

**DEPARTMENT OF DEFENSE AUTHORIZATION FOR
APPROPRIATIONS FOR FISCAL YEAR 2017 AND
THE FUTURE YEARS DEFENSE PROGRAM**

HEARINGS

BEFORE THE

**COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE**

ONE HUNDRED FOURTEENTH CONGRESS

SECOND SESSION

ON

S. 2943

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2017 FOR MILITARY
ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CON-
STRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF
ENERGY, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS FOR
SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

**PART 2
SEAPOWER**

APRIL 6, 13, 2016



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**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2017 AND THE FUTURE YEARS DEFENSE
PROGRAM**

WEDNESDAY, APRIL 6, 2016

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

NAVY SHIPBUILDING PROGRAMS

The subcommittee met, pursuant to notice, at 1:59 p.m. in Room SR-222, Russell Senate Office Building, Senator Roger F. Wicker (chairman of the subcommittee) presiding.

Committee members present: Senators Wicker, Sessions, Ayotte, Rounds, Blumenthal, Hirono, Kaine, and King.

OPENING STATEMENT OF SENATOR ROGER WICKER

Senator WICKER. This hearing will come to order, and thank you all for being here.

This is the Senate Armed Services Subcommittee on Seapower, convenes this afternoon to examine Navy shipbuilding programs. We welcome three distinguished witnesses, the Honorable Sean Stackley, assistant secretary of the Navy for Research, Development, and Acquisition; Vice Admiral Joseph P. Mulloy, deputy chief of Naval Operations for Integration of Capabilities and Resources; and Lieutenant General Robert S. Walsh, deputy commandant for Combat Development and integration, as well as commanding general, Marine Corps Combat Development Command.

Our subcommittee is grateful for the decades of service to our nation from these three witnesses. We are grateful for the sacrifice also of our sailors and marines serving around the globe.

With nearly 100 ships deployed on any given day, our Navy and Marine Corps continue to provide a critical front line of defense for our country. Now, more than ever, a strong Navy and Marine Corps are central to our nation's ability to deter adversaries, assure allies, and defend our national interests. Our sailors and marines are at the forefront of our rebalance to Asia, our ongoing operations against the Islamic State, our responses to a resurgent Russia, and efforts to deter rogue states such as Iran and North Korea.

However, our current fleet of 272 ships is insufficient to address these critical security challenges. Even with recent shipbuilding increases, many of which were initiated in this subcommittee, the

Navy will not achieve its requirement of 308 ships until 2021. There is also no plan to meet the bipartisan National Defense Panel's recommendation for a fleet of 323 to 346 ships.

This afternoon, I would like to hear from our witnesses on what I consider five key issues our subcommittee will review this year: first, vitality of the industrial base. The vitality of the 30-year shipbuilding plan is essential to the strength of our shipbuilding industrial base. The U.S. Navy's dominant maritime position would not be possible without the unique skills, capabilities, and capacities inherent in new construction shipyards and weapons systems developers.

I would like our witnesses to describe how they carefully weighed the effects on the shipbuilding industrial base when they balanced resources and requirements in the shipbuilding plan.

Number two, best use of taxpayer resources: It is critical that this subcommittee conduct rigorous oversight of shipbuilding programs to ensure the Navy is making the best use of limited taxpayer dollars. Congress expects Navy shipbuilding programs to deliver promised capability on time and on budget. Schedule delays and unsatisfactory test results too often result in cost growth and strains on the legacy platforms these ships will replace.

Specifically, I am interested in understanding why the delivery of the USS *Gerald R. Ford*, as well as its advanced arresting gear testing have slid day for day since last September. Delivery is now slated for September instead of last month.

I am also concerned about delays in Littoral Combat Ship mission package testings. Since 2009, the surface package has been delayed 2 years, the antisubmarine package for 3, and the mine countermeasures package for at least 8 years.

Additionally, after years of debating early retirement or inactivation of a number of cruisers and docked landing ships, last year, Congress authorized and appropriated the Navy's request to execute this so-called 2/4/6 plan. This means no more than two cruisers may be inactivated per year. A cruiser may not be inactivated for more than 4 years, and no more than six cruisers may be in the program at any given time, 2, 4, and 6.

However, in this year's budget the Navy has changed course and now wants to inactivate seven cruisers instead of two and keep these ships out of service for up to 10 years rather than 4 before reactivating and re-manning them. I hope the witnesses will explain the merits of this plan, and perhaps there are merits.

Thirdly, building the future force: This subcommittee also has a duty to shape the future of our Navy. Each of our classes of surface combatant ships, cruisers, destroyers, and littoral combat ships [LCS] will begin retiring within the next 20 years. Now is the time to determine the requirements for our future service combatants, as well as the munitions they will carry.

I am concerned that the extraordinary cost of the *Ohio*-class submarine replacement program will place tremendous stress on our already strained shipbuilding budget unless funding from outside this account is provided.

I am also interested in better understanding the Department's decision to down-select to one variant of the littoral combat ship

frigate. Specifically, what analysis supports reducing procurement from 52 to 40 of these ships?

Number four, amphibious ships: The Navy and Marine Corps will serve as the lynchpin of the American force projection around the globe. I am interested in ways we can ensure the Navy shipbuilding plan addresses the demand from our combatant commanders for amphibious ships. This demand is greater than 50 amphibious ships on a day-to-day operational basis, but the current inventory is just 30 amphibious ships. To this end, our subcommittee would like to know to what extent the next amphibious assault ship known as the LX(R) could be accelerated.

Finally, budget constraints: Although the Bipartisan Budget Act has provided some measure of short-term relief, sequestration remains the law of the land regrettably and will return in fiscal year 2018 unless Congress acts. Even with these additional funds, the Department of the Navy continues to face significant budget challenges that are forcing hard choices between readiness and modernization.

The Department's 2017 request is \$8 billion, or 5 percent less than the 2017 value presented in last year's budget. As a member of both the Armed Services Committee and the Budget Committee, I know that tough decisions must be made across the Federal Government. However, I would remind everyone that national defense is solely a Federal responsibility. Defense spending is also known as a twofer, supporting both our national security and our high-tech manufacturing workforce.

As such, I hope our witnesses today will elaborate on the hard choices in this budget and how a return to sequestration would impact the shipbuilding plan.

With that in mind, I look forward to the testimony of our witnesses, and I am delighted to recognize our ranking member, Senator Hirono, for any opening remarks she might have.

STATEMENT OF SENATOR MAZIE HIRONO

Senator HIRONO. Thank you very much, Mr. Chairman, and I certainly share the aspects of this program that you have articulated. Of course I, too, want to thank our witnesses for being here. We are certainly grateful to each of you for your service to the Nation and for the truly professional service of the men and women under your command. We also pay tribute to their families because, of course, the work that the people under your command do is very much involved with the support of their families.

Today, our witnesses face huge challenges as they strive to balance the need to support ongoing operations and sustained readiness with the need to modernize and keep the technological advantage that is so critical to military success. These challenges have been made particularly difficult, as the chairman has mentioned, by the spending caps imposed in the Budget Control Act, caps that were modestly relieved for fiscal year 2016 in the Bipartisan Budget Act, but they will resume in fiscal year 2018 and beyond unless we do something about it.

These caps already seriously challenge our ability to meet our national security needs, and have already forced all of the military

departments to make painful tradeoffs. Unless modified for the years after fiscal year 2018 and later, I believe that these caps will threaten our long-term national security interests.

With that in mind, a continuing focus of this subcommittee has been to see that we improve our acquisition stewardship and thereby ensure that we are getting good value for every shipbuilding dollar that we spend.

We are very pleased to see continued stability and performance in the *Virginia*-class attack submarine production at a level of two per year. We have seen that stability helps drive down costs and improves productivity.

We also support the Navy's continuing efforts to drive costs out of the *Ohio* replacement SSBN program. SSBNs will remain a vital leg of the nuclear triad for the foreseeable future. Establishing and achieving cost-reduction goals in these *Virginia*-class and *Ohio* Replacement Programs will yield significant stability to our nation's submarine industrial base, which will ensure the Navy has a modern, capable submarine fleet for many years to come.

As Admiral Harris noted when I met with him a couple of days ago, it is our submarine force that really provides us with the asymmetric advantage over other countries.

Aircraft carrier programs are another important area for discussion as well. We need to hear about the progress the Navy and the contractors are making to deliver CVN-78 within the cost cap and what progress is being made on reducing the production cost for CVN-79 and the later carriers.

Another topic that we should address is the discussion within DOD of changes to the LCS program. The Navy had planned, as the chairman mentioned, to procure 52 LCS vessels with 20 of these in a new frigate configuration, responding to direction from former Secretary Hagel. This year, Secretary Carter has directed that the Navy truncate the LCS program to 40 ships. Under this revised plan, only 11 of LCS vessels will be in the frigate configuration. We need to understand how all of these changes relate to Navy requirements.

Also, since last year, there have been significant problems in moving to operational testing of the mine countermeasures mission packages for the LCS. I know, based on poor results in developmental testing, the Navy has changed plans for development of mine countermeasure mission module. I look forward to hearing more about the new plan and when we can expect to field that capability.

This year, the Navy will be implementing an engineering change proposal for the DDG-51 destroyer program to include the Air and Missile Defense Radar, or AMDR, on one of the ships in the fiscal year 2016 shipbuilding program. We need to assess whether the Navy and contractors are making significant progress, sufficient progress on the AMDR program to support that production schedule.

I know that the Navy will be moving an engineering development model of the radar to Kauai PMRF [Pacific Missile Range Facility] for testing, and I hope we can hear from Secretary Stackley on this important program as well.

In our country's current fiscal environment, it is very unlikely that we will have much money to spend as the 30-year shipbuilding plan assumes, and fundamentally, that is why these hearings are important. We need to focus on managing these important programs in ways that are efficient and effective in delivering the capability the country needs from the Navy. We need to improve quality and efficiency in all of our shipbuilding programs not only because of the direct savings but also because we need to demonstrate to the taxpayer that we are using every dollar wisely.

Thank you very much. I look forward to your testimony. Thank you, Mr. Chair.

Senator WICKER. Thank you, Senator Hirono.

Gentlemen, the three of you have submitted an extensive joint statement consisting of 28 pages. At this point, that statement will be placed into the record. Without objection, that is so ordered.

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

PREPARED JOINT STATEMENT BY MR. STACKLEY, ADMIRAL MULLOY, AND GENERAL WALSH

Chairman Wicker, Ranking Member Hirono, and distinguished members of the subcommittee, thank you for the opportunity to appear before you today to address the Department of Navy's shipbuilding programs.

The fiscal year (FY) 2017 President's Budget submission is governed by the 2014 Quadrennial Defense Review (QDR), which implements the 2012 Defense Strategic Guidance (DSG) and continues our efforts to ensure our ability to protect the Homeland, build security globally, project power and win decisively. As described in the Chief of Naval Operations' *A Design for Maintaining Maritime Superiority* and the Commandant of the U.S. Marine Corps' *Advance to Contact*, today's strategic environment is dramatically more globalized with accelerating change. Global connections continue to multiply, fueled by rapid advances and proliferation in technology, particularly information technology. Our competitors are pursuing advanced weapon systems at levels and a pace of development that we have not seen since the mid-1980s. It is imperative that we fund a force that can fight and win against any of our five major challenges (Russia, China, Iran, North Korea and Global Counter-Terrorism), investing in advanced capabilities that increase our lethality, for both the current and future force. This budget addresses that imperative by making investments to sustain our ability to fight with decisive capability over the full range of operations—at sea, from the sea, and across all domains.

Though budget issues have challenged the Department, our sailors and marines deployed around the world continue to perform the mission and operate forward, being where it matters when it matters. During a ten month deployment ending in June 2015, the *Carl Vinson* Strike Group and Carrier Strike Group (CSG) ONE conducted 12,300 sorties, including 2,383 combat missions against Islamic State of Iraq and Syria (ISIS). The USS *Theodore Roosevelt* (CVN 71) with CSG TWELVE returned from deployment in November 2015 after conducting over 1,800 combat sorties in Iraq and Syria against ISIS targets. During deployment, CVN 71 quickly relocated from the Northern Arabian Gulf to the coast of Yemen to respond to the Houthi insurgency, keep shipping lanes in the region safe and open, and intercept weapons shipments meant for the Houthi rebels. Day and night carrier-based airstrikes continue from the USS *Harry S. Truman* (CVN 75) which arrived in the Persian Gulf in December 2015 to support Operation Inherent Resolve.

The U.S. 7th Fleet along with allies and partner nations combined for over 110 exercises throughout 2015 to train, build partner capability and relationships, and exchange information. The largest exercise, Talisman Sabre in the Indo-Asia-Pacific region, in July 2015, featured 21 ships, including U.S. Navy aircraft carrier USS *George Washington* (CVN 73) and more than 200 aircraft and three submarines. This exercise continued to emphasize our Navy's worldwide presence and honed the skills to plan and execute contingency responses, from combat missions to humanitarian assistance efforts. The USS *Lassen* (DDG 82) continued to further United States presence and promote maritime security worldwide through participation in multilateral exercises with the Republic of Korea, France and Turkey, and patrols

in the South China Sea. Additionally, the USS *Fort Worth* (LCS 3) conducted Code for Unplanned Encounters at Sea (CUES) exercises with the Chinese People's Liberation Army-Navy and completed the Cooperation Afloat Readiness and Training with our Indonesian allies to enhance interoperability and address shared maritime security priorities.

Our Naval forces in the 5th and 6th Fleet Areas of Operations (AOR) conducted a variety of missions in support of mine-countermine operations, Ballistic Missile Defense, counter terrorism and maritime security throughout 2015. In the 5th Fleet AOR, Commander Task Force 52, consisting of United States and United Kingdom units, successfully completed Mine Countermeasure Exercises (MCMEX) in November 2015. The 6th Fleet's USS *Cook* (DDG 75) conducted ballistic missile defense exercises and participated in NATO's counter terrorism operation Active Endeavor in July and August 2015 in the Mediterranean and Black Seas. Additionally, USS *Ross* (DDG 71) participated in a passing exercise (PASSEX) with Romanian, Turkish and Ukrainian navies to strengthen partnerships with allies advancing security and stability in the Black Sea region. Furthermore, Naval Special Operations Forces (NAVSO) continue operations in the Middle East, the Horn of Africa, and Central Asia. More specifically, NAVSO is manning the Combined Joint Special Operations Task Force-Iraq and deploying forces to Afghanistan. Their operational tempo remains high.

The Marine Corps executed over 100 operations, 20 amphibious operations, 140 Theater Security Cooperation (TSC) events, and participated in 160 exercises during calendar year 2015. Marine Corps units deployed to every Geographic Combatant Command and executed numerous TSC exercises to help strengthen relationships with allies and build partner capacity. Marines from Special Purpose Marine Air Ground Task Force—Crisis Response (SPMAGTF-CR)—Central Command and Advise and Assist teams advised and enabled the Iraqi Army. SPMAGTF-CR—Africa incident response force maintained various alert postures from Naval Air Station Sigonella, Italy, Naval Station Souda Bay, Greece, and Moron Air Base, Spain during multiple iterations of Special Operations Command Africa operations, and provided fixed site security forces to United States Embassy Bangui, Central African Republic, to assist in the reopening of the embassy.

Marine Expeditionary Units (MEU) provided support to the U.S. Embassy Sana'a, Yemen to safeguard American civilians and facilities including facilitating the evacuation of the Embassy in February and March. The 31st MEU also deployed to Saipan to provide Defense Support to Civil Authorities as Typhoon Soudelor passed through the Commonwealth of the Northern Marianas killing 30 and displacing 150,000 people. Marine Security Augmentation Units deployed 33 times in 2015 at the request of the State Department executing 12 Embassy/Consulate security missions and 21 VIP security missions. Additionally, Joint Task Force-505 (JTF-505) was activated in April 2015, under USMC operational command, in response to a large earthquake in Nepal which killed over 8,000 people and injured more than 21,000. JTF-505 Forward assumed command of all Department of Defense assets in support of Foreign Disaster Relief operations in Nepal and delivered about 114 tons of emergency relief supplies, transported 534 personnel and conducted 63 casualty evacuations.

Our Nation's away team, the Navy and Marine Corps, continues to stand the watch with an operational tempo that keeps nearly half of our Fleet underway every day. We must continually adapt to the emerging security environment to ensure our military's reach, presence, capability, and resolve to maintain this pace of operations remains superior in today's and tomorrow's world.

THE FISCAL YEAR 2017 PRESIDENT'S BUDGET REQUEST

Our ability to respond to the dynamic strategic environment, high operational tempo and Combatant Commander requirements is constrained by the current fiscal realities. The Department is still recovering from funding shortfalls over fiscal year 2013–2016 that collectively provided \$30 billion less than the levels requested in our President's Budget submissions. The Bipartisan Budget Act of 2015 (BBA) provided critical relief from a return to sequestration levels in fiscal year 2016 and fiscal year 2017, but even with overseas contingency operations funding, the Navy's fiscal year 2017 request is 3.9 percent less than the fiscal year 2017 funding level requested in the fiscal year 2016 President's Budget.

This fiscal context drives tough choices, but also inspires new thinking in order to best balance between capability, capacity, readiness and the vital industrial base. The fiscal year 2017 President's Budget integrates the mission guidance, operational context, and fiscal constraints in making focused investments, hard prioritized choices, and innovative reform to resource and deliver a global sea-based force. The

Department's shipbuilding plans are formulated to provide the required force structure with the right capabilities, while preserving alternatives regarding the future force and the industrial base required to support it.

The Navy's current battle force objective of 308 ships is set by the fiscal year 2014 update to the 2012 Force Structure Assessment (FSA). The FSA defines the balanced naval force, by type and quantity of ships, required to meet the full range of global naval operations that span from peace time presence to major combat operations.

The Navy's long range plan to reach and maintain the requirements of the FSA is outlined in the "30 Year Shipbuilding" report submitted to Congress each year, as shown in Table 1.

The fundamental principles bridging the long range shipbuilding plan and the 308-ship Navy defined by the FSA are that:

(i) the Navy's force structure, today and for the future, underpins our ability to provide for our national security;

(ii) a balanced mix of ships is necessary in order to conduct the wide range of operations required of the Fleet in the most effective, affordable manner possible;

(iii) the duration required to construct complex naval warships combined with the rate at which we procure these ships, requires the Navy to plan decades in advance to affect the size and capabilities of the force; and

(iv) stable, predictable ship construction at a sufficient rate is critical to Industry to enable it to make the capital investments and retain the critically skilled workforce required to build our Fleet, and critical to the Navy to enable us to procure our Fleet in the most effective, affordable manner possible.

With the strong support of Congress and close adherence to the long range shipbuilding plan over the period 2009–2016, the Navy is certain to reach a Battle Force of 308-ships in 2021 (the nominal year in which those ships procured by 2016 will have been delivered to the Navy), as shown in Table 1. This twelve year span required to go from a Navy of 278 ships in 2009 to 308 ships in 2021, exemplifies the importance of the principles outlined above and, accordingly, why shipbuilding must remain a top priority for the Department of the Navy if we are to continue to provide the measure of maritime security and power projection required of our naval forces in the decades ahead. The fiscal year 2017 President's Budget and the corresponding fiscal year 2017 to fiscal year 2021 Future Years Defense Plan (FYDP) establish the shipbuilding trajectory that will shape our Battle Force and its underpinning industrial base in the years following fiscal year 2021.

Table 1.—FSA and Battle Force Requirement

Platform	Requirement ¹	Current ²	FY 2021
Fleet ballistic missile submarines	12	14	14
Nuclear-powered aircraft carriers	11	10	11
Nuclear-powered attack submarines	48	53	51
Nuclear-powered cruise missile submarines	0	4	4
Large, multi-mission, surface combatants	88	84	97
Small, multi-role, surface combatants	52	17	34
Amphibious Warfare ships	34	30	33
Combat logistics force ships	29	30	30
Support vessels	34	30	34
Total	308	272	308

¹Based on the 2012 FSA interim update (fiscal year 2014), this requirement is the minimum force structure necessary to fulfill the Navy's essential combat missions at an acceptable level of risk.

²As of 1 March 2016.

The fiscal year 2017 President's Budget request includes seven ships in fiscal year 2017: two SSN 774 *Virginia*-class attack submarines; two DDG 51 *Arleigh Burke*-class destroyers; two Littoral Combat Ships (LCS); and one LHA 8 amphibious assault ship. In total, across the fiscal year 2017 FYDP, this budget maintains most of the elements of our planned ship procurements in support of the FSA. However, in view of the Navy's projection that it will meet its force structure requirements in 2021 and in light of a separate capabilities based risk assessment by the Department of Defense, within the constraints of a budget impacted by the BBA, it was determined that a shift from shipbuilding investment towards investment in modernization and advanced capabilities would provide the best overall balance of capability and capacity to meet the needs of the current and future fleet. This decision

results in an overall reduction to 38 ships in the fiscal year 2017 FYDP, most notably impacting our small surface combatants, as shown in Table 2.

Table 2.—FY 2017–FY 2021 New Construction Shipbuilding Procurement and Funding Plan (TY\$M)

Ship Type (\$M)	FY2017		FY2018		FY2019		FY2020		FY2021		Total	
	\$	Qty	\$	Qty	\$	Qty	\$	Qty	\$	Qty	\$	Qty
CVN 78 ¹	2,663		4,361	1	1,650		1,735		3,095		13,504	1
DDG 51	3,211	2	3,428	2	3,508	2	3,595	2	3,665	2	17,408	10
DDG 1000	272		127		54		28				481	
LCS ²	1,126	2	634	1							1,760	3
FF					822	1	739	1	1,416	2	2,978	4
SSN 774 ³	4,955	2	5,179	2	6,773	2	7,324	2	4,393	1	28,624	9
SSBN(X) ⁴	773		787		2,767		1,312		3,611	1	9,250	1
LX(R)					46		1,499	1			1,545	1
LHA(R)	1,623	1	1,679								3,302	1
T-AO(X)	73		530	1	519	1	544	1	540	1	2,206	4
T-ATS(X)			76	1	78	1	80	1	75	1	308	4
Total New Construction	14,696	7	16,801	8	16,217	7	16,856	8	16,795	8	81,364	38

¹ Funding for the CVN 78-class program reflects six year incremental funding authorized in the fiscal year 2013 NDAA.

² Funding does not include LCS mission modules, which are funded in Other Procurement, Navy (OPN).

³ Includes VPM, one in fiscal year 2019, two in fiscal year 2020 and one in fiscal year 2021.

⁴ Fiscal year 2021 represents incremental funding for the lead ship (fiscal year 2021=41% (\$3.6B)/F Y2022=35% (\$3.1B)/fiscal year 2023=24% (2.1B)).

SUMMARY

Safely, reliably, certainly, your Navy and Marine Corps are stationed around the globe; maintaining their readiness, sustaining their high operational tempo, and conducting naval missions spanning from peacetime presence to war in response to the demands of their Combatant Commanders and the needs of the Nation. The Department of the Navy's fiscal year 2017 budget provides the warfighting capabilities—ships, combat and C4I systems, and weapons—required by our sailors and marines in the performance of their mission against the increasingly complex threats that challenge our security and that of our partners and allies around the globe today.

Reductions to the Department's fiscal year 2017 top line due to the Bipartisan Budget Act of 2015 and the Budget Control Act of 2011, however, have forced revisions to the shipbuilding programs that we presented to the Congress with the fiscal year 2016 budget. We have been aggressive in our efforts to drive down the cost of our weapon systems in order to offset this top line reduction to the extent possible. Ultimately, however, we have been required to make cuts to programs that we presented as warfighting requirements just one year ago. We have been judicious in these decisions and are prepared to provide the Committee the basis and impact to operational requirements, cost, and the industrial base associated with each of these decisions. Programmatic details regarding Navy and Marine Corps capabilities and the Department of the Navy fiscal year 2017 budget request are summarized in the following section.

Congress' strong support for the Department of the Navy's fiscal year 2016 budget is a great testament of your support for our sailors and marines and their mission. We look forward to continuing to work closely with you and hope to build upon such past strong support as you evaluate this fiscal year 2017 budget request and carry out your responsibilities to "provide and maintain a Navy."

U.S. NAVY SHIPBUILDING PROGRAMS

AIRCRAFT CARRIERS

The aircraft carrier is the centerpiece of the Navy's Carrier Strike Groups and central to Navy core capabilities of sea control, maritime security, and humanitarian assistance and disaster relief. Our aircraft carriers' ability to provide forward presence; to rapidly and decisively respond to global crises; to simultaneously deter potential adversaries and assure allies; and to project power at sea and ashore make

these national assets the first instruments of our Nation's will and the definitive symbol of our Nation's defense strategy.

Nimitz- and *Ford*-class carriers will be the premier forward deployed asset of choice for crisis response and early decisive striking power in major combat operations for the next half-century. The Department has established a steady state *Ford*-class procurement plan designed to deliver each new ship in close alignment with the *Nimitz*-class ship it replaces. The *Ford*-class design improves warfighting capability, survivability, operational availability, and quality of life for sailors, while reducing total billets, including ship's crew and airwing, by nearly 1,200 personnel and decreasing total ownership costs by approximately \$4 billion per ship.

The Navy is committed to delivering the lead ship of the class, *Gerald R. Ford* (CVN 78) within the \$12.887 billion congressional cost cap. Sustained efforts to identify cost reductions and drive improved cost and schedule performance on this first-of-class aircraft carrier have resulted in highly stable cost performance since 2011. Based on lessons learned on CVN 78, the approach to carrier construction has undergone an extensive affordability review and the Navy and the shipbuilder have made significant changes on CVN 79 to reduce the cost to build the ship. The benefits of these changes in build strategy and resolution of first-of-class impacts experienced on CVN 78 are evident in early production labor metrics on CVN 79. These efforts are ongoing and additional process improvements continue to be identified.

Alongside the Navy's efforts to reduce the cost to build CVN 79, the fiscal year 2016 National Defense Authorization Act reduced the cost cap for follow ships in the CVN 78 class from \$11,498 million to \$11,398 million. To this end, the Navy has further emphasized stability in requirements, design, schedule, and budget, in order to drive further improvement to CVN 79 cost. The fiscal year 2017 President's Budget requests funding for the most efficient build strategy for this ship and we look for Congress' full support of this request to enable CVN 79 procurement at the lowest possible cost.

USS *Gerald R. Ford* (CVN 78) is in the final stages of lead ship completion. As of March 2016, CVN 78 is 97 percent complete. 80 percent of the Hull, Mechanical, and Electrical Testing (HM&E) and 71 percent of Electronics testing is complete. CVN 78 is currently projected to begin Sea Trials in July 2016 and deliver in September 2016. Post Shakedown Availability (PSA) is planned for 2017 and the first of class Full Ship Shock Trials (FSST) are planned for fiscal year 2019. CVN 78's first deployment is planned to follow FSST in fiscal year 2021.

The Navy awarded the CVN 79 fixed price construction contract in June 2015 and as of March 2016 the ship is 18 percent complete. The keel was laid in July and launch is planned for 2020. The Navy will deliver the USS *John F. Kennedy* (CVN 79) within the cost cap using a two-phased strategy wherein select ship systems and compartments that are more efficiently completed at a later stage of construction—to avoid obsolescence or to leverage competition or the use of experienced installation teams—will be scheduled for completion in the ship's second phase of production and test. *Enterprise* (CVN 80) began construction planning and long lead time material procurement in January 2016 and construction is scheduled to begin in 2018. The fiscal year 2017 President's Budget request re-phases CVN 80 funding to support a more efficient production profile, critical to performance, below the cost cap. CVN 80 planning and construction will continue to leverage class lessons learned to achieve cost and risk reduction, including efforts to accelerate production work to earlier phases of construction, where work is more cost efficient.

The *Nimitz*-class Refueling Complex Overhaul (RCOH) is key to both the maintenance and modernization of each carrier in support of the second half of its service life. USS *Abraham Lincoln* (CVN 72) is scheduled to complete steam plant testing in Spring 2016 and is scheduled to complete RCOH and return to the Fleet in November 2016. USS *George Washington* (CVN 73) executed her homeport shift to Norfolk, Virginia in December 2015 for a scheduled RCOH start in August 2017. CVN 73 advanced planning activity and long lead time material procurement initiated in February 2015.

SUBMARINES

Submarines' stealth and ability to conduct sustained forward-deployed operations in anti-access/area-denial environments serve as force multipliers 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 warfare (ASuW), undersea warfare and the insertion of Special Operating Forces (SOF) 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. The Navy is mitigating an impending attack

submarine force structure shortfall that commences in the mid-2020s through multiple parallel efforts: continuing procurement of two SSN 774 *Virginia*-class submarines per year; reducing the construction span of *Virginia*-class submarines; and extending the service lives of select attack submarines (SSN 688s) with the potential to reduce the SSN shortfall of 51 ship years. While each of the Navy's attack submarines provides considerable strike capacity, guided missile submarines (SSGN) provide substantially more strike capacity and a much more robust capability to deploy SOF personnel. Lastly, the Navy's 14 ballistic missile submarines (SSBNs) provide the Nation with an around-the-clock, credible, modern and survivable sea-based strategic deterrent.

Ballistic Missile Submarines coupled with the TRIDENT II D-5 Strategic Weapons System, represent the most survivable leg of the Nation's strategic arsenal and provide the Nation's most assured nuclear response capability. Originally designed for a 30-year service life, the *Ohio*-class was extended to its current limit of 42 years of operation. As the current SSBN and SSGNs' life cycles cannot be extended further, the U.S. continued development of the follow-on twelve ship *Ohio* Replacement (OR) SSBN program for a lead ship delivery in 2028 is vital. This is our top priority program within the Department of the Navy.

The OR program achieved significant progress in 2015 as the program's Capability Development Document (CDD) was validated by the Joint Requirements Oversight Council (JROC) in August and the program Technical Baseline was locked in November with a robust plan for requirements control and cost containment. In January 2016, the Navy released the Detail Design Request for Proposal for the OR program to the prime contractor, General Dynamics Electric Boat (GDEB), and anticipates awarding the contract by the end of 2016. The contract effort will produce the diagrams, drawings and information necessary to design, build, test and operate this class of submarines, enabling the shipbuilder to formally start construction in 2021. The program is on track to mature technologies to meet requirements defined in the CDD and proceed to detail design in the Engineering and Manufacturing Development (EMD) Phase after the Milestone B decision in summer of 2016.

The fiscal year 2017 President's Budget requests funding to continue development of the OR SSBN. The first-of-class ship is to be procured in fiscal year 2021, with Shipbuilding and Conversion, Navy (SCN) funding for detail design commencing in 2017 and advance procurement for long lead time material commencing in 2019. Previous modernizations of the strategic deterrent and nuclear security enterprise were accompanied by topline increases.

The Navy greatly appreciates Congressional support in overcoming the challenges posed by funding the OR Program. The procurement authorities such as Economic Order Quantity, Advance Construction, and Incremental Funding, provided in the fiscal year 2016 National Defense Authorization Act are not required in fiscal year 2017. However, the Navy will work with Congress in 2016 to provide details regarding how these authorities contribute to achieving the overarching objectives of delivering the OR capability on schedule and in the most affordable manner. The 2017 President's Budget continues to request funding for the OR Program via the SCN and Research, Development, Test and Evaluation, Navy (RDT&E,N) appropriations to ensure the same level of transparency, accountability, and adherence to financial management principles and policies as all other shipbuilding programs.

The fiscal year 2017 President's Budget requests full funding for two SSN 774 *Virginia*-class submarines and advance procurement for the fiscal year 2018 and fiscal year 2019 vessels. The *Virginia*-class submarine program has delivered the last eight ships on budget and ahead of schedule. The last ship delivered, USS *John Warner* (SSN 785), which features a completely redesigned bow section as part of the Design for Affordability efforts (an approximate 20 percent design change) delivered over two months early with the least number of deficiencies of any *Virginia*-class submarine to date. The Block IV contract for ten ships continues the co-production of the *Virginia*-class submarines between GDEB and Huntington Ingalls Industries—Newport News Shipbuilding (HII—NNS) through fiscal year 2018. The savings realized with this Multi Year Procurement (MYP) contract was over \$2 billion, effectively giving the Navy “ten ships for the price of nine”. The Navy intends to build on these savings and capitalize on increased efficiency and decreased costs with a *Virginia*-class Block V MYP contract for up to 10 boats, planned for fiscal year 2019.

The Navy's four SSGNs, provide significant undersea strike capability and SOF capability. To mitigate the 60 percent reduction in undersea strike capacity when these boats retire in fiscal year 2026—fiscal year 2028, the Navy is investing in the *Virginia* Payload Module (VPM). VPM will include a hull insert amidships of a *Virginia*-class submarine that will contain four 87-inch diameter missile tubes each capable of launching seven *Tomahawk* cruise missiles utilizing the same Multiple All-

Up Round canisters currently in use on SSGNs. The fiscal year 2017 President's Budget continues VPM Research and Development and starts SCN funding for detail design and long lead time material efforts to enable integrating VPM into Block V *Virginia*-class SSNs starting with one in fiscal year 2019 and then increasing procurement to all the remaining Block V ships starting in fiscal year 2020. Additionally, the fiscal year 2017 President's Budget includes funding for Acoustic Superiority (AS) initiatives to be incorporated in Block V and later *Virginia*-class SSNs. AS addresses the Chief of Naval Operations' (CNO's) undersea dominance mandate to pace the future threat and is comprised of an enhanced hull treatment, the addition of a large vertical array, and selected machinery quieting changes.

In 2014, the Navy led a comprehensive government-Industry assessment of shipbuilder construction capabilities and capacities at GDEB and HII-NNS to formulate the Submarine Unified Build Strategy (SUBS) for concurrent OR and *Virginia*-class submarine production. This build strategy's guiding principles are: affordability, delivering OR on time and within budget, maintaining *Virginia*-class performance with a continuous reduction in costs, and maintaining two shipbuilders capable of delivering nuclear-powered submarines. To execute this strategy, GDEB has been selected as the prime contractor for OR with the responsibilities to deliver the twelve OR submarines. HII-NNS will design and construct major assemblies and OR modules leveraging their expertise with *Virginia* construction. Both shipbuilders will continue to deliver *Virginia*-class submarines throughout the period with GDEB continuing its prime contractor responsibility for the program. Given the priority of the OR Submarine Program, the delivery of *Virginia*-class submarines will be adjusted with HII-NNS performing additional deliveries. Both shipbuilders have agreed to this build strategy.

