operational burden on those assets. Because of the importance of the CRAF, we continue to seek out incentives, especially those that provide additional peacetime business opportunities, to strengthen participation in the program with modernized aircraft by our commercial airline partners.

At TRANSCOM, we view our success through the eyes of the warfighter. We know the combatant commanders around the world absolutely depend on us to deliver the forces and their sustainment day in and day out. We are committed to deliver what the warfighter needs, where they need it, when they need it ... while also being responsible stewards of the taxpayers' trust and dollars. The men and women of TRANSCOM, our components and industry partners are proud to provide world-class support to those who put themselves on the line every day, and ensure we always, always deliver.

Senator REED. Thank you, General.  
General Johns?

**STATEMENT OF GEN. RAYMOND E. JOHNS, JR., USAF,  
COMMANDER, AIR MOBILITY COMMAND**

General JOHNS. Chairman Reed, Ranking Member Wicker, and distinguished members of the subcommittee, on behalf of the 135,000 active duty, Air National Guard, and Air Force Reserve airmen of AMC, we thank you for the opportunity to speak with you about our strategic airlift fleet.

AMC airmen are employed every day around the world, providing global mobility for the Nation. We answer the call of others so that they may prevail. We thank you for your steadfast support for our efforts over the past many years.

As a force provider, AMC is charged with maintaining our strategic airlift fleet and ensuring it has the capability and capacity required by TRANSCOM and the geographic combatant commanders. The strategic airlift fleet is a national asset, allowing America to deliver hope, to fuel the fight, and to save lives anywhere in the world within hours of getting the call.

We are also keenly aware of the fiscal challenges our Nation is facing and take very seriously our role in fulfilling our requirement not only today, but as we look out into the future. It is incumbent on us to maintain effectiveness across the spectrum of operations in the most efficient manner possible.

We are devoted to managing the strategic airlift fleet responsibly. As part of the National Defense Authorization Act for Fiscal Year 2010, several restrictions were placed on the Air Force regarding strategic airlift, including a floor of 316 aircraft and several reporting requirements prior to any C-5 retirements.

The Secretary of the Air Force met the C-5A retirement restrictions earlier this year, and we greatly appreciate the committee allowing us to begin retiring our oldest and least capable C-5s. We are still constrained by the 316 floor and currently are only able to retire one C-5A for every C-17 delivered.

AMC fully supports the President's request to repeal the 316 strategic airlift floor and allow the Air Force to manage its fleet. MCRS-16, the most recent study completed on the strategic airlift requirement, was wholly informed by the National Security Strategy and the NMS. The foundation of MCRS-16 analyses is directly tied to the QDR, and its conclusions reflect our Nation's strategic priorities.

Based on MCRS-16 requirements of 32.7 MTM per day, we believe the program fleet size of 301 C-5s, C-5Ms, and C-17s is sufficient. By allowing the Air Force to retire the additional C-5As as requested, \$1.2 billion, ma'am, as you stated, of unprogrammed cost will be avoided across the FYDP.

Again, we thank you for the opportunity to come before you. Today is an important issue, and we sincerely thank you for your strong continued support. I look forward to your questions.

Thank you, Mr. Chairman.

[The prepared statement of General Johns follows:]

PREPARED STATEMENT BY GEN. RAYMOND E. JOHNS, JR., USAF

INTRODUCTION

Chairman Reed, Ranking Member Wicker, distinguished members of the subcommittee, on behalf of the nearly 135,000 active duty, Air National Guard, and Air

Force Reserve airmen that provide rapid Global Reach for the Nation as part of the Mobility Air Forces, thank you for the opportunity to appear before you today. Our strategic airlift capability is a national treasure which allows us to deliver hope, fuel the fight and save lives anywhere in the world within a matter of hours as evidenced by our continuing efforts in Afghanistan and our response to both the devastation in Haiti in 2010 and Japan earlier this year. The Mobility Air Forces are proud stewards of this capability. We constantly strive to ensure we have the right mix of aircraft and personnel to always be effective while at the same time remain fiscally responsible to the American taxpayer. This is the responsibility that brings us before you today.

#### SUPPORTING FORCES

As the air component of U.S. Transportation Command (TRANSCOM), we are charged with providing the required airlift to support geographic combatant commands (COCOM) around the globe. We do not determine the requirement, but we develop the most effective and efficient airlift fleet possible to support the National Security Strategy, National Military Strategy, and COCOM plans. To that end, we completely support the President's authorization request that would: (1) strike subsection (g) of section 8062 of title 10, U.S.C.; and (2) change the certification requirement in section 137 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111-84), eliminating the 316 strategic airlift aircraft restriction.

#### HISTORICAL PERSPECTIVE

The strategic airlift fleet we manage today traces its roots to the Mobility Requirements Study (MRS-05) completed in January 2001, prior to the attacks of September 11. That study addressed the best mix of strategic airlift required to deploy forces from a posture of global engagement. MRS-05 determined 54.5 million ton-miles per day (MTM/D), provided by a combination of organic strategic airlift and Civil Reserve Air Fleet (CRAF) airlift met requirements with acceptable risk. The organic strategic airlift accounted for 34.0 MTM/D of the 54.5 MTM/D total requirement and could be met with a range of fleet sizes, dependent on the mix of strategic aircraft. Based on the operations tempo around the world post September 11, the Mobility Capability Study delivered in December 2005 confirmed the findings of MRS-05 for acceptable levels of risk. Both studies were led by the Office of the Secretary of Defense (OSD) and the Joint Staff.

The most recent study, the Mobility Capabilities and Requirements Study 2016 (MCRS-16), was completed in February 2010 by OSD and TRANSCOM. This study investigated scenarios that generated an organic strategic airlift requirement of between 29.1 and 32.7 MTM/D. The higher number (32.7 MTM/D) is the benchmark that the Air Force and AMC currently uses to right size the strategic airlift fleet. Between the initial MRS-05 study and the most recent MCRS-16 study, the number of strategic airlifters required has remained relatively steady over the last decade (between 292 and 304 depending on fleet mix).

Notwithstanding the COCOM requirements, the strategic airlift fleet we maintain today is not the one envisioned just a decade ago. When the final C-17 is delivered to the Air Force, we will have over 40 more in the inventory than anticipated during MRS-05. As the force provider, the exact fleet mix is less critical than the ability to provide the required MTM/D.

#### MANAGING THE FLEET

We greatly appreciate the committee allowing the retirement of C-5As in accordance with the National Defense Authorization Act for Fiscal Year 2010 language. Every new C-17 delivered now allows retirement of a C-5A resulting in considerable savings. As more capable aircraft like the C-17 and C-5M enter the inventory, the 32.7 MTM/D requirement can be maintained with fewer aircraft. However, the 316 strategic airlift floor requires us to keep unneeded, less capable C-5As in the inventory. Each of these unneeded aircraft comes with a cost to maintain in flyable status, a cost not programmed in the Air Force budget. Over the Future Years Defense Program, the unprogrammed cost to the Air Force to maintain these aircraft could be as much as \$1.23 billion. For this considerable investment, the Nation will maintain 1.5 MTM/D of excess capacity; approximately 5 percent above the requirement of 32.7 MTM/D.

#### CONCLUSION

Our ability to manage the strategic airlift fleet over the coming years will enable us to be more fiscally responsible to the Nation. The fiscal year 2012 President's

budget includes a strategic airlift fleet of 301. This reflects the highest MCRS-16 requirement of 32.7 MTM/D which can be met with the programmed fleet of 222 C-17s, 52 C-5Ms and 27 C-5As, or 301 total strategic airlifters. With over a decade of study by multiple organizations, we firmly believe the programmed fleet of 301 aircraft meets our current national strategic objectives. We humbly ask the committee and Congress to support the President's vision by repealing the 316 strategic airlift floor and enabling us to manage the fleet to ensure we continue to meet COCOM requirements. We thank you for the subcommittee's continued support of America's Air Force and particularly to its airmen and their contributions to Global Mobility.

Senator REED. Thank you very much, General Johns.

We will do an 8-minute first round, and I think this is a topic that is of significant technical complexity and also interest that we will do a second round. We might have other members join us, too.

But let me just preface my remarks by saying—and this might be more folklore than fact—but I think one of the reasons there was a floor placed with respect to strategic lift is that there are strong intramural and extramural pressures sometimes to avoid buying airlift and buying other platforms. I hope that is not the case going forward.

Because, frankly, I think, as you have demonstrated and continue to demonstrate every day, strategic and tactical airlift is central to everything we do, everywhere we do it, and it deserves premier attention, not secondary attention. So that is just a preface to my questions.

First, in terms of the analysis, there are several terms that are running around. Director Fox, you talk in two categories, steady state and surge. Other people talk about peacetime and wartime.

Do you equate steady state as equals peacetime and surge equals wartime? Just for clarification.

Ms. FOX. Yes, sir. Essentially, that is correct. In the wartime, it includes Homeland defense operations concurrent with the warfight. Perhaps that is part of the confusion. But, yes, what you said is correct.

Senator REED. The surge is not only Homeland security. It is also a major campaign, which would be a conventional fight, unlike the irregular warfare we are seeing now?

Ms. FOX. Absolutely, sir. The most stringent cases, two overlapping, large land warfare campaigns, plus three simultaneously Homeland defense—

Senator REED. That leads to a 32.7 million tons per day figure to meet that?

Ms. FOX. Yes, sir. The max.

Senator REED. The max, and that is what you feel you can obtain, even with these reductions down to 301 aircraft, basically?

Ms. FOX. Yes, sir. A point of clarification, if I could?

Senator REED. Yes, ma'am.

Ms. FOX. The maximum needed is not that. It is 20 MTM/D. But when you look at how you schedule, how you load, the size, so it is really quite conservative. The model tries to go through that so we don't get caught short in our inability to provide it.

Senator REED. Just in terms of modeling, so the range of error—can you quantify that in terms of—were you told to get this within a 2 percent error, or was that not a modeling factor?

Ms. FOX. Sir, the model—I ought to be able to answer your question, but I will have to get back to you. We were not told to get

to something. What we have tried to do is model it as accurately as we can.

Of course, you are right. There are errors in any model. I should know that, but I am afraid I don't.

[The information referred to follows:]

The difference between the 20 million ton-miles per day (MTM/D) that I mentioned in my comment and the 32.7 MTM/D is the difference between the cargo-miles actually moved (20 MTM/D) in the simulation and the capacity of the fleet (32.7 MTM/D) required to achieve that level of activity. When loading aircraft we often run out of space before reaching weight limits resulting in a difference between the capacity of an aircraft and the capability realized. It is also true that due to the location of the airfields, not every aircraft flies the maximum hours/day authorized. The actual hours flown is dependent on weather and the departure and arrival locations. Thus the actual miles flown in a given scenario is always less than the theoretical miles possible. Our models take these factors and many others into consideration to ensure the most realistic simulation possible. In addition we update the model algorithms based on the latest information from current operations. For these reasons and because the model is based on time-distance-payload computations which are very accurate, we are quite confident that the results reflect what we would actually achieve given the scenarios assessed. The results of the Mobility Capabilities and Requirements Study 2016 which range from 29.1 MTM/D–32.7 MTM/D reflect different strategic assumptions and are not reflections or statements of model error.

Senator REED. No, that is quite all right.

The other issue, just a clarification, of steady state. Steady state is essentially what we are in right now.

We have a major operation in Afghanistan. You are doing major operations out of Iraq, particularly airlifting equipment out of Iraq. You have ongoing support requirements globally. So this is steady state?

Ms. FOX. That is correct. Steady state is intense.

Senator REED. Okay. General McNabb, let me—and General Johns or Director Fox, if you feel that you want to comment, please. One of the realities that is facing us right now is in this steady-state process, we are relying upon one of our allies, Pakistan, for terrestrial transit, their roads, et cetera. But given the political dynamics there, I will just ask the question.

The loss of Pakistan as a land transit point would not in any way affect your plans to retire the C-5As you currently have on duty or in any way change your request to—at least in the short run—to go down to as low as 301 aircraft?

General MCNABB. No, sir, it wouldn't at all. We were really constrained going into Afghanistan by the throughput of the airfields in Afghanistan. It is not a matter of number of airplanes that we have. It is how many you can get in through and have and flow through there.

So one thing that we have done is by using those multimodal operations, where we bring stuff by surface as far forward as possible and then maximizing C-17s going back and forth, or C-5s, that has really allowed us to optimize those slot times that we have in Afghanistan. So, we will continue to work very hard at that.

But, no, this would in no way restrict—

Senator REED. Right. But the commander on the—one of the reasons you have been able to do this successfully is most of what you are moving is into the ports in Pakistan and then up through Pakistan. If that option is gone and you have to deliver by air, now you

either shift to K2, I guess, in Uzbekistan or you just have to be much more efficient in those airfields.

General MCNABB. Sir, two things that we are doing there. One, we opened up the operations in the north. We call it the northern distribution network. So we are bringing a lot of the resupply up through the north.

In fact, to the tune of about 35 percent comes from the north, about 30 percent comes through the Pakistan ground, and about 35 percent by air. Everything that is high value, everything that is lethal, everything that is special, we bring in by air now.

What we would have to do is absorb that and bring more of that stuff either through the north, or we would have to bring in by air. Air is our ultimate ace-in-the-hole. Ideally, we will have other ways of getting that in, and right now, we have worked very hard to make sure we have good options.

Senator REED. Right. Let me ask another question. I will direct it to you, Director Fox, but it might be General Johns's area.

So who gets the savings if we go ahead and retire these aircraft?

Ms. FOX. That would probably be a point of issue between the Office of the Secretary of Defense (OSD) and the Air Force. But I am sure the Air Force thinks the Air Force gets the savings. We have to see how all of the budgets and the requirements come out this year. He won't like my answer.

Senator REED. Okay, General Johns? I think your answer is fine.

General JOHNS. What we have done by assuming the savings and the retirements, as we submitted our fiscal request through OSD, was to actually use those resources to support other air forces in the effort. So they have already been spread, and then we will have that discussion with—

Senator REED. So put it another way, you have already spent the savings, conceptually, on Air Force programs?

General JOHNS. Yes, sir. I wouldn't say we spent the savings. We basically—yes, sir, the simple term is, we said if we don't have to preserve these aircraft, we would use them against other obligations.

Senator REED. Okay. I think—and again, probably best to follow up with a question to give us an idea of how you are distributing the savings, and we will follow up with a question.

General JOHNS. Yes, sir. It wasn't like there was the savings there. It was more as we built the POM, we reduced the requirement. So it was used across the Air Force.

Senator REED. So you lowered the amount of request going forward?

General JOHNS. Yes, sir. Yes, sir.

Senator REED. But we will, I think, follow up with a question, try to get an idea of what you are doing with those.

General JOHNS. Yes, sir. But again, it was pretty much spread across. So it is hard to track and say, "This dollar went here, and this dollar went there."

Senator REED. Okay. Thank you.

Let me ask another—General McNabb or General Johns, et cetera, particularly in your testimony, General McNabb, you said the C-17s will continue to meet TRANSCOM future requirements

through currently funded purchases, upgrade programs, and fleet rotation.

All of you in this study assumed no additional acquisition of C-17 aircraft. Is that correct?

General McNABB. Sir, that is true.

Senator REED. That is true.

General McNABB. Just make sure that we upgrade—continue to upgrade the older models so that we have a common model of C-17s across the board with common capabilities.

Senator REED. Now just another question, and I will—as I said, we will have a second round. So let me at this point recognize Senator Wicker, and then I will see you again.

Senator Wicker?

Senator WICKER. I have been absent from the room, and I haven't heard all of the questions. If it is all right, I think I will let Senator Ayotte go before me, if that is all right, Mr. Chairman?

Senator REED. Senator Ayotte?

Senator AYOTTE. Thank you, Mr. Chairman.

Thank you so much, Senator Wicker.

I just want to make sure that we are clear on the results of the 2010 study. As I understand it, according to Director Fox's written testimony—and I would like to make sure that we have the concurrence of the two generals that are here—that if we have reduced the airlift capacity to 32.7 million tons per day, as the conclusion was of the study, that would still allow us the capacity, based on the results of the study, to do two overlapping large-scale land campaigns occurring in different theaters, three nearly simultaneous Homeland defense consequence management events, and ongoing, as we have right now, steady-state operations, including Operation Enduring Freedom (OEF) in Afghanistan.

General McNabb and General Johns, do you concur with that analysis in terms of what capacity we would be left with if we reduce the number to, say, a 301 or in that range, whatever your recommendation would be?

General McNABB. Yes, ma'am. We can do that. Basically, that 32.7 was that two major land campaigns, separate theaters, just as you mentioned, and our ability to still handle the steady-state requirement.

Now, if you talk about an Afghanistan and Iraq along with that, then now you are starting to go a little bit beyond what they were talking about. We are talking in the neighborhood—we actually did a scenario where we did a steady state that was very similar to Afghanistan, along with one land campaign, and that was one of the other scenarios that we ran to make sure that we could do a much larger steady state, like we have today, along with another scenario.

So based on how you just said that, if you, depending on how you would define Iraq and Afghanistan, what level we are at when you brought that up, that is the one where I would go it would depend how large we are still in Iraq and Afghanistan and then to be able to go do two theater wars.

Senator AYOTTE. General, I just wanted to follow up. The situation right now, for example, let us assume we stay where we are, current operation in Afghanistan, which would be peak right now,

given the number of troops we have there with the surge before any of them are withdrawn, and we also were to be in a situation where we decided to leave additional troops, because the Iraqis have asked us to, in Iraq because we have obviously seen some flare-ups there because of the influence of others that want to undermine our success.

If we change the capacity, would we be able to handle that type of situation? Because I think that is, obviously, a very real scenario we could face in the coming year.

General MCNABB. Yes. I think what we would do is we would be taking a very hard look at—because a lot of it is the number of forces you have engaged there. So it wouldn't be—lift probably wouldn't be the thing that you would start looking at. It would be all the intelligence, surveillance, and reconnaissance assets, all the other assets that you would have to bring all that to bear.

Senator AYOTTE. Right.

General MCNABB. So lift, I would say that from the standpoint we will move what needs to be moved where it needs to be moved. It is just that overall capacity, if you mirror that with two very large land campaigns along with that, I would say we would have to prioritize within that.

Senator AYOTTE. Okay.

General MCNABB. That is beyond, I think, what the MCRS looked at. I don't know, Ms. Fox, how you see that. I saw that as the one option that we looked at for the scenario in Africa. Go ahead.

Ms. FOX. So the least stressful case that we looked at was an Operation Iraqi Freedom (OIF), Iraq-like sustained campaign, plus a major ground war, land war campaign concurrently. So, yes, I agree with General McNabb.

But the most stressing case was two large land campaigns, separate theaters. The steady state was more—was not the OIF peak, but it was consistent with OEF at a lower level, the Afghanistan.

Senator AYOTTE. Really, the point would be that this is a very conservative estimate. If we are in a position where we are engaged in two major, large-scale land campaigns and obviously a situation like we are sustaining right now in OEF in Afghanistan, that is a very significant engagement level for our country. I am not saying that we shouldn't be prepared to be there. I think our readiness should always be well beyond where we are.

But as I understand your analyses, it is very conservative in terms of what you have provided for testimony if we were to reduce our capacity to 301. Is that right?

Ms. FOX. If I could add, don't forget three additional concurrent Homeland events at the same time. So, yes, I would say it is very conservative.

Senator AYOTTE. So anyone that would be concerned about our readiness posture should be satisfied if we were to reduce the fleet to 301?

General JOHNS. Yes, ma'am. Again, from Air Mobility and the Air Force perspective, we want to deliver on the requirements that come from TRANSCOM through the analyses of CAPE. So, we will look at that to ensure across the spectrum to do the two MCOs, as you talk about.

But as we look at Iraq and Afghanistan today, they are at a surge period, per se, and probably a little bit above what we consider steady state.

Senator AYOTTE. Okay. Thank you.

General MCNABB. Senator, could I mention one other thing, is the other part to that is when we think about doing two major theater land campaigns, you really are going to mobilize the complete force, mobilize all our total force, and activate our CRAF. So this is you are bringing everything to the game.