In addition to the Department of the Navy's budget request, the continued support of Congress for Naval Reactors' Department of Energy (DOE) funding is vital to the Navy mission and ensuring the safe, reliable and enduring operations of the nuclear-powered Fleet. The President's fiscal year 2017 DOE budget fully funds Naval Reactors request for the OR SSBN. This funding is critical to maintain the reactor design and development in synch with the Navy shipbuilding schedule to support lead ship procurement in 2021. The DOE budget submission also provides full funding for refueling the Land-based Prototype. This effort not only supports development of the OR SSBN life-of-the-ship core, but also ensures Naval Reactors continues to train about 2,000 nuclear-qualified sailors per year for the next twenty years. Naval Reactors' DOE budget also includes funding for the Spent Fuel Handling Project. Recapitalizing this capability is critical to the Navy's tight refueling and defueling schedule of nuclear-powered aircraft carriers and submarines.

LARGE SURFACE COMBATANTS

Guided missile cruisers (CGs) and guided missile destroyers (DDGs) comprise our large surface combatant fleet. These ships fulfill broad mission requirements both independently and in conjunction with a strike group with demands for increased capability and capacity in Ballistic Missile Defense (BMD) and Integrated Air and Missile Defense (IAMD), a continued focal point. In order to meet the increased demand for BMD, the Navy forward deployed four BMD capable DDGs, USS *Donald Cook* (DDG 75) and USS *Ross* (DDG 71) in fiscal year 2014, and the USS *Carney* (DDG 64) and USS *Porter* (DDG 78) in fiscal year 2015 to Rota, Spain. Additionally, the BMD ships USS *Benfold* (DDG 65) and USS *Barry* (DDG 52) departed in October 2015 and January 2016 respectively to forward deploy to Yokosuka, Japan. The Anti-Submarine Warfare (ASW) combat systems on DDGs and CGs are also being upgraded, bringing significant improvements over legacy systems.

The *Arleigh Burke*-class (DDG 51) program remains one of the Navy's most successful shipbuilding programs with 62 ships currently operating in the Fleet. The fiscal year 2017 President's Budget includes funding for two destroyers to execute the final year of the current MYP. Both ships will incorporate Integrated Air and Missile Defense and provide additional BMD capacity known as Flight III, which incorporates the Air and Missile Defense Radar (AMDR) and will deliver this much needed capability, essential for future sea-based BMD, to the Fleet in the early fiscal year 2020s. The \$1 billion of incremental funding provided by Congress in the fiscal year 2016 budget for an additional DDG underscores the importance of these ships. The Navy will keep Congress advised throughout 2016 as we develop plans to award this ship.

AMDR is the future multi-mission radar of the Navy's surface combatant fleet, which will meet the growing ballistic missile threat by improving radar sensitivity and enabling longer range detection for engagement of increasingly complex threats. The AMDR radar suite will be capable of providing simultaneous surveillance and

engagement support for long range BMD and area defense. The program continues to demonstrate maturity in its design development including the successful completion of the AMDR System Critical Design Review and the successful design verification testing conducted thus far in the early stages of developmental testing. Detail design efforts for the DDG Flight III design will continue in fiscal year 2016, ultimately leading to over 90 percent detail design completion prior to start of construction on the first Flight III ship in fiscal year 2016.

The DDG 1000 *Zumwalt*-class 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. In addition to the ship's two 155mm Advanced Gun Systems capable of engaging targets with the Long Range Land Attack Projectiles, the ship will be capable of conducting ASW, Anti Air Warfare (AAW), land attack, and will provide valuable advancements in technology such as signature reduction (both acoustic and radar cross-section), active and passive self-defense systems, enhanced survivability features, and shipboard automation (in support of reduced manning). The DDG 1000 program accomplished several construction milestones in 2015 including an initial sequence of sea trials which tested the ship's hull, mechanical, and electrical systems. DDG 1000 is on track to complete sea trials for Navy acceptance in April 2016 and deliver to the Navy later this year.

SMALL SURFACE COMBATANTS

The Littoral Combat Ship (LCS) enables the Navy to implement the Defense Strategic Guidance (DSG) directive to develop innovative, low-cost, and small-footprint approaches to achieve our security objectives. The modular, open systems architecture inherent in LCS allows for rapid, affordable integration of new warfighting capabilities as technology evolves. LCS is designed to fill critical warfighting gaps assigned to the small surface combatant force across the full range of military operations while also fulfilling naval global commitments in operations other than war. 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 (C4I); sensors; and weapons systems, allow LCS to bring unique strengths and capabilities to the mission.

The Fast Frigate will incorporate significant improvements in lethality, survivability and capability from the LCS baseline configuration. The ship will provide multi mission ASuW and ASW capabilities as well as continuous and effective air, surface and underwater self-defense capabilities. The Frigate will be equipped with over-the-horizon (OTH) surface-to-surface missiles (in addition to LCS baseline Surface Warfare (SUW) and ASW Mission Package (MP) capabilities), and additional upgrades to combat and electronic warfare systems.

The 2014 FSA update outlines the requirement for 52 small surface combatants and determined a need for 26 deployed SSCs to meet the Navy's global peacetime and wartime requirement. The Navy's 2016 Long Range Shipbuilding Plan and the fiscal year 2016 FYDP included procurement of 14 LCS/Fast Frigate (FF) ships in fiscal year 2017–2021. In order to balance current and future capability needs within the fiscal year 2017 top line constraints, the procurement plan for LCS/FF was reduced to seven ships within the FYDP and the overall inventory objective was reduced from 52 to 40 ships. The Navy will evaluate the risk associated with this budget decision, in the broader context of total large and small surface combatant ship inventory, in the course of the 2016 FSA update to inform future shipbuilding plans.

The fiscal year 2017 President's Budget requests funding for the Navy to competitively award one LCS to each shipbuilder and solicit block buy LCS proposals from each shipbuilder, to be submitted with their 2017 ship proposals. Additionally, it includes a request for RDT&E,N funding to proceed with completion of respective Frigate designs. A competitive down-select to a single shipbuilder is planned for fiscal year 2019, but potentially as early as fiscal year 2018 based on the proposed Frigate design and the modified block buy cost. This acquisition strategy sustains the two shipbuilders competing for the single ship awards in fiscal year 2017 while enabling competitors to align long term options with their vendor base in support of the subsequent down-select, and accelerates delivery of the desired more lethal and survivable Frigate capability to the Fleet. Additionally, the plan preserves the viability of the industrial base in support of a pending decision regarding Foreign Military Sales opportunities, all the while preserving future decision space regarding the Frigate procurement should further future changes to operational requirements, budget, or national security risk dictate the need.

It is recognized that this down-select decision places one of our shipbuilders and part of the support industrial base at risk of closure. The Navy will use this current period of stable production—prior to the down-select decision—to thoroughly assess the impact of such potential closure on our strategic shipbuilding industrial base, the cost of our shipbuilding program, and our ability to support in-service ships, in order to identify appropriate actions to mitigate these impacts to the extent practical.

The LCS Mission Modules program provides focused Mission Packages for LCS that address critical Navy SUW, Mine Countermeasures (MCM), and ASW gaps identified in the 2004 Assured Maritime Access in the Littorals Initial Capabilities Document. The LCS Mission Modules program continues to field capability incrementally as individual mission systems become available in order to fill these critical warfighting gaps. The SUW MPs are being introduced in three phases, providing capability to address Fast Attack Craft and Fast Inshore Attack Craft in the littorals and maritime security and escort roles previously assigned to *Oliver Hazard Perry*-class Frigates and *Cyclone*-class patrol ships. MCM MPs are being fielded in four phases delivering capability to address maritime mines and to replace legacy *Avenger*-class Mine Countermeasures ships and MH-53E Sea Dragon helicopters that are nearing the end of service life. The ASW MPs will be delivered in a single phase and provide counter-submarine capability in littoral and deep water environments, High Value Unit (HVV) ASW escort and barrier patrol capability.

Increment 1 of the SUW MP, which consists of the Gun Mission Module (2 Mk 46 30 mm guns) and the Aviation Module (embarked MH-60R) and Increment 2 which adds the Maritime Security Module (small boats), completed the initial phase of Initial Operational Test & Evaluation (IOT&E) in September of 2015 aboard the USS *Coronado* (LCS 4). A subsequent phase of IOT&E will be conducted on another Independence-variant LCS in the summer of 2016, following upgrades to the ship's Integrated Combat Management System and SeaRAM weapon system. USS *Fort Worth* (LCS 3), with an embarked SUW MP, is currently on an extended operational deployment based out of Singapore. This embarkation of an SUW MP is also the first instance of an MQ-8B Fire Scout Vertical Take-off Unmanned Aerial Vehicle being deployed in conjunction with an MH-60R helicopter aviation detachment. The Navy completed the second in a series of Guided Test Vehicle launches of the Army's Hellfire Longbow missile in December 2015 to evaluate performance of the LCS Surface-to-Surface Missile Module in a littoral environment. The demonstration showed that the vertically-launched missiles could effectively acquire, discriminate and engage the representative targets.

Increment 1 of the MCM MP consists of the Remote Multi-Mission Vehicle (RMMV), towed sonar, and airborne mine detection and neutralization systems. Technical Evaluation (TECHEVAL) was completed in August 2015, aboard USS *Independence* (LCS 2). The Mission Package met the majority of its sustained area coverage rate test requirements, but significant reliability issues were noted with the RMMV and associated subsystems, which constitute the Remote Minehunting System (RMS). Based on TECHEVAL results, CNO and ASN (RDA) chartered an Independent Review Team to assess the RMS. The review team recommended halting the procurement of the RMMV Low Rate Initial Production (LRIP) 2 and recommended pursuing acceleration of other promising near term technologies to accomplish the MCM mission. The Navy will coordinate with all stakeholders, particularly the Fleet, in developing the way ahead for this important capability.

The ASW Mission Package, comprised of a continuously active variable depth sonar (VDS), multi-function towed array (MFTA), and a torpedo defense capability, is in development and preparing for Developmental Testing (DT). The ASW Mission Package completed its initial integration test onboard USS *Freedom* (LCS 1) on September 30, 2014. All primary test objectives were completed successfully. ASW MP testing has been successfully conducted using the Advanced Development Model (ADM) Platform. This platform allowed integration testing of the Continuous Active Sonar and VDS that will be associated with the ASW escort module. The ASW MP is on track to complete DT with IOT&E in late fiscal year 2018.

AMPHIBIOUS SHIPS

Amphibious ships operate forward to support allies, respond to crises, deter potential adversaries, and provide the Nation's best means of projecting sustainable power ashore. They also provide an excellent means for providing humanitarian assistance and disaster relief. Amphibious forces comprised of sailors, marines, ships, aircraft and surface connectors provide the ability to rapidly and decisively respond to global crises without a permanent footprint ashore that would place unnecessary political or logistical burdens upon our allies or potential partners. There are two

main drivers of the amphibious ship requirement: maintaining persistent forward presence, which enables both engagement and crisis response, and delivering the assault echelons of Marine Expeditionary Brigades (MEB) for joint forcible entry operations.

The CNO and Commandant of the Marine Corps have determined that the force structure for amphibious lift requirements is 38 amphibious ships, fiscally constrained to 34 ships. Balancing the total naval force structure requirements against fiscal projections imposes risk on meeting this requirement. Based on the footprint of a 2.0 MEB assault echelon force and assuming 90 percent operational availability, a minimum of 30 operationally available ships is assumed for operational planning. This would require a force made up of ten Amphibious Assault Ships (LHD/LHA), ten Amphibious Transport Docks (LPD) and ten Dock Landing Ships (LSD). At the end of fiscal year 2017, the Amphibious Force Structure will be 32 ships (9 LHD/LHAs, 11 LPDs, and 12 LSDs) increasing to 34 ships throughout the 2020s and 2030s. The Navy plans to maintain 11 deployable LSDs in the active force until LX(R) delivers by rotating three LSDs to complete phased modernizations beginning in fiscal year 2016. This will extend USS *Whidbey Island* (LSD 41), USS *German-town* (LSD 42), and USS *Tortuga* (LSD 46) to ensure 40 years of operational service life. This plan mitigates presence shortfalls and supports 2.0 MEB Assault Echelon shipping requirements.

LHA 6 *America*-class ships are flexible, multi-mission platforms with capabilities that span the range of military operations, from forward deployed crisis response to forcible entry operations. These ships will provide the modern replacements for the LHA 1 *Tarawa*-class ships, which have all decommissioned as of 2015, and the aging LHD 1 *Wasp*-class ships as they begin decommissioning in the late 2020s. USS *America* (LHA 6) and *Tripoli* (LHA 7) are optimized for aviation capability and do not include a well deck. USS *America* completed a portion of its Operational Test and Evaluation activities in San Diego, CA and commenced PSA in May 2015. The ship is scheduled to complete PSA in Spring 2016 and will subsequently complete further operational testing and training. As of March 2016, LHA 7 construction is 44 percent complete and on schedule to deliver in 2018.

LHA 8, the first Flight 1 ship, will have a well deck to increase operational flexibility and a reduced island that increases flight deck space to enhance aviation capability. The Navy completed the LHA 8 early industry involvement affordability phase in fiscal year 2015 in which 300 cost reduction initiatives were developed by industry and the Navy and Marine Corps. The affordability cost reduction initiatives drove technical and production improvements throughout the ship design culminating in the ship specification issued to industry for more affordable ship design and construction. LHA 8 is currently in competitive source selection as part of an amphibious and auxiliary shipbuilding acquisition strategy to support stability and affordability for this sector of the industrial base. Long lead time material procurement and detail design is scheduled to begin in June 2017, construction is funded in fiscal year 2017 and fiscal year 2018 and delivery is planned for fiscal year 2024.

The *San Antonio*-class (LPD 17) provides the ability to embark, transport control, insert, sustain, and extract elements of a MAGTF and supporting forces by helicopters, tilt rotor aircraft, landing craft, and amphibious vehicles. Two ships are under construction, *John P. Murtha* (LPD 26) and *Portland* (LPD 27), and will deliver in Summer 2016 and 2017, respectively. The balance of funding for LPD 28 was provided in fiscal year 2016. LPD 28 will possess all of the key fundamental capabilities and characteristics associated with LPDs 17 through 27, to include command and control, aviation operations and maintenance, well deck operations, and medical and will also incorporate system updates due to obsolescence. LPD 28's design and construction features will, at the same time, exploit many of the ongoing LX(R) design innovations and cost reduction initiatives that are necessary for the program to achieve affordability goals while maintaining the high level capabilities of the LPD 17 class. The procurement of LPD 28 will also assist in mitigating critical impacts to shipbuilding and combat systems industrial bases caused by the gap in ship construction, pending the award for LX(R) procurement.

LX(R) is the replacement program for the landing ship dock, LSD 41 and LSD 49 classes, which will begin reaching their estimated service life in the mid-2020s. LX(R) is envisioned to be a flexible, multi-mission warship with capabilities that support execution of the full range of military operations. The need to support disaggregated or split operations away from the Amphibious Ready Group or to deploy independently is a key driver for the design of this ship class. The inherent flexibility of amphibious ships is demonstrated by their support to seven of the 10 missions in the DSG. LX(R) will leverage mature design using the LPD-17 hull form while balancing cost and requirements to deliver key capabilities. The lead

LX(R) will deliver in fiscal year 2025 in advance of LSD 43's retirement in fiscal year 2027.

The Consolidated Appropriations Act, 2016 added funding for the acceleration of LX(R) and the program focus during fiscal year 2016 will be on validating the requirements in the Capability Development Document and executing contract design efforts. The Navy will initiate key long lead time material procurements critical to maintaining a stable supplier base, and commence design efforts necessary to accelerate design activities to fiscal year 2019. This earlier start will enable design completion and start of construction up to a year earlier, and delivery in fiscal year 2025, one year earlier than originally planned. The LX(R) contract design effort is part of the Navy's combined limited procurement acquisition strategy of LHA 8 and six T-AO(X) ships. Both General Dynamics NASSCO and Huntington Ingalls Industries, Ingalls Shipbuilding will be awarded a share of the LX(R) Contract Design, upon awards of LHA 8 and T-AO(X) contracts.

AUXILIARY SHIPS

Support vessels such as the Expeditionary Sea Base (ESB, formerly Afloat Forward Staging Base), Expeditionary Transfer Dock (ESD, formerly Mobile Landing Platform) and the Expeditionary Fast Transport (EPF, formerly Joint High Speed Vessel) provide additional flexibility to the Combatant Commanders. The USNS *Montford Point* (ESD 1) and USNS *John Glenn* (ESD 2) provide two core capabilities of vehicle and equipment transfer at-sea and interface with surface connectors to deliver vehicles and equipment ashore to complete arrival and assembly. The USNS *Lewis B. Puller* (ESB 3), the first Afloat Forward Staging Base (AFSB) variant of the ESD, was delivered in June 2015. ESBs are flexible platforms capable of hosting multiple mission sets with airborne, surface, and subsurface assets. The Navy started construction of ESB 4 in October 2015, and is planning for a fiscal year 2016 award of the fifth ESB. While not a substitute for amphibious warships, the ESB will relieve pressure on our amphibious fleet in routine operations. The EPF provides a high-speed, shallow-draft alternative to moving personnel and materiel within and between the operating areas, and to supporting security cooperation and engagement missions. The Navy continues to explore opportunities to further enhance EPF's operational profile to support/enhance warfighter requirements such as Special Operations support, Maritime Interdiction Operations, and ISR missions. EPF 6 was delivered in January 2016 and production continues with EPFs 7–10. In fiscal year 2016, Congress provided funding for a twelfth EPF and the Navy is currently issuing a Request for Proposal for construction of EPF 11 and 12.

The Combat Logistic Force consists of T-AOE fast support ships, T-AKE auxiliary dry cargo ships, and T-AO fleet replenishment oilers. Combat Logistics Force ships fulfill the vital role of providing underway replenishment of fuel, food, repair parts, ammunition and equipment to forward deployed ships and embarked aircraft, to enable them to operate for extended periods of time at sea. The T-AO and T-AKE ships serve as shuttle ships between resupply ports and their customer ships, while the T-AOE ships serve as station ships, accompanying and staying on-station with a Carrier Strike Group to provide fuel as required to customer ships. The Navy continued its efforts in 2015 to mature its concept for the replacement of the *Kaiser*-class (T-AO 187) of Fleet Replenishment Oilers. The new replacement oilers, currently designated as T-AO(X), will be double-hulled and meet Oil Pollution Act 1990 and International Marine Pollution Regulations. The lead ship is funded in 2016 with serial production beginning in 2018. The total ship quantity is planned to be 17 ships.

Beginning in 2016, the Navy will begin procurement of a combined Towing, Salvage, and Rescue (T-ATS) ship to replace the four T-ATF 166 class fleet tugs, which reach the end of their expected service lives starting in 2020, and the four T-ARS 50 class salvage ships, which reach the end of their expected service lives starting in 2025. The Navy appreciates the efforts of Congress to bolster the force structure and support the industrial base with the fiscal year 2016 accelerated funding for T-ATS and ESB.

SURFACE SHIP MODERNIZATION

The fiscal realities facing the Navy make it imperative that we modernize and extend the service lives of our in-service ships to meet the FSA requirements. The bulk of our current surface fleet was procured in the late 1980s and 1990s, and as such will reach the end of their service lives and retire at the same rate creating inventory shortfalls across the battle force. An important element of mitigation is the extension and modernization of our *Arleigh Burke*-class DDGs, *Ticonderoga*-class cruisers, and LSD 41/49 class amphibious ships.

The fiscal year 2017 President's Budget includes funding for the modernization of two destroyers to sustain combat effectiveness, ensure mission relevancy and to achieve the full expected service lives of the AEGIS Fleet. The destroyer modernization program includes HM&E upgrades as well combat systems improvements with upgraded AEGIS weapons systems Advanced Capability Build (ACB) 12 to include open architecture computing environment, BMD capability, installation of the Evolved Sea Sparrow Missile (ESSM), integration of the SM-6 missile, and improved air dominance with processing upgrades and Naval Integrated Fire Control-Counter Air capability. This renovation reduces total ownership costs and expands mission capability for current and future combat capabilities.

Cruiser modernization ensures long-term capability and capacity for purpose-built Air Defense Commander (ADC) platforms. Eleven recently modernized CGs (CG 52–CG 62) will perform the ADC function for deploying Carrier Strike Groups while the Navy modernizes the newest eleven ships (CG 63–CG 73). The newly modernized CGs will replace the first eleven CGs on a one-for-one basis as each older ship reaches the end of service life (35 years) starting in fiscal year 2020. To date, the Navy has modernized CGs 52–58 with the ACB 08 Combat System as well as substantial HM&E upgrades, and completed modernization on CGs 59, 60, and 62 with the improved ACB 12.

In fiscal year 2015, the Navy inducted the USS *Cowpens* (CG 63) and USS *Gettysburg* (CG 64) into modernization. The next two CGs, USS *Vicksburg* (CG 69) and USS *Chosin* (CG 65), will be inducted in April 2016. The modernization for these four ships is being executed in accordance with congressional legislation and is utilizing funding from the Ships Modernization, Operations, and Sustainment Fund (SMOSF). The induction of these ships also greatly supports industrial base workload. For example, our ability to accelerate the USS *Gettysburg* (CG 64) modernization is helping to mitigate the significant workload valley in the Hampton Roads area during 2016.

The fiscal year 2017 President's Budget requests \$521 million across the FYDP (in addition to current SMOSF funding) to support CG Modernization (\$183 million in fiscal year 2017) and proposes a CG/LSD modernization plan within this funding profile that ensures the long term capability and capacity for ADC platforms. This plan will avoid \$3 billion over the FYDP compared to the current Congressionally mandated plan. The fiscal year 2017 President's Budget supports the induction of an additional seven cruisers in fiscal year 2017, phased to ensure completion, where applicable, of each ship's planned operational deployment prior to induction.

During modernization, costs avoided by minimizing manpower and operations and support provide a fiscal offset that partially funds the modernization itself. This plan paces the threat through the installation of the latest technological advances in combat systems and engineering and will provide the means to retain the best ADC and Marine expeditionary lift capabilities through the 2040s. The plan proposed in the fiscal year 2017 budget provides significant cost avoidance within the FYDP, and Navy is fully committed to funding and completing modernization outside the FYDP. The Navy will continue to work with Congress to develop and evaluate funding options to mitigate the effects of the BBA and continue this vital modernization with adequate funding in fiscal year 2017 and beyond.

Similarly, the Navy plans to perform the final *Whidbey Island*-class midlife modernization as well as to extend two LSDs. This plan completes the HM&E midlife and modernizes combat systems, engineering and ship's control, satellite communications, computers, and intelligence gathering capability on USS *Tortuga* (LSD 46) extending expected service life from 35 to 44 years. LSD 46 was inducted into modernization in December 2015 and is scheduled to return to the Fleet in fiscal year 2019. Additional post-midlife modernization is planned for USS *Whidbey Island* (LSD 41) and USS *Germantown* (LSD 42) to execute structural, engineering, and combat systems modernizations to extend their expected service life. LSD 41 is planned for induction into modernization in fiscal year 2020.

COMBAT SYSTEMS

The Navy continues to field the most capable and lethal surface and submarine combat systems in the world. The combination of forward stationed and rotationally deployed AEGIS Baseline 9 cruisers and destroyers is a uniquely adaptable means to maintain global military presence while respecting the sovereignty of other nations. The forward presence of these large surface combatants provides an expansive range of options to influence events and project power in peacetime, crisis and war. AEGIS Baseline 9 incorporates advances in technology and keeps pace with emerging threats using networked-based, commercial off-the-shelf computing system infrastructures to bring increased warfighting capabilities. The related AEGIS Common

Source Library (CSL) enables software reuse and commonality across all modern AEGIS Combat System configurations: Air Defense Cruisers, IAMD Destroyers, New Construction IAMD Destroyers, and AEGIS Ashore.

To ensure the Navy maintains its defensive capability in the next decade and beyond, the Department is pursuing affordable defensive systems that are employable from multiple platforms. The use of spiral development has been utilized to acquire and field the newest surface ship electronic warfare systems. Under the Surface Electronic Warfare Improvement Program (SEWIP), we are replacing aging analog electronic warfare defensive systems first fielded in the early 1970's with new, digital systems. The first SEWIP program, Block 1, provides a digital backbone and highly sensitive receivers, while SEWIP Block 2 will add larger receivers to detect the current and projected future threats in the electromagnetic spectrum. These two spirals completed a highly successful deployment, aboard USS *Bainbridge* (DDG 96) in 2015. The SEWIP Block 3 program, entering its engineering and manufacturing development phase now, will add an active jamming system. Block 3 is currently on track to begin fielding in the 2019–2020 timeframe.

The Submarine community continues to successfully deliver improvements in Anti-Submarine Warfare utilizing a bi-annual spiral development model and leveraging Commercial-Off-The-Shelf (COTS) technologies via the Acoustic Rapid COTS Insertion (A-RCI) program. Developmental towed arrays with improved telemetry have been successfully fielded on deployed fast attack submarines and new contracts with these new telemetries will be awarded in fiscal year 2016. Progress in development of the Large Vertical Array continues on track in support of the Acoustic Superiority program.

Surface Navy ASW is evolving to an active sonar approach to counter advanced submarine capabilities. The AN/SQQ-89(V) sonar system processes active and/passive sensor data from the hull-mounted and towed arrays, and sonobuoys. We have installed over 30 SQQ-89 systems which include the multi-function towed array for extended passive detection. Additionally, the LCS ASW MP remains on track to achieve Initial Operational Capability (IOC) in fiscal year 2018. LCS with the ASW MP is capable of detection and tracking of submarines at extended ranges via multiple convergence zones. The ASW MP leverages existing and fielded technology, including a continuous active sonar/variable depth sonar (CAS/VDS), the multi-function towed array (MFTA), a command and control module, a torpedo defense module, and an aviation module.

WEAPONS

The Navy has made significant strides in extending the fleet's layered defense battle-space while also improving the capabilities of the individual ship defense layers in order to pace the increasing anti-ship missile threat. Standard Missile-6 (SM-6) provides theater and high value target area defense for the fleet and with integrated fire control has more than doubled defensive battle-space. SM-6 testing between March 2015 and January 2016 achieved maximum range, reliability and multi-mission capability goals. The Evolved Sea Sparrow Missile (ESSM) program awarded the Block 2 Engineering Manufacturing and Development contract in 2015, which will leverage the SM-6 active guidance section architecture to improve ship self-defense performance against stressing threats and environments. Rolling Airframe Missile (RAM) Block 2 achieved IOC in May 2015, providing improved terminal ship defense through higher maneuverability and improved threat detection.

The fiscal year 2017 President's Budget includes funding to upgrade the Standard Missile-2 (SM-2) inventory with active guidance. This investment provides an affordable, integrated fire control capable, area defense missile to counter stressing threats. (Potential \$2 billion savings compared to filling the entire area defense inventory needs with the SM-6 Block 1A missiles.)

Affordability continues to be a focus for weapons. International cooperation on ESSM and RAM results in our allies sharing 50 percent or more of the program costs. By leveraging investment in previous designs, the Navy's development, production, and maintenance costs are reduced. The increased capabilities inherent in these new designs can also support the use of these weapons in additional roles thereby creating multi-mission weapons from existing designs. The fiscal year 2017 President's Budget provides the funds required for these critical activities.

EXPEDITIONARY WARFARE

The Navy/Marine Corps team provides the Combatant Commanders and our Nation the options needed to engage with our partners, to deter our adversaries and, when needed, to fight and win. Unique to our expeditionary warfare capabilities is the ability to maneuver ashore and force entry once there. That ability is provided

through the combination of air and surface connectors to move the ground force from the sea base to the ashore objective and the organic capability of the ground force to maneuver and fight once ashore.

The Seabasing Joint Integrated Concept requires surface capability to transport personnel, supplies and equipment from within the seabase and maneuver them to objectives ashore. Surface connectors with enhanced speed and range will provide future expeditionary force commanders greater flexibility to operate in contested environments. Our primary surface connectors, the Landing Craft Air-Cushion (LCAC) and the Landing Craft Utility (LCU) are reaching the end of their service lives and require modern replacements.

The fiscal year 2017 President's Budget requests \$128 million for new Ship to Shore Connector (SSC) air cushioned vehicles and additional funding across the FYDP for procurement. The SSC is the replacement for the aging LCACs which have undergone service life extension programs (SLEP) and a Post SLEP sustainment program to mitigate the gap as the SSC is developed and fielded. Additionally, funding was provided in fiscal year 2016 to accelerate the procurement of the LCU-1700 Program (formerly known as the Surface Connector (X)-Recapitalization (SC(X)) program), which is planned to recapitalize the aging LCU 1610 class.

These platforms are essential in connecting the combat power and logistical sustainment that the sea base provides with the forces that are operating in the littorals and inland for all missions. The Department will continue to explore future connector options that will increase our ability to exploit the sea as maneuver space by increasing range, speed, and capacity.

The whole principle of Expeditionary Warfare is to operate forward, to exploit the seas as maneuver space—as a base for global power projection—and to be ready to maneuver to shore when so ordered. Our ability to deploy from the sea in austere environments at a time and place of our choosing gives us significant tactical, operational and strategic advantages over potential adversaries.

UNMANNED SYSTEMS

The Department of the Navy has placed a priority on the development of unmanned systems leading to a fully integrated manned and unmanned fleet. Unmanned technology will not replace our sailors and marines, instead it will unlock their full potential as we integrate this technology with our total forces.

Currently, our warfare communities are all doing superb work in unmanned systems and integrating them into the existing architecture within their own framework, but as this technology becomes more complex and widespread, ensuring we have a cohesive management function is critical to maintaining our superiority across all domains, and possibly even multiple domains.

Autonomous Undersea Vehicles (AUV) are a key component of the Navy's effort to expand undersea superiority. These unmanned vehicles operate independently from or in cooperation with manned vehicles, conducting maritime missions such as ISR, Seabed Warfare, and Deception. AUVs and undersea fixed systems will operate in areas that are inaccessible to manned submarines and ships.

Dozens of AUVs are conducting sea sensing and mine countermeasure tasks today with human-in-the-loop supervision. Developmental work to expand AUV endurance, autonomy, and sensor/payload capability will eventually enable AUVs to operate for days or weeks with minimal human interaction needed to ensure successful task completion. While nominal force structure requirements for fiscal year 2025 have not been determined, the Navy is committed to growing both the size and composition of the AUV force. In the near-term, AUVs present an opportunity to increase undersea superiority and offset the efforts of our adversaries.

The Large Displacement Unmanned Underwater Vehicle (LDUUV) is an unmanned undersea vehicle to offload "dull, dirty, dangerous" missions from manned platforms & mitigate the submarine gap beginning in 2022. LDUUV will be launched from a variety of platforms, including both surface ships and submarines. The craft's missions will include ISR, acoustic surveillance, ASW, MCM, and offensive operations.

The Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) commonly referred to as Knifefish employs a low frequency broadband synthetic aperture sonar. Knifefish simultaneously detects volume and buried mines in high clutter environments, and is planned for incorporation into Increment 4 of the LCS MCM MP.

The Common Unmanned Surface Vehicle (CUSV) is capable of towing sensors that provide various capabilities, including minehunting and influence sweep. The vehicle's modular design allows it to be reconfigured to perform either function.

CUSV, Knifefish and an upgraded RMMV are being considered as replacements for the RMMV in the LCS MCM Mission Package.

AFFORDABILITY AND THE SHIPBUILDING INDUSTRIAL BASE

Stability and predictability are critical to the health and sustainment of the Nation's shipbuilding and combat systems industrial base. A healthy design and production industrial base is critical to achieving Department priorities and fulfilling Navy near term and long term needs. The shipbuilding industry, with its interdependent suppliers and vendors, is a complex system where today's decisions have a cascading effect both in the near-term and the future. Perturbations in naval ship design and construction plans are significant because of the long-lead time, specialized skills, and extent of integration needed to build military ships. Each ship is a significant fraction of not only the Navy's shipbuilding budget, but also industry's workload and regional employment. Consequently, the timing of ship procurements is a critical matter to the health and sustainment of U.S. shipbuilding and combat system industries, and has economic impacts at the regional and local levels. It is important, therefore, for the Department to provide stability and predictability to the industrial base, including key suppliers and vendors, to maintain our ability to continue to build the future Fleet as outlined in the long range shipbuilding plan.

While top-line budget reductions impose significant challenges and result in some uncertainty for portions of the industry, the Navy is committed to identifying and implementing solutions to stabilize and maintain the base. The Navy will continue to take prudent actions to contain and reduce costs, foster efficiency and sustain the industrial base. Key to cost containment and reduction is the implementation of innovative acquisition strategies that stabilize ship construction workload while maximizing competition within the industrial base. Just as vital for cost reduction is a focus on product design to include initiatives such as design for affordability and modularity, incorporation of combat system open architecture, design and ship specification stability, and strict control over change orders. Improved material management and selection, utilization of Economic Order Quantities and the pursuit of cross-program common equipment buys further cost containment and reduction objectives. To foster efficiency, the Navy will continue to make investments to support shipyard facility improvements and the development of optimal build plans which support current and future ship construction.

In support of industrial base sustainment as well as cost reduction, the Navy will continue to stabilize procurements through utilization of block buys and Multi Year Procurements. Additionally, we will consider judicious use of Advance Procurement to bridge production gaps and sustain the vendor base while at the same time mitigating material risk and improving program schedule and cost performance. Navy support of shipbuilding capability preservation agreements and build strategies (such as SUBS) will also provide stability and improve potential for cost reductions. In addition to improving affordability in procurement, these strategies minimize life-cycle costs, improve and ensure quality products, facilitate effective and efficient processes, and promote competition—which all support Department priorities.