As I mentioned last year, during the very peak of the surge, our highest requirement was in the 16 MTM, about half of what we would surge to. But it gives you an idea of what all we would then bring to bear, and that is how—every once in a while that gets lost in it, is that you are taking everything and everything we have in reserve all goes.

Senator AYOTTE. So, General, just to use your example, you said March 23 was the peak, and that is only half, in terms of Afghanistan and the surge, of what you have been doing. So that was really only half the capacity of what we would still have as a capacity if we reduce to 301?

General MCNABB. That is right. Now we did not fully mobilize, but we did mobilize, do a partial mobilization of C-17 and C-5 crews to be able to handle that increase.

Senator AYOTTE. Okay. General Johns?

General JOHNS. Yes, ma'am. Yes, Senator.

We called March 2011 "March Madness" as we looked at it from the mobility force. We had Japan going on. We had the support of Libya. We had a presidential banner mission. We had Afghanistan and Iraq working.

In my history, that was the busiest period. So, again, March Madness of a different silk.

In looking at that, around the 23rd of March to about the 29th is where we had our heaviest commitment of our gray tails, of our mobility fleet. It was 127 C-17s, 33 C-5s, and 208 tankers across the globe. So I have never seen such a heavy demand, but still that is less than half of what we could deliver.

Senator AYOTTE. Great. I really appreciate your putting it in that perspective. When you think about that much activity, and that is only half of the capacity that we would still be leaving here if we reduce the fleet to 301 or near that level.

I also wanted to follow up, some who have been critical in the past of reducing the strategic Air Force airlift capacity to the requirements that you are recommending have cited the fact that we lease commercial aircraft as an argument against reducing or eliminating the aircraft floor. Yet I am also told by the Air Force that we sometimes lease aircraft for two reasons.

First, in order to meet short-term surges in airlift demand, and second, sometimes it is more cost effective to lease commercial assets for a brief period rather than purchasing and having to continually maintain an asset.

General McNabb, can you address this issue to those that might raise this issue in terms of concerns about leasing and our capacity?

General MCNABB. Certainly, Senator.

I basically run an enterprise, and I have three parts to that enterprise. I have the active duty fleet. I have the Guard and Reserve total force augmentation of that as well. So I have the total force to augment that, and third, I have our commercial partners.

All three of them are integral parts, and my job is to match the capability against the requirement. What goes into that is, is it a military-type mission like air drop or going into some high-threat fields where I have to use a military airplane? Second, it goes into cost. How much will it cost me if I end up taking MRAPs or M-ATVs?

In fact, in general, if I can use our commercial partners, if I can use them, it is normally cheaper than if I use military airplanes. That does the two things you mentioned. It preserves their longevity. It preserves those airframes for when I need them later. Saves you in the long term.

But more importantly, if I have an immediate requirement, then I have that extra capacity to go. We are always mixing and matching. As General Johns mentioned, March Madness, we were pivoting the enterprise to take care of Iraq and Afghanistan, pivoting it to Libya, pivoting it to Japan, pivoting it to South America for the movement of the President. All of those things are going, and our ability is to swing that very rapidly.

A lot of questions came up, and Mr. Chairman, you brought up the AN-124s. The 124s actually are a subcontractor to one of our CRAF members, in this case Atlas Air. They actually could move MRAPs cheaper on that than we could on any other airplane, cheaper than C-17s, cheaper than C-5s. It also then freed up C-17s to be able to go do the additional air drop that we do in theater.

Those are the kinds of things that I will be looking at. Again, if I am helping our commercial partners, our CRAF, they obligate their fleet to us in wartime for peacetime business. So when I give them business, it is good for everybody. It is good for them to operate in our system. It brings jobs, and it is also cheaper for the taxpayers to do it that way.

Again, it preserves my military capability for where I need it, and it normally has to do with threat and then also availability. If I were running short of airplanes, then, in fact, I would say, "well, okay, I am out of C-17s. I am going to have to use one of these others."

I haven't had to do that in the last couple of years. It has been because of cost where I have used them.

Senator AYOTTE. Thank you, General.

My time is expired. Appreciate it. Thank you.

Senator REED. Senator Wicker, please?

Senator WICKER. Thank you very much.

This has been a very informative hearing. Let me just see if I can nail a few things down.

General McNabb, would a programmed fleet of 301 strategic airlifters provide enough capacity to meet wartime and peacetime requirements?

General MCNABB. Yes, sir.

Senator WICKER. General Johns, do you agree?

General JOHNS. Yes, Senator.

Senator WICKER. Gentlemen, would there be any increased risk at all in getting your jobs done by moving to this reduced number?

General McNABB. Senator, it would not. In fact, from my standpoint, those facilities, those air crews, the maintainers, the aerial porters, making sure that I have them targeted on our best assets is smart business and actually helps me because I better manage a right-sized fleet.

Senator WICKER. The risk would be reduced, in your view?

General McNABB. Sir, I hate to have folks working on stuff that I don't need. Manpower is absolutely critical.

Again, as I think about this, running it like a business, those facilities and the people are the most critical factor in all of this. The \$1.2 billion is a savings, but it is really taking full advantage of our great people.

Senator WICKER. General Johns, do you concur?

General JOHNS. Senator, I do concur. I think the excess above 301 is over capacity. I may not use the term "risk." I may say it is extra workload on our airmen to keep that capability when we don't need to utilize it.

Senator WICKER. So it is more than getting rid of a luxury. It is actually getting rid of something that stands in the way of doing our best job?

General JOHNS. Yes, Senator.

Senator WICKER. General Johns, why does the number change? During previous testimony, we have been told 316 was the right number. Why does that change?

General JOHNS. Sir, I think when we were here last time—or before me. In fact, when General McNabb was the AMC commander, we didn't have the results of MCRS-16. So, that number really was not definitized until we saw the results of MCRS-16. Once we had that, we now had the analyses to articulate a position based on facts.

Senator WICKER. General McNabb, how long have you seen this coming? I have been meeting with you for a long time.

General McNABB. For the 300?

Senator WICKER. Yes.

General McNABB. The fact that about 300 was what we were going to need, and as we went above that—

Senator WICKER. Indeed. Moving from the larger number to the 300, how long have you really honestly seen this coming?

General McNABB. I think ever since MCRS-16 was complete. Because what changed really was we, from MCRS—

Senator WICKER. That was when?

General McNABB. I am sorry? Oh, 2010. It was 2010.

Senator WICKER. So that was just last year, okay.

General McNABB. So, but where we, at MCRS-05, we had a range, 292 to 383. The administration came in, and we said that we needed 292 fully modernized aircraft. That is C-17 and C-5M.

What changed was the Nunn-McCurdy breach on the C-5 Reliability Enhancement and Re-engining Program. Basically, we looked at that, and DOD got together and said, "Okay, what is the best way to address this?"

When we did this, they said, "well, if we don't do all of the C-5s because of cost, if it is not cost effective to do all of them, let

us use—the JROC came up with a requirement, 33.9, and said here is how much we want to take all the alternatives and then cost the different ways of getting at that.” That is where the 316 came from.

But we always acknowledged that MCRS-16 was going to relook at all of the things that you mentioned, like steady-state requirements, how would we do intra-theater, all the things that you mentioned earlier in your opening statement, sir. We did that.

We always knew that once we had the results of MCRS-16, we would come back and take a look at that and see is 316 the right number, or would it be less? It ended up being less, 301.

Senator WICKER. We are looking at very serious budget constraints. General McNabb, based on your illustrious career and your vast experience, is this more or less an isolated savings, or do you think if we dig deeply we can find this Air Force-wide?

Would you—and I ask that question in the context of the desire of many people in the public arena saying that there is a real savings that can be made in the defense budget.

General MCNABB. Yes, sir. I think that is what Secretary Gates, now Secretary Panetta, are really after on efficiencies. “Go take a look at every part of what you do.”

We happen to have the opportunity to look at this as an enterprise because it is all parts. It also includes our ability to use land and air, use commercial versus military, all of those things. Go back and say “every nickel we can save, we need to save,” and look at every part that you do.

I think that that is what—Ms. Fox can actually talk to this for the whole DOD. But from my standpoint, that is what I was tasked to do by the Secretary. I think all the COCOMs and the Services were asked to do the same thing. Go take a look at every part of your operation and say “are there places where we can save money prudently, smartly?” Still get the capability that we need but make sure that we are not wasting any money.

Given the demands, as you mentioned and the chairman mentioned, there are a lot of things out there that are really wearing out that you need to spend dollars on. We want to make sure we are putting the dollars against the right thing.

We have had great support because of what we have done the last 10 years in the mobility world. Congress has been tremendously supportive, as has the administration. We have been able to do lessons learned. We have been able to try to figure out how to use C-17s and C-5s in commercial and different ways.

What that has done is allowed us to look into some of these things and come up with alternative ways of using airplanes, different concept of operations that would allow us to maybe say, hey, we can actually do this better, save some money, and actually reduce risk.

This is one of those departments where I think when the 316 number came, we always said we will use MCRS-16 to make sure that we refine that number, take full advantage of the C-17, the full 222—at that time 223 C-17s being in the inventory. Let us see how that plays out. Let us see how the C-5M does. Let us make sure that we model that.

Let us see how this whole thing comes together with how we do the lessons learned from doing 10 years of surge, and let us put that together. That is the results that you have.

I am very comfortable with the results. TRANSCOM and CAPE co-led that and did that together, and I am very comfortable with the results on that. I think that it captured Services, COCOMs, all the agencies, and made sure that we had all the parts to the puzzle and everybody had a voice. I think, in general, I have not had a lot of pushback on the MCRS results within DOD at all, at least from my standpoint.

So we are basically saying we have done that. Now we come back and tell you here is what the answer that we get, this is what the analysis shows, and I am very comfortable with saying that you can come down to the 300 strategic airlifters.

Senator WICKER. Finally, who can tell me what will become of the 32 C-5A aircraft?

General JOHNS. Sir, the C-5As will go down to AMARC and put into our storage there.

Senator WICKER. Is that the most efficient thing we can do with them?

General JOHNS. Senator, as opposed to selling them or doing something else, sir, I think that preserves us the capability of putting them into storage there down at Arizona.

Senator WICKER. All right.