Senator WICKER. We will recognize each of you for as much as 5 minutes each. Secretary Stackley, we will begin with you and then followed by Vice Admiral Mulloy and Lieutenant General Walsh.

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

Mr. STACKLEY. Yes, sir. Mr. Chairman, Ranking Member Hirono, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to address Navy's shipbuilding.

On behalf of the Navy and the Marine Corps, I would like to start by thanking the Seapower Subcommittee for your strong support in the 2016 defense bill not only as Congress fully supported our request, but you have increased funding for our ship programs, sending a strong signal regarding the priority you place on the role of the Navy and Marine Corps.

We are committed to make good on that investment to uphold our end of our shared responsibility to protect the Nation, to take care of our men and women in uniform, and to do so in the most cost-conscious manner possible to protect the taxpayer. We have been faithful to our fiscal responsibilities leveraging every tool available to drive down cost.

However, fiscal challenges remain. Across the past 4 fiscal years, the Navy's budget has been reduced by \$30 billion compared to the funding that we determined was necessary to meet the defense strategic guidance. This fiscal environment continues to drive tough choices, and it requires new thinking in order to improve the balance between capability, capacity, readiness, and the vital industrial base.

Independent of the fiscal environment, the demand for naval presence remains high. Today, greater than half of our fleet is at sea and near 80,000 sailors and marines are deployed. From the Sea of Japan to the eastern Mediterranean, they are our first defense against the threat of ballistic missiles. From the Strait of Hormuz to the Strait of Malacca, they are the providers of maritime security.

They are engaged in expeditionary maneuver from the Western Pacific to West Africa, ready to move ashore should conditions on the ground call for it or provide humanitarian assistance, disaster relief wherever disaster may occur. They are training and operating with coalition partners in all corners of the globe, and below the surface of the sea, they are our nation's surest deterrent against the use of strategic weapons.

Consistent with these demands, we have placed a priority on forward presence, near-term readiness, investment in those future capabilities critical to our long-term technical superiority and stability in our shipbuilding program. Today, with greater than 60 ships under contract and construction, we are on track to meet our requirement for a 308-ship Navy by 2012.

We are preparing CVN-78, the *Gerald Ford*, our first new design aircraft carrier in 40 years for sea trials in June and continue construction of her sister ship CVN-79, the *John F. Kennedy*. In doing so, we have been successful in our drive to control and improve cost on these capital ships, and we will continue to do so.

We are also proceeding with planning and material procurement to refuel CVN-73 *George Washington* scheduled to start next year. The *Zumwalt* destroyer, DDG-1000, our first new-design destroyer in 30 years, successfully completed her builder's sea trials in March and is preparing for acceptance trials later this month. Meanwhile, DDG-51 construction is progressing well with a first restart ship DDG-113 on track to deliver this year and follow ships 114 and 115 in the water.

We recently awarded the two fiscal year 2016 ships of the DDG-51 multiyear contract, and we are intent on awarding the additional DDG incrementally funded by the 2016 defense bill pending determination regarding the balance of funding for this ship.

We are also on track to award the Flight III destroyer upgrade with the Air and Missile Defense Radar later this year as modification to the latter of these fiscal year 2016 ships.

The Littoral Combat Ship construction program continued its strong cost improvement with the delivery in 2015 of USS *Milwaukee* and USS *Jackson* and with the award in 2016 of the final three ships of the 2010 block buy contract.

As you are aware, we revised the program one year ago to upgrade the LCS with increased capabilities consistent with a frigate. The first of these frigates is on track to award by fiscal year 2019. As a result of the budget reductions since that decision, this year's request downsizes the program from 52 to 40 ships total. The two ships requested in 2017 are the minimum necessary to maintain a healthy industrial base until we can run the down-select competition for the frigate. We will keep you advised as we formulate the acquisition strategy for this revised program.

In submarines, the *Virginia* program continues to deliver below budget and ahead of schedule, and we are accelerating the pace of design on the *Ohio* Replacement Program to support her critical schedule, releasing the contract solicitation for detailed design and construction of the lead boat earlier this year.

In other major programs, the 10th LPD-17 [San Antonio-] class ship *John P. Murtha* is on track for acceptance trials this month. The big-deck amphibious assault ship Tripoli LHA-7 is on track towards her 50 percent milestone, and we are continuing excellent learning curve performance with construction of *Hershel "Woody" Williams*, our second expeditionary staging base.

Meanwhile, we are evaluating proposals for three major new programs to be awarded this year: the fleet oiler T-AO(X), the next big-deck amphib LHA-8, and the design for the LSD-41 class replacement LX(R).

It is also worth noting that we are proceeding with execution of our cruiser and LSD [dock landing ship] modernization programs. The first four of 11 remaining cruisers have entered modernization, and this budget requests an additional \$521 million across the Future Years Defense plan, in addition to the \$1.6 billion prior appropriated funding to support cruiser modernization.

This falls well short of the \$3.5 billion that would have been required in the 2017 through 2021 years to continue cruiser modernization per our congressional direction in the 2016 NDAA [National Defense Authorization Act]. We are unable to fund this approach while our top line was decreasing. Nonetheless, we are committed to modernize these ships to perform their defense commander mission into the 2040 time frame, and the Navy submission provides an affordable path to do so.

In summary, the Department's 2017 budget request has balanced the resources provided by the Bipartisan Budget Act with our requirement to provide the capacity, the capability, and the readiness necessary to uphold national policies, to protect our nation, and assure our allies. We look for your continued strong support for this budget request as you have shown in this year's 2016 budget.

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

Senator WICKER. Thank you very much.

Vice Admiral Mulloy, do you have a statement?

Admiral MULLOY. Yes, sir, I do.

STATEMENT OF VICE ADMIRAL JOSEPH P. MULLOY, USN, DEPUTY CHIEF OF NAVAL OPERATIONS FOR INTEGRATION OF CAPABILITIES AND RESOURCES (N8)

Admiral MULLOY. Chairman Wicker, Ranking Member Hirono, and distinguished members of the subcommittee, I am honored to be here today to testify on the Navy's 2017 budget request and our shipbuilding programs. I look forward to working with all of you during the year.

As detailed in the Chief of Naval Operations' recently issued design for maintaining maritime superiority, the emerging security environment is rapidly becoming increasingly globalized with accelerating change and rapid advances and proliferation of technology. We must continue to invest in sustaining our ability to outpace our adversaries and fight with decisive capability across the full range of operations at sea, from the sea, and across all domains.

However, the fiscal realities drove tough choices, particularly in 2017 where the Navy had to balance over a \$4 billion reduction on the Bipartisan Budget Act. After integrating strategic guidance, operational context, and fiscal constraints, I do believe that our 2017 budget provides the best balance between capability, capacity, and readiness within our fiscal guidance.

We made focused investments, hard prioritized choices, and innovation reform efforts to deliver a global sea-based force that can fight and win against our five major challenges, and we invested in advanced capabilities that increase our lethality for both our current and our future force. We remain committed to the Asia-Pacific rebalance and we will achieve 308 ships by the end of 2021.

In prioritizing advanced capabilities, our hard choices came with some increased risk, primarily in capacity, military construction, and some readiness. In shipbuilding, this risk is primarily seen in the reduction of the LCS and frigate's small service combatant force from 52 to 40. We also had to reduce weapon inventories by almost 900 munitions over our 5-year plan.

This reduced capacity in readiness in our presence options slows our time to arrive in a combat zone, which could result in longer timelines to achieve victory should we have to engage in war. However, absent fiscal relief, our 2017 investments and critical capabilities strengthen our naval power at and from sea not only to address today's threats but also tomorrow's.

On behalf of all our sailors and civilians, I thank the subcommittee for the immense support you have shown the Navy over many years. We are very grateful. We again ask your support for our 2017 budget request and the balance provides under the Bipartisan Budget Act.

I look forward to answering your questions.

Senator WICKER. Thank you, sir. Lieutenant General Walsh?

STATEMENT OF LIEUTENANT GENERAL ROBERT S. WALSH, USMC, DEPUTY COMMANDANT FOR COMBAT DEVELOPMENT AND INTEGRATION; COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT COMMAND

General WALSH. Thank you, Chair Wicker and Ranking Member Hirono. Just a few comments I would like to make.

I would like to first thank the committee for the strong support you have given to our Navy and our marines over the years, especially last year with LPD-28 and the acceleration of the LX(R) has gone a long way towards meeting our requirements, our global requirements that we have got across the world.

I think as you look at the shipbuilding plan, I think we are on a strong path right now on our amphib ship program. I think we have reversed the downward decline to 30, and we have got a strong path with LX(R) coming online. The LPD-28 is that bridge ship as we are calling it, going from an LPD-17 to the LX(R). We are excited about the LHA-6 America that we have got out and our LHA-7, which Tripoli is right behind, and the contract negotiations that we are soon to have on LHA-8, which will follow with bringing oil deck back into our big-deck amphib.

I think as you look across the connector force, I think there are a lot of good things going on there as we have got our amphibious warships, our marines on those ships, which are a landing force, and then we have got to get those marines ashore. We are replacing our aged LCACs [Landing Craft Air Cushion] with the ship-to-shore connector program, which is moving in the right direction and is going to bring us tremendous capability as it replaces those LCACs. Right behind that is replacing our old landing craft units with the new LCU 1700, which is going to bring us also good capability.

I think, Chairman, as you discussed balancing readiness and modernization, I think that is a challenge we all have. We have talked about the budget and the pressure that is on the budget. I kind of compare it to looking back at the cold war a little bit and where we are at today, two completely different times. What we have got today is our marines, even though we have reduced operations in Afghanistan and Iraq, we are still deployed at about a 1-to-2 deployment-to-dwell ratio.

You mentioned requiring to meet commander demands over 50 amphibious ships. The demand is very high for our Navy and Marine Corps all across the globe, and we see that. No change really at all in how hard our sailors and marines are working across the globe, and like I said, it is really seen in that 1-to-2 deployment-to-dwell ratio.

The thing that I will say, though, that is changing in my mind is for the last 14 years we have been against a fairly steady state threat in Iraq and Afghanistan, and we have had a clear focus on that. What we see is that threat continues to stay out there and is not diminishing, but at the same time we see a rise in China in East and South China Seas. We see a tremendous growth in their modernization and their military capability. At the same time we see Russia and Syria, in Georgia, Crimea, and Ukraine and some of the activities. They have gotten high-end capabilities that they are delivering out there.

All those would be a challenge to our force today with the capabilities that we have been focused on for the last 14 years. I think that is going to take a change in the modernization strategy that we are on right now. We all see that to be able to operate on tomorrow's battlefield with those complex and hybrid threats that we are

going to see in a very complex world that we are seeing out there today.

That balance between that readiness and modernization, as I look back to the cold war, we stayed very focused on a high-end threat, and it was a gradual increase in our capabilities after really World War II that we just continued to ramp up those high-end capabilities.

This is more of a coming out of Iraq and Afghanistan and now seeing that threat right in front of us, we have not had that time to ramp up that capability while the threats have continued to modernize and increase their capability.

I think that is the difference is looking at the threats we see today are a lot of the same type of threats that we saw back in the cold war that we in the Marine Corps certainly and I think also our Navy partners had not focused on the high end that had been in the electromagnetic spectrum, signals intelligence, some of those areas there to be able to defeat a higher-end threat.

Our focus is really changing. That balance between trying to maintain that high-end for deployed forces, along with modernizing a force is that balancing that risk that we are under right now.

Again, I thank the committee's support for all you are doing for our Navy and Marine Corps.

Senator WICKER. Well, thank you, all three of you, for your very impressive opening statements and your insights.

General Walsh, you began by talking about the LX(R) and our teamwork in accelerating that program. How important is this class of ship to the Marine Corps in meeting your requirement, and how important is it to our marines?

General WALSH. Sir, that is a great—you know, we talked about the demand on the amphib force right now and in the Navy in general about the ships. What we are seeing right now is—I would say specifically an example would be we used to have an amphibious-ready group in the Mediterranean years ago when we had a larger-size force. I think over the last 14 years or so it has kind of been quiet in that area, but things have gotten a lot more complex off of African and the Mediterranean region. We would like to have a capability of the ships that are there.

As you are well aware, if we put a Special-Purpose MAGTF, Special Purpose Marine Air-Ground Task Force in Moron, Spain, that operates out of Moron, Spain; Sigonella, Italy; and also Souda Bay, Greece, we kind of work out of those three places because we do not have enough amphib ships in that area.

I think as we look at the amphibious ships we have got right now, we went from a time and place where we had three amphibious ships tied together in an amphibious-ready group with our Marine Expeditionary Unit, always worked up together, trained together, deployed together. We are expected to stay together. Those commanders loaded those ships to be able to expect to operate and work together.

Recently, we have written a concept of operations for disaggregated ARG [amphibious ready group] MEU concepts to be able to allow us to train in advance, to be able to split those ships up in advance when they deploy and be able to operate that way.

The LSD ships that we have today are really cargo trucks that we have to be able to carry the gear that goes with those amphibious ready groups. The LPD-17 class ship is able to—because it is a newer ship, brings tremendous aviation capability, medical capability, along with probably most important command-and-control capability to those ships. By allowing it to have that capability, we can split that ship off with an aviation debt with a pretty good significant punch to go with it to be able to deploy independently and sail whether it is on an independent deployment or away from the ARG MEU. The LSDs do not really have that capability.

By going to the LX(R) with a derivative of that or if we are using the same hull form, we are going to have pretty close to the same capability that is going to allow us to be in more than one place at the same time with the capabilities that that ship brings.

Senator WICKER. All right. Secretary Stackley, both you and General Walsh mentioned that we work together, we are able to get an extra \$279 billion above the President's request. To what extent did that help us accelerate based on last year's congressional action?

Mr. STACKLEY. Yes, sir. It helped in a couple of ways. First, the dollars that were provided in the 2016 bill and the authorizations that came with us allowed us to first go after the planning activities, which is the first thing you have to do with a new ship program, get the planning activities going. We are working in parallel with what we refer to as preliminary design for the ship, and then perhaps most importantly is to start ordering long-lead-time material that will support, one, the vendor base, and then two, will start an earlier start of construction for the ship.

Senator WICKER. From when to when?

Mr. STACKLEY. Right now, it is at 2020 procurement. The advanced procurement material that you have allowed us to go ahead and go forward with in 2016 we believe that we can pull construction to the left by a year, and this year's budget reflects—

Senator WICKER. 2019?

Mr. STACKLEY. Effectively, we are on the same schedule for construction as though we were going to procure the ship in 2019. In other words, when you award the ship, typically, you do not start construction right away. But with the advanced procurement, we will have enough material ready and the planning ready and the design ready that the shipbuilder can in fact accelerate construction by a year. It has the effect of accelerating the program by a year.

Senator WICKER. What if anything could we do in the NDAA this year to further accelerate?

Mr. STACKLEY. Additional advanced procurement dollars, buying additional material will not further accelerate the LX(R). As I look at the issue—

Senator WICKER. Is there any way to further accelerate?

Mr. STACKLEY. The critical path today is the design, leading to a competitive award. The design would support an award in 2019. We believe that we could support a 2019 contract award, and with the advanced procurement [AP] would allow us to then double-down on the acceleration. The AP in 2016 would provide one year's

acceleration. Design would support a second year's worth of acceleration. The challenge becomes the budget.

As we have already discussed in our opening statements, the challenges that we have in the budget today stand as a hurdle between us and pulling that ship to the left another year. What I would propose is that we take a hard look at what the funding stream would be required to support that additional year's worth of acceleration, and without pulling the whole ship to the left, what additional funding, with incremental funding authority, would allow the acceleration without breaking our budget.

Senator WICKER. There is additional acceleration that could be had if we work together and are smart?

Mr. STACKLEY. Yes, sir. Critical path is designed—the design right now, we are on a path to support and award as early as 2019. We have budget challenges associated with doing that. A way to mitigate the budget impact would be looking specifically at the funding requirements on a year-by-year basis and look to see if it would make sense to incrementally fund that ship to allow it come to the left a year.

Senator WICKER. Okay. Well, I am way past my time, but let me ask one other aspect of this program since we are on it, and that is are we going to have a production gap between the LPD and the LX(R) as we did when we paused the DDG destroyer program, and upon restarting production there, costs increase by perhaps 25 percent? Are we looking at the same thing possibly happening because of a gap between the LPD and the LX(R) and what efficiency and cost losses could we avoid in that regard looking forward?

Mr. STACKLEY. Yes, sir. The first place where a gap would occur is the vendor base. Again, we are taking the advanced procurement dollars that you have provided and we are serving the vendor base to identify any potential breakage that would occur to make sure that we are first addressing those issues between now and when LX(R) starts.

Now, recognize that the acquisition strategy for LX(R) is to compete the program, and so today, Ingalls is building the LPD-17 class. If Ingalls were to win the competition and we were not able to further accelerate the LX(R), then there would not be the overlap that you want on a shipbuilding program to retain efficiencies and retain the skilled workforce. The impact would not be the same that we saw on DDG-51, but there would be an impact.

Senator WICKER. Thank you.

Senator HIRONO?

Senator HIRONO. Thank you very much.

As long as we are on the subject of the LX(R), I know that the Navy announced an intention to compete a package of ship contracts, including the T-AO(X) oiler, the LHAR, and the LX(R) ships. There is a desire to accelerate the LX(R). You know, could Congress accelerate the LX(R) program in a responsible way and avoid undermining your acquisition strategy? If so—you have spoken you could accelerate by 1 year, by 2 years—can we do this in a responsible way and maintain your strategy of competition?

Mr. STACKLEY. Yes, ma'am. You touched on two topics. One is the pending contract to award for the combined solicitation for the LHA-8 and the T-AO(X). In the chairman's opening remarks, he

wanted us to address what we are doing to help provide stability for the industrial base. That acquisition strategy goes exactly at stability for the industrial base while also preserving competition on the two programs.

We have two shipbuilders that are competing for two separate shipbuilding programs, and in the end, we will receive the competitive pricing that we desire, but we are going to be providing stability to both those builders because they both recognize that they will get—that that work will be split between them.

Now, after we complete that award in about the June time frame, we will have a clear picture of what the workload looks like at the same two shipbuilders that will be competing for the LX(R) contract. We will understand what the workload picture looks like.

Your question regarding the ability to accelerate and preserve competition, we can accelerate a year without impacting the competition. From 2020 to 2019, that work that needs to be done for design we could accelerate a year and we would not harm either competition or the maturity of the design that we want for the LX(R). Then the second year we effectively gain by simply having the material available so construction can start to an earlier schedule. That is the potential in terms of 2 years of acceleration to construction while also preserving competition.

Senator HIRONO. I think that is a worthy goal to follow.

Regarding the 308 ships that is our goal, and we are told that by 2024 we will get there, and with the rising of China, I did want to ask Admiral Mulloy, how are you incorporating the shift to the Asia and the Pacific in reviewing requirements for the number of ships that you will need and where they will be based? Because you also mentioned that, yes, we have a continuing commitment to the rebalance to the Asia-Pacific.

Admiral MULLOY. Yes, ma'am. As we currently move the ships we currently have and as we build more, the focus is getting to 60 percent of the Navy by platforms in the Pacific. We are currently at about 57 going on 58 percent, so we still have some more ships to move. We are also moving as they are new out there also. We just moved two more DDGs to Japan that have the ballistic missile defense capability. We put a fourth submarine in Guam. We moved a second submarine tender to Guam to be able to maintain the submarines and be able to actually assist all the Pacific ships. As one of the tenders leaves Guam, it can also go be repaired.

We are putting the most modern airplanes out there. We are putting—the first Joint Strike Fighter squadron will be in Lemoore, California. We are putting—right now, we have one LCS in Singapore. We will have four LCS by 2019.

As we focus on the newest platforms, the newest technologies, we position them in the Pacific and the numbers go up. Across the board in every aspect of the Navy, once again, new is there and also more numbers are there.

We have to balance slightly, though, as we look at the new world order only because what I could is the more rapid reemergence on the world scene of Russia and their ability to move their product and dangerous equipment around, in Syria they have now installed missile systems which are a tremendous threat.

As we look at what do we have to have in the Pacific, in many cases we have to deal with the same electronic warfare high-speed weapons or similar on a Russian technology. It implies the four DDGs in Rota, we need those for ballistic missile defense. We also need to make sure they can survive cruise missile attacks, which are similar but different than China.

It is a constant tension, as we talked to the CNO [Chief of Naval Operations] and the Secretary of the Navy where to put these ships. Generally, the Pacific will get more, but you still have to put a Baseline 9 Aegis ship in the Atlantic such that it can go to the Mediterranean because if you are in the eastern Med or the Black Sea or near Russia, you need to be also very aware of a dangerous missile system.

Senator HIRONO. With both Russia and China really increasing and modernizing and adding to their military assets, one wonders whether 308 ships is really, you know, what we should be talking about.

Admiral MULLOY. Yes, ma'am.

Senator HIRONO. But it is all a function of money, I realize.

Admiral MULLOY. Yes, ma'am. It is a function of money and also looking at the world. The 308-ship Navy was based upon the 2014 force structure assessment. Chief of Naval Operations has commissioned me to do another one, and we are in process now, which will take into account changes in China but largely the changes in, as General Breedlove has talked about as he looks at the world and advises the chairman and the President on the status in Europe and Russia, we will also look at it.

I think the CNO in testimony before you hearing of the whole committee talked at very length that that number would probably go up over time. But we actually need to go through that and do our analysis, and we will come back in next year's budget, lay out what we think the Navy really is necessary for national defense.

Senator HIRONO. I look forward to that.

Regarding the Littoral Combat Ship program—

Senator WICKER. Can I interject? Do you want to give Senator Hirono a sneak preview about what that number might be later on this year? Come on.

[Laughter.]

Admiral MULLOY. Sir, you know, I will not even have a number until September, so perhaps—

Senator WICKER. Okay.

Admiral MULLOY. I cannot really commit to any "sneak peeks," sir. I mean, we certainly will come over and talk to the committee as we go through this process. We can talk about it, but we really have to deliver that to the CNO first, and I am not expecting to have that discussion with him until the end of August.

The teams are actually in the process of arranging flights out to the numbered fleets as I speak, sir.

Senator WICKER. She is pretty correct. It is likely to go up?

Admiral MULLOY. Yes, sir. The CNO did kind of say at his hearing that as he looks across the world as more dangerous, the size of the Navy very likely will have to go up in that world, sir.

Senator WICKER. Senator Hirono?

Senator HIRONO. Thank you very much. My time is up, Mr. Chairman.

Senator WICKER. Thank you, ma'am.

Senator SESSIONS is next.

Senator SESSIONS. Thank you, Mr. Chairman. I thank all of our witnesses.

Mr. Stackley, we are glad to have you with us. I think the country is blessed to have someone with your experience in this work and your integrity.

I want to focus on the LCS, littoral combat ship. The way I look at the numbers, our Navy procurement plan in 2016 was for 48 ships, for 2017 it was 38 ships over 5 years to be procured, and that is a fundamental reduction of the 10 ships from the LCS, a rather dramatic change, one of the most dramatic changes in shipbuilding I have seen in a number of years here in the Congress. I think we need to talk about that.

Admiral Mulloy, the 52 LCS ships that were Navy requirements, a requirement is done through a formal process, is it not?

Admiral MULLOY. Yes, sir. It is done through that process, the force structure assessment, as we look at the needs of the commanders of the Navy around the world.

Senator SESSIONS. As a result of—and that requirement has never been altered by the Navy?

Admiral MULLOY. No, sir. That number is still 52. We will go and probably verify it, but I do not see that number changing as we work through our next force structure assessment.

Senator SESSIONS. Secretary Stackley, Secretary Hagel wanted a more combat-oriented ship, and he made an evaluation and decided to use an up-armored—as might call it—LCS, and that would be 52 ships, but 20 of them would be classified as frigates, is that correct?

Mr. STACKLEY. That is correct. We were specifically tasked with coming up with an alternative that would be more lethal, more survivable, and that at least 20 of the 52 small service combatants would be this frigate-type ship.

Senator SESSIONS. That was the recommendation that was made to Secretary Carter from the Navy to maintain the 50 ships with 20 frigates when he made his decision to reduce the number from 52 to 40.

Mr. STACKLEY. The way I would describe it was we spent the prior year, the 2016—as we built the 2016 budget, going through our requirements review, effectively an analysis of alternatives arriving at the frigate design, and we carried that exact plan into our 2017 budget. The 2017 budget that the Navy built included 32 LCSs, 20 frigates, and the frigate would start in 2019.

Senator SESSIONS. You wrestled with that and you made your priorities on the amount of money you had, and you still recommended that the LCS be a total of 50, but the Secretary decided otherwise?

Mr. STACKLEY. Well, I would say that our requirement for 52 small service combatants was unchanged. Our budget, as we built it for 2017, supported the 52 plan just as it was presented in 2016 to Congress. Then with the reductions to the budget, in the budget process the final decision was made that we would truncate the

program to 40 and effectively reduce the rate at which we procure the LCSs in the Future Years Defense plan.

Senator SESSIONS. Well, if you go to a—so the plan calls for a down-select to one shipyard, in effect a closing of the other shipyard, is that correct?

Mr. STACKLEY. Yes, sir. The profile that has come across in the budget, it is insufficient to support two builders, and that would drive a down-select decision.

Senator SESSIONS. You know, Marinette, Wisconsin, and the shipyard in Alabama, I assume, are similar. There are 4,000 people working at this shipyard in Alabama producing a fabulous new ship, I think.

With regard to the capabilities of the ship, is it not true that essentially the framework—the ship itself is performing well?

Mr. STACKLEY. Yes, sir. The ship has been performing well.

Senator SESSIONS. There have been—we heard mentioned a little earlier some of the packages that had some difficulties, but it is really not as bad as some have suggested with the packages. But the difficulties you have had do not question the viability of the ship itself, do they?

Mr. STACKLEY. No, sir. I would characterize the packages—we have three mission packages today. What is referred to the anti-surface warfare mission package, that is what is deployed today on USS *Fort Worth* over in the Western Pacific. There are future increments. We will continue to upgrade the mission package with missile systems as we complete those developments.

There is an antisubmarine warfare mission package that I will describe as the best ASW [anti-submarine warfare] capability that we will have afloat. It is a combination of what is referred to as variable depth sonar plus a towed array sonar that its performance and developmental testing has been unlike anything else that we have afloat today. We look forward to completing that and going through the operational testing per plan in 2018.

The mine countermeasure mission package is the one that has garnered the most attention. In 2015 we did technical evaluation of the mine countermeasure mission package. In fact, in four series of runs about 3 weeks each, we demonstrated the system's ability to meet our overarching requirement for detecting, identifying, and clearing mines.

The one part of the system, however, referred to as remote multi-mission vehicle, the one part of the system that did not meet its reliability requirements, we canceled that in order to move forward with other alternatives that promise to be able to perform that function in a more affordable fashion.

Senator SESSIONS. Well, thank you. I think you do well. I think you manage toughly. You are not satisfied with that one aspect, and you are demanding it be fixed. But I do think it is fair to say, do you not, that the ship is performing well, all the bugs are out, and it is performing at the level that you would hope it to perform at?

Mr. STACKLEY. Both platforms have completed what they refer to as our initial operational capability meeting our requirements.

Senator SESSIONS. My time is up, Mr. Chairman.

Senator WICKER. Thank you, Senator Sessions.

Let me just ask Vice Admiral Mulloy. Did you earlier say that in going from 52 to 40 of these LCSs there would be a substantial delay in our ability to respond? Did you make that statement?

Admiral MULLOY. I was talking about the total size, but part of it revolved around this—

Senator WICKER. To what extent—could you sort of give us an example there?

Admiral MULLOY. The actual specifics we can bring over in a classified discussion, but it was involved as the ships are deployed and then respond to an area—let us say the central area commander has a need for suddenly a flow of Navy, some country in his area may be doing something, he would then use the ships he has and then have a flow of ships from the United States. The same would happen in the Pacific.

Well, when you have only 40, not 52, you have fewer ships than America to flow. You have to take more from areas where you are worried about another country now. That is essentially the risk we are taking is tradeoffs between our combatant commanders because they have no longer the force back in the United States to flow forward that we have to then start making trades in areas—what I would then call you have an emergent competitor or someone who is taking advantage of a situation, which happens in the world. That is when I talk about the flow of risk.

Also, in any major event, we would have to then—if we do not keep our Navy at 308 and keep growing, we worry about the entire force. But LCS is part of that, sir.

Senator WICKER. Delays that affect security and the level of risk we are prepared to take?

Admiral MULLOY. Yes, sir. It would be days of delay of the ships arriving and then also the risk of the ships would not be in the other theater where they might be. It is a combination of—and the actual specifics we could come back over and see you and your staff with some classified analysis on the risk taken. That was part of this calculus, and the decision was some risk—you know, as people have talked about, the combatant commanders would like to have a 450-ship Navy and they would like to have 50 amphibs.

Everyone takes some risk. This is one area that was drilled down in the fall that was determined was this is a risk that we thought the Navy would be able to take to be able to spend the weapons on aircraft for other areas.

Senator WICKER. Thank you.

Senator King?

Senator KING. Thank you, Mr. Chairman.

A couple of preliminary comments: First, I just heard on the way over that the Navy has made a decision to name the DDG-120 the Senator Carl Levin, which I compliment. That is a wonderful decision and certainly will look forward to participating in the commissioning of that ship. I just think that is great news.

Secondly, I think it is important in this discussion about budget to put it into some kind of context. We often hear about the size of our defense budget and it is very large relative to the discretionary budget. The reality is defense spending as a percentage of GDP [gross domestic product] is the lowest today that it has been in 70 years, the lowest today that it has been in 70 years.

Going back just—I have some data going back to the 1960s. Defense spending as a percentage of GDP was about 8.6 percent in the 1960s. It fell to 5.2 percent in the early 1990s. Today, it is 3.3 percent. Yet we are now being bound by numbers derived 5 years ago in the summer of 2011 before Syria, before ISIS, before Russia's incursion into the Ukraine, before Russia's militarization of the Arctic, before the rise of the danger of cyber attacks, before China's military modernization, before North Korea's nuclear capabilities.

All of those things have happened since we locked ourselves into a number that we are now trying to squeeze all of our response to these threats in the context of this lowest percentage of GDP for defense spending in 70 years. I just think we need some fundamental rethinking of what we are trying to do here and the threats we are trying to meet.

Jim Clapper said that it is the most complex and dangerous world he has seen in 50 years, and yet we are still trying to budget and work within a constraint that was defined in the summer of 2011 before all those other things happened.

Mr. Chairman, I think we have got to really start to make the case here in the Congress and to the people of America that we are not fully meeting our fundamental responsibility in the preamble of the Constitution to provide for the common defense.

If you can find a question in there, you are welcome to.

[Laughter.]

Mr. STACKLEY. Well, can I make a comment?

Senator KING. Yes, please. This is a shipbuilding hearing. The defense budget, 3.3 percent of the gross domestic product, shipbuilding is about 3.3 percent of the defense budget. We are talking about a small percentage of a small percentage.

Mr. STACKLEY. That is right. That is one of the things that we try to keep before everybody is we are talking about force structure, the size of the Navy, the mission of the Navy, and the tax or the burden that places on the overall economy, it is a small, small portion of the overall economy, and yet it has a big impact in terms of national security.

Senator KING. Yet when we are going to need it, we are going to really need it, and if it is not there, we are going to suffer the consequences.

You mentioned, Secretary Stackley, in your remarks the importance of the DDG program. I mentioned the *Carl Levin*. The additional DDG that was partially funded in the prior year, where do we stand on that? What needs to happen in order to award that ship and move that forward?

Mr. STACKLEY. Yes, sir. First, I appreciate the significant add in 2016. It was not just the \$1 billion towards the additional destroyer but also incremental funding authority. Now, that add came across the line after we were done our 2017 budget. Today, we have no funding in the 2017 budget to complete the ship.

We have included it on our unfunded priorities list the balance of funding that would be required, \$433 million. We are proceeding with planning, and we have modified our acquisition strategy to account for the additional destroyer.

But absent Congress addressing that unfunded priority, then we are tied to the 2018 budget process, and we will have to—we are just at the front end of that budget process.

We are moving forward with the intent of executing on the 2016 schedule, but we are doing that absent the balance of funding required to complete the ship. Between your action in 2017 and our deliberations in 2018, we need to get it the rest of the way there.

Senator KING. Thank you. Next year is the year that you would normally address the multiyear procurement. Would there be any advantages to authorizing the multiyear to start in 2018 to start in this budget, in the 2017 budget rather than waiting until 2018.

Mr. STACKLEY. There is always a benefit in terms of certainty because what we are in the process of doing is we are putting together all of the analysis in terms of the benefits, the substantial savings that are going to be required associated with the multiyear. As we do that, it leaves a degree of uncertainty in terms of planning on the part of the shipbuilders in terms of the vendor base. If in fact we had authorization at this point in time, we can press on, focused on the execution and capturing the savings as opposed to the analysis preceding that effort.

Senator KING. Of course a multiyear is always going to be better for the taxpayer than one at a time.

Mr. STACKLEY. The DDG-51 program has been inside of a multiyear since 1998, and this again goes back to the chairman's initial comments regarding stability for shipbuilding. The stability that the multiyear brings not just for the shipbuilders but throughout the vendor base, we have been able to capture no less than that 10 percent target that we have for savings in shipbuilding. We have done it on the DDG-51 program, we have done it with the *Virginia* program, and we have effectively done it on the LCS program with the block buy approach.

Senator KING. Thank you. Thank you very much, gentlemen. Thank you, Mr. Chairman.

Senator WICKER. Secretary Stackley, get back to us on the record about where that percentage of the total defense budget shipbuilding has been, where it has been historically. That might be helpful to us. If you will supply that to us on the record—

Mr. STACKLEY. Yes, sir.

Senator WICKER.—I would appreciate that.