General JOHNS. Then potentially using some of those to sustain the other aircraft down the road. We will have to look at the discussion about do you take some of the parts from those to sustain the fleet to reduce operating costs in the future? So there is the tradeoff there we look.

Senator WICKER. Thank you very much.

Thank you, Mr. Chairman.

Senator REED. Thanks, Senator Wicker.

Let me initiate a second round. I have a few questions.

One, just for the record to clarify Senator Wicker's question, Director Fox, this is the opinion not just of the Department of the Air Force and TRANSCOM. This is DOD, the Secretary, presumably as General McNabb said, all the CINCs, commanders, have been able to weigh in. So, this is the conclusion of DOD, all the way up to the Secretary, about the right number?

Ms. FOX. That is correct, sir. This has been vetted by everyone in DOD, and it does have the support of the Secretary.

Senator REED. Thank you very much.

General McNabb, particularly in a surge, you have to call on the civilian fleet. What number of millions of tons per day or miles per tons per day would they have to contribute in a surge?

Because, i.e., that 32.7 million of tons per day is just what your organic aircraft are delivering. There is another number, and that number is what? Do you know?

General MCNABB. Yes, sir. I will get that for the record for you, but it is about 20 MTM per day.

[The information referred to follows:]

Mobility Capabilities Requirements Study 2016 (MCRS-16) reported a peak demand for 149 wide-bodied cargo aircraft and 157 wide-bodied passenger aircraft. MCRS-16 used these commercial aircraft in the Civil Reserve Air Fleet (CRAF) to

deliver approximately 43 percent of the cargo (bulk, containerized, and palletized cargo) and approximately 93 percent of our passengers/troops. The 149 wide-bodied cargo aircraft in CRAF can generate about 25.4 million ton-miles per day (MTM/D) in addition to the 32.7 MTM/D provided by military organic lift to move oversize and outside cargo.

Senator REED. Right.

General MCNABB. We plan on doing 37 percent of our cargo movement done by our CRAF in those two theaters that we were talking about. So 37 percent. So over a third will be done on the commercial, and 93 percent of our passengers.

So when you say how have you sized your fleet, the gray tails—the C-17s, C-5s—are tailored toward rolling vehicles and military-type cargo because that is what they are optimized for. Where all your bulk cargo, your pallets and all that, would be carried on commercial.

The one thing that makes it a little different that you have to throw in there is that sometimes the commercial can't go all the way forward because of the threat and then we have to transload. We have that built in there. But that is also where the one tanker, if it is not being used for tanking, would make a very big difference because it has the defensive systems to be able to do that.

Senator REED. You obviously have less control over the composition in terms of airframes of the civilian fleet. Are there any concerns you have about commercial companies buying different aircraft that might support passengers, but not any kind of bulk or pallets or, i.e., has that been factored in?

General MCNABB. Yes, sir. We work very closely with the commercial industry, and we have a mix of passenger and cargo. We make sure that we meet both of those.

Just for clarification, you brought up the AN-124s, we don't plan on using any of that during those surges. This will be totally our U.S. commercial fleet, and they do a great job. The good part there is that they already are incentivized to modernize. They are already incentivized to take care of all the other things to get better, more efficient, fuel efficient, all of those things, because they can't survive in the commercial market if they don't do those things already.

Senator REED. Let me ask you another question, which is this—I think it is looking at the worst possible case, but that, in some cases, is what we get paid for. What about attrition of aircraft, either through normal wear and tear or through combat action? Has that been built into the model?

General MCNABB. Yes, sir. What I would say is that for the big airplanes, we have lost one C-17 and one C-5 in the last 8 to 10 years.

I would say that one of the things that General Johns—and I will ask General Johns to jump in here. Because primarily the Air Force, then—one of the reasons they talk about 301—and I think it comes up was at 299 or 301—a lot of that is to make sure that he has the right-sized backup aircraft inventory (BAI), and he has that factored in.

But again, for the large airplanes, because we don't lose very many, it is not the same as what we do in fighters and others, where that you are going to lose some airplanes.

So, I would say we do it a little differently. I think we capture it. The BAI helps us do that. By the time that we really have to get at, usually we are into another platform, and we can adjust at that time.

Senator REED. Let me just—a follow-up question before I recognize General Johns. Is that the point you raise about—right now, in the steady-state environment, the ability, the willingness of commercial entities to fly is a lot more—is a lot, I guess, better than the situation where they are afraid or the insurance companies are afraid they might get shot at.

General MCNABB. Right.

Senator REED. So, have you effectively factored in a situation, and particularly in the surge, where, for many reasons, just the insurance companies simply saying, “you ain’t flying,” that you would not be able to meet your—

General MCNABB. Yes, sir. A couple things that you do there. One, we work with the Federal Aviation Administration to guarantee insurability, wartime insurance. So we already do that. So, whenever you have operations into Afghanistan or Iraq, that is one of the things that I will sign off and say, we recommend that we allow that.

But to your point, we also are not going to put any of our airplanes into harm’s way unless they have the defensive systems and the training and all the things that go with that. So what we will do then is we will transload. We will take it as far forward as possible, and then we will transload.

That is where these multi-modal ops, sometimes it is surface-to-air, sometimes it is commercial air-to-military air. We do that in Manas now. All of our passengers going into Afghanistan will go in on a C-17 and C-130. But we take them commercially to Manas and then transload them onto an airplane where they have the defensive systems. They have night-vision goggles. They have the tactics, techniques, and procedures to get our folks in and out in the safest possible way.

Senator REED. General Johns, your comments on that? I have a few other questions for you.

General JOHNS. Yes, Mr. Chairman.

With the large aircraft, because we haven’t experienced the losses, we don’t build in attrition reserve, as we do with the tactical aircraft. So our model basically is how many aircraft do you need to accomplish your mission? Then we have a backup inventory to allow us to have enough aircraft available and still have aircraft in the depot.

So we have the two modeled. We don’t add the third element, which is attrition reserve. It hasn’t been warranted, and that would cause us to have more capacity than we need.

Senator REED. Let me ask you a follow-up again on Senator Wicker’s very good question about what happens with the C-5As. Have you done—and this is, again, the worst-case, and again, we have to ask these questions—an analysis of how much it would cost you to take a C-5A out of the desert and put it back in the air, if all this very thoughtful analysis proves to be wrong? Because that happens sometimes.

Is that part of the—would all the savings evaporate in two or three retrofits and recommitments?

General JOHNS. Mr. Chairman, I would like to take the specific numbers for the record, if I may?

Senator REED. Absolutely, sir.

[The information referred to follows:]

The cost to return a C-5A to flying status after it has been inducted into the Aerospace Maintenance and Regeneration Group would depend on the type of storage the aircraft is placed into and the length of time it has been in storage. Type 1000 storage, which is the most costly, would maintain the retired aircraft in anticipation of future requirements and ensure parts were maintained in a serviceable manner. Type 1000 storage would generate a reoccurring cost of approximately \$50,000 every 4 years per aircraft with an actual regeneration cost, the cost to return an aircraft to the fleet, estimated at \$300,000. Based on the length of time the aircraft are in storage, there could be additional costs such as implementing time compliant technical orders for safety and periodic depot maintenance. Should all of these additional actions be required we estimate the cost would be \$35 million per aircraft.

General JOHNS. But we look at putting them in storage and keeping at different levels of readiness and then having to take them out and make sure they are current for the wartime employment or the safety employment. So let me take the specific numbers.

But it is still very low in comparison to keeping that many aircraft, and the likelihood of needing them also is considered.

Senator REED. One other follow-up, and that is part of the savings going forward that you are projecting are a function of Congress changing the law. Just as bookkeeping or policy-wise, how often do you do that, Director Fox, in terms of the defense budget? Like, these guys will get it. We have a lot of confidence in them.

Ms. FOX. Sir, I would like to tell you that we only do that when we have the best analyses available to support the decision.

Senator REED. That is a very good answer, but just it raises some policy issues with us.

Ms. FOX. Yes, sir, I understand.

Senator REED. But I just wanted to flag it.

Ms. FOX. Yes, sir.

Senator REED. I don't think it is a major issue at the moment.

Ms. FOX. It is a very fair question, sir.

Senator REED. My time expired. I just must say I think this has been a very useful hearing. I am going to recognize Senator Wicker for any questions, and Senator Ayotte?

Senator WICKER. I will pass, and I understand that Senate Ayotte has some.

Senator REED. Senator Ayotte.

Senator AYOTTE. I thank you very much, Mr. Chairman.

I have one brief follow-up. Director Fox, is it fair to say that Congress has added, by earmarks, C-17s over and above what DOD has requested, particularly in 2007 and 2008?

Ms. FOX. Yes, Senator, it is.

Senator AYOTTE. Is that one of the reasons why, in part, we find ourselves here and examining this important issue of what is the right size that we have?

Ms. FOX. I do believe that the number of C-17s that we are ending up with, above what we had planned, is a factor. As we look

at what we would do to get to the number that the study says we need, it obviously points you in a particular place. So, yes.

Senator AYOTTE. Thank you. Obviously, I hope going forward that we rely on your recommendations, as opposed to—it is one of the reasons that when I ran this past fall, I decided to swear off earmarks. So, I appreciate what can be the unintended consequences of some of our perhaps well-intentioned actions on behalf of our constituents.

So, thank you all.

Senator REED. Senator Wicker has a second round.

Senator WICKER. Let me just follow up on that. If there were earmarks that increased the number of these aircraft, they were based on the Air Force's studied opinion at the time, that those were appropriate numbers. Is that not correct?

Because we have testimony that the requirement changed last year after MCRS-16.

Ms. FOX. Sir, let me get back to you with the record of exactly what we asked for. But it is my understanding the total number of aircraft that you need, yes, sir, that has changed. It has come down.

[The information referred to follows:]

Over the last decade, the Department of Defense (DOD) has consistently maintained that an organic strategic airlift fleet of about 300 aircraft is required to support the strategy with acceptable risk. Changes to the strategic environment, as well as adjustments in the fleet mix, which include changes to the number of modernized C-5s, have contributed to variations in the total number of aircraft required. Prior to September 11, the Mobility Requirements Study concluded that DOD needed between 252 to 302 aircraft depending on the strategic assumptions and the mix of C-17s, C-5s, and modernized C-5s. In 2005, the Mobility Capability Study concluded that a fleet of 292 aircraft, comprised of 180 C-17s and 112 fully modernized C-5s, would meet DOD's requirements. In 2008, when DOD reduced the C-5 Reliability Enhancement and Re-engining Program from 112 to 52 aircraft, the required number of aircraft increased slightly. During this timeframe, DOD briefed Congress that a new mobility study was underway to update earlier findings based on lessons learned from ongoing operations and the evolving strategic environment. Subsequently Mobility Capabilities Requirements Study assessed 3 different strategic cases and determined that the airlift capacity needed to support the strategy ranged from 29.1 to 32.7 million ton-miles per day which can be met with a fleet of 264-300 aircraft.

Senator WICKER. It just changed last year?

Ms. FOX. It is a small change, frankly, but it is a change. You are right. It went up, actually, a little bit from what we had thought before. But Congress wanted it to be 316 for a safety margin, as General McNabb has explained, until we finished the MCRS study.

The mix within that total number is, I think, perhaps the question with regard to C-17s, and Congress has given us more C-17s than we have requested in the past. But I don't have with me the exact numbers we requested and what we received. But that is the history.

Senator WICKER. Thank you.

Senator REED. My only comment is, and I think it is trying to encapsulate what Senator Ayotte said, had we not added additional C-17s, either at the request of the Air Force or the request of Congress, then we would not be able to retire these C-5As. So any way you look at it, the debate today about retiring C-5As is a function, at least in some respect, of the additional C-17s.

Now one of the issues, and I think this goes to one of the points that Senator Ayotte made and one that I suggest, is that your analysis assumes that we will not add any additional C-17s, that the Air Force is not going to come up and recommend that we build more C-17s because, unfortunately, this study has reduced the number of aircraft and we need more aircraft. Is that fair to say, General Johns?

General JOHNS. Mr. Chairman, the Air Force is very content with the 222 C-17s. It will not be asking for additional ones.

Senator REED. The swing, if you will, if—again, I think this analysis is very thoughtful. But if there are conditions, unpredictable at the moment, the swing comes out of civilian fleet. It comes out of, as you have suggested, you will have at least the capacity of reactivating C-5As which have not flown their full life of service. Those options, I presume, would be advanced to us prior to any other options?

Ms. FOX. Yes, sir, absolutely. We have done a lot of cost analyses of those various options. So, again, my testimony today is about the total number.

Senator REED. Right.

Ms. FOX. Then the mix within is something that you also look at for cost.

Senator REED. General Johns?

General JOHNS. Mr. Chairman, as we talked about how do you take them out of the depot if they are there? What you have to do is you have to unwrap them, and you may have to put them through a depot itself. You may have to do some modernization.

But what you are hugely saving is the annual flying hour program of not having to fly them. So, we have to look at then do we put them all in that type of storage, or do we allow some to be used to part out and support the other aircraft?

Senator REED. Sure.

General JOHNS. So there is a mix there between the type of storage we use. That is the biggest difference.

Senator REED. If there are no additional questions, again, I think, as we reflect upon these issues, we might have written questions, which we will submit to you. I think there has been some indications that you would like to provide some written information.

We would accept that, and we would like to let us give ourselves a week, until next Wednesday, for written questions submitted to the panel. We would ask you to respond as quickly as you could to any written request made by the committee.

Again, I have to thank Senator Ayotte because she has raised this issue, and she has done it with great insight into an important program. I think this hearing has been very useful to me, and I thank her for urging us to do it.

Senator AYOTTE. I want to thank the chairman and the ranking member, Senator Wicker, again because I raised the issue, but this has provided much more helpful information to be able to bring this to the floor of what the right number is and also really support for such an important issue.

So I think this hearing was very helpful. I want to thank both of you for accommodating my having it. Rather than having that

vote in committee, I think this is really a better place to be in terms of how much information we have.

Thank you.

Senator REED. Thank you.

If there are no further questions, the hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

AIRCRAFT SERVICE LIVES

1. Senator REED. General Johns, what is the average number of flight hours on the C-5A aircraft that you intend to retire?

General JOHNS. The 22 C-5As projected for retirements have an average of 21,237 flight hours

2. Senator REED. General Johns, how does this average compare to what we believe is the total service life of the C-5A aircraft?

General JOHNS. The expected service life of the C-5A is 47,270 flight hours. At the current flying hour rate, the fleet is not projected to reach or exceed the total service life before 2040.

3. Senator REED. General Johns, how about comparable numbers for the C-5B fleet?

General JOHNS. The C-5B fleet has an average of 19,157 flight hours per aircraft with a service life expectancy of 52,500 hours.

4. Senator REED. General Johns, what is the average number of hours of service life expended by the C-17 fleet?

General JOHNS. Average actual airframe hours for the entire C-17 fleet are 9,650.

5. Senator REED. General Johns, how does this average compare to the total expected service life of the C-17 aircraft?

General JOHNS. Designed service life of the C-17 is 30,000 hours before we examine any service life extensions.

6. Senator REED. General Johns, if we keep burning hours on the C-17 at the current rate, when would we need to begin a C-17 replacement program?

General JOHNS. The C-17 fleet averages more than the planned 1,000 actual flight hours per year, but the life-limiting effects "felt" by the fleet are within limits. The C-17 fleet will meet its service life of 30 years, and based on historic usage severity, should be available much longer. Targeted fleet service life extension programs (SLEP) can be utilized to refresh aging aircraft drivers (wing upper cover, landing gear) as appropriate to enable continued safe/reliable/economic C-17 operations.

*Supporting Information:*

The C-17 was delivered with an engineered service life of 30,000 actual flight hours (AFH), programmed to fly 1,000 AFH per year for 30 years. Recent history shows higher usage.

The true measure of an airframe's "remaining life" is total Equivalent Flight Hours (EFH), based on aircraft usage severity; in effect, what the aircraft "feels" it is flying. Usage severity is specific to each tail number by mission (e.g., low-level airdrop is more "severe" than high-altitude, straight/level).

While the entire aircraft accumulates AFH at the same rate, individual "regions" of an aircraft accumulate EFH at different rates, depending on each region's loading environment. For all but one aircraft region, the average accumulated annual EFH is under the designed 1,000 EFH annual standard. Wing Upper Cover (Control Point W2) is the exception; and it is only the exception at Altus Air Force Base (AFB), due to the harsh training environment which, in effect, "ages" the upper cover faster.

HQ Air Mobility Command (AMC) and the C-17 SPO coordinate to monitor these operational effects at Altus, and rotate aircraft on a schedule through Altus. The System Program Manager and Boeing confirmed that W2 EFH accumulation slows down and starts to recover after aircraft leave Altus, as AFH begins to outpace EFH again.

As C-17 aircraft sections approach life limits, SLEP can be utilized to refresh these sections in order to breathe new life into the fleet. For instance, a W2 SLEP, when applicable, could be applied to essentially reduce the aircraft "age" by reducing the leading aircraft service life driver. Currently, the only proposed C-17 SLEP relates to landing gear, which has a life limit of 19,000 landings (although it was tested to 4 lifetimes); the fleet's high time aircraft currently has over 17,000 landings (~3 years of service life left at current rate); SLEP will provide a solution for these "high landings" fleet drivers, enabling continued aircraft availability. The proposed SLEP will analyze landing gear available life, determine components requiring modification to attain 38,000 landings, and implement required modifications or impose life limits on components.

#### AIRCRAFT AVAILABILITY

7. Senator REED. General Johns, normal Air Force planning for force structure includes additional aircraft for attrition reserve, so-called back-up inventory aircraft that protect against aircraft being unavailable during periods of depot maintenance, et cetera, and aircraft for training purposes. To what extent have your assessment of the adequacy of a force of 301 aircraft taken these factors into account?

General JOHNS. AMC plans for Backup Aircraft Inventory (BAI) to account for aircraft that are in depot for maintenance, modifications, etc. Formal training requirements for mobility aircraft are also taken into account when considering the proper fleet size. The assessment that 301 inter-theater airlift aircraft will meet MCRS-16 peak demand takes both BAI and formal training aircraft into account. Unlike tactical aircraft fleets, AMC does not program for attrition reserve aircraft because the historic and forecasted loss rates for mobility aircraft does not justify the additional investment.

8. Senator REED. General Johns, is there any attrition reserve in the 301 number, or back-up aircraft inventory, or provisions for training aircraft? If not, what would you propose to do if we should lose another C-17 or C-5 aircraft in a major mishap?

General JOHNS. AMC plans for BAI to account for aircraft that are in depot for maintenance, modifications, et cetera. Formal training requirements are for mobility aircraft are also taken into account when considering the proper fleet size. The assessment that 301 inter-theater airlift aircraft will meet MCRS-16 peak demand takes both BAI and formal training aircraft into account. Unlike tactical aircraft fleets, AMC does not program for attrition reserve aircraft because the historic and forecasted loss rates for mobility aircraft does not justify the additional investment. Any loss in the C-17 or C-5 fleets would be filled by BAI aircraft.

9. Senator REED. General Johns, C-5B aircraft will be unavailable for nearly a year in the Reliability Enhancement and Re-engining Program (RERP) modification, which continues through 2015. In fiscal year 2013 and fiscal year 2014, you will have 11 C-5B aircraft offline undergoing the modification. If Congress removes the 316 floor, the Air Force plans to complete the action of getting down to 301 aircraft by 2014. What assumptions have you made about the availability of C-5B aircraft that are undergoing the extensive RERP modification, where these aircraft will be unavailable for almost a year at a time?

General JOHNS. AMC has taken into account depot possession of C-5Bs as they continue through the RERP modification. If a fully-mobilized scenario requiring all inter-theater aircraft were to arise in the near-term, steps would be taken to defer aircraft inputs into depot and/or accelerate aircraft through depot lines. The increased depot load for the C-5 RERP modification will not adversely impact current day-to-day operations.

10. Senator REED. General Johns wouldn't the Air Force plans for retirement actually allow capabilities for million ton-miles per day (MTM/D) to fall below the revised requirement for several years in the Future Years Defense Program (FYDP)?