[The information referred to follows:]

The historical trend information provided herein is primarily from the Department of Defense (DOD) budget for new construction Shipbuilding and Conversion, Navy (SCN) account. Funds were appropriated in SCN, and in certain years National Defense Sealift Fund, to buy new aircraft carriers, attack submarines, surface combatants, amphibious ships, and support ships. Going back to 1980, shipbuilding new construction funding and quantities were at their highest in the mid-to-late 1980s. During the 1980s, new construction shipbuilding averaged 3.8 percent of the DOD budget. During the 1990s, the ten-year average dropped to 2.3 percent of the DOD budget. From fiscal year (FY) 2000 to fiscal year 2009, the new construction shipbuilding share of the DOD budget was 2.0 percent. In this decade, it is expected that new construction shipbuilding's share of DOD budget will increase to 2.3 percent as projected by the Annual Long-Range Plan for Construction of Naval Vessels for fiscal year 2017.

Senator WICKER. Also, Senator King, thank you for that pleasant news item about the Carl Levin. I think you saw heads nodding on both sides of the table. Senator Levin is a distinguished and

thoughtful American statesman and was as evenhanded a chairman as I have ever served with in my 21 years in the House and Senate, so that is excellent news.

Senator Ayotte?

Senator AYOTTE. Thank you, Chairman.

Let me just add my congratulations to Senator Levin, who, as a new member on this committee, I just enjoyed his leadership and well he treated all of us and how well he handled his position. I cannot think of a better person to name this ship after, so it is great.

I wanted to follow up, Admiral Mulloy, on—you were talking about the requirements overall for the size of our fleet. Well, one of the issues that I am concerned about as we look at all the threats that we are facing and all the challenges that were certainly outlined well by Senator King is the Navy's requirement for the attack submarine fleet was actually established, as I understand it in—I think it was around 2006.

Given all the things that have changed since 2006 and the challenges that we face and in particular obviously even in the Asia-Pacific region, is the Navy going to undertake establishing a new requirement for the attack submarine fleet as well? We already know that 50 to 60 percent of our combatant commanders' requests for the attack submarines is being met.

Admiral MULLOY. Yes, ma'am. As part of that force structure assessment, there are actually nine analyses of carriers, large-surface combatants, and one of those is SSNs and SSBNs as well. Clearly, the number is 48. It has been since the 2006 study. Unfortunately—and we are slightly above it right now. But based upon the decommissioning rate of the 688 class submarines, we built them at four or five a year with the tremendous support of Congress back in the 1980s. We will go down to a number of 41 in 2029, and we will stay below 48 for over 10 more years.

It is important to execute that multiyear, and one item that we have been asked by the House Armed Services Committee and we are looking at now in next year's budget is in fiscal year 2021 we go to one *Virginia* because we start the first *Ohio* replacement.

Senator AYOTTE. You are reading my mind.

Admiral MULLOY. Yes, ma'am.

Senator AYOTTE. I love this.

Admiral MULLOY. That is clearly—we are now looking at what are the advantages that would come from the authorization of more of those ships and that multiyear. Could we get further savings out of the hulls? We will have to come back next year. But clearly, the first submarine that fills in that divot is buying the 2021 submarine.

Mr. Stackley had commissioned a group and he will probably be able to talk more about it, the Submarine Unified Build Strategy that looked at *Virginia*-class, *Virginia* payload, and *Ohio* replacement, and we think we would be able to do that.

Senator AYOTTE. Well, Secretary Stackley, I would certainly love your comment on that of what Admiral Mulloy just said because this is also something that has been raised by—both the chief and the vice chief have expressed a real interest in not going down to one *Virginia*-class submarine in 2021 and our ability to keep it at

two. Even with two, you know, we have a gap, but with one, it is just—it is not sensible.

Mr. STACKLEY. Yes, ma'am. We have been building two submarines a year since 2011, and this year is actually the first year we start delivering it two per year. We have got stability in the line. Admiral Mulloy referred to the Submarine Unified Build Strategy. Twenty-one is a challenge year because of the high replacement.

We have spent a lot of time this past year working with industry taking a look at how can we best build the *Ohio* Replacement Program so that we can leverage the best of our two submarine builders, Electric Boat and Newport News. As we worked through that, what we are uncovering is opportunity and capacity across the two builders.

One of the challenges was capacity and imposing potential risk on the *Ohio* replacement. We think we have the capacity to address that. A second challenge is design associated with the *Ohio* replacement. We have that on track today. A third challenge then becomes cost, and so as we look at building the *Virginia* multiyear and as we look at driving down costs, frankly, in the *Ohio* Replacement Program, we are finding more opportunities.

We are working. This is a top priority in our 2018 budget build to be able to come back and fill in that 2021 submarine. Because of all the decisions going forward to mitigate the shortfall that Admiral Mulloy described, that boat is the first and best mitigation effort that we can have.

It is a priority. We think we have tools available to address it as opposed to just bringing it back to large build and a lot of risk associated with it, and we look forward to continuing to work with you all in the course of this year and with next year's budget to do so.

Senator AYOTTE. Well, I think that is excellent, and I look forward to working with you both on that issue.

I had one final question for Admiral Mulloy and General Walsh. Russia has provided advanced anti-craft and anti-ship systems to Syria that pose a challenge to our most sophisticated ships and aircraft, as well as partners in the region like Israel. How has the deployment of advanced Russian systems like the S-400 anti-aircraft and the P-800 Yakhont anti-ship cruise missiles changed how United States Naval Forces are operating in and around Syria? General?

General WALSH. Senator Ayotte, I do not know if I could specifically say. I will defer to Admiral Mulloy in how the ships, the fleet is operating right now around Syria. But I will tell you that one of the things the CNO and the commandant has us looking at—one of the other things I do, I co-chair the Naval Board, and one of the things they asked us to do is look at how we would operate in a contested environment. With Naval Development Warfare Center and Combat Development and Integration down in Quantico, we are working together on writing a concept for littoral operations in a contested environment, which takes into all—across all the globe places we would look at. One of the areas is the scenario you just talked about.

As we look at that, how those type of threats would affect fleet operations, specifically how we would conduct, whether it is a non-combatant evacuation or it would be high-end conflict and how those threats, we have to deal with that.

What we are definitely seeing is those threats impact us, and we are going to have to work much closer and integrate with the rest of the battle force, that the amphibious ready group is certainly not going to have all the capabilities to be able to operate independently and is going to need the rest of the battle force to integrate and operate closely and work together with the high-end threats that the cruisers, destroyers bring, the carriers bring, along with the submarine force.

Admiral MULLOY. Yes, ma'am. A lot of the specifics would be very classified. We can come back in a separate session.

Senator AYOTTE. Sure.

Admiral MULLOY. What I can tell you is that items such as the decoys you have on board, we have done—above-threshold reprogramming is a great support from your committee to fund next-gen jammers. The focus the fleet has to put on is ranges and distance to the coast, where we have to be for our operations, and then the level of the ships you bring. If you have an E-2D, the Advanced Hawkeye airplane, that has the ability to link up with our cruisers to block 9, if that is the force you have, you can be closer or be able to survive. Other times, you have to be farther away.

It is combination we call CONOPS [concept of operations], the ability to operate, and then the equipment you bring. But the more modern that we can bring in terms of the better airplanes, more advanced Aegis, a ship can look up for missiles and look close at water for missiles—I know there is a modern ability to search both areas—one ship can defend itself and others around it better.

It is a combination technology and operations, but it clearly, as I said, was at the very beginning operations in the eastern Med, the Black Sea near Russia are as much of a threat as they are being operated near the China coast. Both can bring tremendous change. We need to look at, once again, the modernization we talked about to get the advanced electronics, as well as the weapons to deal with it.

Senator AYOTTE. Thank you.

Mr. STACKLEY. Can I exhaust the topic a little bit here?

Senator AYOTTE. Chairman's permission.

Senator WICKER. Absolutely.

Mr. STACKLEY. We have gone forward with deploying four AEGIS destroyers to the Mediterranean in part dealing with the phased adaptive approach for ballistic missile defense for Europe.

In doing that, we sent over our more advanced baselines to have basically the ability to deal with both the ballistic missile threat but also the AAW [anti-aircraft warfare] threat. As these other threats emerged, we basically prosecuted, you know, I will call it rapid deployment of capabilities. We went to a naval research lab and we brought their best and brightest, and within a cycle of a year were able to develop a thing called the Transportable Electronic Warfare Module to specifically deal with the threat that you described.

Then this past year, we followed up with installing and testing overseas what is referred to as C-RAM [Counter Rocket, Artillery, and Mortar], which is a combination of a Close-In Weapon System and the Rolling Airframe Missile.

We have been able to put electronic warfare, as well as self-defense capabilities on these advanced destroyers, four deployed in the Mediterranean in response to these threats as they emerge. This type of turnaround as the threat emerges, frankly, what we need to be doing every day, every day.

Senator AYOTTE. Absolutely. Thank you for the information on that. Russia said it was being so helpful in Syria. I think we know the truth. Thanks.

Senator WICKER. Thank you, Senator Ayotte.

Senator Blumenthal?

Senator BLUMENTHAL. Thank you, Mr. Chairman. Thank you all for your service.

I want to focus on the *Ohio* Replacement Program, which you have identified as the Navy's top priority with the lead delivery plan for 2028, I believe. Considering that around that time there will be a shortfall or a fall below the desired 48 minimum boat level for the *Virginia*-class reaching the low point of 41 boats in 2029, I would expect that you were planning to produce essentially three boats a year for some period of time after 2020 because the *Virginia*-class will have to continue with two boats a year and you will have to be building the *Ohio* Replacement Program. Is that expectation correct?

Mr. STACKLEY. Not yet. What you have described is the problem because we need both. First, our top priority is *Ohio* replacement, and that is scheduled for her delivery and her patrol in 2031 is chiseled in stone. Everything that we are doing on the program and things around the program are to support that schedule. Frankly, what we need to be doing now is we need to be moving left, building margin back in that schedule because it is as tight as it is.

Now, in doing that, what we have heard is a long-range shipbuilding plan, a 30-year plan. It proposes that we build two submarines per year for the next 30 years, but those two submarines are going to be—in years where you have an *Ohio* replacement, it would just be one *Virginia*. That is a fiscal issue, and it is a capacity issue. I discussed earlier what we are doing to address the capacity issue. But it still remains a budget issue largely because of the significant cost associated with the *Ohio* Replacement Program. The first boat is just entering this Future Years Defense plan in 2021.

What we have been describing and we are being very clear about this is if we have to build out the *Ohio* replacement on the back of our current shipbuilding total obligation authority, our shipbuilding budget, if we do not get relief, then we are going to be a very different Navy in the late 2020s and 2030s.

Senator BLUMENTHAL. Essentially, what I hear you saying is that \$100 billion, which is the cost of the *Ohio* Replacement Program, somehow has to be addressed, that significant challenge. But at the same time, will the program for the *Virginia*-class lead to replenishment of the shortfall that is anticipated when the number drops from 48 to 41?

Mr. STACKLEY. Yes, sir. Today, we are first focused on the year 2021. That is the first year when *Virginia* drops down from two to one boat. We will spend this budget cycle coming to grips with what it will take to keep *Virginia* up to two per year. We are making that—as I described earlier, we are making that a priority in our budget build.

In the near term we are going to address 2021. The next year that we drop down to one *Virginia* is 2014. Our success in being able to sustain two *Virginias* through the *Ohio* Replacement Program cycle is going to depend on our success in getting two in 2021, that first year, and executing it, and then our success in getting some relief, some help in terms of financing the *Ohio* replacement during the 15-year period of that program.

Senator BLUMENTHAL. What you are describing is the financing challenge, not the capacity challenge? Because I am assuming that the capacity challenge can be addressed. That is a shipbuilding challenge that Electric Boat and Newport News are going to have to address, and I am of the view—it may be overly optimistic—that they are up to that task. They can address it. They can do it. Really what you are posing to us is the financing challenge.

Mr. STACKLEY. Yes, sir. The challenge on the shipbuilder side—that is the Navy and that is industry—to ensure that that ramp, because it is a tough ramp, that we climb that ramp smartly. It is also bouncing across the two boat builders because there is significant capacity available across the two. What we need to do is balance that capacity with the risk and separately address the funding requirements.

Senator BLUMENTHAL. But you would agree with me, considering you acknowledge it in your testimony, that the shipbuilding program for submarines has operated on budget, on schedule, perhaps even under budget, ahead of schedule, that so far the capacity would seem to be available? But the important point, I think, that is raised here is that your plan is to continue building two *Virginia*-classes through 2021, you need to do it through 2024, the lead delivery is going to be 2028, and you need to develop a financing plan very soon to meet, in effect, those two programs?

Mr. STACKLEY. Yes, sir. We have got to nail down what it is going to cost to add a second *Virginia* in 2012. In POM [Program Objective Memorandum] 2018 we have got to come to grips with that funding requirement because it is going to come out of somewhere else. In terms of the capacity issue, I agree with exactly the way you described it.

Senator BLUMENTHAL. Thank you. Thank you, Mr. Chairman.

Senator WICKER. There is not a capacity problem; it is just a financing problem. In that respect you are agreeing with Senator Blumenthal?

Mr. STACKLEY. I am agreeing that we have to manage the growth that is going to be required because we are going to double the amount of submarine work. That is significant growth. We are going to have to manage that. But when we talk about maintaining two *Virginias* per year, once we get up on that plateau, we are there. Then we have to sustain it.

The near years is going to be growing our submarine workforce to go with the increased volume of work that will be required, and

we are set about managing that across our two boat builders. That is our responsibility.

Then there is a funding challenge associated with adding that second *Virginia* in 2021, and we are working that in POM 2018.

Senator WICKER. Okay. Mr. Clerk, we are going to take a second round, so you can start my clock.

But following up on the *Ohio*-class, and I am sorry Senator Blumenthal has to leave, but I think you told him if we do not find an innovative way to pay for the *Ohio*-class, the Navy is going to look far different. Did you say words to that effect?

Mr. STACKLEY. Yes, sir.

Senator WICKER. Okay. Could you elaborate on that? Instead of 308 ships, what does that do to that number? What did you mean specifically?

Mr. STACKLEY. Yes, sir. In our long-range shipbuilding plan, we lay out the ships that we need to procure, the period that we need to procure them, and we also described the funding that will be required to do that. In the period of the *Ohio* Replacement Program starting about 2021 until about 2035, that 15-year period, there is \$100 billion of additional procurement required for that program.

Today, when you look across the 2017 FYDP [Future Years Defense Plan], the average funding for new construction is about \$16.5 billion per year. That is about on average. That has to go up to north of \$20 billion per year to support the *Ohio* replacement over that period of time.

If the Navy is going to have fund that within our notional shipbuilding budget, then that is going to put pressure on all of our procurement accounts. We will look—

Senator WICKER. Pressure is a euphemism.

Mr. STACKLEY. Yes, sir.

Senator WICKER. What is your suggestion, sir?

Mr. STACKLEY. Well, in this FYDP, in the budget that we have submitted to Congress, we have been working with OMB [Office of Management and Budget] to get that type relief. In 2021, first, we have proposed to incrementally fund the first boat over 3 years so we do not have a huge spike associated with the first boat of the class. The dollars in 2021 with the lead boat is about \$3.6 billion in 2021. OMB has provided relief for about two-thirds of that. In the first year of a 15-year procurement plan, we did receive relief. We have to continue to work this OMB and POM 2018 and each year going forward.

Senator WICKER. All right. Okay. Well, are you finding that OMB acknowledges that this is something they are going to have to help you solve? Are you getting all the help you need at OMB?

Mr. STACKLEY. The first year was the easy year, and we have got two-thirds of our need.

Senator WICKER. Okay. Well, keep us posted.

I think I need to follow up on a couple things I mentioned in my statement that you still have not touched on. Which one of you wants to discuss the deviation from the 2/4/6 plan?

Admiral MULLOY. I can certainly talk about that, sir.

As Mr. Stackley pointed out in his opening remarks, to fund the Navy back to 2/4/6 would be about between 3.2 and \$3.4 billion I did not have in this FYDP. As I looked at the money to then—be-

cause those ships would then require more crewing, more operations, and more maintenance faster.

I also then—but my bigger issue as I laid out with the CNO and the Secretary of the Navy last summer is this idea of force structure size. We have 22 cruisers. If we operate all those cruisers to their end and in fact we execute 2/4/6, we actually cause block retirement. All the cruisers will retire in 2035 and 2036 and one more in 2037. Effectively, a cruiser decommissioning rate of five per year, the same as the Burkes, rapidly, and the large-surface combatant numbers that we talk about in our FSA were over right now, we would be under and we would have a shortfall of large-surface combatants as deep and longer than the submarine shortfall we have right now.

Our cruiser plan allows us to continue to build the Flight III Burkes and start looking at where during this period of time when we are building the *Ohio* replacement not to be building three or four DDGs a year. Once again, the DDGs decommission at three to five a year, just like the SSNs did. They were all built in the 1980s and early 1990s. That is the conundrum in front of us.

As we looked at this force structure issue, that is as much—it is a bigger problem but it is further away. I also look at the money problem nearby. The best way to keep effectively of these cruisers—we have 11 battle groups and I need one cruiser per battle group now. I put 11 I operate now, the other 11 is I put then in phase modernization, I de-man down to a level, and then I bring them back. You know, as other ships retire, I am able to put that out there.

If an emergency happened in the world in 9 to 12 months, I could bring those ships back, but if I burn them out and I get to 2035, nothing will bring them back. I will have a permanent shortfall of ships. That is—

Senator WICKER. Did you voice these concerns last year?

Admiral MULLOY. Yes, sir, we did, and we got the 2/4/6. I voiced the same concerns, but it is even more emphatic as I stated the force structure issues and came back again because we talked about the *Virginia*-class. When we stop building 688s and we delayed starting *Virginia* and we delayed going to two a year, we made that bathtub. This is going to be the same thing again.

Senator WICKER. Senator Hirono?

Senator HIRONO. Thank you.

There was some discussion about the mine countermeasure testing that we are doing. Secretary Stackley, can you describe the modified mine countermeasures program for the subcommittee a bit more and give us an estimate of what impact this restructuring has on being able to provide LCS-based mine countermeasures capability to the fleet? When can we expect to get the initial operating capability of this module?

Mr. STACKLEY. Yes, ma'am. First, to briefly describe the module itself, the first thing you need to do is find the mines. The workhorse for finding the mines is an unmanned vehicle, a remote multi-mission vehicle that tows a sensor. The sensor is basically detecting the mines.

The technical evaluation that we performed last year demonstrated that we successfully found the mines and then followed

up to classify the mines and destroy the mines at the rate that is required of the mission package. But in doing that, that remote multi-mission vehicle did not prove reliable enough for our purposes. The failure rate was not where it needs to be.

We had a couple of choices. One is to proceed with building the new design that would improve the reliability. That would be about a 3-year program, and then to go back into testing. That had cost and uncertainty associated with it.

Second is to utilize a different unmanned vehicle called an unmanned surface vehicle that is currently being built and will be delivered this summer as a part of the mission package for the LCS.

What we are planning to do is rather than build the upgraded design for the RMMV and 3 years later go back into testing, to utilize the unmanned surface vehicle that we get this year that has other functions and make it dual-purpose. One of the purposes would be to tow the sensor.

This summer we will get the unmanned surface vehicle, and we will proceed with demonstrating the ability of the surface vehicle to tow the sensor where the sensor has already proved its performance. Assuming success, that mission package would be ready for IOC [Initial Operational Capability] in about the 2020 time frame.

Now, in the meantime, we have 10 other remote multi-mission vehicles that are already built. What we plan to do is we plan to upgrade those with fixes for reliability to improve their reliability. It will not get up to the full level that we require, better than what was demonstrated in technical evaluation, and better than anything we have out there today, and have them deployable because the rest of the mission package around it is ready to go.

It is not the long-term solution, but it is an interim solution using the RMMV [Remote Multi-Mission Vehicle]. We expect the midterm solution to be the unmanned surface vehicle, which is already a part of the mission package. We believe the long-term vehicle is simply an unmanned underwater vehicle that does not require a separate tow but in fact carries the sensor on the front end called the Knifefish. The Knifefish today is deploying. However, it does not have the endurance that we need.

We have a short-term fix associated with the RMMV upgraded; midterm, unmanned surface vehicle; and what we are exploring for the longer term is simply a vehicle like the Knifefish, which works today, but getting the endurance that we need for the mission itself.

Senator HIRONO. All this is going to be taking place within a year or so?

Mr. STACKLEY. These are three—

Senator HIRONO. All these different components that you are putting together?

Mr. STACKLEY. Yes, ma'am. These are three parallel efforts we expect that the mission package with the upgraded RMMVs would be ready for deployment in 2018. We expect that the mission package with the unmanned surface vehicle will be going through the formal IOT&E [initial operational test and evaluation] testing to support this operational capability in 2020. During this time, we are already working with the Knifefish. This is not—the endurance requirements that we are going to try to impose on the Knifefish

are not as mature, and this is a longer-term vision that we are going to try to get to.

Senator HIRONO. We will stay in touch with you on all of that.

I did have one question regarding the Air and Missile Defense Radar that will be tested at PMRF on Kauai. Are you confident that the radar will be ready to install in one of the fiscal year 2016 DDG-51 destroyers without causing any delays in that shipbuilding program?

Mr. STACKLEY. Yes, ma'am. The radar that we are sending out to PMRF that you referred to as an engineering development model radar, that is a production-representative radar. You will not see differences in terms of production of the radar that is going to PMRF and the radar that is ultimately going to the ship.

The radar has completed its critical design review last year. It is on track. The efforts today are the ship-integration portions of the design that we are working, and the ship critical design review is scheduled for November. The radar, we have got a lot of testing to complete, but we have very high confidence in the radar's performance and its design.

The ship design, we do not see that as risk. We see that as a lot of work to complete leading up to its critical design review in November, which well supports the 2016 construction schedule.

Senator HIRONO. Thank you very much.

Senator WICKER. Senator King?

Senator KING. Just some comments and questions about the *Ohio* bow wave. I call it the *Ohio* bulge. It is a bulge in the budget, and just some quick notes. It looks like it is about a 40 percent increase in the basic levels of \$16 billion a year, \$6 billion a year for 15 years. It seems to me that we and the Congress have to really be talking about this because—and you are already thinking obviously very deeply about it talking to OMB, but if we do not deal with this and there is not a significant bump up in the shipbuilding budget, it is going to really decimate the remainder of the shipbuilding program during that period. There has to be a recognition that this is a sort of class-by-itself expenditure, is that correct?

Mr. STACKLEY. Yes, sir. I think there is recognition that it is a class by itself, but that does not take away the challenge associated with funding it. But historically, going back to our first ballistic missile submarine referred to as 41 for Freedom, if you look at the Navy's budget and shipbuilding budget, in fact, they were increased during that period.

The next instantiation was the *Ohio* itself. If you look at our shipbuilding budget during that period of time, it also was increased—

Senator KING. It was increased to accommodate that cost?

Mr. STACKLEY. Let us just say that cost was inside of the increases. That was the Reagan buildup as well, so there was a lot of increase during that period of time. But you would see significant increase in terms of our shipbuilding budget. When we look ahead at the *Ohio* replacement, if we do not likewise see that type of increase to our shipbuilding budget, then we will not be able to execute the long-range plan that we have laid before Congress that builds and sustains our 308-ship Navy.

Senator KING. Yes. Good. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Thank you all. Without objection, we will leave the record open for questions for the record for 4 days. Thank you, gentlemen. I thank the members of the committee. I think it has been very helpful to us.

The hearing will be closed.

[Whereupon, at 3:39 p.m., the hearing was adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ROGER F. WICKER

AMERICAN NAVAL ARCHITECTURE AND TUG DESIGN

1. Senator WICKER. I understand that design work for the Navy's next generation fleet tug may utilize a foreign vendor. Has the Navy determined that domestic naval architecture firms are not capable of handling this design? If not, why?

Assistant Secretary STACKLEY. The Navy's upcoming fleet ocean tug (T-ATS) solicitation will specify the required performance parameters and characteristics of a towing, salvage, and rescue vessel. Shipbuilders will have the flexibility to offer their own specific designs or select from a wide range of foreign or domestic naval architecture and marine engineering subcontractors to provide the best value to the Navy. The solicitation will include clauses requiring that the vessels be constructed at a shipyard in the United States and built from a majority of domestic components in accordance with 10 U.S.C. 7309, 41 U.S.C. 8301 (Buy American Act), and the Federal Acquisition Regulation. The fleet ocean tugs are also required to be built to American Bureau of Shipping regulatory body standards.

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

RAPID INNOVATION FUND

2. Senator SHAHEEN. Mr. Stackley, as you know, the Rapid Innovation Fund (RIF) is a competitive, merit-based program designed to fund innovative technologies, reduce acquisition costs and rapidly insert technologies needed to meet our critical national security needs. Since the program was established in fiscal year 2011, over 85 percent of the awards have gone to small business. Over 60 percent of awards have gone to firms participating in the Small Business Innovation Research (SBIR). RIF provides a responsive funding mechanism for the testing of innovative SBIR-developed technologies like Beacon Interactive's energy management products. Beacon's technology provides Mission Assurance for a ship's CO to know if there is enough energy available on the ship to get where they are going, fire their weapons and get home.

In my home state of New Hampshire, a number of SBIR and Small Business Technology Transfer (STTR) firms have been able to utilize this valuable resource. For example, Mentis Sciences, from Manchester, received a Rapid Innovation Fund award to advance the design and engineering of prosthetic devices that cost less to manufacture and last longer. The combination of initial SBIR funding for prototype development and the follow-on funding from RIF enables a more rapid delivery of much needed operational capability to the Fleet than the traditional procurement process allows.

In your January 2015 memo, entitled "Tapping Into Small Business in a Big Way," you stated that the SBIR and STTR programs could benefit from greater Phase III commercialization transitions for a greater return of investment on Navy research and development. Given that RIF is helping fill that need you mention, would you support making RIF permanent and giving it a stable funding source?

Mr. STACKLEY. The RIF program has been successful for the Department of the Navy (DON). It has provided a path to transition innovative technologies and capabilities rapidly into the hands of the warfighters. ASN (RD&A) supports the continuation of the RIF program as it is currently funded but recommends further analysis with respect to SBIR, STTR and rapid prototype experimentation and demonstration before making it permanent.

As stated in testimony to the House Armed Services Committee on Acquisition Reform: Experimentation and Agility, January 7, 2016, fundamental to the Department's efforts toward improving our acquisition outcomes is the increased use of rapid prototype experimentation and demonstration early in a program's formula-

tion. Early prototyping efforts jump start the capability development process and inform the development of material solutions. These prototyping and experimentation efforts are essential elements in our ability to get the requirements right; to inform critical decisions on the operational utility, technical feasibility, producibility and programmatic risks early; and to expedite fielding of needed capability to our operational forces. With this objective in mind, the DON is increasing our focus on research and development initiatives directed at rapid prototype development to address operational gaps and needs identified by Navy and Marine Corps operational forces.

The DON RIF Program in addition to other efforts we have initiated help to achieve this objective now and in the future. Our ultimate goal is to provide technically feasible capability rapidly to the warfighter while reducing total acquisition costs. The DON RIF program provides a path to do just this while actively growing the small business base where much of the nation's technical innovation occurs.

SBIR

3. Senator SHAHEEN. Mr. Stackley, absent Congressional action, both the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will expire at the end of September 2017. During the last reauthorization efforts, there were 14 extensions that harmed both small businesses and SBIR/STTR agencies in working on our country's technology challenges. It is a priority for me to permanently authorize both the SBIR and STTR programs before they expire to avoid repeating those disruptions, and I know that Navy's SBIR and STTR programs are the gold standard.

The Navy's SBIR program has given us technologies that benefit the Navy's mission and save taxpayer dollars. For example, Creare, a small business from New Hampshire, has developed protective covers to protect corrosion of equipment in a challenging maritime environment. These investments saved the Navy over \$600M in corrosion prevention and maintenance costs in the last 10 years. Would you support making the SBIR and STTR programs permanent?

Mr. STACKLEY. I support making the SBIR/STTR programs permanent. SBIR and STTR programs have proven their ability to deliver innovation to our Naval warfighters with great efficiencies in cost and schedule, and noteworthy improvements in performance.

4. Senator SHAHEEN. Mr. Stackley, in your leadership role, what efforts have been put in place to better leverage the SBIR and STTR programs to meet the mission of DOD?

Mr. STACKLEY. In January, 2015 I issued a memorandum to the Department of the Navy (DON) to support increased use of small business, and specifically SBIR and STTR technologies, by making my Deputy Program Managers—that is, senior acquisition management—responsible and accountable for building and managing SBIR and STTR technology inventories within their portfolios. This guidance is consistent with the Secretary of Defense's "Better Buying Power" initiative, with the overall DOD acquisition instruction 5000.02, and especially with Congressional reauthorization of SBIR and STTR in 2011, and your emphasis on DOD commercialization.

I have required the major Systems Commands and Program Executive Offices to formulate a Small Business contract plan. In addition I have enforced SBIR and STTR accountability in Milestone Reviews for DON acquisition programs and helped transform the department's Office of Small Business Programs so that it too can help foster the ability of SBIR and STTR to serve DOD missions.

**MARINE CORPS GROUND MODERNIZATION IN
REVIEW OF THE DEFENSE AUTHORIZATION
REQUEST FOR FISCAL YEAR 2017 AND THE
FUTURE YEARS DEFENSE PROGRAM**

WEDNESDAY, APRIL 13, 2016

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

MARINE CORPS GROUND MODERNIZATION

The subcommittee met, pursuant to notice, at 2:00 p.m. in Room SR-232A, Russell Senate Office Building, Senator Roger F. Wicker (chairman of the subcommittee) presiding.

Members present: Senators Wicker, Ayotte, Rounds, Tillis, Sullivan, Hirono, Kaine, and King.

OPENING STATEMENT OF SENATOR ROGER F. WICKER

Senator WICKER. Good afternoon. This hearing will come to order. The Senate Armed Services Subcommittee on Seapower convenes this afternoon to examine Marine Corps ground modernization programs.

This afternoon, we welcome Mr. Thomas Dee, Deputy Assistant Secretary for the Navy for Expeditionary Programs and Logistics Management; and Lieutenant General Robert S. Walsh, who serves as Deputy Commandant for Combat Development and Integration. General Walsh is also the Commanding General of the Marine Corps Combat Development Command.

Gentlemen, thank you for your service. We thank the 184,000 marines who serve in more than 40 countries around the world. The Nation asks much of the Marine Corps. Its amphibious mission, its role as the Nation's expeditionary crisis response force, and its provision of key enablers to joint task forces from Kandahar to Anbar to northern Iraq offer a unique set of capabilities. The United States calls upon these capabilities often.

The consequences of this high operation tempo and fiscal uncertainty are clear. As General Neller observed last month before the full committee, the Marine Corps is no longer in a position to simultaneously generate current readiness, reset our equipment, sustain our facilities, and modernize to ensure future readiness. The modernization of the Marine Corps, particularly of its ground forces, must be even more focused and economical than usual. Fortunately, Marine Corps—marine ground programs are targeted,

relatively small, and well managed. Today, our witnesses will update us on their work to meet the need for the Nation's global crisis response force. They will provide assessments of Marine Corps requirements, going forward. Of course, they will answer critical questions.

First and foremost, the subcommittee wishes to discuss the Marine Corps's strategy for modernizing its vehicle fleet, particularly the Amphibious Combat Vehicle and the joint light tactical vehicle. This fleet provides maneuver from the sea as well as protection and tactical flexibility ashore. The subcommittee wishes to discuss the design, suitability, and acquisition strategy for the amphibious combat vehicle, or ACV, which are perhaps most critical to the Corps's amphibious role.

Last fall, two companies received contracts to develop prototypes of the first increment of the ACV. This vehicle will serve as a substitute for the canceled Marine Personnel Carrier [MPC], utilizing wheels and a limited swim capability that will likely require a connector to move it ashore. A fully amphibious increment of ACV that can be—that can self-deploy is being considered for future development. I'm interested in the progress of both concepts and the plan, going forward.

We also want to discuss the Joint Light Tactical vehicle, or JLTV. I'm encouraged by the progress the Army and Marine Corps have made on this multiservice program, which provides our troops with a highly mobile protected means of transportation. The subcommittee would benefit from hearing how the Marine Corps plans to acquire its fleet of 5,500 JLTVs, particularly in light of the decision to defer 77 vehicles in fiscal year 2017, and to provide more funding to the ACV and the Ground/Air Task-Oriented Radar [GATOR] programs. Such shortfalls have an impact on capability, readiness, and program cost that must be addressed in order for our Humvees to be replaced as soon as possible.

More broadly, we remain committed to maintaining a healthy industrial base through competition. With both the ACV and the JLTV, I understand the Marine Corps relies on competition to gauge, early on, what is technologically feasible and affordable. Competition requires viable competitors, which we do not always have. I would like our witnesses to provide their best assessment of the state of the U.S. industrial base for ground combat and tactical vehicles. I hope they will suggest what can be done to sustain the vitality of our manufacturing base.

In addition to its work on tactical vehicles, I've previously mentioned the Marine Corps's development of the ground/air task-oriented radar, or G/ATOR, to replace five older radars. I believe this is a matter for discussion. Intended as an all-purpose system that can provide marines with early warning from missiles, indirect fire, and aerial systems, G/ATOR will also provide air traffic control capabilities. The subcommittee wishes to learn more about this complex program and its future role.

We're eager to hear our witnesses discuss other equipment essential to the Marine Corps mission, such as small arms. Over the past year, the Marine Corps has collaborated with the Army on a joint 5.56-millimeter round. I hope our witnesses can speak to the

status of this important project. We also welcome updates on the status of other critical capabilities, such as artillery and armor.

The Marine Corps budget accounts for approximately 6 percent of DOD's total budget. I remain concerned about the impact of budget uncertainty on modernization and readiness across the Defense Department, but especially on the Marine Corps. As such, I hope our witnesses today will elaborate on the impact that uncertainty has on our expeditionary marines, their ability to execute our country's national security strategy, and the vitality of our defense industrial base.