General JOHNS. AMC's plan for 301 inter-theater airlift aircraft steadily improves our MTM/D capability between fiscal year 2012 and fiscal year 2015. As we begin fiscal year 2012, our current inventory of 212 delivered C-17s and 104 C-5s (5 C-5Ms, 45 C-5Bs, 2 C-5Cs, and 52 C-5As) provides approximately 31.0 MTM/D. Continued delivery of C-17s to a total of 222 and the progress of the C-5 RERP modification for 52 aircraft will steadily improve MTM/D capability to 32.1 by end of fiscal year 2012 and above 32.7 by end of fiscal year 2015. This steady improvement in capability is balanced with realistic unit conversion schedules from the C-5A to

the C-17 and avoids expenditures on modifications and depot maintenance on retiring aircraft.

#### IMPLEMENTATION OF REDUCTIONS

11. Senator REED. General Johns, have you decided which C-5A aircraft you want to retire, and which units will be losing aircraft without replacement by C-17s if you have to maintain 316 aircraft?

General JOHNS. The main driver in selecting specific C-5A aircraft for retirement is the programmed depot maintenance (PDM) schedule. We typically choose aircraft coming due a PDM, and we are formulating that list. The remaining aircraft will be redistributed across the remaining C-5A units after the remaining ARC unit for conversion to the C-17 is selected through the Air Force's strategic basing process. All existing inter-theater units will be covered with aircraft.

12. Senator REED. General Johns, which aircraft and which units would be affected if we either eliminate the floor or lower the floor to 301 aircraft?

General JOHNS. The fiscal year 2012 request reduces the C-5A fleet to 27 as the overall inter-theater fleet is reduced to 301 (222 C-17s, 52 C-5Ms, and 27 C-5As). A remaining ARC C-5A to C-17 unit conversion will be announced as we complete the Air Force's strategic basing process. No units will go uncovered as we reduce the inter-theater fleet to 301 aircraft.

13. Senator REED. General Johns, if we eliminate the 316 floor, would the Air Force retire more than the number it takes to get to a total of 301?

General JOHNS. Based on the most stressful MCRS-16 requirement of 32.7 MTM/D, our fiscal year 2012 request is to retire C-5As to achieve an inter-theater fleet of 301 aircraft (222 C-17s, 52 C-5Ms, and 27 C-5As). We will maintain the strategic fleet of 301 aircraft until such time that a new requirement is established and/or a follow-on study is accomplished that points to a reduced inter-theater airlift requirement in the future.

14. Senator REED. General Johns, what would be the effect of immediately implementing these reductions, rather than spacing them out over the FYDP?

General JOHNS. Attempting to immediately implement all proposed C-5A reductions in 1 year would initially exceed the Aerospace Maintenance and Regeneration Group ability to accept the aircraft and would exceed the converting unit's ability to initially train operations and maintenance personnel in the C-17. The proposed C-5A retirement schedule attempts to balance fiscal savings with achievable aircraft acceptance and unit conversion schedules.

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#### QUESTIONS SUBMITTED BY SENATOR ROGER F. WICKER

##### HEAVY-LIFTING CAPABILITY

15. Senator WICKER. General McNabb, how does U.S. Transportation Command (TRANSCOM) engage the private sector to support the lift mission from big and heavy equipment like a mine-resistant ambush protected (MRAP) vehicle to other essentials that are large and bulky?

General McNABB. TRANSCOM starts with the lift requirement as identified by the Geographic Combatant Commander. We examine restrictions such as size, weight and delivery timeline. For heavy equipment such as MRAPs, joint priorities, delivery timelines, and cost effectiveness are all factors in vessel and mode selection. Rapid delivery often requires military organic solutions, deliveries over time may allow engagement of commercial partners, and more cost effective multi-modal solutions. To ensure the best value and meet mission parameters, TRANSCOM acquisitions uses departmental contracting guidelines to engage commercial industry.

16. Senator WICKER. General McNabb, how important is cargo preference to sustaining an adequate sealift capability?

General McNABB. Maintaining U.S.-Flag sealift readiness is a top priority for TRANSCOM. Sealift is the primary means for delivering combat forces and sustainment during major and contingency operations. TRANSCOM's partnership with U.S. commercial sealift industry is a vital component in meeting the Nation's strategic sealift requirements. To date, over 90 percent of all cargo to Afghanistan and Iraq has been moved by sea in U.S.-Flag vessels.

Under cargo preference laws, the Department of Defense (DOD) gains critical access to U.S.-Flag commercial sealift and transportation networks in exchange for our U.S.-Flag maritime industry to have first opportunity to move U.S. Government cargo. This allows the continued viability of the U.S.-Flag fleet and the pool of citizen mariners who man them. U.S. commercial sealift industry depends on preference cargo. Any reductions in available U.S.-Flag sealift will have to be offset in other ways to maintain DOD sealift readiness.

17. Senator WICKER. General McNabb, the Defense Advanced Research Products Agency hopes that its Pelican program will provide heavy-lifting capability from lighter-than-air vehicles for the U.S. military. What role do you see for such aircraft in the future?

General MCNABB. Initial research observations lead me to believe that airships could provide a balance of cargo throughput at lower operating cost and fuel savings. Such operations can potentially blend efficiency and cargo velocity independent of infrastructure. Beyond creating alternative approaches to operations, it also has the potential to improve the effectiveness of the existing transportation system.

We are presently developing understanding of competing technical viewpoints through our participation in multiple Cooperative Research and Development Agreements with industry to analyze different aspects of this technology. To date, our analyses have reinforced the importance of flexible cargo delivery options.

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QUESTIONS SUBMITTED BY SENATOR CLAIRE MCCASKILL

AIR FORCE AIR FLEET

18. Senator MCCASKILL. Director Fox, with the high costs of keeping the C-5As (\$30,167/hour for the C-5A vs. \$13,767/hour for the C-17), how much of an impact would retiring C-5As have on the operation and maintenance budget?

Director FOX. DOD currently has more airlift than it needs, and thus there would be no reason to replace C-5As with C-17s. Furthermore, the 2009 congressionally mandated fleet mix study conducted by the Institute for Defense Analyses (IDA) concluded that it is not cost effective to replace C-5As with C-17s. Their analyses accounted for the full life-cycle costs, and the operational readiness and cargo capacity of both aircraft. That said, retiring C-5As would save DOD approximately \$9 million per aircraft per year in annual flying hour cost.

19. Senator MCCASKILL. Director Fox, if the full fleet of C-5As were retired and the Air Force wished to maintain the same total lift capability as it has now, how many additional C-17s would be required taking into account operational readiness and cargo capacity of both aircraft?

Director FOX. DOD currently has more airlift than it needs, and thus there is no reason to replace the 32 aircraft the Air Force currently plans to retire. Retiring 32 of the 59 C-5As leaves DOD with enough airlift capacity to meet the peak demand of the most stressing set of scenarios examined in the Mobility Capabilities and Requirements Study (MCRS-16). That said, when considering operational readiness and cargo capacity, it would take 22 C-17s to replace the remaining 27 C-5As.

20. Senator MCCASKILL. Director Fox, what would it cost to secure this capability taking into account the lower cost per flight hour rates for the C-17, reduced maintenance costs for the C-17, and reduced manpower costs for the C-17?

Director FOX. Taking into account operational readiness and cargo capacity, it takes 22 C-17s to replace the capability of 27 C-5As at an upfront cost of about \$6 billion in procurement. This could save approximately \$160 million per year in operations. It is worth noting that the 2009 congressionally mandated fleet mix study conducted by the IDA concluded that it is not cost effective to replace C-5As with C-17s. They based their conclusion on analyses of full life-cycle costs, and they accounted for the operational readiness and cargo capacity of both aircraft. Their conclusion was that if DOD needs the capacity, it is more cost effective to maintain some C-5As versus buying additional C-17s.

21. Senator MCCASKILL. Director Fox, can you retire all C-5As and still meet your war-time mobility requirements?

Director FOX. Retiring all the C-5As would result in a fleet capacity capable of meeting the demands of two of the three strategic cases assessed in the MCRS. The demands of the most stressing and least likely strategic case involving two large

overlapping land campaigns would not be met at 100 percent and the associated risk would have to be assessed.

22. Senator MCCASKILL. Director Fox, would the purchase of C-17 to replace the C-5As reduce the requirement to recapitalize the C-130 fleet?

Director FOX. No. While C-17s can support many intra-theater missions, the C-130Js are far more efficient in that role.

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QUESTIONS SUBMITTED BY SENATOR SAXBY CHAMBLISS

CIVIL RESERVE AIR FLEET

23. Senator CHAMBLISS. Director Fox, in your statement you comment: "When not operating at full war-time capability, Guard and Reserve Forces are not mobilized, and Civil Reserve Air Fleet (CRAF) aircraft are not activated. This is why DOD sometimes relies on commercial/foreign source airlift like the Russian-built IL-76 and AN-124 to support current operations. Accommodating a short-term surge with use of commercial assets is more cost-effective than maintaining additional force structure that is not required full time." If that is true, could a limited activation of the CRAF accomplish the same objective?

Director FOX. Generally speaking a limited activation of CRAF would not be able to accomplish the same objective. The IL-76 and AN-124 are typically used to move large cargo, like MRAP vehicles. This type of cargo is ill-suited for most CRAF aircraft, which are normally used to move personnel and bulk cargo. It's important to keep in mind that DOD accesses the Russian-built aircraft by providing peacetime cargo business to DOD's CRAF partners. They in turn determine how best to support the requirement. In the past, the AN-124s were provided via a subcontract to one of our CRAF members.

24. Senator CHAMBLISS. General McNabb and General Johns, section 137 of the National Defense Authorization Act for Fiscal Year 2010 requires the Air Force, before retiring any C-5 aircraft from the active inventory, to provide a report to Congress several items including "an assessment of the costs, benefits, and implications of transferring C-5 aircraft to U.S. flag carriers operating in the CRAF program or to coalition partners in lieu of the retirement of such aircraft." Please explain what, if any, actions the Air Force has taken regarding this assessment.

General McNABB. TRANSCOM does not oppose the transfer of C-5A aircraft to CRAF program carriers or to our coalition partners. Based on current policy however, the C-5A is catalogued on the U.S. Munitions List as a "category C" aircraft. That policy requires the removal or destruction of certain components before transferring ownership. In this case the list of components includes the wing spars, fuselage, and tail assembly making the aircraft inoperable. If the policy were altered to allow the transfer, commercial carriers would then have to determine if refurbishment required to meet Federal Aviation Administration standards were fiscally viable for operations.

The transfer of the C-5A to coalition partners would not fall under the same policy. As with the acquisition of C-17s and other military aircraft, it would be possible for our coalition partners to acquire and operate the C-5A.

General JOHNS. The Air Force delivered the requested report, "Report on Retirements of C-5A Aircraft" to the four congressional defense committees in October, 2010. That report concluded that the benefits of transferring C-5A aircraft to CRAF are limited, primarily because a transfer of these aircraft to the commercial fleet would create an increase in capacity that isn't required, i.e. the excess capacity would merely be traded from one fleet to another. There is also a high cost to transfer the aircraft to commercial carriers due to required demilitarization.

RUSSIAN AND UKRAINIAN AIRCRAFT

25. Senator CHAMBLISS. Director Fox, it has been estimated that between 2005 and 2009, DOD spent \$1.7 billion contracting airlift from the Russians and Ukrainians. Are Russian and Ukrainian aircraft available world-wide or just in limited locations?

Director FOX. DOD provides peacetime cargo business to our CRAF members as an incentive for their voluntary participation in the CRAF program. They in turn leverage the capability of foreign carriers (i.e. Russian and Ukrainian aircraft) to move our peacetime cargo at less cost to the taxpayer than using our organic fleet. Additionally, this helps preserve our fleet for its wartime mission. Finally, DOD

only uses these foreign aircraft where they are accepted, and we do not rely on their capability to meet our wartime surge demand.

26. Senator CHAMBLISS. Director Fox, General McNabb, and General Johns, how does the United States account for the fact that, based on the specific requirement the Russians and Ukrainians are asked to support, they might decline to do so, similar to how some countries where we have troops or assets stationed have denied over-flight rights or denied our request to use those troops or assets for certain purposes?

Director FOX. DOD leverages the capability of Russian and Ukrainian aircraft because it is often less expensive than using our organic fleet and it helps preserve our fleet so that we can meet wartime demands when called upon to do so. We do not rely on the capability of the Russian and Ukrainian aircraft to meet our wartime surge demand.

General MCNABB. Russia continues to be a strong partner in support of Operation Enduring Freedom (OEF), including the recent approval of Polar Overflight. Our transit agreement with the Russians has been instrumental moving passengers into Afghanistan. Approximately 60 percent of troops deploying and redeploying in support of OEF transit over Russia's airspace. Over 1,300 flights have transited Russia ferrying 211,000 soldiers. In the unlikely event Russia or Ukraine change their stance, TRANSCOM would seek to maximize routing through Georgia, Azerbaijan, and Pakistan. The flexibility of the Northern Air Lines of Communication provides TRANSCOM with several options.

The Northern Distribution Network provides strategic surface flexibility, metering cargo between the Pakistan ground routes and European/Russian/Caucasus routes. Loss of Russian access would have a large impact on this northern route system, with 79 percent of northern cargo passing through Russia in July 2011. Additionally, losing Russian access would essentially cut off supply lines from ports in Lithuania, Latvia, and Estonia. The load would be carried by ground lines in Pakistan, Georgia, Azerbaijan, Uzbekistan, Kazakhstan, Turkey, and Kyrgyzstan, but with slightly less volume due to host nation infrastructure limitations. We could also increase the amount we bring in by air, especially through multimodal operations.

General JOHNS. We are fully capable of meeting our national objectives without relying on Russian and Ukrainian assets air mobility assets to meet our national objectives. Studies like the MCRS-16 define requirements we will meet with U.S. military organic lift (like C5s, C-17s, and C-130s) combined with partnerships from carriers in the CRAF. A prerequisite of membership in the CRAF is being a U.S. flagged carrier; no foreign flagged carriers are CRAF partners. Beyond our combatant commander requirements and where contractual law permits, DOD can and does contract for commercial business with foreign flagged carriers. In some cases, such an arrangement results in lower costs to the taxpayer. In other cases, we use foreign contracts to access locations where a U.S.-Flag presence may be politically unwise or diplomatically difficult. U.S. troops or assets stationed in harm's way can always depend on support from U.S-Flag carriers whether they be military or commercial when needed.

#### MOBILITY CAPABILITIES AND REQUIREMENTS STUDY

27. Senator CHAMBLISS. Director Fox, General McNabb, and General Johns, in 2008, the Office of Secretary of Defense (OSD) conducted a Strategic Airlift Review and concluded that the then current program of record was the most cost-effective and there was no need for additional C-17s. The Joint Requirements Oversight Council (JROC) also established a requirement for 33.95 million ton-miles (MTM) organic capability and stated that any reduction in strategic airlift capability would increase risk to unacceptable levels and jeopardize DOD's ability to adequately support the combatant commands (COCOM).

In 2008, OSD also certified the need for 316 strategic airlifters. In 2009, a congressionally directed airlift review conducted by the Institute for Defense Analyses concluded that the current program of record (316 aircraft) met all requirements and that retiring C-5As to buy/operate additional C-17s was not cost effective. Air Force leadership also testified to Congress that 316 strategic airlift aircraft was "the sweet spot."

In 2009, the MCRS established a new 32.7 MTM worst case requirement which was lower than previous studies in recent years. The Air Force's desire to retire 30+ C-5As which could drive the strategic airlift fleet below 300 aircraft is based on this most recent study.

Over the last 3 to 4 years, DOD and the Air Force have changed their positions several times on what the strategic airlift requirement is. How do you compare the results of these studies and which study is most correct?

Director FOX. Over the last decade, DOD has consistently maintained that an organic strategic airlift fleet of about 300 aircraft is required to support the strategy with acceptable risk. The small changes in the numbers of aircraft (i.e., 292 vs. 316 vs. 301), and the required fleet capacity, expressed in MTM/D (i.e., 33.95 vs. 32.7 MTM/D) result from changes in the National Military Strategy (NMS), changes in force structure, and changes in the capabilities of the airlift fleet. The most recent mobility study, MCRS-16 assessed three different strategic cases and determined that the airlift capacity needed to support the strategy ranged from 29.1 to 32.7 MTM/D. This can be met with a fleet of 264 to 300 aircraft. One of the reasons we no longer view 316 aircraft as “the sweet spot” is because that number was based on a greater proportion of the fleet consisting of C-5As. Because the C-17 is more capable than the C-5A and because Congress added 43 C-17s over DOD’s program, DOD doesn’t need to retain as many C-5As to meet its fleet capacity requirements.

General McNABB. The Mobility Capability Study (MCS) of 2005 determined that the 2005 programmed force mix of 180 C-17s and 112 C-5s (all intended to be reliability enhanced and reengineered; RERP-ed) was sufficient to meet organic strategic airlift requirements. The MCS did not establish a specific MTM/D requirement. Subsequent to MCS, as a result of the Nunn-McCurdy breach in the C-5 RERP, the Air Force limited the C-5 RERP program to 52 C-5Bs and continued with plans to acquire 205 C-17s to meet requirements. As part of the Nunn-McCurdy process, the JROC validated an organic strategic airlift requirement of 33.95 MTM/D. The JROC validated this requirement based on the fleet mix used in MCS and pending the results of the MCRS-16. DOD subsequently determined that 316 tails (111 C-5s and 205 C-17s) best met the interim requirement of 33.95 MTM/D of organic capacity.

The MCRS-16, released in 2010, determined a specific organic airlift requirement of 32.7 MTM/D based on updated scenarios approved by the Deputy Secretary of Defense (DEPSECDEF). MCRS-16 examined various C-17/C-5 force mixes able to meet the new 32.7 MTM/D requirement, and determined that a mix totaling about 300 tails fulfills the requirement. Although the MCS fleet mix in the 2005 study was sufficient to meet organic strategic lift requirements, MCRS-16 provided a much more specific and reliable airlift requirement, based on high-fidelity, DEPSECDEF-approved scenarios. Bottom line: I don’t see anything on the horizon that will substantially alter MCRS-16 results.

General JOHNS. Your recount of history is accurate and we know that the current demand signal for 32.7 MTM/D of strategic organic airlift capacity from MCRS-16 can be met with approximately 300 aircraft. Our program of record for 222 C-17s, 52 C-5Ms, and 27 C-5As assures we can address the most demanding validated needs of the Nation with this force structure. All previous DOD-level studies you reference were “correct”; the MCRS-16 is the most “current” and serves as the foundation for a requirements demand signal extending to fiscal year 2016. History has shown a need to update such studies every quadrennial review cycle and we respond to those validated and reviewed changes each time we submit a new Program Objective Memorandum.

28. Senator CHAMBLISS. Director Fox, General McNabb, and General Johns, how do we know that you have it right this time and that we are not incurring unacceptable or unnecessary risks?

Director FOX. Over the last decade, DOD has consistently maintained that an organic strategic airlift fleet of about 300 aircraft is required to support the strategy with acceptable risk. The minor variations in the numbers of aircraft (i.e., 292 vs. 316 vs. 301), and the required fleet capacity, expressed in MTM/D (i.e., 33.95 vs. 32.7 MTM/D) result from changes in the NMS, changes in force structure, and changes in the capabilities of the airlift fleet. The most recent mobility study, MCRS-16, assessed three possible strategic cases and determined that the airlift capacity needed to support the strategy ranged from 29.1 to 32.7 MTM/D. This can be met with a fleet of 264 to 300 aircraft. The high end number of 300 aircraft is very conservative as it represents the fleet required to support two overlapping major campaigns concurrent with three nearly simultaneous Homeland defense consequence management events, plus support to ongoing steady-state operations, to include OEF.

General McNABB. The MCRS-16 is the most comprehensive study done to date. TRANSCOM and OSD led the effort and the study enjoyed the contributions of all the Services, COCOMs, and the Joint Staff. MCRS-16 addressed three demanding cases to integrate overlapping campaign-level warfights with concurrent protection

of the Homeland, support to small scale security postures around the globe, and maintain a preparedness to respond to critical alert requirements. The completeness of the study and the collaboration among all key participants gives us great confidence that we are not incurring unacceptable or unnecessary risks.