So, we look forward to your testimony.

I'm delighted, as I always am, to be joined by my teammate and Ranking Member, the Senator from Hawaii, Ms. Hirono.

STATEMENT OF SENATOR MAZIE K. HIRONO

Senator HIRONO. Thank you very much, Mr. Chairman, for holding this important hearing on Marine Corps ground modernization.

Of course, I'd like to welcome our witnesses and thank you for your service.

First, I'd like to begin by acknowledging the men and women serving in support of U.S. Marine Corps Forces Pacific and Marine Corps Base Hawaii. These marines are vitally important to our national defense and for the ongoing rebalance to the Asia Pacific.

Currently, Secretary Carter is traveling to the region to solidify our relationship with our Asia-Pacific partners. I commend the Department for the continuing emphasis and commitment on the rebalance.

Our hearing today is focused on the Marine Corps's ground modernization. But, after nearly 15 years of continuous military operations, it is crucial that we evaluate the current status of our military forces also. Last year alone, the U.S. Marine Corps conducted 100 operations, 20 amphibious operations, 140 theater security cooperation events, and 160 major exercises. While our marines remain ready and capable to address contingencies at a moment's notice, challenges persist.

In their budget request, the Marine Corps made rebuilding readiness in the Active Duty Marine Corps and the Marine Corps Reserves a priority. Currently, less than half of our Marine Corps units are ready to perform their core wartime mission, and 80 percent of aviation squadrons do not have the required number of aircraft to train.

Furthermore, increased readiness includes not only training, but providing marines with equipment that has been reset and is in proper working order. According to the Marine Corps, 77 percent of its ground equipment has been reset. However, the budget request funds ground depot maintenance in the base budget and OCO [Overseas Contingency Operations] accounts at 79 percent of the validated requirement, which could impact the readiness of nondeployed units in the future.

To ensure that our marines will be supplied with the most effective equipment, the fiscal year 2017 budget request makes targeted investments in the ground combat and tactical vehicle portfolio of the Marine Corps. This budget provides \$158.7 million in funding to the Amphibious Combat Vehicle, ACV, program for research, de-

velopment, testing, and evaluation, RDT&E, activities. Fielding the ACV is imperative, as it will replace the Assault Amphibious Vehicle, AAV, which has been in operation for over 40 years.

Some of the other comments that I will make will echo what the Chairman has already noted, but I think that that's good, because that means he and I are on the same page.

In November 2015, the Marine Corps awarded contracts to two vendors, each tasked with building 16 prototypes of the ACV 1.1 vehicle to be used for testing over the next 2 years. Following testing, the Marine Corps plans to down-select to a single vendor. I welcome an update from our witnesses on the status of the program. In particular, I would like your thoughts on whether you anticipate any problems with the program schedule due to the contract protest, which I know has been resolved.

The other priority for the Marine Corps is the joint light tactical vehicle, JLTV. JLTV is a joint Army and Marine Corps program that will replace the high mobility multi-wheeled vehicle, another acronym, HMMWV [Humvee]. The fiscal year budget includes \$136.2 million in funding for the JLTV program; and, of this amount, \$113 million will be used to procure 192 vehicles, while \$23.3 million is dedicated to the RDT&E activities. Over the course of the program, the marines will procure a total of 5,500 vehicles. Of course, we know the Army will procure many, many more of these vehicles.

Like the ACV program, the JLTV program also had a vendor protest following the contract award. The protest was finally resolved in the Marine Corps's favor in February, but the winning vendor was under a stop-work order until the issue could be resolved. Again, I would like to know from our witnesses what impact this delay will have on this particular program.

One final program critical to Marine Corps ground modernization is the amphibious assault vehicle, AAV. The Marine Corps is currently upgrading part of their AAV fleet with survivability upgrades to address obsolescence and increase the vehicle's capability until the AAV can be replaced by the ACV, the amphibious combat vehicle. It is my understanding that this program is slightly ahead of schedule and that the Marine Corps is on track to begin testing this month.

In addition to the major ground modernization programs that I've highlighted, the Marine Corps is also developing the common aviation command and control systems which will consolidate the current control system of the marine air command and control systems into a single upgraded system with common hardware, software, and equipment. The Marine Corps is also developing, as the Chair mentioned, the ground/air task-oriented radar, G/ATOR. The G/ATOR is an expeditionary radar system that will replace legacy radar systems currently fielded by the Marine Air-Ground Task Force. However, this committee has expressed concerns about the status of this program, including poor developmental test results and reliability issues with the system's software. I look forward to any comments our witnesses have on this program.

Again, thank you, Mr. Chairman, for holding this hearing. I look forward to hearing from the witnesses.

Senator WICKER. Thank you, Senator Hirono.

Gentlemen, you have submitted a joint statement consisting of 9 pages, which will be inserted in the record at this point, without objection.

Lieutenant General Walsh, I see that your name is listed first on the statement, so you are recognized for whatever comments you might have.

**STATEMENT OF LIEUTENANT GENERAL ROBERT S. WALSH,
USMC, DEPUTY COMMANDANT FOR COMBAT DEVELOPMENT
AND INTEGRATION; COMMANDING GENERAL, MARINE
CORPS COMBAT DEVELOPMENT COMMAND**

General WALSH. Okay. Thank you, Chairman Wicker and Ranking Member Hirono, also Senator Rounds, Senator Kaine, and Senator King. Thank you very much for allowing us to be here.

Joining me today is my good friend, Mr. Tom Dee, Deputy Assistant Secretary of the Navy for Expeditionary and Logistics Management. With your permission, I'd like to submit that for the record, our written testimony.

Senator WICKER. It will be received.

General WALSH. The Marine Corps's ability to serve as the Nation's premier crisis response force is due, in large part, to the subcommittee's continued strong support on behalf of all marines and your marines, and we thank you for that.

The Marine Corps faces a challenging future operating environment in which peer and near-peer adversaries approach parity with some key capabilities. Anti-access and area-denial capabilities will proliferate and are becoming cheaper, more lethal, and harder to target from our end. Hybrid adversaries with mass signatures will fight in distributed fashion in densely populated urban littorals, and U.S. satellite capabilities may be degraded or denied. Cyberthreats will target the digital networks that are central to the way we currently fight. Adversaries will leverage advanced commercial off-the-shelf, or COTS, technologies to outcycle our acquisition process. Information warfare will exploit global communications in social media. We will face all these challenges in an area of reduced manpower and fiscal austerity.

To fight and win in such an environment, we are conducting a very deliberate forced structure review that will field future Marine Air-Ground Task Forces [MAGTFs] that are naval, leveraging the sea as maneuver space to project power from the sea base; lethal, employing 21st-century combined arms; agile, employing 21st-century maneuver to generate overmatch of combat power with the ability to rapidly aggregate forward from distributed locations and from CONUS [the Continental United States]; and expeditionary, able to rapidly deploy, employ, sustain in littorals and further inland.

With the smallest modernization budget in the Department of Defense, the Marine Corps continually seeks to leverage the investments of the other services. Carefully allocating our modernization resources to those investment areas which are most fiscally prudent and which—those that promise the most operationally effective payoffs. Innovative warfare fighting approaches and can-do leadership are hallmarks the Marine Corps, but these cannot overcome the vulnerabilities created by our rapidly aging fleet of vehi-

cles. Long-term shortfalls in modernization have a detrimental impact on readiness, degrade our crisis response capability, and will ultimately cost lives during crisis. We are seeking to balance the increasing costs of maintaining legacy platforms with the needed investments in modernization across many portfolios. Eventually, sustaining fleets of severely worn and legacy systems become inefficient and no longer cost-effective.

Our ground vehicle modernization strategy is to sequentially modernize priority capabilities, reduce equipment inventory requirements wherever possible, and judiciously sustain remaining equipment. The future security environment requires a robust capability to operate from the sea and maneuver ashore to positions of advantage.

The amphibious combat vehicle enables us to do so and is the Marine Corps's highest-priority ground modernization program, and consists of two increments. This program, when coupled with improvements to our existing fleet of assault amphibian vehicles, generates a complementary set of capabilities to meet the general support lift capability and capacity requirements of our ground combat element.

The second highest priority within the portfolio remains the replacement of our Humvee fleet that is most at risk, those trucks that perform a combat function and are typically exposed to enemy fires. In particular, the Army, the Marine Corps have sequenced the JLTV program to ensure affordability in the entire GCTV [Ground Combat Tactical Vehicles] portfolio while replacing 5,500 units of the legacy Humvee fleet with modern tactical trucks prior to fielding the first increment of ACV.

These core Marine Corps modernization efforts have been designed in a manner to ensure their affordability. However, if the budget is fully sequestered in fiscal year 2017 or beyond, it will jeopardize both the timing and resources required to undertake the strategy, and greatly affect our ability to achieve our requirements in both vehicle fleets.

Finally, the ground/air task-oriented radar that combines five current radar programs will enhance our ability to command and control the Marine Air/Ground Task Force. This solution will allow us to support air defense, air surveillance, counterfire, targeting, and air traffic control missions through simple software swaps on a single piece of hardware, a much more expeditionary solution than numerous offers of radar solutions for each mission. It will increase our sensing and sharing effective across the range of military operations, suborning missions in high-end conflict, hybrid warfare, and low-intensity conflict; and thus, enabling the command and control of our forces.

Thank you again for this opportunity. I look forward to your questions.

Senator WICKER. Thank you, sir.

Mr. Dee.

STATEMENT OF THOMAS P. DEE, DEPUTY ASSISTANT SECRETARY OF THE NAVY FOR EXPEDITIONARY PROGRAMS AND LOGISTICS MANAGEMENT, OFFICE OF THE ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Mr. DEE. Yes, sir, thank you. Chairman Wicker, Ranking Member Hirono, distinguished members of the subcommittee, thank you for the opportunity to testify before you today.

Lieutenant General Walsh and I have submitted a joint statement. So, with your permission, I'll be very brief with my opening remarks.

General Walsh highlighted the challenging environment in which we operate and within which we expect to operate through the foreseeable future. The pace of technological innovation, the ubiquitous availability of information, and the shifting demographics and political and economic balance of the world's population requires more than ever a Marine Corps that is forward-deployed, expeditionary, and agile.

The Commandant has testified that this challenging geopolitical environment is further complicated by the fiscal environment and the budget pressures that face our Navy and Marine Corps. Last week before the subcommittee, Secretary Stackley observed that our shipbuilding account represents only about 3.3 percent of the defense budget in this time of diminishing defense budgets relative to the national GDP [gross domestic product]. Well, as context for this hearing, the total Marine Corps budget request for fiscal year 2017 is \$24.9 billion, approximately 4.3 percent of the Nation's defense budget. If you include all of the support the Navy provides—aviation, seabasing, manpower, et cetera—that percentage edges upwards to only about 7 and a half percent. Within those limited dollars, our Marine Corps investment and ground modernization accounts allow only about \$2.4 billion, four tenths of 1 percent of the defense budget, to equipment and modernize your Marine Corps. These funds need to cover the range of ground force capacities, from combat and tactical vehicles to artillery and missiles, enterprise IT [information technology], command and control, and radars, unmanned aerial vehicles, personal protective equipment, small arms and ammunition, generators, tents, and everything in between, all while investing in the R&D [research & development] to build a future Marine Corps that will be inherited by the next generation and remain as the Nation's premier forward-deployed and ready force.

So, with the need to stretch so few dollars over so many critical capabilities, the Marine Corps is specially conscious of every—of making every dollar count and of the opportunity cost of making less-than-optimum decisions. The Marine Corps must strike a delicate balance between current and future readiness, with our future readiness to fight and win somewhat dependent on the wise selection and execution of our R&D and procurement projects. We cannot afford to do everything we might like to do. The good news is that the current global and fiscal environments do not only impose a threat, they also help to serve as a sometimes uncomfortable catalyst for the Navy and the Marine Corps to think differently and to be innovative in our acquisition efforts.

So, even while still in the early production stage, our ground/air task-oriented radar, G/ATOR, is introducing new but mature and proven technologies to reduce cost and improve performance as we move to operational test. Our ACV program wisely took a pause, reevaluated capability priorities, and heavily leveraged the benefits of competition to provide the Marine Corps with a capable and modern amphibious combat vehicle.

Now, being innovative means doing things differently, which sometimes results in unusual schedule or funding profiles. We appreciate the support of your committee in understanding that, to be innovative and agile, sometimes our programmatic must also be agile.

Over the past few years, with the support of the subcommittee, the Navy and the Marine Corps team has been diligent in making difficult trades to balance risk within our modernization portfolio. It's incumbent now upon us to execute those decisions well so that your Marine Corps will remain America's expeditionary force in readiness well into the future.

Mr. Chairman, thank you for the support you and your committee have provided and continue to provide to our Marine Corps. I look forward to answering your questions.

[The prepared joint statement of General Walsh and Mr. Dee follows:]

PREPARED JOINT STATEMENT BY LIEUTENANT GENERAL ROBERT S. WALSH AND
MR. THOMAS P. DEE

Introduction

Mr. Chairman, Ranking Member Hirono, and distinguished members of the Subcommittee, we thank you for the opportunity to appear before you today to discuss Marine Corps Ground Force Modernization. Our testimony will provide the background and rationale for the Marine Corps' fiscal year 2017 budget request which is aligned to our strategic priorities and budgetary goals.

The United States is a maritime nation with global responsibilities. Our Navy and Marine Corps persistent presence and multi-mission capability represent U.S. power projection across the global commons. We seek to move at will across the world's oceans, seas and littorals, and extend the effects of the sea-base deep inland. We enable global reach and access, regardless of changing circumstances, and will continue to be the nation's preeminent solution for employing deterrence through global presence, sea control, mission flexibility and when necessary, interdiction. We are an agile strike and amphibious power projection force in readiness, and such agility requires that our Naval expeditionary forces remain strong.

The Marine Corps is the Nation's expeditionary force-in-readiness. By congressional mandate, it has a unique role and structure as a ". . . balanced force. . . in-readiness, air and ground." This mandate results in the requirement for the Marine Corps to maintain a high state of combat readiness to be "most ready, when the Nation is least ready."

Operating Environment

The Marine Corps executed over 100 operations, 20 amphibious operations, 140 Theater Security Cooperation (TSC) events, and participated in 160 exercises during calendar year 2015. Marine Corps units deployed to every Geographic Combatant Command (GCC) and executed numerous TSC exercises to help strengthen relationships with allies and build partner capacity. In Syria and Iraq, Marine squadrons continued over 1,275 total sorties and 325 strikes in support of Operation Inherent Resolve (OIR). 300 marines from Special Purpose Marine Air Ground Task Force—Crisis Response—Central Command (SPMAGTF-CR-CC) and Advise and Assist (AA) teams advised and enabled the Iraqi Army. SPMAGTF-CR-AF incident response force (IRF) maintained various alert postures from NASSIG, Italy, Souda Bay, Greece, and Moron Air Base, Spain during multiple iterations of SOCAF operations, and provided fixed site security forces to US embassy Bangui, Central Afri-

can Republic, to assist in the reopening of the embassy. In addition, SECFOR provided security at Diplomatic Transit Facility, Sana'a, Yemen and AMEMB Yemen.

Marine Expeditionary Units (MEU) provided support to the U.S. Embassy Sana'a, Yemen to safeguard American civilians and facilities including facilitating the evacuation of the Embassy in February and March. The 31st MEU also deployed to Saipan to provide Defense Support to Civil Authorities (DSCA) as Typhoon Soudelor passed through the Commonwealth of the Northern Marianas killing 30 and displacing 150,000 people. The 15th MEU and III MEF supported the President's travel in Kenya, Ethiopia, and Malaysia. Additionally, the 15th MEU provided support to SOCCENT by offloading air combat assets into Djibouti to make room on the USS *Anchorage* to provide an Afloat Forward Staging Base (AFSB) capability in support of SOP tasking in the region.

Marine Security Augmentation Units (MSAU) teams deployed 33 times in 2015 at the request of the State Department executing 12 Embassy/Consulate security missions and 21 VIP (POTUS/POTUS/SECSTATE) security missions. MSAU marines deployed to Iraq, Burundi, South Sudan, Belgium, Egypt, Philippines, Kenya, Ethiopia, Turkey, Uruguay, Canada, Tajikistan, Chile, Switzerland, Jamaica, Panama, Sri Lanka, Germany, Jordan, Kyrgyzstan, France, Burkina Faso and Ukraine. Additionally, Joint Task Force-505 (JTF-505) was activated in response to a magnitude 7.8 earthquake in Nepal in April 2015 that killed over 8,000 people and injured more than 21,000. JTF-505 Forward assumed command of all DOD assets in support of Foreign Disaster Relief operations in Nepal and delivered about 114 tons of emergency relief supplies, transported 534 personnel and conducted 63 casualty evacuations.

Future Environment

If one characteristic defines the future operating environment it is uncertainty. Crises, whether natural disasters or manmade, will continue to arise at an ever increasing pace. The 2014 Quadrennial Defense Review correctly states that "the international security environment remains uncertain and complicated. The United States will likely face a broad array of threats and opportunities and must prepare to address both effectively in the coming years." Exacerbating these future threats is the nature of our adversary's capabilities. We continue to see the power of disruptive technologies distributed to more diffused and decentralized actors. In what has been described as a 'new normal,' extremism, economic disruption, identity politics and social change generate new potential security threats at an accelerating pace.

Two years ago we published Expeditionary Force 21, our Marine Corps capstone concept, which establishes our vision and goals for the next 10 years and provides a plan for guiding the design and development of the future force that will fight and win in this environment. It is aligned with our Cooperative Strategy for 21st Century Seapower and informs decisions regarding how we will adjust our organizational structure to exploit the value of regionally focused forces and provide the basis for future Navy and Marine Corps capability development to meet the challenges of the 21st Century. Developed in close coordination with the refresh of the maritime strategy, Expeditionary Force 21 provides guidance for how the Marine Corps will be postured, organized, trained, and equipped to fulfill the responsibilities and missions required around the world. We will publish an updated Expeditionary Force 21 in May. It will continue to guide refinements to how we operate from the sea and provide the right sized force in the right place, at the right time.

A key attribute of this force will be its requirement to remain flexible, with the capability to arrive from a variety of platforms and seamlessly aggregate to serve as a leading edge of the United States response or assume command of a Joint Task Force (JTF). In addition these forces will operate over even greater distances and be employed in even smaller packages to include the increased reliance on independent company sized units. This diffusion of combat power will place increasing demands on our command and control, communication, and logistics support architecture.

Marines must be ready to respond anywhere in the world, at any time, with the full spectrum of expeditionary capabilities across a range of operations, to include, crisis response, disaster relief, or armed conflict. Consequently, we man, train, and equip our force and prioritize resources for readiness. As one of the five pillars of readiness, equipment modernization is a critical factor in our ability to support our capability requirements. But under current fiscal constraints, we have prioritized near-term readiness while assuming risk in other areas, including equipment modernization. The support of this committee is greatly appreciated in relieving this budgetary pressure.

We are committed to delivering required warfighting capabilities to marines in a timely and affordable manner. Continued funding shortfalls in our investments will

force reliance on aging equipment and diminish our technical advantage over our adversaries. The continuing need to maintain and update legacy systems takes the focus off innovation and is costly in its own right. Experience tells us that investing in new capabilities and technologies is a proven cornerstone for your marines and sailors to achieve mission success today and into an uncertain, but no less demanding future.

Ground Modernization

A fundamental strength we have working for us is the close partnership between Navy and Marine Corps. Naval integration is a critical factor in our mission performance. The Marine Corps also works closely with the Army, other Services, and industry to provide the most effective and affordable capabilities to your marines and sailors. The Marine Corps and the Army have worked together on programs such as the Joint Light Tactical Vehicle (JLTV), the Enhanced Combat Helmet and the Modular Scalable Vest. To improve our collaborative relationship, this year we are resuming use of the Army Marine Corps Board, with regularly scheduled meetings at the 3-star level, to identify, develop, review, and resolve issues with concepts, capabilities, service approved requirements and programs.

Ground force modernization is focused on high-priority programs such as the Amphibious Combat Vehicle (ACV) 1.1, Amphibious Assault Vehicle (AAV) survivability upgrades, Ground/Air Task Oriented Radar (G/ATOR), and Joint Light Tactical Vehicle (JLTV).

GROUND COMBAT AND TACTICAL VEHICLES (GCTV)

The overarching priority within the GCTV portfolio is the replacement of the legacy Amphibious Assault Vehicle (AAV) with modern armored personnel carriers through a combination of complementary systems. The ACV program is the Marine Corps highest ground modernization priority and will use an incremental approach that consists of two Phases: ACV Phase 1 Increment 1 (ACV 1.1) and ACV Phase 1 Increment 2 (ACV 1.2). Phase 1 Increment 1 will field a personnel carrier while Increment 2 will deliver improved personnel carrier capabilities, a command and control variant, and a recovery variant. Phase 2 will examine potential High Water Speed solutions.

The second highest priority within the portfolio remains the replacement of a portion of the high mobility multi-purpose wheeled vehicle (HMMWV) fleet that is most at risk; those vehicles that perform a combat function and are typically exposed to enemy fires. In partnership with the Army, the Marine Corps has sequenced the JLTV procurement so as to ensure affordability of the entire GCTV portfolio while replacing one third of the legacy HMMWV fleet with modern tactical vehicles.

Amphibious Combat Vehicle (ACV) 1.1

The Fiscal Year 2017 President's Budget requests \$158.7 million in RDT&E for ACV 1.1. The Marine Corps appreciates the support of the Congress and this Committee in the restructuring of the ACV program in the fiscal year 2015 defense authorization. The Marine Requirements Oversight Council (MROC) approved ACV 1.1 on March 6th, 2015, Milestone B was certified on November 11th, 2015, and two competitive contracts were awarded to industry on November 24th 2015. Those vendors are scheduled to deliver 16 prototype vehicles each in fiscal year 2017. The ACV 1.1 program successfully leveraged technology demonstrations and competitive prototyping to create a set of realistic requirements that are achievable with a non-developmental vehicle. Market research and extensive discussions with industry confirmed that requirements could be met with low-risk, affordable solutions. The use of demonstrated mature technologies and stable requirements reduced technical risk and allowed foregoing the Technology Maturation and Risk Reduction (TMRR) phase, accelerating Initial Operational Capability (IOC). The condensed Engineering and Manufacturing Development (EMD) phase will focus on manufacturing and testing rather than system design. An acquisition strategy that included affordability constraints and competition through to Low Rate Initial Production (LRIP) will continue to ensure affordability. The Acquisition Objective (AO) for ACV 1.1 is 204 vehicles. This AO provides lift for two infantry battalions and is planned to achieve Initial Operational Capability (IOC) in fiscal year 2020. This aggressive schedule for ACV 1.1 requires full funding and the continued support of this Committee and Congress.

The Marine Corps is also investing in the exploration of a range of high water speed technology approaches to provide for an affordable, phased modernization of legacy capability to enable extended range littoral maneuver. These efforts will develop the knowledge necessary to reach an informed decision point in the mid-2020s

on the feasibility, affordability, and options for developing a high water speed capability for maneuver from ship-to-shore.

Amphibious Assault Vehicle (AAV) Survivability Upgrade (SU)

The Fiscal Year 2017 President's Budget requests \$38.0 million for RDT&E and \$73.8 million for PMC for the AAV program. To restore much needed survivability and mobility to the current AAVs, approximately one third of that fleet will undergo a survivability upgrade. The AAV Survivability Upgrade (SU) improves AAV capability in order to support Marine Expeditionary Unit (MEU) deployments, and when globally sourced, provide the capacity necessary for the amphibian assault echelons of two Marine Expeditionary Brigades. The combination of a modern amphibious armored personnel carrier alongside the improved AAV generates a complementary set of capabilities to meet general support lift capability and capacity requirements of our Ground Combat Element.

Joint Light Tactical Vehicle (JLTV)

The Fiscal Year 2017 President's Budget requests \$23.2 million in RDT&E and \$113.2 million in PMC for the Marine Corps portion of the JLTV program. The Department remains firmly partnered with the U.S. Army in fielding a JLTV that meets requirements of both services while remaining affordable. The JLTV program strives to control ownership costs by maximizing commonality, increasing reliability over the legacy HMMWV fleet, and improving fuel efficiency. The program completed the EMD phase in November 2014. The program received a Milestone C decision on August 25th 2015 and the LRIP contract was awarded to Oshkosh Defense. The acquisition objective of 5,500 will be procured in the first increment.

GROUND FORCE COMMAND AND CONTROL (C2)

The ability to coordinate and synchronize distributed Command and Control (C2) sensors and systems is critical to the success ashore of the MAGTF. Modernization priorities in this area are the Ground/Air Task Oriented Radar (G/ATOR), the Common Aviation Command and Control System (CAC2S), and Networking on the Move (NOTM). These systems will provide modern day, interoperable technologies that support real-time surveillance, detection, targeting and force protection, in addition to the common C2 suite required to enable the effective employment and situational awareness of the MAGTF.

Ground/Air Task Oriented Radar (GIATOR)

The Fiscal Year 2017 President's Budget requests \$83.5 million in RDT&E and \$135.0 million in PMC for the G/ATOR program. GIATOR is the Marine Corps short and medium range multi-role radar designed to detect aircraft, unmanned aerial systems, cruise missiles, air breathing targets, rockets, artillery and mortars. GIATOR Block 1 provides air defense and air surveillance capability, and achieved Milestone C in 2014. Block 2 is in the EMD phase and will provide counter-battery and target acquisition capability. RDT&E funding resources Block 2 development. PMC funding resources procure three LRIP assets. This program is critical to replacing radars that have exceeded their expected life cycle and technological relevance and we appreciate the continued support of the committee in furthering the capability.

Common Aviation Command and Control System (CAC2S)

The Fiscal Year 2017 President's Budget requests \$11.8 million in RDT&E and \$47.3 million in PMC for CAC2S. CAC2S Increment 1 is a modernization effort to replace existing Marine Air Command and Control System (MACCS) equipment. Increment 1/Phase 1 successfully fielded a product baseline Processing and Display Subsystem (PDS) and Communications Subsystem (CS) during 4th Quarter Fiscal Year 2013. Increment 1/Phase 2, covers the integration of sensor capabilities with the PDS and addresses the remaining Air Combat Element (ACE) Battle Management and C2 requirements through integrating the Air Command and Control Subsystem.

Phase 2 completed a successful Milestone C in February 2015. Funding in this budget supports the assembly and Initial Operational Test and Evaluation (IOT&E) of the first four Limited Deployment Units and the required government furnished equipment. IOT&E is scheduled for fiscal year 2016. Phase 2 completion will result in the delivery of the full CAC2S Increment 1 capabilities and is planned to begin fielding in fiscal year 2017. The approved AO is 50 systems.

Networking on the Move (NOTM)

The Fiscal Year 2017 President's Budget requests \$9.1 million in RDT&E and \$37.5M in PMC for the NOTM program. NOTM provides the MAGTF with a robust,

over-the-horizon/beyond line-of-sight digital command and control capability while on-the-move and at-the-halt. RDT&E funding resources the development of a NOTM Airborne variant for MV-22 and KC-13 OJ systems in support of the SPMAGTF-Crisis Response forces, and the development of a NOTM Internally Transportable Vehicle (ITV) variant on a vehicle internally transportable in a MV-22. PMC funding is focused on production of the current NOTM Ground Combat Vehicle (GCV) variant towards its Approved Acquisition Objective (AAO).

SMALL ARMS MODERNIZATION

Informed by operational lessons, technological maturity, industrial capabilities, and guided by concepts and initiatives such as Expeditionary Force 21 and the Marine Expeditionary Rifle Squad Initial Capabilities Document, the Marine Corps is aligned with the Joint strategy for weapons modernization to improve accuracy, lethality and mobility. Initially prioritizing selective modernization and sustainment of critical legacy capabilities, longer-term goals will capitalize on technological advances to deliver modern replacements for critical weapon systems. Our end state is to develop improved lethality while also improving the mobility of the individual marine, the Marine Rifle Squad, and the MAGTF. The Fiscal Year 2017 President's Budget requests \$1.4 million in RDT&E and \$5.2 million in PMC across the Marine Corps' small arms portfolio.

In the near term, we will selectively modernize systems and conduct a prioritized sustainment of legacy capabilities. For example, an adjustable buttstock of the M16A4 has been fielded in limited quantities while commanders have been authorized to procure more and modify rifles as necessary to improve the ergonomics relative to the stature of the individual Marine. In 3rd Quarter fiscal year 2016 we will achieve IOC on the quick change barrel for our M2A1 heavy machine gun, an improved capability common to all the services. We are realigning our existing M4 inventory to provide our infantry battalions with our most capable service rifle. We anticipate completion in 3rd Quarter fiscal year 2016. Finally, the Marine Corps will participate in the Army's Precision Sniper Rifle (PSR) program in addition to fielding the M40A6 Sniper Rifle, ensuring the most accurate and lethal fires for our Scout Sniper community.

In the long term, we will look to make larger gains in capability through pursuit of next generation weapons with the other services. This includes working with the Army to explore the Modular Handgun System (MHS) in pursuit of developing a pistol that features increased accuracy, improved ergonomics, and a higher degree of reliability/durability over legacy systems. We will also work together to develop the next generation of infantry squad weapons by taking a holistic approach to integrating technological and materiel advancements for small arms to improve accuracy and increase lethality out to 600m.

FAMILY OF BALLISTIC PROTECTIVE SYSTEMS (BPS)

Coupled with our infantry weapons systems, we seek to improve the protection and lethality of our marines through BPS. BPS provides technologically advanced ballistic protection at the lightest possible weight. It provides the critical ballistic protective systems to save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more marines in the fight. Major BPS programs include: Plate Carrier (PC); Improved Modular Tactical Vest (IMTV); Enhanced Small Arms Protective Inserts (ESAPI); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); and hearing protection. As in small arms, we are actively working with the Army to develop improved protection systems that maximize mobility while providing the requisite protection through the active sharing of novel designs and materials. A key component of all of the BPS programs is that as new threats emerge on the battlefield, BPS equipment will be ready to adapt and meet these new threats. This initiative supports this requisite adaptability as well as sustaining currently fielded protection. Continued Congressional support is critical to enable this capability. The Fiscal Year 2017 President's Budget requests \$2.7 million in RDT&E and \$4.2 million in OMMC across the BPS portfolio.

CONCLUSION

The Marine Corps continues to improve our essential ground capabilities through a strategy that is stable and affordable. We recognize the need for continued vigilance in achievement of a proper balance between current readiness and the long-term imperatives of modernization and innovation. This balance is critical to ensuring the Marine Corps and the individual Marine has the capability to fight and win future battles while being prepared to respond today as our Nation's force in readiness.

On behalf of the marines and sailors who provide the Nation with its forward deployed crisis response force, we thank you for your constant support in an era of competing challenges. We are proud of our reputation for frugality and we remain one of the best values for the defense dollar. These critical modernization investments, among many others, will ensure our success not if, but when future conflict occurs. Fiscal uncertainty has threatened both our capacity and capabilities, forcing us to sacrifice our long-term operating and training health for near-term readiness. Recognizing these fiscal challenges, we remain committed to fielding the most ready Marine Corps the Nation can afford. Mr. Chairman, and distinguished committee members, on behalf of your marines, we request your continued support for our modernization strategy.

Senator WICKER. Thank you. Thank you very much, Mr. Dee, for emphasizing that we need to make every dollar count.

Let's just jump right into this top priority, which is the ACV. On your joint testimony, pages 4 and 5, you discussed this in some detail. Mr. Dee, you mentioned competition. The marines expect to down-select one vendor in 2018. How is that going? What can you tell us about the entire acquisition strategy and your confidence that the cost and schedule are under control?

Mr. DEE. Yes, sir. I alluded to this in my opening remarks. ACV—everybody's familiar with the history of EFV [Expeditionary Fighting Vehicle] and with the history of MPC. We were on a path for an amphibious combat vehicle with some question still as to what the priority capabilities were. We took a pause for that. With that pause, we were able to reprioritize or prioritize and emphasize the capabilities that we most required, the ability to effectively operate ashore once we got ashore. We looked at mature technologies. We looked at seven different vendors, five of which were interested in competing for this particular program. We down-selected to two vendors in order to allow the competition to produce our EMD vehicles. The idea behind that was—is the competition will cause price to come down, which it has, significantly below our previous service cost position. So, we were very successful in that. We've got a very abbreviated EMD—engineering, manufacturing, development—phase, which will lead to testing—development—developmental testing, as well as the beginnings of some operational tactics development, which will allow us to do a down-selection in fiscal year 2018 and go forward then with a low-rate initial production [LRIP] and a production contract. Everything is on track. We are at cost or below cost. We are a little behind in schedule now, because of the protest, which was mentioned earlier. But, it's a fairly minimal delay that we're experiencing with this. Both contractors leaned forward during the period of delay to avoid losing much time. No more than one-quarter. The good news on this is that the funding is still phased in the correct year to support both the EMD phase as well as the procurement portion, fiscal year 2018, to allow those initial LRIP contracts. So, we don't expect any major significant delays as a result of the program—

Senator WICKER. For the record, the pause was from when to when?

Mr. DEE. The protest was initiated in November. I believe it was cleared in early February.

Senator WICKER. That was the reason for the pause?

Mr. DEE. Oh, no, sir. No. I'm sorry. I thought—

Senator WICKER. My question was—

Mr. DEE.—I thought you meant the—

Senator WICKER.—about the pause.

Mr. DEE.—the—so, we had a program that was intended to begin RDT&E in fiscal year 2015. We were still looking at evaluating the value of high water speed. We took a pause on initiating that program, which put our money a little bit out of phase, so we have RDT&E money in 2015 for a program that we didn't really initiate and award the contracts to until last year. So, the pause was between the EFV [Expeditionary Fighting Vehicle], the MPC, the original ACV concept. Took a pause on that to reevaluate the requirements and what the priority was for that before we initiated the program and led to the RFP and the competition. So, that was back in 2015.