General JOHNS. The MCRS-16 is the most current assessment of the need for mobility assets based on 2 years of studying three demanding cases involving the integration of scenarios to simultaneously protect the Homeland, posture our Nation to respond to events around the globe, and be prepared to address significant overlapping combatant campaigns in response to threats to our national interests. These DOD validated scenario sets are continuously being reviewed and updated to assure we can respond to world events and address conflicts with acceptable levels of risk. Each year we submit our programming actions based upon the most current family of scenario sets and demands approved by DOD.

29. Senator CHAMBLISS. Director Fox, did the MCRS-16 account for the possibility of future losses—combat or otherwise—in the strategic airlift fleet? If not, why not?

Director FOX. Unlike combat aircraft and bombers, DOD does not program an attrition reserve for mobility aircraft. DOD does program (and the MCRS accounted for) BAI at approximately 10 percent of the fleet size.

30. Senator CHAMBLISS. Director Fox, did the MCRS account for already planned heavy depot modifications and upgrades to both C-17s and C-5s that will continue through 2016, and how these modifications and upgrades will affect the aircraft's availability? If not, why not?

Director FOX. The study accounted for depot rates consistent with all programmed modifications.

31. Senator CHAMBLISS. Director Fox, did the MCRS analysis include or exclude training assets?

Director FOX. MCRS included training assets. During the steady state portion of the analysis, the demand included full training operations consistent with the training demands witnessed over the past 7 years. When operating under surge conditions, as would be the case if engaged in two overlapping warfights, DOD plans to curtail routine training while sustaining the primary training pipeline. The fleet capacity of 32.7 MTM/D required to meet peak demands of overlapping warfights includes a 50 percent reduction in training aircraft for the 45-day surge period.

#### AIR FORCE C-5Ms

32. Senator CHAMBLISS. General McNabb and General Johns, as I understand, the Air Force currently has five C-5Ms in operational service. Please provide a summary of how well the C-5Ms are performing operationally.

General McNABB and General JOHNS. The C-5M has demonstrated its superior capability as early as Operational Test and Evaluation where a small fleet of aircraft were employed to provide direct delivery of heavy outsized cargo to U.S. Central Command's (CENTCOM) front door. The C-5M was able to overfly the en route gas stops where any other AMC airlifter would have to land for fuel. These 23 hour roundtrip missions delivered approximately 120,000 pounds of cargo on each mission from Dover AFB, DE, to Turkey and Iraq, dramatically increasing mission velocity and reliability. Approximately 36 missions were completed by 3 aircraft and 6 crews in only 35 days.

In February, Dover AFB, DE, brought together an all-star team of 8 aircrews and 28 maintainers, composed of Active and Reserve airmen, and deployed 2 C-5Ms and 2 C-5Bs in support of an intermodal movement of 2 Combat Aviation Brigades (CAB) of the 101st Airborne Division. In only 31 days, Team Dover successfully delivered 172 helicopters plus personnel and support equipment totaling over 6 million pounds. The C-5M outpaced the C-5B by consuming approximately 20 percent less fuel, moving 59 percent of the cargo, and increased mission effectiveness and velocity by overflying intermediate gas stops required by the C-5B (while carrying heavier cargo loads in and out of the theater). The C-5M maintained a phenomenal 87 percent logistics departure reliability rate.

In June, a C-5M from Dover AFB was tasked to complete the first direct, non-stop mission from Dover AFB, DE, to Bagram, Afghanistan. This was the first flight of its kind which involved flying over Canada towards the Arctic Circle, then down through Russia and into Afghanistan. This history-making flight was made possible by the improved reliability and capability of the C-5M. The flight took over 15 hours to complete. The success of this mission laid the ground-work for future polar

over-flight operations from the United States directly delivering high priority outsized cargo into the area of responsibility (AOR).

33. Senator CHAMBLISS. General McNabb and General Johns, is the Air Force satisfied with the C-5M?

General McNABB and General JOHNS. Yes, the C-5M's performance is exceeding our expectations. Five C-5Ms have been delivered to the Air Force; however, over the past 18 months we have had three or less C-5Ms which are available to fly missions in support of our customers. The other C-5Ms have been receiving modifications such as large aircraft infrared countermeasures (LAIRCM), programmed depot maintenance, or have been supporting follow-on reliability enhancement reengining program (RERP) development testing. With a possessed fleet size of three or less, a peacetime Mission Capable Rate does not provide a meaningful measure of the current and future performance of the C-5M. To date we assess the performance of the C-5M as exceeding our expectations. The propulsion system which is over 70 percent of the modification is proving very reliable and provides the C-5M much higher climb, payload, range, and exceptional noise abatement performance over the legacy C-5. Consequently, a C-5M uses less mobility assets and 10 to 20 percent less fuel to accomplish the same mission than a legacy C-5. On several occasions, we have tasked C-5Ms to perform their wartime representative surges and their wartime mission capable rate has exceeded 75 percent with maintenance departure reliability rates exceeding 85 percent. The C-5M is lauded by both aircrew and maintainers as being an outstanding platform. Aircrews praise the climb, payload, range, diagnostics system, and upgraded flight station equipment and displays. Maintainers now deal less with the legacy issues that were upgraded by the RERP conversion and maintainability has become much more user friendly thanks to improvements in diagnostics system and maintenance manuals. The C-5M maintenance repair time and mission essential equipment fix rates are much better than the standards established by the C-5 RERP Capabilities Requirement Document.

34. Senator CHAMBLISS. General McNabb and General Johns, one of those C-5Ms was previously a C-5A. How is that aircraft performing relative to the other C-5Ms?

General McNABB and General JOHNS. There is minimal difference between A and B model C-5s. The C-5Ms are still a relatively small fleet and we do not have enough data to determine how the "A-model" conversion is performing relative to the other C-5Ms.

#### C-5 RELIABILITY ENHANCEMENT AND RE-ENGINEING PROGRAM

35. Senator CHAMBLISS. General McNabb and General Johns, as reported in the 2008 C-5 Capabilities Production Document signed by then Chief of Staff of the Air Force General Moseley, the Air Force conducted a cost/benefit analyses of the C-5 RERP effort and concluded that modernizing 52 C-5s to the C-5 RERP configuration results in an \$8.9 billion reduction in total ownership costs after paying for all development and production through 2040. This suggests that the current 52 aircraft C-5 RERP not only pays for itself, but generates sufficient net savings that would also pay to RERP the entire C-5A fleet if the Air Force chose to modernize them as well. Is this your understanding as well and are these estimates still accurate?

General McNABB and General JOHNS. The reduced total ownership cost (RTOC) estimate will be at least \$8.9 billion (BY00). However, the RTOC for the RERP modification of 52 C-5s will not be realized until after 2025 which is late to funding modification of C-5As, i.e., fiscal years 2014 to 2019. The estimated cost to RERP 27 C-5As is in excess of \$3 billion. The Air Force does not need to RERP additional C-5As to meet known strategic airlift requirements. Currently the Air Force plans to use savings from RERP to pay for future budget reductions.

36. Senator CHAMBLISS. General McNabb and General Johns, the MCRS assumes full Guard/Reserve mobilization to meet national requirements. Once that happens, all assets are brought to bear to meet strategic airlift requirements. However, in peacetime that is not the situation. I have heard that AMC has challenges day-to-day meeting peacetime requirements. Please comment on what effect your desire to retire up to 32 C-5s will have on your ability to perform your peacetime mission?

General McNABB. Bottom Line—there is sufficient capacity for peacetime operations. While supporting both the troop withdrawal from Iraq and the surge in Afghanistan, the busiest day for TRANSCOM's component, AMC, was 16.6 MTM/D. So far in 2011, it has been 15.9 MTM/D, highlighted by our ability to support oper-

ations in Afghanistan, Iraq, and Libya, while responding to the disasters in Japan, where we were able to deliver over 3,600 tons of supplies and evacuate over 7,500 dependents. I am confident we have enough organic surge capacity and commercial partner augmentation to satisfy the anticipated workload based upon our recent years' experience.

General JOHNS. The Air Force's need to retire 32 C-5s, excess to the maximum demand of 32.7 MTM/D, will not result in an adverse impact to our day-to-day peacetime operation. Today, in the midst of the lower access to C-5 aircraft because of the avionic modernization program (AMP) and RERP modification lines, we have still been able to balance our C-17 and C-5 fleets to meet current airlift requirements. Our challenge has been to keep the C-5s moving in the system. The reliability rates we've been experiencing have reduced our capacity to move as much airlift as we might like with the C-5. With the 52 C-5M tails presently programmed, we forecast an increase to C-5 airlift capacity. This increase comes from an increased aircraft reliability or mission capable rate of 54 percent with our legacy fleet to 75 percent for our RERP'd fleet and increased C-5M range and tonnage capability over the C-5A/B.

#### AN-124 AUGMENTATION

37. Senator CHAMBLISS. General McNabb and General Johns, will we see TRANSCOM continuing or increasing reliance on foreign AN-124 augmentation to get their job done?

General MCNABB. We will continue to take advantage of AN-124 aircraft's ability to carry outsize cargo when they are the lowest cost option, thus allowing us to fly our C-5 and C-17 fleets at lower utilization (UTE) rates and preserve their service life. AN-124 augmentation will not be at the expense of CRAF carriers and the AN-124 capability will be arranged as a subcontract through CRAF carriers.

General JOHNS. The ability to meet the requirements of U.S. combatant commanders around the globe does not rely upon the use of foreign flagged aircraft like the AN-124. Studies like the MCRS-16 come with solutions that rely wholly on U.S. flagged capabilities. We will continue to augment our organic capability and our partnerships with U.S. flagged carriers in the CRAF with foreign flagged carriers to reduce operational/personnel tempo on our troops, to save wear-and-tear on our military assets, to reduce costs to American taxpayers, and to facilitate diplomatic access to destinations that may be restricted or denied to U.S. carriers. We do not rely on foreign augmentation, but we do seek to build partnerships and trust throughout the international community where foreign contractual relationships make sense to save time, save money, and/or free our people and assets for other activities.

[Whereupon, at 3:46 p.m., the subcommittee adjourned.]