Senator WICKER. The 1.1 relies on commercial off-the-shelf wheeled vehicles that will rely on connectors to get ashore, and then, gentlemen, you say, on page 5, "Phase 2 will examine potential high water speed solutions."

General, would—what's the reason for this deferred objective of high water speed?

General WALSH. Chairman, you know, I think, going back to what Mr. Dee was saying about, "Why do we feel like we're in pretty good shape with the program, itself?"—is—one of the things is, when we made that decision on the ACV, to go with a wheeled vehicle, we went with a capability that was nondevelopmental. So, using vehicles that were part of the original MPC program, we started with those. So, when we went with those, those vehicles were not designed to go ship-to-shore. Those were vehicles that were designed to go shore-to-shore, with an objective capability to go ship-to-shore of 12 miles. So, that capability in the 1.1 was to provide a capability that would give us more combat power once we got ashore, and, as you said, that they would come from connectors. We still have our assault amphibious vehicle capability of 392 vehicles in that program that we're going to the AAV upgrade program. Those are our main capability to get the marines ashore while we develop the ACV 1.1 capability, and then see how that goes to—as we go forward into the second increment, or the 1.2, which would hopefully have the ship-to-shore capability while still maintaining our intent to try to get to a high water speed down the road.

Senator WICKER. Are you certain we'll go to a 1.2, General?

General WALSH. Right now, I think what we've got is—the capability we've got right now is a personnel vehicle. So, the 1.2 would come in with a command-and-control vehicle and a recovery vehicle capability. So, we're—we'll go to some type of vehicle that will bring those capabilities in, and then what type of requirements—we still have to develop our requirements documents for what those would be.

Senator WICKER. So, it might be a 1.1 or it might be what?

General WALSH. It could—I guess it could be a follow-on to the 1.1 or it could be a 1.2. It would be a second increment that would bring in those other capabilities, like a personnel variant or recovery variant or a C2 [Command and Control] variant, and potentially different capabilities within it to give it more ship-to-shore capability.

Senator WICKER. When will the decisionmakers know on that?

General WALSH. I think we'll probably be working those requirement documents—probably in about 2018 would be the time period we'd start doing that. I think about 2019 would be the time we'd starting working in—that into the program to start putting requests out there for when we'd start to need those vehicles.

Senator WICKER. Thank you.

Senator HIRONO.

Senator HIRONO. Thank you, Mr. Chairman.

You've already been asked some questions regarding the ACV, which is your highest ground modernization priority. We know that the Marine Corps has had a mixed record developing a new amphibious vehicle. The first attempt, the expeditionary fighting vehicle, EFV, cost the Marine Corps \$3 billion before it was canceled in early 2011 because it demonstrated poor performance during operational testing. Can you explain to this committee how the ACV effort this time will be different and what steps the Marine Corps has taken to ensure that we don't have another failed program in this your most important modernization priority?

General? Secretary?

General WALSH. I think the thing that probably would be different at this point, Senator Hirono, would be that we have been putting so much focus on the high water speed in our expeditionary fighting vehicle program and then in our amphibious combat vehicle program. We've kind of taken that off the table with the ACV 1.1. Even the 1.2, the one that would be the follow-on variant, we don't believe we're going to get the high water speed with that. The decision point for us to go to a high water speed, we think we're going to use about the next 10 years, til 2025, to continue to look at that on whether, in the longer term, what we'd be calling probably a ACV 2.0, beyond the 1.2, might be a time period where we'd be looking at that vehicle coming in, following when our AAVs start to run out, in about 2035.

So, I think the thing that would be different here is, is that taking that high water speed requirement, staying with something that we think is much more achievable in the 1.1 program, and then seeing where that—the 1.1 program gets us for follow-on development into the 1.2 program.

So, I think what we've done is, we've reduced a lot of that risk by trying not to put the high water speed. That's where we came into the tradeoffs with high water speed by taking off protection, lethality, those kind of things that we weren't willing to trade off once we got ashore to get—just to get to the high water speed. We realize, at this point in time, the technology is not there.

Senator HIRONO. No.

General WALSH. So, we kind of limited that as part of the requirement that was stressing the program.

Senator HIRONO. You probably could make that kind of comment with regard to any of our acquisition programs, because the more requirements we place in terms of design survivability and all of that, that can really increase the risk of the acquisition actually performing. That's what happened, apparently. Thank you for noting that. I hope, going forward, that we really make a very accurate assessment as to what we really need from these programs.

As far as the joint light tactical vehicle program, in light of the delay due to the protests that occurred—and I don't know whether these protests are becoming a common thing and whether you just factor in the delays as a result of the protests so that we—you know, we don't come and ask you, "Well, what's—what has the delay cost?" But, do you feel confident that the program is now on track and will still meet the development and testing timelines? Because you are going to acquire a lot of these vehicles.

Mr. DEE. Yes, ma'am. In regards to protests, we don't account for the potential protest in our schedules, generally. We try to establish our selection criteria so that it is very clear to the vendors so that we are at minimal risk of protest. But, that doesn't stop protests from happening. So that I think the Department gets probably about 2,000 per year, out of tens of thousands of contract awards. So, we don't account for protests up front.

The impact of the protest definitely affects the schedule. So, I mentioned, in an ACV, because the dollars were phased, it's a fairly minimal impact that we've got in the ACV program. JLTV is a little bit differently. So, JLTV, the same scenario—it was a little different, in terms of the process of the protest, in the fact that it went to the Court of Federal Claims as well as to the GAO [Government Accountability Office]—but, in terms of the impact, the—that 90-day delay cascaded into a further delay in testing because of test-range availability and testing schedules. So, a 90-day delay grew into about a 6- or 8-month delay just because of, now, the difficulty in rescheduling the test phase that we were going to do, which then impacts the decision date for the full-rate production decision, which, in turn, puts our funding out of phase for the JLTV program for our production decision for JLTV, which then allowed us to take a look at the time difference between the completion of testing and that full-rate production decision, and it ended up stretching out IOC [initial operational capability] about a year. A 90-day protest period resulted in about a year delay in achieving IOC.

Now, not all of that is directly related to the protest itself, that 90-day protest, but the cascading effect—

Senator HIRONO. Yes.

Mr. DEE.—of the protest, and then some decisions we made internally to be able to better address any potential changes that come out of the testing prior to FRP [full-ride production] to make sure that we're giving the first battalion equipped a capable, ready vehicle to go out.

So, we—so, the impact on JLTV is about a year—a little over a year, actually, for IOC [initial operational capability]. That came out of a 90-day protest period.

Senator HIRONO. Well, thank you for explaining how a short protest period can have the cascading impact, as you say. So, the idea is to minimize any kind of a potential for protest, even though we know that they will occur, because we're talking about a lot of money and contracts at stake.

Mr. Chairman, do you mind if I ask one more question? I—

Senator WICKER. Please go ahead.

Senator HIRONO. Thank you so much.

In light of the evolving security—this is for General Walsh—security environment and the unanticipated global challenges—and you did note in your written testimony when you stated that, “If one characteristic defines the future operating environment, it is uncertainty”—do you believe that the Marine Corps has the force structure necessary if called upon for major combat operations?

General?

General WALSH. Senator Hirono, I guess I would say that we are prepared for today, and we are—we’re ready to fight in any operation we may have to fight. But, as you project out into the future, what the future operating, as—environment, as we call it, I think, as you take a look at the threats we’re seeing and how quickly—I think a lot of it’s the technology we’re seeing today, and the proliferation of the technology, how quickly our adversaries can bring technology in. A lot of it’s the things that we view very beneficial to us, that we can bring in plug-and-play, rapidly bringing those capabilities. They’re able to do the same thing. I think, while we, on the Marine Corps, have been focused very much over the last 14 years on combat operations in Iraq and Afghanistan, our adversaries have continued to grow their capabilities. So, as we look at our peer competitors, countries such as Russia or China, you can just rapidly see what they’re doing with those capabilities that are certainly keeping pace with us, and outpacing us in many capabilities.

But, also at the lower end. I think some of the things you’re seeing on the ground in Syria today—capabilities like antitank guided missiles, where, before, we were very concerned about IEDs [improvised explosive devices], now those kind of capabilities that we’re seeing for complex attacks with those type of capabilities, proliferation of unmanned aerial systems, drones, that are out up there now to be able to see our forces, target our forces, and bring in pretty sophisticated capabilities pretty quickly, that what we’re seeing is, we are having to take a look at our force structure—we talked the—before, on the force structure review that the Navy was doing with its ships, its force structure assessment at the last hearing. We’re doing the same thing. In fact, I just left the Commandant, with all the senior leadership, just before I came over here, and we’re conducting our force structure assessment, and it’s all projected into that future operating environment. We see this as probably the most complex operating environment, both at the lower end of the spectrum and certainly at the higher end of the spectrum, that we have not really seen since the Cold War, these types of capabilities, when we start getting into precision weapons, ability to sense the area, and also working in the electronic magnetic spectrum.

Senator HIRONO. Thank you—

Senator WICKER. Thank you.

Senator HIRONO.—very much, Mr. Chairman.

Senator WICKER. Thank you, Senator Hirono.

Senator Rounds.

Senator ROUNDS. Thank you, Mr. Chairman.

General Walsh, I just want to walk my way through this a little bit. Please help me with the concepts behind getting these marines from a ship to the shore. I understand that, first of all, we’ve got

the AAV, which is 40 years old. I understand that—I mean, it's got to be replaced. It's got a 2-mile capability, basically, coming in, as I understand it, from ship to shore. Then right now we're talking about the ACV, the—and the variant is the 1.1, to begin with. My understanding is, is that the 1.1 that you're looking at today has very limited amphibious capabilities, but you think you can begin with that one with adding a connector to it to get it from the ship to shore. Is that correct? Can you walk us through that a little bit?

General WALSH. Yes, Senator. The first thing I would say is, the AAVs—we've got an amphibious assault vehicle upgrade program. So, we've got that going on right now. We just got our first vehicle in the EMD phase. It just came out—and we went out there and—went out there a couple of weeks ago and looked at it—which completely really refurbishes that vehicle and brings in a lot of good capabilities to it. So, it's basically pretty much a new vehicle.

Senator ROUNDS. So, you would use the AAV—the new model AAV—

General WALSH. Right.

Senator ROUNDS.—with the upgrades, to get a marine to shore.

General WALSH. That is our primary—to meet our 2 MEB [Marine Expeditionary Brigade] amphibious assault requirement, the current AAVs that we're upgrading will provide that capability.

Senator ROUNDS. When they do that, will that have a capability greater than the 2-mile capability today?

General WALSH. The 2-mile—I think if we looked at that, is that—you know, we've seen the AAV swim in from 12 miles. Now, a lot of that has to do with sea state, what the conditions are, how long those marines under—on the—and that's one of the reasons we want to go faster. One is maneuver, to maneuver away from the threat; but, the other thing is how long marines in higher sea-state conditions can live and survive—not survive, but, you know, be an effective fighting force when they come out of them when we get ashore. So, I would say, 2 miles, we're—we can easily exceed that. But, we're not out to where we'd like to be. The ACV, again, would be a vehicle that would be coming ashore as the follow-on echelon, not the initial wave coming in.

Senator ROUNDS. Now, this is a 1.1 variant—

General WALSH. This would be the 1.1 variant.

Senator ROUNDS. All right.

General WALSH. Now, the other thing I would say with that is, because we were buying a nondevelopmental capability, that we put on the requirement that the vehicle would just be a shore-to-shore capability, because that's what the companies really had—you know, had been designing for. What we hope to see as we get these 32 EMD vehicles and get out there and start working with them, getting them with our marines, and getting them in the operating environment, we think they're probably going to do a lot better than just shore-to-shore. So, not for a requirement to meet our requirement for the 2-MEB [Marine Expeditionary Brigade] joint forcible entry, but, if they do better than that, then we're really on a good step to start moving for that ACV 1.2 and follow-on capabilities.

Senator ROUNDS. Now, share with us a little bit about the 1.2 and the differences between the 1.1 variant and the 1.2 variant. Would the 1.2, under current plans, be fully amphibious?

General WALSH. My feeling right now—we haven't done that requirements document yet. Like I said, I think we'd be developing those requirements documents 2018–2019, bringing the vehicles in probably in around 2024 or so. But, the intent right now would be, they're going to be amphibious. I think what we're going to be doing between now and then is working with the 1.1 vehicle. One of the things we've got going on is working with the Office of Naval Research. We've gotten money into the program to continue to develop the—increase the speed of the 1.1 variant to make it better, to be able to operate at sea and come from further distances. We think that will then roll into the 1.2 capabilities down the road.

Senator ROUNDS. Okay. But, in both cases, we're not talking about it replacing the new variant of the AAV. Or are we?

General WALSH. No. Those would be the—those four that we have—when we bring in the 1.1, they're additional capabilities. The 1.2 variant capabilities would then—right now our plan would be—those would actually be going to the Reserve forces as extra vehicles, again, replacing some of our older-model AAVs.

Senator ROUNDS. What would be going to replace the older-model AAV?

Senator WICKER. The 1.1 or 1.2?

General WALSH. It would be the 1.2s.

Senator ROUNDS. Okay.

General WALSH. The 1.1 right now—I'm sorry—so, the 1.1 is not intended to replace the AAVs from a ship-to-shore capability.

Senator ROUNDS. Okay.

General WALSH. It would be the 1.2 coming in to start bringing in that capability.

Senator ROUNDS. So, you—

General WALSH. Ship-to-shore.

Senator ROUNDS. So, you would eventually have—you've got a vehicle right now which is being upgraded, and that is the AAV.

General WALSH. Right.

Senator ROUNDS. That's going to be the one that our marines are going to leave a ship and they're going to make it to shore on.

Number two, you've got a 1.1 variant, which is—which will be a follow-on, but it will be the vehicle which will move marines once they are on shore. But, it does have a mobility or a connector that gets it to the shore.

Then you've got a 1.2. A 1.2 will have full amphibious capabilities, or at least that's the plan. It'll come down later. But, then which one of those three—the current AAV, the 1.1, or the 1.2—will then be shipped to the Reserve units?

General WALSH. Right now, the current plan we have is, it would be—the 1.2s would be going into the Reserves.

Senator ROUNDS. So—

General WALSH. That's a follow-on decision, though, that could be changed, and it could be the 1.2s going into the Active Force and the AAVs going into the Reserves.

Senator ROUNDS. Okay.

Mr. Chairman, thank you.

Senator WICKER. Thank you very much.

Senator ROUNDS. That did help. Thank you.

Senator WICKER. Vice President Kaine.

[Laughter.]

Senator WICKER. I'm sorry.

Senator KAINE. Oh, boy.

I—General Walsh, your testimony really interested me—your oral testimony, right at the beginning. You used a phrase—and I sometimes act like I know what military folks mean when they say things; and I'm just looking smart, and I don't really know. I want to make sure I understood this one. I think you said, as you were describing the adversarial environment that we may face, that adversaries will use COTs, which I think was commercial off-the-shelf, technologies to out-cycle our acquisition process. I thought that was an interesting phrase. So, what I thought you probably meant by that was that there's so much off-the-shelf, you know, technology that's available that, while we're doing an acquisition process to be really careful about getting 100-percent solution, our adversaries are able to just buy off-the-shelf 80-percent solutions and maybe race ahead of us, in terms of some of their capacity. Could you elaborate? Did I—do I interpret that right? Could you elaborate a little bit more on that worry and how we need to deal with it? Because we're going to be doing some acquisition reform stuff as part of the big NDAA [National Defense Authorization Act], and I want to make sure, if we're thinking about acquisition reform, we're thinking about this problem.

General WALSH. Sure. No, I think, Senator Kaine, that it comes along with rapid prototyping and how we can go faster with our acquisition cycles and our programs. You see a lot of these things, like these unmanned aerial systems, which are commercial off-the-shops—shelf. You can go into Walmart and buy those things. Those kind of capabilities, we're seeing right now out in Syria and Iraq that are being used to target, you know, coalition or our own forces. So, those are the kind of things that are coming in very quickly.

When I look at the marines' capabilities, when I look at the technology that we operate in our command operation centers, for example, our command operation centers are intense, but we're able to bring technology in very quickly. So, over the last 14 years, we've watched technology be brought into our tents and rapidly bring that capability in, where a young person today looking inside that tent would look at it and go, "Wow, this is pretty high-tech." Now, go aboard our amphibious ships. Trying to bring that type of technology onto those ships that may just get a midlife upgrade, or periodically come in for long-term upgrades to their capabilities, that technology isn't flowing as fast into those capabilities.

When I was flying F-18s, and I got into an F¹—our MiG-29 for the first time, in the Cold War, and I looked inside at the technology of the MiG-29 for the first time. You know, we watched it turn fast, fly fast, and I was really concerned that this is going to be a better airplane than we had. When I got inside the cockpit and looked inside the cockpit and looked at the technology, it was something that I thought that I was flying back in the F-4. It was way behind, from a technology standpoint.

Now as I take a look at the F-35 coming in, and looking at that technology, now you look at what the Chinese variant, that J-20 that looks very much like an F-35—on the outside, looks like the F-35. Is it like the MiG-29, or are they going to be continuing to upgrade their technology faster than we can, that, in 5 years from now, 10 years from now, their technology is better than ours, that they're able to spiral that in into their programs faster than we can?

Senator KAINÉ. Did—anything to add, Secretary Dee? Or is—

Mr. DEE. Sir, so—

Senator KAINÉ. Especially in terms of advice for us as we're thinking about acquisition reform issues that kind of—you know, what would you tell us to pay attention to?

Mr. DEE. So, I believe we all need to be agile, on both sides of the river. We need to be able to take a look at decisions, decide what our requirements are, reduce the requirement cycle quickly. We need to look at innovative ways to do acquisition. We need to look at open architectures, when appropriate, which is not always appropriate, but when appropriate, so that we can quickly incorporate new technologies. So, that involves standards and interface standards, mechanical, electrical, logical interface standards that we need to be able to define and have access to the intellectual property to allow us to do that with. We need the agility on the funding side, as well. So, it's very difficult, if you're trying to incorporate a new technology, where you're looking at POMing [Program Objective Memorandum], programming, 4-year requirements. We're beginning to do—we're well through 2018 already. So, if we had a new requirement today, we'd really be looking at 2019. Incorporating that, getting it through our process within the building, within the executive branch, and getting it over here for execution dollars in fiscal year 2019. A 3-year budget cycle is not helpful for being agile.

What we are doing within the Department—and the General alluded to it, in terms of prototyping. So, we've requested in 2017, over here, \$55 million to support our rapid prototyping initiative, which will be a pot of money, flexible funds that are not defined to any specific project, but will allow us to look at priorities as they evolve during the course of the year, and select prototyping projects that we can then give to the fleet, that we can allow the marines to play with, that we can determine the usefulness of the technologies to see if the requirement—if the capability that we might be able to prototype very quickly is good enough to meet the need for the General to make a decision on.

So, there are several things we need to do to be more agile and be able to turn more quickly.

Senator KAINÉ. Great. Thank you.

Senator WICKER. Thank you, Senator Kaine.

Senator KAINÉ. Thanks, Mr. Chair.

Senator WICKER. Senator Tillis.

Senator TILLIS. Thank you, Mr. Chair.

General Walsh, thank you for your distinguished service. Mr. Dee, thank you also for your service.

I want to go back to the acquisition piece. You know, I believe that you're doing everything you can to get the capabilities that

you need to fulfill the requirements and take the fight to the bad guys. So, I want to talk a little bit more about the agility question, but at a—maybe a different way, which could be difficult for you, Mr. Dee, but it's to kind of put a mirror where you're standing right now and talk about constraints that we've placed on the process, maybe well-intentioned at some time, but, over time, a hairball of constraints and requirements that—could you describe for me—and you could pick any acquisition program you want—when I'm talking to the Army, I like to talk about a handgun and a 600-page RFP [request for proposal]. But, in this particular case—only 39 pages of which, by the way, are specifications—in this particular case, when we're talking about some of the delays that some of the other members have discussed, could you give me an idea of how much of that are changing requirement, budget changes over time that affect you or move things to the right and kind of get things out of cycle? Those are things you have to deal with. Factors that are largely driven by direction from the Congress, either constraints or other things that we should look at to potentially reform so that we can help you be more agile, get inside the decision cycles of the enemy, versus what we've heard here, that China could literally be to a point to where they could get inside our decision cycles on our joint strike fighter?

Mr. DEE. Yes, sir. So, there's lots to talk about within that question. So, at a high level, we've had—and you have witnessed, and we have witnessed—difficulties over the years, over decades, with various acquisition programs. Generally speaking, each one of those has resulted in a fix being put in place either by ourselves through policy, through regulation within the FAR [Federal Acquisition Regulation], or through statute. So, when those get put into place in order to fix a problem, that generally results in additional oversight requirements, it generally results in additional bureaucracy, it generally results in additional steps that a program manager needs to get to, to get through, in order to be able to get to a decision. So, that's at a very high level.

There's—

Senator TILLIS. Would you say that it would be common or uncommon, at that point in time where you find that constraint that's going to potentially delay—would it be common or uncommon for you all to come back before this body and say, “Change the rules so that we can be more efficient?” Does that happen?

Mr. DEE. Yes, sir, it happens every year. We submit legislative proposals. We sit down with your staff from—

Senator TILLIS. But, does it have—I mean, is it more a perspective—is it something that could have a meaningful impact on the existing processes, or is it something so we continue to slide? Is there any way that we could be more resilient, more agile, in terms of providing relief so that the things that are going to slide, we get ahead of the curve, versus make it less worse or fix it in the future? I'm trying to get an idea—

Mr. DEE. Yes, sir.

Senator TILLIS.—of how we become more resilient in the way that we refine the acquisition process.

Mr. DEE. So, from my perspective, sir, generally speaking, the professionalism and the competencies of our program managers is

the key. So, providing support to the acquisition workforce, providing folks with the authorities to run and the oversight to ensure that, if they run, they can be held accountable for things. Generally speaking, I believe less is better, in terms of the—whether it's statute, policy, or regulation that's put in place over them, but holding them accountable for outcomes.

So, I am a fan of reducing the oversight, the regulations, but then holding the executors accountable, and doing that, you know, through the appropriate bodies, service acquisition executive, the defense acquisition executive—

Senator TILLIS. Well, I'd—because I want to ask a real brief question before I get the gavel—but I'd like to follow up more and maybe find some case examples that are instructive to us that go beyond maybe some of the requests you've made.

General, we had a Emerging Threats committee hearing yesterday, and one of the things we're talking about here are big rocks that are going to be used for—I mean, they can be used for a variety of purposes, but largely to make sure that we can match what have been more conventional threats. What work are we doing, and what confidence level do you have, that we're also better preparing our men and women to fight the kinds of fights that we're seeing that are small autonomous units? Do we have enough attention to that, in your opinion, versus what we've talked about here?

General WALSH. You know, I think an example that would kind of maybe tie to that is that we are—our operating concept, Expeditionary Force 21, relies on distributed and dispersed operations. We think we can maneuver to our advantage by being more distributed and dispersed. C2 precision fires, overhead situational awareness will allow us to maneuver faster than the enemy.

Where I think some of this is changed, though, that I would tie this in, and it kind of comes back to rapid prototyping and how we can move faster, and that area is our aircraft. Our aircraft, if you—or trying to take—approach with our ground vehicles the same way we have with our aircraft. When we started getting threats on our aircraft—our helicopters, our fixed-wing aircraft—against infrared missiles, we quickly put on capabilities to defeat those type of missiles. Now we're seeing the threat on the ground changing, becoming a much more sophisticated threat on the ground. What we've continued to do is up-armor our capabilities on the ground, put more armor on them. We've got to start thinking more with the higher technology capability, with vehicle protective systems, active protective systems that can defeat anti-guided tank munitions, RPGs [rocket-propelled grenades], top-down capabilities that we're seeing from threats on our vehicles, along with soft capability, which is the technology our aircraft have. We have both hard and soft kill on our aircraft. We need that same type of technology on our vehicles. So, as you project where the threat is going, that's where we've got to move quicker in that area with our vehicles.

Talking about the rapid prototyping that Mr. Dee talked about is—it could take us a long time to develop active protection systems on our vehicles. We could be here for a long time. The threat continues to move ahead of us. So, we're working very closely with the Army to develop active protection systems. We're going to go out and try to buy or lease some trophy systems that are out there,

working with the Army, and we're going to put those on our M1A1 tanks. Take that, use it, see how it works. As the Army is doing the same thing on their Stryker and M1A2s, use that and see how it works. Learn from that and then see whether we buy that or buy something else, but at least we learn from it, rather than slowly developing a program over time.

But, I think that technology, just like on the aircraft—we saw our aircraft and helos getting shot down in Iraq and Afghanistan. We're going to have the same problem if we don't get our—you know, out in front of this technology on the ground side also.

Senator WICKER. Thank you, Senator Tillis.

Senator King.

Senator KING. Thank you.

I've never heard "agile" used so much in a hearing before, and I can't help but be reminded of my high school football coach, who said he wanted us to be agile, mobile, and hostile.

[Laughter.]

Senator KING. So, maybe that's a good motto for what we're talking about today.

A couple of, just, short questions. I noticed the light tactical vehicle is joint. I presume that means you're working with the Army on that? That's—

Mr. DEE. Yes, sir. In fact, the Army is the lead service on the JLTV.

Senator KING. Okay. So—and, I mean, that's something, I think, that's very important. I'm glad that's happening. We can't be developing slightly different versions of the same weapon systems as between the services. So, that's a plus.

Now, a dumb question about the ACV and the AAV. What's the difference? They look the same to me. They look pretty close. You said you're upgrading the AAV, and it's going to have greater capability. What is the ACV going to have that the AAV doesn't have? One has treads, and the other has—

Mr. DEE. Yes, sir. One has treads. The other is wheels. One is—well, it's 40 years old, but it was really built with that seagoing requirement in mind. It's—beyond being an old vehicle and being difficult to maintain and such, it doesn't have the mobility characteristics ashore, or the efficiency ashore, or the protection level ashore, specifically for underbelly protection and things like RPGs and—

Senator KING. So, basically, the ACV is an—is an upgraded version of the—

Mr. DEE. Well, the ACV, the requirement that we're meeting with the ACV is really for the ground mobility more than the water mobility capability. So, it's focused on ground maneuver more so than it is on amphibious capability at the moment. It provides a very much improved protection level for the operators.

Senator KING. So, the idea is that the AAV will be used to get the marines ashore. Would they then transfer into the other vehicle and—

Mr. DEE. Sir, if I can—

Senator KING.—go from there?

Mr. DEE. I'll ask the General to correct me, here.

Senator KING. I know you've been over this, I'm sorry, but—

Mr. DEE. So, to try to explain it a different way. So, there's—we have a requirement for 10 battalions of lift——

Senator KING. Right.

Mr. DEE.—right?—at the moment. All of those, at the moment, are fulfilled by double-AVs, by AAVs. The plan for the future is, we're upgrading four battalions worth of double-AVs, 392 vehicles, as the General discussed, to meet four of the 10 requirements. The ACV 1.1 is going to provide lift and follow-on echelon for two battalions of lift. The ACV 1.2, when that comes about, is going to provide four, so it's going to replace——

Senator KING. So, it's a phased——

Mr. DEE. It's a phased replacement plan. So, ultimately, leading into—currently within the strategy, leading into the 2030s, we have four battalions' worth of double-AV with the survivability upgrades, and we have six battalions of AAV 1.1 and 1.2. A decision down the road, in the 2020s, is, When do we replace those four battalions' worth of double-AVs? That depends largely on the outcome of the capabilities that we develop in ACV 1.1 and what we're calling—in 1.2—and what we're calling 2.0, looking at future capabilities in the requirements perhaps for high water speed or other additional capabilities that will allow us to replace those last four battalions.

Senator KING. Okay. To move from the particular to the more general. You mentioned the 2020s. We had a hearing the other day on the Navy. We've got a bulge of acquisition coming. It's the pig in the python. It's the *Ohio*-class submarine, it's the Long-Range Strike Bomber [LRS-B], nuclear modernization, deployment of the F-35—are all hitting at the same time. The procurement, just the *Ohio*-class, as I recall, Mr. Chairman, adds something like 6 billion a year to the acquisition budget during this period of the late teens into the 2020s. That means we've really got to think hard about, (a) what we're procuring, and (b) how we're doing it. I think Senator Kaine mentioned something about 80-percent solutions. I mean, we've really got to think about, How do we get at—and I'm worried, not only about the price part, but about the timing part. It—we've got to be able to do these things more quickly. We want you to help us. You don't have to do it now, for the record or—we are going to be doing something about procurement reform in this bill. The Chairman—Chairman McCain has made it clear that that's something he's interested in. Now is the time for you guys that are doing this on a daily basis to tell us how we could improve this system, both in terms of how—what we do and in terms of how the whole system works. Because we've got to be able—we're facing a really serious crunch when the *Ohio* nuclear—the *Ohio*, the nuclear modernization, and the Long-Range Strike Bomber come into the budget cycle, and we don't want the Marine Corps to be left behind. But, you're one part of this procurement process. To the extent you can write us an essay on—If you started with a blank sheet of paper, how would you design the weapons procurement system? I think that would be very helpful. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Well, if you'd like to start, we'll leave the record open for a few days, and you can start on that essay.

[Laughter.]

Senator WICKER. Because Senator King has opened a very important subject.

[The information referred to follows]:

Introduction:

Although starting with a “blank sheet of paper” and redesigning and implementing an entirely new acquisition system is not practicable, any attempt to reform the system must begin with an acknowledgement that circumstances change. Rarely do requirements, technology, or adversaries remain static throughout the course of an acquisition program. Threats change. Technology advances.

Our acquisition system, and the authorizations and appropriations that enable it, must be agile enough to move at the pace of change being experienced by the world in the 21st century. If it cannot, the comparative advantage held by the US military will diminish relative to that which we’ve held since the end of the cold war.

We cannot legislate or regulate agility. The success of our system is dependent on the knowledge, experience, initiative and leadership of the people who work within it. As in any large bureaucracy governed by strict laws, regulation and policy, we have created of culture of compliance within our acquisition system. Further efforts at reform should create an environment that rewards outcomes—not compliance with process. Successful reform efforts will lead to a culture of initiative and innovation that delivers the right capability at the right time and within affordable limits.

Acquisition Reform:

Since the establishment of the Department of Defense (DOD) in 1947 there has been a persistent perception that the defense acquisition process is broken and urgently in need of repair.

Despite having a defense budget larger than the next seven countries combined (down from 2003 when our defense budget was larger than the next 13 countries combined) we cannot assume that our wealth advantage will sustain our military advantage indefinitely. DOD funding levels will remain constrained as the Nation continues to cope with budget pressures, and we must ensure that our investment dollars enable successful acquisition outcomes and deliver needed capability in a timely fashion.

While the equipment and systems used by the US Military are the envy of the world, over the years well publicized failures of the DOD acquisition system, combined with its massive budget, have fueled an increasingly frustrated appetite for effective and enduring acquisition reform. Given the enormous size and complexity of the DOD as an organization, the budgets it executes, the systems it develops, and the statutes, regulations, policies, processes and cultures that govern it, the potential to make improvements and find efficiencies may seem boundless.

The DOD History website (<http://history.defense.gov/>) hosts a 2011 publication by J. Ronald Fox: *Defense Acquisition Reform 1960–2009 : An Elusive Goal*. Mr. Fox highlights that between 1960 and 2009, more than 27 major studies of defense acquisition were commissioned by various institutions—exclusive of the many reviews directed by Congress and its supporting offices (GAO, CRS, etc.). Over the years, corrective actions that were informed by the conclusions of these studies—and by anecdote—were implemented to improve oversight and preclude the repetition of mistakes. These actions have resulted in the thousands of pages of statute, regulation and policy which govern our Defense Acquisition System (DAS) today. The unintended consequence of this accumulation of governance has been to create a culture where compliance with guidance is rewarded and innovative processes that deviate from established processes are discouraged.

Major acquisition reform efforts have continued through today, and recent National Defense Authorization Acts (NDAAs) have routinely included provisions intended to improve the execution and oversight of acquisition efforts.

Most recently, Section 809 of the fiscal year 2016 NDAA implicitly recognized the burden placed on DOD by reams of compliance standards and directed the Secretary of Defense to establish an advisory panel on streamlining acquisition regulations. Within two years the panel shall review and provide a report on “the history of each current acquisition regulation and make recommendation as to whether the regulation and related law (if applicable) should be retained, modified, or repealed” and to provide such additional recommendations for legislation as the panel considers appropriate.

The Section 809 panel is only one of 14 sections within the fiscal year 2016 NDAA that directs the Department to conduct a study, a review or an analysis of some aspect of the DAS. Despite the significant changes made in the fiscal year 2016 NDAA

and the many studies it directs, major reforms are again included in both the House and Senate versions of the fiscal year 2017 NDAA ranging from expanded reporting requirements to a reorganization of OSD.

The demand for action to fix a perceived broken system has led to “concurrency” in our reform efforts. Just as beginning production on a new weapon system before the design is complete introduces risk to the program, risk is similarly introduced to the success of reform efforts by continually implementing corrective changes to the acquisition system before the effect of previous changes can be observed and assessed. Rather than speeding our acquisition reform efforts, we are continually confounding them by introducing new reforms before the effect of earlier reforms can be observed. To analogize Col Boyd’s OODA loop, we are disrupting our own acquisition reform decision cycle by deciding and acting, without the requisite orienting and observing. As the former Vice Chairman of the Joint Chiefs of Staff, ADM Sandy Winnefeld, testified before the House Armed Services Committee on 3 February 2016, “I think we should be mindful of the fact that it takes a while to see the effects of change in this business... We should take a deep, though very watchful breath, and let the good work of the past few years in reforming acquisition take effect.”

Compliance vs Innovation:

The Defense Acquisition System as we know it today is designed to minimize risk through the imposition of meticulous documentation requirements with many layers of oversight, both within the DOD and by the Congressional Defense Committees.

Management theory tells us that “you get what you measure”. In choosing what to measure however, we implicitly prioritize what’s important. In prescribing detailed process and reporting requirements along with expanded oversight we reinforce a culture of compliance.

Acquisition risk is typically measured in terms of “cost, schedule, and performance”, where cost and schedule are measured against the originally approved acquisition program baseline and performance is measured against the parameters specified in the approved requirements documents. The imperative for change to the acquisition system, however, is no longer driven by the need to remain within those parameters, but rather by the risk of losing our military superiority. In today’s era DOD no longer holds a monopoly on technological innovation and commercial enterprise is at the cutting edge of many critical technologies. The world communicates through open and largely unregulated global information networks in which not only social content is available, but detailed technical data is globally shared—either voluntarily or nefariously—with both friends and adversaries. In this environment, a defense acquisition system designed to reward compliance with process while minimizing program risk now struggles with the imperative to become innovative and agile. Success of our acquisition system must now be measured by the level of agility the system demonstrates to respond to accelerating threat cycles and technology opportunities.

To transition from a defense acquisition mindset that rewards compliance to one that permits agility and innovation, we may need to accept more potential risk in our traditional acquisition parameters (cost, schedule, performance) in order to reduce the risk of losing our military advantage. The correct balance of risk however, is not to be found solely within the traditional acquisition parameters, but among the three main elements of capability development: (1) deciding what you need (requirements); (2) providing adequate and stable resources to develop and procure it (programming and budgeting); and (3) executing a sound strategy to acquire and sustain it (acquisition). Collectively, the requirements system (JCIDS), the Planning, Programming, Budgeting, and Execution System (PPBES), and the Defense Acquisition System (DAS) are known as “Big A” acquisition. Any comprehensive proposal to reform the acquisition system must be a collaboration of all three elements of the Big “A”. If we only needed to address the DAS itself, USD AT&L’s Better Buying Power initiative would provide an ample guide with which to improve the system.

Principles for 21st Century Acquisition:

While it’s not possible in this paper to review every statute and regulation that governs the acquisition system (that is the charge of the Section 809 panel), it is possible to suggest some broad principles from which to consider future reforms.

People: The foundation of an agile and innovative acquisition system is the people that operate that system. Whether in the requirements community, the programming and budgeting community or the acquisition community, it is the knowledge, experience and wisdom of people—not rigidity of process—which will enable successful acquisition outcomes. A successful acquisition system will be one that empowers

leaders and holds them accountable for outcomes, not process. Any reform efforts must begin with the question as to whether the statutes, regulations, and policies that govern the system create an environment that encourages and rewards initiative, innovation, and leadership, or whether they discourage those traits through the bureaucratic imposition of process oversight.

Increased flexibility in hiring, retention incentives, and educational opportunities will all help to attract and retain a professional workforce. The most powerful incentive to our workforce, however, will be the removal of bureaucratic barriers and the establishment of a culture that tolerates risk and rewards innovation.

JCIDS: Perhaps the most important element of “Big A” is the requirement. We consistently emphasize the need to “get the requirements right” and achieve requirements stability throughout the program. The rapid pace of change, however, makes it increasingly difficult to predict at the inception of a program what that requirement should ultimately be when the system is fielded and through the life of the program.

Requirements need not be fully mature prior to initiating action. Requirements processes—and the associated cost, schedule, and performance parameters—should allow sufficient flexibility for performance specifications to evolve as knowledge is gained throughout the project. A major improvement to the requirements leg of Big “A” would be to enable greater use of prototyping, demonstrations, and experimentation in order to accelerate and inform concepts and requirements development, and to enable thoughtful cost, schedule, and performance tradeoffs before the initiation of a program of record.

Schedule matters. The longer a new capability takes to design, develop, manufacture, and field, the more likely it is that the program will face obsolescence issues and that competitors will find asymmetric means to mitigate our advantage. Requirements need to be informed not only by the operational capability gap and the programmatic risk, but also in recognition of the temporal nature of the requirement. Requirements should specify not only what capability is needed, but when it is needed.

Requirements should define the sufficient capability—but not necessarily the best capability—necessary to deliver the desired effect on the relevant timeline to maintain our advantage and deter competitors. But what is “good enough” to meet today’s threat may not be good enough to meet tomorrow’s. The commercial market cannot always be expected to anticipate and provide sufficient capabilities and the system must allow the time and funding for investment in higher risk and longer term development efforts.

PPBES: The second leg of Big “A”, budget, is understandably rigid. On behalf of the taxpayer, Congress demands full oversight of the dollars the Department is spending and our Financial Management Regulation is designed to enable that oversight. Budgets are prepared two years prior to the intended execution year, lacking knowledge of future changes to the threat or of new technology opportunities, and with limited ability to reprogram dollars within the execution year to adjust to new circumstances. Programs are held to strict obligation and execution benchmarks with under execution—regardless of the cause—placing future funding at risk. This challenge has been exacerbated in recent years with “Continuing Resolutions” delaying funds until later in the year further challenging funding execution rates, and with the use of overseas contingency funds (OCO) further limiting funding stability.

The rigidity of the funding process also precludes a healthy prototyping, demonstration and experimentation effort which further challenges the ability to “get the requirements right” before initiation of a program. The Department’s Research and Development funds are requested, authorized, and appropriated for specific programs. The Congress must develop an appetite to accept some level of risk in authorizing and appropriating funds that are not tied to a predetermined acquisition program in order to enable the prototyping and experimentation that will improve our concept and requirements development and, subsequently, our acquisition effectiveness.

DAS: The acquisition process itself is not broken. It has produced the most capable and reliable weapon systems known to man. It is, however, inhibited by a culture that sometimes rewards compliance over outcome and by a constantly shifting governance environment fueled by continual efforts at reform.

As we move through the 21st century, the acquisition professional will be faced with an increasingly complex environment. The pace of technology change will lead to expectations that military requirements can be satisfied rapidly and cheaply. At the same time, we will be striving to maintain an edge over those same commercial technologies that are ubiquitously available to our potential adversaries. Our most advanced and complex systems will continue to take a decade or more of development before fielding, making the need to “get the requirement right” all the more

pressing. We will continue to minimize our vulnerabilities to cyber-intrusions and counterfeits. As the service life of major military equipment is extended to 30+ years, readiness challenges will compound and life cycle sustainment considerations—to include obsolescence planning and intellectual property strategies—will become ever more important. The nature of the US industrial base will continue its tendency towards services and away from manufacturing, and the acquisition community will be challenged to maintain a competitive environment that will enable innovation and affordability into the next century.

These are significant challenges for defense acquisition, but the system doesn't need to be reformed in order to meet the challenges. The acquisition process as it currently exists can meet all of the challenges outlined above. Over the past 15 years at war we have demonstrated that when urgency dictates, we can work within the current system and tailor our processes to balance risk with urgency and to align resources with priorities. The key to ensuring the continued success of acquisition outcomes is not more law or regulation, but to empower our acquisition leaders and hold them accountable for outcomes, not process. Creating an environment that encourages and rewards initiative, innovation, and leadership should be the foundational principle of any reform effort.

Summary:

The Section 809 report will provide recommendations that “clean sheet” acquisition regulations and statutes. We should exercise patience in awaiting that report. In the interim, we should acknowledge that from Silicon Valley, to DARPA, to the Pentagon, and to our Warfare Centers, Labs, and Program Offices, people thrive in environments that encourage their initiative and measure their outcomes, not process.

Acquisition is not a mechanical activity, but a human activity. Its success cannot be reduced to a compendium of statutes and regulations. It is a collaborative effort between people from the requirements, budget, and acquisition communities. Any effort to reform the system must include all elements of the Big “A” system. Risks must be communicated and understood by all stakeholders, tradeoffs made, timelines determined, requirements defined and programs expertly managed by the offices charged with project execution.

In seeking to improve our acquisition outcomes, we must acknowledge that circumstances will change and that our acquisition programs need to have the agility to change with them. That agility will come from our ability to innovate, the foundation of which is our human capital whose initiative and professionalism must continue to be cultivated.

Senator WICKER. Let me just conclude, here, on behalf of my Ranking Member and me.

Tell us about Asia-Pacific rebalance. Specifically, the Marine Air/Ground Task Force operating from Darwin, Australia, and the plans for additional force in Guam, and touch on the marine air/ground task force at—rotational, the idea of a rotational 2500-person presence.

General?

General WALSH. The 2500-person presence, Chairman, in Darwin, the one in—

Senator WICKER. Right, in Australia, yeah.

General WALSH.—in Australia, all right. We're still building up towards that 2500 number in Australia. All part of the—our repositioning or rebalancing to the Pacific as we move forces around. I think, you know, in past years, we've been focused very much on the Korea and—Peninsula forces up in Japan. So, with that rebalance moving forwards under DPRI [Defense Policy Review Initiative] down towards Guam is part of that, and we're in the middle of that transition, or start—I shouldn't say in the middle, but progressing along that timeline to move our forces to Guam, some of them from Japan.

The other piece is—as we look at that landscape of where we need to be, one of the pieces was trying to put more presence down further south. So, you're seeing us do more training exercises with

countries, you know, down—like the Philippines, down in that area. Part of it also is with our—building our partnership, or continuing our partnership, with the Australians, down in that part. All part of the Pacific, all part of being in different areas and trying to get presence in different locations throughout the area operations.

Senator WICKER. What about that timeline? Could you be a little more specific? You say we're really more toward the beginning of that—

General WALSH. I would say probably in the Guam part. You know, we're still in the early stages—

Senator WICKER. But, what are the specifics—

General WALSH.—of the DPRI piece that we're still—I mean, some of these pieces are some of the things that are still being negotiated with the Government of Japan as part of the Futenma rule, a placement facility, moving some of our forces off of Okinawa to be able to reposition some of those forces down towards Guam. Some of those decisions are still going on with negotiations with the Government of Japan. With that replacement facility from Futenma, that's a player in some of these pieces of moving the forces down to Guam. But, I think we're on track, on schedule. I'd have to get back with you on the exact—

Senator WICKER. Well, just put that—

General WALSH.—schedule that we're doing.

Senator WICKER.—on the record. That'll be great.

[The information referred to follows:]

The rebalance to Asia and the Pacific remains a priority for the Marines. Some of the more visible manifestations of our efforts include our rotational presence in Darwin, Australia and our continuing efforts to relocate ~5,000 marines to Guam, ~4,100 of coming from Okinawa.

The Marine Rotational Force—Darwin (MRF-D), is deploying now on its fifth rotation with ~1,250 marines including 4 x UH-1Y helicopters. Our goal for the MRF-D remains a MAGTF of up to 2,500 marines. Achieving that size depends on several variables including force availability and cost-share negotiations with Australia the results of which will help us understand the total cost for that force going forward.

In Guam we are building facilities to support aviation training on the north ramp of Anderson AFB and preparing to award a contract for the initial construction of the future Marine Corps Base Guam (MCBG). The next project will be ranges at AAFB northwest field and should award in the fall. While we anticipate awarding these contracts in June and September respectively, we are awaiting a Biological Opinion (BO) from US Fish and Wildlife Service (USFWS) before initiating construction that would disturb raw land on Guam. We are working diligently with USFWS and our partners from DoN to achieve a BO that supports our efforts. Our plans support the initial force flow from Okinawa to Guam in 2022.

The Futenma Replacement Facility (FRF) has been in the news quite a bit recently due to the cessation of construction on the 4th of March. The policy of the US has not changed; the FRF is the only solution for moving marines out of Futenma and ultimately closing the facility and returning the land to Japan. Since 2012 our efforts in Guam have not been linked to progress on the FRF, so we will continue our work in Guam despite this delay at Camp Schwab. The agreement allows for our continued operation of MCAS Futenma until the replacement facility is operational, and that too has not changed.

A related but separate program is the consolidation of the USMC footprint on Okinawa and the return of land to the Government of Japan. Despite it being a separate program from the Camp Schwab reconfiguration (FRF), it is related and in many cases sequential due to the fact that several units will be consolidating to the FRF. So, the FRF and Guam buildouts must be completed in order to execute the consolidation plan. We had planned on updating the most recent OkiCon plan this spring, but the cessation of the construction at Camp Schwab and unknowns associated with the FRF and Guam have delayed that effort. We are now planning on

convening the update planning process with our Japanese partners towards the end of the summer.

When we talk about this rebalance, the focus tends to be on our alliance with Japan and actions affecting Okinawa in particular. However, we also like to discuss the MCAS Iwakuni transformation that has been going on for the better part of a decade. This project has been a model of success in working with the Japanese, both the central government and the local population. We have already relocated VMGR-152 from MCAS Futenma to MCAS Iwakuni (in the summer of 2014). We are on-track to receive CVW-5 in 2017, consistent with bilateral agreed timelines. Iwakuni is also scheduled to receive the first permanent overseas basing of the F-35B Joint Strike Fighter early in 2017.

Senator WICKER. Senator Sullivan.

Senator SULLIVAN. Thank you, Mr. Chair.

I actually want to follow up on—General, good to see you, sir—and follow up on some of the questions that we were asking just on timeline on the rebalance. But, first—and I apologize if it's already been asked—but, you know how the—the redeployment of marines from Okinawa to Guam, to Hawaii, to Australia has a dispersal effect, as you know, General, in terms of dispersing the forces throughout the Asia-Pacific, but it's also a big Asia-Pacific theater. I know that the PACOM [United States Pacific Command] commander has testified to this, but are there concerns that our strategic lift capabilities are not, kind of, in line with what our strategic needs are? Meaning, as we look at moving marines throughout the Asia-Pacific, out of Okinawa, that we lack the strategic lift capability to respond to a crisis in a moment's notice, which is what the Marines are known for throughout their history, in a way that we have the ability to do that, whether it's with shipping, whether it's with, you know, C-17s? Does the Marine Corps remain concerned about this issue that the PACOM commander has indicated is a strategic issue we need to be concerned about? Then, how do we address it?

General WALSH. I think—you know, I think the Pacific area of responsibility—it's obviously a—it's a big area. It's a maritime area. So, strategic lift, when you get in an area like that, that's—it's so wide and so spread out, as it is—strategic lift is going to be a critical thing to be able to conduct the operations that go on.

I think, from an amphibious shipping standpoint, obviously we've got our requirement for 38 ships. Right now we're at 30. We're on a plan to start building back up to that capability. So, I think, as long as we keep the shipbuilding plan that we're on, with our LHA-7 and -8, and continuing the LHA [Landing Helicopter Assault Ship] program along with the LX(R) [amphibious ship] replacement program, we're going to be on a good track on our amphibious ships.

Now, to be able to meet the COCOM [combatant command] demand, we know that number is much higher than the 38 requirement we have. But, I think building towards that amphibious warship capability, we're on a path to do that in the 30-year shipbuilding plan.

From a—from the other asset strategic lift that we've got, we've got Diego Garcia in Guam, our two maritime pre-positioning squadrons, which each have seven ships in there. One of the things—ships that were just added was the John Glenn and the Montford Point, which are new MLPs, which add capability into those maritime pre-positioning squadrons. So, from a pre-positioning ship

squadron to be able to get those follow-on forces in after the assault echelon goes in, which we talked about on the amphibs, we've got that capability. I think we've—always going to have a struggle ensuring that we've got enough of the aircraft lift to be able to move strategic forces around, because that's a competition that we'd have to be competing with COCOM demands to be able to get other forces like the Army or the Air Force into theater.

Senator SULLIVAN. Let me ask another question that relates, not to strategic lift, but to training opportunities. So, as you know, General, on Okinawa, the training is limited for infantry units and—can you even do indirect fire there? I don't think—can you do 81s or artillery there? I think it's still limited.

General WALSH. On the artillery side, I'll have to get back to you on mortars or 81 millimeter mortars, specifically. We'll take that for the record.

[The information referred to follows:]

Marine units can fire 60mm and 81mm mortars into the Central Training Area on Okinawa. The firing of artillery on Okinawa was moved to the Fuji Maneuver Area (FMA) on mainland Japan under an agreement with the Government of Japan. The FMA is located near Mount Fuji, Japan, and is a training facility jointly used by the Japanese Ground Self Defense Force (JGSDF) and U.S. forces. Marine Corps Camp Fuji is administered and maintained by the JGSDF. The Marine Corps coordinates the use of ranges and training in the FMA by Marine Expeditionary Force units stationed in Japan (including Okinawa) and units deployed to the Western Pacific.

General WALSH. But, artillery, we're not able to conduct artillery on island, like in years past where we were able—

Senator SULLIVAN. So, Okinawa's limited. How about the training opportunities in the CNMI [Companion Wealth of the Northern Mariana Islands] and/or Guam? It—I was in Guam last year, and did not make it out to some of the islands, but are there concerns that—it's Okinawa, it's Guam, it's CNMI. I even think there are some training limitations with regard to the deployments to Hawaii. Obviously, Australia seems to be much more open, like CACs [Combined Arms Companies] or Twentynine Palms. But, are you concerned about—we're going to redeploy these marines to different parts of the Asia-Pacific, and yet the limitations that were some of the concerns that we had in Okinawa, in terms of serious infantry combined-arms training, we're going to have limits in the next places we go to? If that's the case, what should we—should we be looking at other places, where the training is wide-open, serious, no-limitations, all combined-arms capabilities, including close air support? Do you have concerns about that?

General WALSH. I think the Pacific Commander and also General Toolan, our Marine Forces Pacific Commander, they're always working those opportunities into the theater security cooperation engagement plan. So, I think there's a balance of training and getting the most focus on the best training you can get, along with building partnerships and alliances in working with our allies. So, I think part of that is—if I focus specifically on the Guam piece, I think our training plan—we've got some training on-island at Guam, but we've also got capabilities that we're building into Tinian and building up some capabilities there.

Senator SULLIVAN. But, are those—I mean, have we nailed those down yet? It seems like we're always in negotiation with the island

governments on additional training that—I know, talking to some of the officers who have been working that, it seems to be an—kind of a continuing source of frustration.

General WALSH. I think we're working through that. I know the Commandant testified, just recently, on—one of the things we've got to ensure is—as we build up Tinian, is a training location. We've got to be able to get our marines from Guam to Tinian—is going to be a challenge that we've got to do. We talked about Australia, though, is the marine rotational force Darwin to be able to move forces in there, not only build partnership and alliances with our Australian partners, but a very good training area that we've got, along with our Australian partners there.

So, I think the more exercises, the more opportunities, working with other allies and partners over there, it gives us more training opportunities. One of the reasons is, marines like to get off-island in Okinawa, to be able to go other places, because a lot of the training opportunities exist in other places we go. Why they like to deploy up to Korea, there's a lot of good ground training capabilities we get there. We get those—the amphibious exercises there, which provide us a lot of the training capabilities.

So, I think they're out there, and you have to balance where you go along with continuing to work with allies and partners so you can continue to make those relationships. Sometimes you are making some trades on the training to be able to build those partnerships and alliances.

Senator SULLIVAN. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Thank you, Senator Sullivan.

Senator HIRONO.

Senator HIRONO. Just one short followup regarding the movement of our marines out of Okinawa. There are a lot of moving parts to that movement. Right now, I know that there is a delay, probably a rather substantial delay, in moving our troops out of Futenma into Henoko. At the same time, we are doing what we need to be doing with regard to Guam and—and we do need to figure out the training that we're going to do in CNMI.

So, my question—clarification, General, is that—as long as we are not able to build the facility in Henoko, we will—our—the remaining marines will still be in Futenma. Is that your understanding?

General WALSH. The intent, Senator Hirono, is to move those marines from Futenma up to Henoko in the Futenma replacement facility. What I understand is, the Okinawa Governor has brought a protest against—

Senator HIRONO. Yes.

General WALSH.—that, in negotiating with the Japanese government. Until that's cleared, we really, obviously, can't get the construction going to be able to build the facility that would allow us to move from Futenma up there to the facility that we're looking to build as an offshore facility up there to replace the Futenma location.

Senator HIRONO. Everybody understands, including the Governor of Okinawa, that if we can't build the facility in Henoko, we will be in Futenma.

General WALSH. That's been the position of the government, is—we will stay there until we can solve that solution, ma'am.

Senator HIRONO. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Has construction or site preparation completely halted because of the protest?

General WALSH. I'll have to get back with a specific answer, Mr. Chairman, but I believe it has stopped while the protests have been ongoing.

[The information referred to follows:]

Complete cessation of all construction did not occur until the Government of Japan (GOJ) agreed to an out-of-court settlement with the Okinawan Prefectural Government (OPG) on 4 March 2016. Though the out-of-court settlement only addressed construction within areas of Camp Schwab covered by the land fill permit, GOJ voluntarily suspended all construction activities aboard the camp. As such, the current halt in construction is not due to protest activities, but rather the ongoing legal actions between GOJ and OPG, and the efforts to bring them to resolution.

Senator WICKER. Thank you.

Well, listen, it's been a great hearing. We appreciate your service, as all members have said. We appreciate you being patient with us on our questions today.

Without objection, we'll leave the record open for other questions for the record for 5 days.

If there's nothing further, this hearing is closed.

[Whereupon, at 3:15 p.m., the hearing was adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ROGER WICKER

OPERATING ENVIRONMENT AND CONCEPTS

1. Senator WICKER. As you look at the future operating environment, conduct exercises, and set requirements for future systems, to what extent are you assuming air superiority, close and unopposed access to the beach, and uninterrupted communications and satellite access?

General WALSH. The Marine Corps makes no assumption of air superiority, close/unopposed beach access, or uninterrupted communications and satellite access in the future operating environment. Potential peer and near-peer adversaries already possess significant capabilities in integrated air defense systems (IADS), anti-access/area denial (A2AD), and technology denial. With proliferation of these technologies, the threat in these areas will continue to expand beyond what would traditionally be considered "peer" competitors, to encompass a broad range of potential adversaries around the world. The scope and scale of the future threat is described in detail by the Marine Corps Intelligence Activity in its publication 2015–2025 *Future Operating Environment: Implications for Marines* (MCIA, 2015, classified SECRET//REL USA, FVEY). Future sea and airspace, as well as the electromagnetic spectrum and cyber domain, will be contested by the adversary as the new norm in 21st century military conflict. This fact must drive the future design of our force across the full range of Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, and Facilities (DOTMLPF) so that we train our people and allocate limited resources efficiently towards development of a force that remains competitive in a highly contested future operating environment.

2. Senator WICKER. Last year General Neller ordered the Marine Corps to examine the future of the Marine Air-Ground Task Force (MAGTF) called "Force 2025," with two teams developing an "evolutionary" approach and a "revolutionary" approach that will be briefed to the Commandant this month. How might these approaches impact Marine ground modernization priorities? How could modernization priorities change?

General WALSH. The "evolutionary" and "revolutionary" force design approaches were used in the Force 2025 process to develop two courses of action for consideration by the Commandant. Force 2025 is moving forward with examination of how

to build a force, within directed resource constraints, which balances proven existing capabilities with the requirement for new capabilities to address the demands of the future operating environment. Force 2025 produced two alternate courses of action for consideration by the Commandant of the Marine Corps; these will be wargamed in June 2016 and assessed against a peer competitor. The outputs of the wargame will provide the Commandant and senior leadership with a greater understanding of the capabilities required, and ensure that the Marine Corps has sufficient capacity to satisfy the full range of roles and missions envisioned for the Service in the 21st century. The results of Force 2025 will inform the Marine Corps Capability Based Assessment process and drive requirements for future capability development. Ground modernization is included in consideration, but Force 2025 will drive planning for modernization across the Marine Corps enterprise. Priorities will reflect the imperative to remain competitive against a rapidly evolving, technology-enabled threat across the range of military operations, from steady state to crisis response and major combat operations.

3. Senator WICKER. General Walsh, Can you explain how the Marine Corps will ensure that it will continue to meet its surface lift requirement for a two Marine Expeditionary Brigade Assault Echelon, within the required timelines to get ashore, while you modernize to the Amphibious Combat Vehicle?

General WALSH. The assault amphibian modernization strategy is designed to sustain sufficient capability and capacity for the assault echelon of two Marine Expeditionary Brigades (MEB). Each MEB requires two surface infantry battalion lift equivalents (Battalion Landing Teams) and each of those is met with an Assault Amphibian (AA) company. This results in a total of four infantry battalion lift equivalents.

Four of the Marine Corps six Active component assault amphibian companies will be modernized with the survivability upgraded AAV (AAV SU). AAV SU is intended to be the primary amphibious armored personnel carrier forward deployed on naval amphibious warfare ships. In time of war, as AAV SU equipped units aggregate into an assault echelon they will be reinforced with AAVs from the Maritime Prepositioning Squadrons (MPS) in order to provide sufficient capacity to rapidly build up combat power ashore. Follow-on echelons will deliver the remaining two Active component amphibious combat vehicle (ACV 1.1) equipped units in support of sustained operations ashore. In future years we will modernize an additional four assault amphibian companies with ACV 1.2.

4. Senator WICKER. Can you walk the subcommittee through the Marine Corps concept of operations for how marines will get ashore from amphibious ships in the future? Please describe the roles of the Ship-to-Shore Connectors, Landing Craft Utility, and Amphibious Combat Vehicles.

General WALSH. To meet our 2.0 Marine Expeditionary Brigade (MEB) assault echelon requirement, the Marine Corps has family of systems that allow for flexible and tailored task organization when moving marines ashore.

We will maintain our requirement of deploying four infantry battalion lift equivalents via surface assault with the Amphibious Assault Vehicle Survivability Upgrade (AAV SU) while also using CH-53E/K and MV-22 vertical connectors to maneuver additional forces from amphibious warfare ships to objectives ashore. These self-deploying vehicles are complimented by the Navy's surface connectors (Landing Craft, Air Cushion (LCAC)/LCAC 100, Landing Craft Utility (LCU)/LCU 1700) which allow the movement of non-amphibious assets ashore.

Simultaneously, Marines will leverage Maritime Prepositioning Force (MPF) assets such as the Expeditionary Transfer Dock (T-ESD); Large, Medium Speed, Roll-on/Roll-off (LMSR); and Dry Cargo/Ammunition (T-AKE) ships to integrate marines and equipment at sea. This will reinforce the flow of combat power in the form of heavy combat equipment, large numbers of marines, and sustainment, across the shore, in follow-on echelons.

For lower intensity missions (Non-combatant Evacuation, Humanitarian Assistance/Disaster Relief, Theater Security Cooperation, etc), the above mix of platforms allows the Marine Corps to employ tailored mission packages that exploit the complementary capabilities of these assets to optimize effectiveness for the task at hand.

5. Senator WICKER. Can you discuss the extent to which the Marine Corps is with experimenting with smaller and more independent units in a more distributed geographic manner? What is the vision for where these units would operate, what platforms would support them, and what objectives they would achieve?

General WALSH. In order for the Marine Corps to fight successfully in a future operating environment where airspace, sea lines of communication, and the electro-

magnetic spectrum are highly contested, Marine forces must have the ability to distribute as conditions require, and mass at the chosen time and place when conditions are set to enable concentration. This concept is not new to the Marines Corps. These same principles were laid out in *Operational Maneuver From The Sea* and *Ship To Objective Maneuver*, written in early 1990s. The same attributes were reinforced again in the 2014 publication of *Expeditionary Force 21*. The Marine Corps recognizes that these concepts were valid – they were just ahead of their time.

Given advances in technology, the Marine Corps believes that we can now realize these concepts. Recent experimentation has focused extensively on development of the Company Landing Team (CLT) as a base unit of employment for combat. While still subordinate to a parent battalion, the CLT will be enabled beyond the capabilities of a traditional company, allowing it to operate at extended distance from its parent unit for missions of limited scope and duration. New capabilities and skill sets will provide the CLT with the ability to employ organic precision fires and unmanned aerial systems (UAS) for both kinetic strike and battlefield situational awareness. New digital command and control (C2) capabilities will provide reach back to higher echelons for access to long range fire support, intelligence, and sustainment. The CLT has been the focus of experiments within a number of exercises, including Rim of the Pacific (RIMPAC) 2014 and the upcoming RIMPAC 16. The MAGTF Integrated Exercise (MIX), as part of RIMPAC 16 in the summer of 2016, will test the ability of a Marine Expeditionary Unit to project a CLT ashore for independent operations, while sustaining and supporting it from afloat. The construct of the CLT as a base unit of employment will drive future concept development for employment of distributed forces. Distributed operations from the sea and from expeditionary advance bases will enable marines in a contested littoral environment to conduct advance force missions to set conditions for the concentration and introduction of larger follow-on forces, both from the Marine Corps and the Joint Force.

The *Concept for Littoral Operations in a Contested Environment* (service chief signature expected in the summer of 2016) will serve as a joint Navy/Marine Corps operating concept to drive further development and experimentation in the realm of distributed operations. Additionally, the *Concept for Distributed Operations* is being written to describe Marine Corps distributed operations; the circumstances that drive distributed operations; and implications to the Service spanning the range of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF).

6. Senator WICKER. With high demand for Marine crisis response capabilities and the shortage of amphibious platforms, Special Purpose Marine Air Ground Task Forces—Crisis Response were developed in 2012. Can you provide the subcommittee with an update on the current role and future vision for these task forces? How does this focus on crisis response affect readiness for major contingency operations?

General WALSH. SPMAGTF-CR-AF and SPMAGTF-CR-CC provide the AFRICOM and CENTCOM combatant commanders (CCDRs), respectively, a flexible response force with a battalion of light infantry, organic tilt-rotor lift, and limited sustainment capacity for rapid response to a range of military missions. The SPMAGTFs have the capacity to conduct low-intensity, short or medium-duration missions (i.e., embassy reinforcement or small-scale Non-Combatant Evacuations (NEO)). They can also serve as a rapidly deployable lead echelon in support of a large NEO or other crisis response mission. In support of major combat operations, the SPMAGTFs can provide a forward deployed lead echelon capable of aggregating with other Marine forces and equipment from the Maritime Prepositioned Force (MPF) to form a composite Marine Expeditionary Brigade, capable of full-spectrum combat operations. The forward presence and inherent readiness of the SPMAGTFs can enable the Marine Corps to establish a rapid foothold, and shorten the lead time required to generate and deploy a larger force for a major contingency in the AFRICOM or CENTCOM AOR. In steady state operations, the SPMAGTFs can engage in Theater Security Cooperation missions, establishing enduring host nation relationships, which will facilitate access to key points of entry and host nation support in the event of a crisis or major contingency in the region. Creation of the SPMAGTFs has enhanced awareness within the DOD of the demand from the CCDRs for forward deployed forces for both steady state operations and crisis response.

In the future, given the availability of amphibious shipping, moving the SPMAGTFs aboard ships would significantly improve their expeditionary character and provide CCDRs additional capabilities, flexibility, and range. Further, the Marine Corps is prepared to aggregate forward deployed forces, be they SPMAGTFs or Marine Expeditionary Units (MEU), under higher headquarters to create Marine

Expeditionary Brigades (MEB) to respond to Major Contingency Operations (MCO). In this way, these forward deployed units actually enhance the Marine Corps' ability to meet these requirements.

MAJOR MARINE GROUND PROGRAMS

7. With development initiated ten years ago, the Marine Corps is moving forward with a long-delayed and expensive radar system, the Ground/Air Task-Oriented Radar or G/ATOR, which will replace a number of older radars and will protect marines from rockets, artillery, cruise missiles, and UAVs while also serving as an air traffic control system. Can you tell us more about why this program is essential to the marines' role as an expeditionary force and your acquisition strategy for the program?

Mr. DEE. This program is an essential enabler and a critical modernization piece of the Marine Corps role as the Nation's force-in-readiness. The G/ATOR will ultimately replace five radars, two of which are already obsolete. The G/ATOR is more expeditionary and provides a dramatic improvement in performance against smaller threats in high clutter environments, a capability we currently lack. Without the G/ATOR, the Marine Corps will not have the ability to control its airspace as aviation threats continue to become smaller and the proliferation of rockets, artillery and mortars capable of exceeding the range of our current target acquisition capabilities become more common place. G/ATOR ensures Combined Force Air Component Commander/Joint Force Air Component Commander delegation of airspace control for the MAGTF.

The G/ATOR is rapidly deployable via heavy-lift helicopters, tilt-rotor aircraft, KC-130s, or ground vehicles during the initial stages of operations. This system will augment sea-based air-defense sensors, aviation command and control, and provide invaluable indirect fire detection for the landing force as combat power and capability transitions ashore. G/ATOR will provide naval and joint forces expeditionary radar with a cruise missile detection capability that extends landward battlespace coverage. When fully fielded, the diverse capabilities of G/ATOR and the many warfighting functions it supports will make it a highly valued asset to the MAGTF commander.

G/ATOR's expeditionary, multi-role capabilities represent the next generation of ground radar technology. Because of its software defined capabilities, it will be able to pace the threat for the foreseeable future. This flexibility, combined with G/ATOR's improved update rate and accuracy, enables G/ATOR to be a potential source for current and future integrated fire control concepts (i.e., this radar's data can be used for expanding engagement solutions from multiple sources).

The acquisition strategy for the G/ATOR program employs an evolutionary approach that utilizes a common hardware suite and baseline software that via software block upgrades adds additional mission capability. The initial hardware and software baseline capability, defined as the Air Defense/Surveillance Radar (AD/SR) G/ATOR Block 1 (GB1), provides capabilities in the Short Range Air Defense (SHORAD) and Air Surveillance mission areas. G/ATOR Block 2 (GB2) adds software for the Ground Weapons Locating Radar (GWLR) capability that supports Counterfire Targeting missions utilizing the same common hardware and software baseline from GB1. G/ATOR Block 4 (GB4) will provide Expeditionary Airport Surveillance and air traffic control capability. GB4 is a future mission capability that currently is not resourced in the budget.

(Note: G/ATOR Block 3 (GB3) was previously removed from the upgrade strategy, and for administrative purposes GB4 was not renamed/renumbered.)

8. Senator WICKER. G/ATOR is a complex and multifunctional piece of equipment, replacing five legacy radar systems. Ultimately its capabilities will enable air traffic control, protect marines from indirect fire, and enable surveillance of UAVs and other low observables. Can you comment on the progress of each of these capabilities in testing? When do you anticipate testing in a live fire scenario?

Mr. DEE. Initial G/ATOR development efforts started with development of the hardware solution and G/ATOR Block 1 (GB1) software. The hardware was designed to meet all of the requirements for all the missions. Development of follow-on software capability blocks resides on the common hardware and software baseline developed during GB1. GB1 provides Air Defense/ Surveillance Radar (AD/SR) capability which supports surveillance of UAVs and other low observables. Formal live test events of the pre-production hardware and GB1 software started in 4QFY 2012 and completed in 1Qfiscal year 2014. During this test period, G/ATOR demonstrated its ability to meet all key performance parameters. The G/ATOR system has been

used in several exercises since then with performance continuing to improve. GB1 testing on the first production systems begins in 2QFY 2017.

G/ATOR Block 2 provides indirect fire detection utilizing the same hardware and rides on the GB1 baseline software. Initial contractor integration testing of GB2 in October 2016 will use live rockets, artillery and mortars. Government testing of this capability, again using live rockets, artillery and mortars, will begin 4QFY 2017.

G/ATOR Block 4 (GB4) will provide Expeditionary Airport Surveillance and air traffic control capability. GB4 is a future mission capability that currently is not resourced in the budget.

9. Senator WICKER. Does the current and projected amphibious ship inventory meet Marine Corps training needs and operational lift requirements?

General WALSH. No. There is not enough amphibious warship capability to support an assault echelon of two Marine Expeditionary Brigades required for contingency response. The Navy and the Marine Corps have determined that 38 amphibious warships are needed in the inventory to support this requirement as well as the training and readiness of fleet Marine forces. There are 31 amphibious warships in inventory today. The planned average amphibious inventory from fiscal year 2016–fiscal year 26 (near-term) is 34 ships. The planned average amphibious inventory from fiscal year 2027–fiscal year 2037 (mid-term) is 36 ships, with 38 being reached for one year (fiscal year 2033) of the fiscal year 2017 Long Range Shipbuilding Strategy (LRSS). The support of the Congress for these critical ships is appreciated and must continue for the Marine Corps to meet the Nation's needs.

Shortfalls in amphibious warship inventory have multiple negative effects. This must be viewed as a two-faceted problem of inventory and availability. A decreased inventory has negative effects on both overall capacity and maintenance. This puts the nation at risk of being unable to embark the 2 MEB assault echelon required for a forcible entry capability. Further, as ships are stressed due to increased use, they require more maintenance, which compounds the availability problem.

The Chief of Naval Operations and the Commandant of the Marine Corps have determined the force structure to support the deployment and employment of 2 MEBs simultaneously is 38 amphibious warfare ships. Understanding this requirement, in light of fiscal constraints faced by the Nation, the Department of the Navy has agreed to sustain a minimum of 34 amphibious warships. However, Combatant Commander Demand is more realistically assessed in excess of 50.

To mitigate this, the Navy and Marine Corps are exploring opportunities to deploy marines on non-combatant auxiliary platforms. This is not ideal. Auxiliary platforms are not a replacement to the capabilities and survivability of amphibious warships. Furthermore, this shortfall has forced the Navy and Marine Corps to explore ways to distribute elements of a single Amphibious Ready Group (ARG)/MEU across combatant commander boundaries to provide some measure of coverage in various regions. Again, this is not an ideal method when compared to the preferred employment of the full ARG/MEU as an aggregated three-ship force which can bring to bear its full capability.

Finally, shortfalls negatively affect our ability to train. Conducting amphibious operations with our joint services is not just a matter of putting marines on Navy ships. Those units must have the opportunity to operate with each other during their workup to establish relationships, tactics, techniques, procedures, and build interoperability.

10. Senator WICKER. As you know, Marines are currently supporting the fight against ISIL with field artillery in northern Iraq. The National Commission on the Future of the Army recently noted that field artillery is an area where the Army will need to focus more on in light of the United States voluntary participation in the cluster munitions ban, munition short falls, and changes in doctrine. Do you believe that field artillery should also be a modernization focus area for the Marines? If so, what are the Marine Corps' current plans?

General WALSH. Field Artillery in the Marine Corps has been a focus of modernization for the past two decades, and will continue to be so with an emphasis on longer range, enhanced lethality munitions. The Marine Corps is currently procuring the Guided Multiple Launch Rocket System—Alternate Warhead (GMLRS—AW) as its rocket cluster munition replacement strategy. Additionally, the Marine Corps continues to collaborate with the Army on science and technology initiatives to achieve greater capabilities in these areas as well as pursue efforts through the Office of Naval Research. The Marine Corps is sponsoring the Future Naval Capability science and technology development of the High Reliability DPICM Replacement (HRDR) and the Moving Target Artillery Round (MTAR) artillery munitions.

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11. Senator WICKER. In testimony before the full committee last year, General Dunford identified inventories of Javelin, TOW and HIMARS weapons programs as insufficient to meet USMC requirements. Can you describe in more detail the risks being assumed by these shortfalls and your efforts to mitigate them? Are there are other weapons systems that face similar shortages?

General WALSH. TOW and Javelin missiles have been brought up to an acceptable level of risk against the most demanding of Major Combat Operations scenarios given the current budget restrictions. Successful missile life extension programs have reduced the need for extensive missile reprourement in the near term. Additionally, an inter-Service transfer of Javelin missiles from the U. S. Army has ensured a healthy Marine Corps stockpile. The procurement lead time associated with both missiles requires a relatively continuous procurement program in order to avoid sharp inventory decline.

The current High Mobility Artillery Rocket System (HIMARS) munitions procurement consists of the Guided Multiple Launch Rocket System – Alternative Warhead (GMLRS AW) and a training rocket. The GMLRS AW will be the only area effects munitions fired from HIMARS after calendar 2018, when the Dual Purpose Improved Conventional Munition (DPICM) rockets are removed from inventory per U.S. policy. GMLRS AW procurement began in 2015, and the rocket has an average delivery time of 18 months. Current programmed funding will deliver only 12 percent of the total munitions required by the time that DPICM rockets must be removed from inventory under current policy but will deliver approximately 75 percent of the munitions required for the stressing Major Combat Operational scenarios by fiscal year 2022.

12. Senator WICKER. Over the past year, the Army and the Marine Corps have explored developing new 5.56mm ammunition for their service rifles. The Marine Corps was initially concerned that the round could damage the rifle and cause malfunctions. Have you resolved that issue? If so, how? If not, how do you plan to resolve it?

General WALSH. We are committed to finding a common solution with the Army. In March 2016, the US Army, with Marine Corps observers, began a new series of tests of the Army and Marine Corps enhanced 5.56mm ammunition with Marine Corps weapons in order to address the Marine Corps concerns. Test officials plan to produce an interim test report in 1st Quarter fiscal year 2017 and the final test report by the end of 2nd Quarter fiscal year 2017. In addition, 2016 National Defense Authorization Act language requires a federally funded research and development center to conduct a study on the use of different types of enhanced 5.56mm ammunition by the Army and Marine Corps. This OSD sponsored study is ongoing and is expected to be completed in 4th Quarter fiscal year 2016. The results of the tests and the OSD study, in combination with related equipping costs and other relevant considerations, will provide the basis for recommendations on the way forward for enhanced 5.56mm ammunition to Marine Corps leadership. The desired end state is for the Marine Corps and Army to utilize the same 5.56mm round.

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13. Senator WICKER. I understand that the Marine Corps is closely following the Army's development of a next-generation pistol. In recent testimony before the House Armed Services Committee, the Army Chief of Staff stated that the 356-page requirements document and the testing process was "two years long on known technology." Do you agree with General Milley's characterization of the acquisition process for a new service pistol? How will the Marine Corps learn from this experience as they prepare to replace Marine small arms in the years to come?

General WALSH. The Marine Corps acknowledges the challenges that face the acquisitions process. We are committed to working with the Congress, our sister services, and the industrial base to find solutions to this which will yield better equipment, on a faster timeline, at less cost to the taxpayer. Our next generation pistol is no exception. The Marine Corps has been closely joined with the Army on the development and evaluation of requirements for the next generation pistol.

The Marine Corps remains committed to learning lessons from every iteration of the acquisitions process. For other small arms, we see significant value in joint collaboration with the Army. We intend to work with and to procure the same weapons as the Army when similar operational requirements can be met with common solutions. This should provide cost savings, allow us to leverage expertise and resources from both services, and improve interoperability on the battlefield. The Marine Corps will use the established Joint Capabilities Integration and Development System and the Defense Acquisition System to define requirements and manage weapon system acquisition programs.

14. Senator WICKER. On April 3rd, the Washington Post reported that U.S. Special Operations Forces are using the EOTech holographic rifle sight manufactured that has a known defect—particularly in extreme weather, like our troops encounter in Afghanistan and Iraq—that can cause the sight to be off-target by six to twelve inches away when a shooter is 300 feet away from a target. According to the Post, the Marine Corps continues to use 6,000 of the sights. Can you describe what the Marine Corps is doing to bridge and rectify this problem?

General WALSH. The Marine Corps utilizes two versions of the sights; one is used for close quarter battle, and the other is used with heavy machine guns for close target engagements while mounted to a vehicle platform. In March 2016, the Marine Corps issued a Safety of Use Message to inform users that testing of the Marine Corps version of EOTech sight confirmed that a reticle shift occurs when exposed to temperature variations (thermal drift).

Recently, the Marine Corps completed discussions with the vendor and identified solutions for EOTech sight issues occurring within the Marine Corps inventory. The Marine Corps will continue to evaluate the operational effectiveness of these sights and take corrective action as necessary. Affected sights will be replaced as they are identified.

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STRATEGIC ISSUES AND FOREIGN POLICY

15. Senator WICKER. Can you describe how the Marine Corps is continuing to support the Asia-Pacific rebalance? Please comment on the Marine Air Ground Task Force operating from Darwin, Australia and the plan to base an additional Marine Air Ground Task Force in Guam.

General WALSH. The Marine Corps remains committed to the rebalance to Asia and the Pacific. The Marine Corps is implementing a distributed laydown of forces which realigns approximately half of the Marines currently in Okinawa throughout the Pacific. This distributed laydown will establish MAGTFs in four key locations:

Okinawa, Darwin, Guam and Hawaii. To this end we are breaking ground on the main cantonment of the future Marine Corps Base Guam later this year, and have requested as a part of the fiscal year 2017 budget request \$62.2 million for MILCON to support the move to Guam.

The Marine Rotational Force—Darwin (MRF-D), a part of the distributed laydown, alliance modernization and the rebalance to Asia and the Pacific, is in its fifth rotation and is composed of 1,250 marines. The MRF-D MAGTF is currently built around a reinforced infantry battalion with attachments that include 4xUH-1Y helicopters, a combat engineer platoon, and a combat logistics detachment. The plan for increasing the size of the MRF-D relies on the resolution of several factors to include completion of a cost share implementing arrangement, facilities availability, and force sourcing to support the deployment in the context of global demand. Full implementation of the initiative envisions a MAGTF of up to 2,500 marines.

16. Senator WICKER. Can you update the subcommittee on Marine Rotational Force—Darwin, which will conduct exercises and training on a rotational basis with the Australian Defense Force? I understand the intent in the coming years is to establish a rotational presence of up to a 2,500-person Marine Air Ground Task Force in Australia.

General WALSH. The Marine Rotational Force—Darwin (MRF-D) is currently deployed to Australia for its fifth rotation since the announcement of the agreement to increase engagement with Australia was made in 2011. The 2016 MRF-D rotation is organized around an infantry battalion supported by four UH-1Y helicopters and a combat logistics detachment. During the 2016 rotation the MRF-D will participate in unilateral, bilateral, and multilateral training events inside and outside Australia. Of note, elements from the 2016 MRF-D will participate in Exercise HAMEL with the Australian Army at training area Cultana. They will embark HMAS Adelaide, one of two new Australian LHD amphibious assault ships, in Brisbane and transit to Adelaide, where they will offload and participate in the exercise at training area Cultana. Exercises of this significance have not been conducted to date by the MRF-D and demonstrate a commitment to the Force Posture Agreement by both the Australian Defence Force and the Marine Corps. Additionally, elements of the MRF-D will conduct security cooperation activities with countries within Southeast Asia in support of PACOM's Theater Security Cooperation Plan. Continued growth of the MRF-D for subsequent rotations relies on the resolution of several factors to include completion of a cost share implementing arrangement, facilities availability, and force sourcing to support the deployment in the context of global demand. The end-state goal is a Marine Air Ground Task Force of up to 2,500 marines deploying to Darwin during the Australian "dry season", April-October. The Marine Corps is working closely with the Australian Defence Force and Australian Defence Department during the implementation of the MRF-D initiative.

17. Senator WICKER. To what extent can equipment used in Afghanistan be repaired or rebuilt versus needing to be replaced? What equipment must be replaced because it cannot be repaired or rebuilt? Can you give us a rough estimate in terms of cost and quantities?

General WALSH. The Marine Corps is executing an aggressive equipment reset of 71,859 Principal End Items (PEI) used in Operation Enduring Freedom and Operation Iraqi Freedom. To date, we are 81 percent complete with reset. We have repaired or rebuilt over 39,000 items at the depot or field maintenance level and used normal DLA-Disposal Services for approximately 20,000 items that were not economical for repair. The remaining items are in the repair cycle or awaiting inspection and maintenance. The estimated reset liability is just under \$800 million.

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18. Senator WICKER. I understand this budget completes the congressionally-directed expansion of the Marine Corps Embassy Security Group, providing for operations and sustainment for the existing detachments and the establishment of nine new detachments. Can you comment on this critical Marine Corps function and what this expansion means for embassy security around the world?

General WALSH. The National Defense Authorization Act (NDAA) of 2013 authorized additional marines for embassy security. Realizing the need to improve security at its overseas diplomatic posts the Department of State, in consultation with the Marine Corps, has activated 22 of 50 new detachments from the original Department of State list, as well as improved security at all current detachments. The Marine Corps continues to work with the Department of State to complete the expansion and also to ensure that the security requirements at U.S. embassies and consulates overseas continue to be met and improved.

INDUSTRIAL BASE

19. Senator WICKER. How would you describe the state of the industrial base that supports your programs? In the event of further budget reductions, what must this subcommittee be particularly mindful of related to the industrial base?

General WALSH. The defense industrial base is doing the maximum they can to cope with the turbulent budget of the last few years. However, with an unpredictable budget, they have had to make difficult decisions regarding investment in emerging technologies. In order to identify potential issues with the industrial base, OSD has tasked the Services with an assessment, scheduled to be complete in June 2016.

The Marine Corps continues to work closely with the industrial base that supports our programs to create innovative solutions to validated requirements while keeping cost-effectiveness and sustainability in mind during this prolonged period of fiscal constraint. The primary concern remains keeping procurement schedules predictable and on timeline which enables us to maximize productivity and cost savings. Stable and predictable budgets will enable this to the maximum extent possible by allowing both the Marine Corps and our industrial partners to plan procurement and capital investment in a rational manner which provides the taxpayers with the highest quality product at the best price.

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**NAVY AND MARINE CORPS AVIATION
PROGRAMS IN REVIEW OF THE DEFENSE
AUTHORIZATION REQUEST FOR FISCAL
YEAR 2017 AND THE FUTURE YEARS
DEFENSE PROGRAM**

WEDNESDAY, APRIL 20, 2016

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

NAVY AND MARINE CORPS AVIATION PROGRAMS

The subcommittee met, pursuant to notice, at 2:02 p.m. in Room SR-232A, Russell Senate Office Building, Senator Roger F. Wicker (chairman of the subcommittee) presiding.

Committee members present: Senators Wicker, Ayotte, Rounds, Tillis, Sullivan, Shaheen, Blumenthal, Hirono, Kaine, and King.

OPENING STATEMENT OF SENATOR ROGER F. WICKER

Senator WICKER. This hearing will come to order.

The Senate Armed Services Subcommittee on Seapower convenes this afternoon to examine Navy and Marine Corps aviation programs.

This afternoon our subcommittee welcomes three distinguished witnesses: Vice Admiral Paul A. Grosklags, Commander, Naval Air Systems Command; Lieutenant General Jon M. Davis, Deputy Commandant for Marine Corps Aviation; and Rear Admiral Michael C. Manazir, Director of Air Warfare for the Department of the Navy. Our subcommittee is grateful to these gentlemen for their presence today and decades of service to our Nation.

Over the course of the past year, a wide variety of witnesses from both inside and outside the Department have testified before the Senate Armed Services Committee that our Nation faces the most diverse, complex, and potentially dangerous threats to national security in recent history. There is a need to strengthen our military and ensure that our men and women in uniform have comprehensive training and world-class equipment.

Instead, our reduced military budgets have damaged our military's force structures, modernization, and readiness amid years of sustained operations.

The stakes are high during these challenging times. Extremists of the Islamic State in Iraq and Syria are increasingly spreading

terror to North Africa, Europe, and beyond. Vladimir Putin's belligerence has dashed our hopes for cooperating to benefit the people of Russia and the United States. Instead he continues to test our resolve in eastern Europe and Syria. The Peoples Republic of China continues to expand and modernize its military and engage in destabilizing behavior in the Asia-Pacific region.

Given this global environment, I hope our witnesses today will collaborate on the current readiness of our naval and marine aviation forces, the efforts to modernize our forces to pace growing threats and the vitality of our aviation industrial base.

This afternoon our subcommittee will examine five key areas related to the Navy and Marine Corps aviation programs.

First, the subcommittee is concerned with the current state of readiness of our naval and marine aviation forces. Delays in the development of new aircraft, intense budgetary pressures, and years of high levels of ongoing operations have created a situation where the Navy and Marine Corps do not have enough ready basic aircraft for our aviators to fly the hours they need to remain qualified, proficient, and motivated. Our airframes are wearing out faster than anticipated, further stressing the fleet, although improving the throughput in our depots remains challenged to meet demands.

General Davis, in the Marine aviation plan, you state, "I am concerned with our current readiness rates both in equipment and personnel. We have seen a decrease in flight hours per month per aircrew and an up-tick in our mishap rates". Perhaps we will expound on that testimony.

The subcommittee shares your concerns and looks forward to hearing from you and Admiral Manazir on the path out of this critical situation for the Navy and Marine Corps.

Secondly, the strike fighter shortfall. Our subcommittee would like to learn more about the gaps in the Navy fighter fleet. The Navy has estimated the shortfall at two to three squadrons of strike fighter aircraft. The CNO [Chief of Naval Operations] and Commandant both included strike fighters in their unfunded priority lists, ranking them as the number one and number three priorities for the Navy. I hope our witnesses today will be able to provide more details on the unfunded requirements for multi-role fighter aircraft.

Third, Joint Strike Fighter operations. We would like to know more about the development and operations of the F-35B and F-35C Joint Strike Fighter. Last August, the Marines declared initial operation capability of the first F-35B squadron, the Green Knights of VMFA-121. The subcommittee looks forward to hearing an update on F-35 operations and preparations for the Green Knights' move to Japan in 2017 and shipboard deployment in 2018.

Fourth, we would like to learn more about the F-35 follow-on modernization program. The Joint Program Office is beginning the development of block 4, the next increment of capabilities for the F-35. The Department is expected to spend nearly \$3 billion on this program over the next 6 years alone, and both the GAO [Government Accountability Office] and the Director of Test and Evaluation have recommended the program be managed as a separate major defense acquisition program. The subcommittee looks for-

ward to hearing the witnesses' views on follow-on modernization and the recommendations of these two agencies.

Then finally, munitions shortfall. Our subcommittee would like an update on the status of the Navy and Marine Corps air-launched munitions inventories. Years of budgetary neglect and high operational tempo have left munitions inventories depleted, some critically so. The subcommittee needs to understand where the Department is taking risk, what is being done to mitigate that risk, and the ability of the industrial base to produce the required munitions.

We welcome our witnesses. We thank you for your service.

I am delighted at this point to recognize my ranking member, Senator Hirono.

STATEMENT OF SENATOR MAZIE K. HIRONO

Senator HIRONO. Thank you, Mr. Chairman.

I too want to welcome our witnesses to the hearing this afternoon. We are grateful to each of you for your service to our country and, of course, that of your families and the truly professional way that you serve our country. We also pay tribute to, as I mentioned, all of the workers and the people who are under your command, men and women of our armed services.

Today our witnesses face huge challenges as you strive to balance the need to support ongoing operations and sustain readiness with the need to modernize and keep the technological advantage that is so critical to military success. These challenges have been made particularly difficult by the spending caps imposed in the Budget Control Act, caps that were modestly relieved for fiscal year 2016 in the Bipartisan Budget Act. However, these caps are scheduled to resume in fiscal year 2018 and beyond. These caps already seriously challenge our ability to meet our national security needs and have already forced all of the Military Departments to make painful tradeoffs. Unless modified for the years after fiscal year 2018 and later, I believe that they will threaten our long-term national security interests.

With that in mind, a continuing focus of the subcommittee has been to see that we improve our acquisition stewardship and thereby ensure that we are getting good value for every single dollar that we are spending. This year I believe we have three pivotal issues in naval aviation.

Since last year, the Marine Corps declared initial operating capability, or IOC [Initial Operational Capability], for the F-35B, the short takeoff, vertical landing, STOVL. That is all well and good, but we need to hear how the testing is proceeding and how other parts of the program are supporting the Navy's IOC declaration plans for 2018. Continuing the F-35 program on schedule is important for maintaining force structure. The chairman has already also noted that concern.

Second, the Navy is facing a major shortfall in its strike fighter inventory, again already mentioned by the chairman. But I want to echo his concerns. The Navy responded to forecasts of a shortage of almost 200 aircraft several years ago by better managing the remaining life of the existing aircraft by redistributing aircraft within the force, designing a series of modernization and rehabilitation

measures, including a service life extension program, or a SLEP, for older aircraft and buying new F-18 aircraft.

After several years of predicting significant improvements in the Navy's ability to support operating forces, including aircraft carrier squadrons and Marine Corps squadrons with strike fighter aircraft, the Navy last year was predicting a major erosion in that ability. This year, the Navy has not provided a specific estimate of the strike fighter shortfall. We would like to hear from you as to what that number is.

The committee received previous testimony from Navy witnesses that a shortfall of roughly 65 strike fighters was manageable. We need to understand what the estimate of the shortfall is this year, as I mentioned, and whether that estimate is up or down from last year and what actions the Navy can or should take to reduce or mitigate that shortfall.

Finally, fiscal year 2017 is the last year of the second V-22 multiyear contract. The Navy plans to buy as many as 72 more aircraft after the current multiyear contract is finished, including 48 aircraft to replace the Navy's C-2 fixed wing aircraft in the carrier onboard delivery mission. However, under the terms of the current multiyear 2 contract, the Department of the Navy is required to purchase 18 aircraft in fiscal year 2017. The fiscal year 2017 budget request includes only 16 V-22 aircraft. We need to understand why the Department of the Navy has made this proposal, because if we are supposed to be buying 18 and we are buying only 16, I think that abrogates the contract, and what the implications of this action are.

In the interest of time, Mr. Chairman, I will stop there so we can hear more about the concerns that both of us have expressed on other issues from our witnesses this afternoon. Thank you.

Senator WICKER. Thank you, Senator Hirono.

Gentlemen, you have submitted a very extensive statement, jointly submitted consisting of some 44 pages. That statement will be included in the record. Without objection, so ordered. Vice Admiral Grosklags, we will start with you.

**STATEMENT OF VICE ADMIRAL PAUL A. GROSKLAGS, USN,
COMMANDER, NAVAL AIR SYSTEMS, DEPARTMENT OF THE
NAVY**

Admiral GROSKLAGS. Thank you, Mr. Chairman, Ranking Member Hirono, distinguished members of the subcommittee.

I have just got a brief opening statement, and then we will look forward to your questions.

First, thanks for the opportunity to appear before you today to talk about our naval aviation programs. I am, obviously, pleased to be here with General Davis and Admiral Manazir.

On behalf of the Navy and Marine Corps, I would like to start by thanking the Seapower Subcommittee for your strong support of the Department of the Navy in previous years, as well as, more particularly, your support of naval aviation.

As you have noted, the current fiscal environment drives some tough choices, and we are clearly balancing between capabilities, capacity, and readiness. But independent of that fiscal environ-

ment, the demand for our naval presence and in particular naval aviation remains very high.

As Secretary of Defense Carter recently testified, there are five evolving strategic challenges that are driving our planning and budgeting: Russia, China, Iran, North Korea, and terrorism. Planning scenarios for each one of these strategic challenges involve in key aspects naval aviation.

Consistent with those demands, we have placed priority on two specific aspects of naval aviation that you have already talked about. The first is recovery of our near-term readiness, and the second is investment in those future capabilities critical to our long-term technical superiority while ensuring that we have got the capacity to win our Nation's battles.

Our current readiness, particularly in some of our Marine Corps communities, is well below the required levels. We are addressing this readiness problem through a number of lines of effort, but sufficient and stable funding is a key component of our "get well" plan.

Specifically, we ask for your help in maintaining the funding requested by the Department to sustain the aircraft we have on the flight lines today. Stability in all of the multiple lines, funding lines in PB17 that drive our current readiness and sustainment, must be maintained so that we can ensure the proper balance and harmonization across our flying hours, our depot maintenance, our air systems support, aviation spares, and the rest of the accounts that make up our sustainment effort for aviation.

In parallel, continued investment in the procurement of F-35's and F-18's is critical to ensuring we can successfully manage our strike fighter inventory through the decade of the 2020s.

While our focus in naval aviation leadership is clearly on those two priorities, I do want to take just a few seconds to highlight some significant milestones since last year's hearing.

Both the chairman and the ranking member have already touched on the IOC for the F-35B. The Marines have two full squadrons operating and a third one ready to stand up early this summer. Gaining that capability and confidence that they are getting through their daily use of this aircraft in a tactical environment is really building momentum for the entire F-35 program, and the Marine Corps in this case is truly in the vanguard of the F-35.

On the Navy side of the house, last October we completed our second carrier-based test period aboard the USS Dwight D. Eisenhower. We conducted 66 launches and successful arrestments.

The CH-53K King Stallion program conducted its first flight last October. To date, they have got two aircraft flying. They have got two more planned to fly in early June. They have flown about 60 hours, reached air speeds up to 140 knots, 30 degrees angle of bank. The airplane is performing very well. They are on track for an LRIP [low-rate initial production] decision in fiscal year 2017 and a critical initial operating capability in 2019.

Our transition from P-3's to P-8's, a very, very capable aircraft, is about 50 percent complete. Our planned mission capability, the incremental upgrades that you all have heard about in the past, are on track. Last year, we implemented the broad area ASW [anti-

submarine warfare] search capability. To date, we have seen about a 98 percent mission completion rate out of our forward-deployed P-8's.

Last the presidential helicopter program completed their preliminary design review last August. They are on track for a 2020 initial operational capability. The program is doing extremely well. They are executing to schedule, and more importantly, they are executing to a budget. In fact, we were able to pull a couple hundred million dollars out of their program due to their outstanding execution.

Mr. Chairman, we believe the Department's 2017 budget request has properly balanced the capacity, capability, and readiness that I talked about. We ask for your continued support for that budget submission.

Thank you for the opportunity to appear before you today. I look forward to your questions.

[The prepared joint statement of Admiral Grosklags, General Davis, and Admiral Manazir follows:]

PREPARED JOINT STATEMENT BY VICE ADMIRAL PAUL GROSKLAGS, LIEUTENANT
GENERAL JON DAVIS, AND REAR ADMIRAL MICHAEL C. MANAZIR

INTRODUCTION

Mr. Chairman, Senator Hirono, and distinguished members of the Subcommittee, we thank you for the opportunity to appear before you today to discuss the Department of the Navy's (DON) Aviation programs. Our testimony will provide background and rationale for the Department's fiscal year 2017 budget request for aviation programs aligning to our strategic priorities and budgetary goals.

The United States is a maritime nation with global responsibilities. Our Navy and Marine Corps' persistent presence and multi-mission capability represent U.S. power projection across the global commons. They move at will across the world's oceans, seas and littorals, and they extend the effects of the sea-base and expeditionary basing deep inland. Naval Aviation provides our nation's leaders with "off-shore and onshore options" where it matters, when it matters. We enable global reach and access, regardless of changing circumstances, and will continue to be the nation's preeminent option for employing deterrence through global presence, sea control, mission flexibility and when necessary, interdiction. We are an agile maritime strike, amphibious and expeditionary power projection force in readiness, and such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong.

As described in the Chief of Naval Operations' *A Design for Maintaining Maritime Superiority* and the Commandant of the U.S. Marine Corps' *Advance to Contact*, today's strategic environment is dramatically more globalized with accelerating change. Global connections continue to multiply, fueled by rapid advances and proliferation in technology, particularly information technology. Our competitors are pursuing advanced weapon systems at levels and a pace of development that we have not seen since the mid-1980s. It is imperative that we fund a force that can fight and win against any of our five major challengers (Russia, China, Iran, North Korea and Global Counter-Terrorism), investing in advanced capabilities that increase our lethality, for both the current and future force. Our fiscal year 2017 budget addresses that imperative by making investments to improve our ability to fight with decisive capability over the full range of operations—at sea, from the sea, and across all domains.

Our ability to respond to the dynamic strategic environment, high operational tempo and Combatant Commander (COCOM) requirements is constrained by the current fiscal realities. The Department is still recovering from reduced funding over fiscal years 2013–2016 that collectively provided \$30 billion less than the levels requested in our President's Budget submissions. The Bipartisan Budget Act of 2015 (BBA) provided critical relief from a return to sequestration levels in fiscal year 2016 and fiscal year 2017, but even with overseas contingency operations funding, the Navy's fiscal year 2017 request is 3.9 percent less than the fiscal year 2017 funding level requested in the Fiscal Year 2016 President's Budget.

This fiscal context drives difficult choices, but also fosters new thinking in order to best balance between capability, capacity, readiness and a vital industrial base. The Fiscal Year 2017 President's Budget integrates the mission guidance, operational context, and fiscal constraints in making focused investments, hard prioritized choices, and innovative reform to resource and delivers a global sea-based force. The Department's aviation plans are formulated to reach and maintain the required force structure with the right capabilities, while sustaining the initial industrial base required to support this force.

The Navy/Marine Corps *Vision for Naval Aviation 2025* provides the framework for determining investment priorities across the triad of warfighting capability, capacity, and aviation wholeness and there are several central themes to our 2017 Naval Aviation budget plan: 5th generation fighter/attack capability; netted persistent multi-role intelligence, surveillance, reconnaissance and targeting; supporting capabilities such as electronic attack, maritime patrol, and vertical lift; advanced strike weapons programs; readiness; and targeted modernization of the force for relevance and sustainability.

First, we are acquiring F-35 5th generation fighter/attack aircraft and planning to procure additional F/A-18E/F aircraft within the Future Years Defense Program (FYDP) to address near-term tactical aviation (TACAIR) capability and overutilization challenges. Our plan will integrate 5th generation technologies into the Carrier Air Wing (CVW), the Aviation Combat Element in our Amphibious Ready Groups, and expeditionary forces while maintaining and modernizing the capability of the current TACAIR fleet. The F-35B and F-35C will replace Marine Corps F/A-18 and AV-8B aircraft significantly increasing capabilities across the range of military operations of Marine sea- and land-based Marine Air-Ground Task Forces (MAGTFs). The F-35C, F/A-18E/F, and EA-18G provide complementary capabilities that enhance the versatility, lethality, survivability, and readiness of our CVWs. F/A-18A-F and AV-8B aircraft will continue to receive capability enhancements to sustain their lethality and Fleet interoperability well into the next decade. Future avionics upgrades will enable network-centric operations for integrated fire control, situational awareness and transfer of data to Joint command-and-control nodes afloat and ashore.

To meet the demand for persistent, multi-role intelligence, surveillance, and reconnaissance (ISR) capability, the Navy and Marine Corps are building a balanced portfolio of manned and unmanned aircraft focused on missions in the maritime environment. A future unmanned carrier-based capability (MQ-XX), which takes the place of the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) program, will enhance carrier capability and versatility for the joint forces commander through integration of a persistent, sea-based, multi-mission aerial refueling and reconnaissance Unmanned Aircraft System (UAS) into the CVW. The MQ-XX system is envisioned to be an integral part of the future CVW; its robust organic refueling and long-endurance ISR capability, with open standards to enable future capabilities growth after it has been successfully integrated into the air-wing, is essential to the CVW Multi-Mission concept of the future. MQ-4C Triton will provide persistent land-based maritime ISR and complement our P-8 Multi-Mission Maritime Aircraft (MMA); MQ-8 Fire Scout will provide ISR support and Maritime surveillance to our Littoral Combat Ships (LCS), Fast Frigates (FF) and other suitably-equipped air-capable ships; and smaller unmanned systems such as the RQ-21A Blackjack and RQ-7B Marine Corps Tactical UAS will provide the shorter duration, line-of-sight reconnaissance capability integral at the unit level.

The fiscal year 2017 budget request enables Naval Aviation to continue recapitalization and modernization of our aging fleets of airborne early warning and maritime patrol platforms. The Department is recapitalizing our fleet of E-2C airborne early warning aircraft with the E-2D, P-3C maritime patrol and reconnaissance with the P-8A, EA-6B airborne electronic attack with the EA-18G, and C-2A Carrier Onboard Delivery (COD) with the V-22. E-2D integrates a new active electronically-scanned array radar that provides a two-generation leap in technology with the capability to detect and track existing and emerging air-to-air and cruise missile threats in support of Integrated Air and Missile Defense. P-8A combines the proven reliability of the commercial 737 airframe with avionics that enable integration of modern sensors and robust communications. The fifth and sixth operational P-8A deployments are currently underway, and the program is on track to complete the transition of all twelve P-3C squadrons to P-8A by 2019. Electronic attack capabilities, both carrier-based and expeditionary, continue to mature with the fielding of EA-18G squadrons while we develop the Next Generation Jammer (NGJ) to replace the legacy ALQ-99 Tactical Jamming System. With the Marine Corps fielding of the F-35B and Intrepid II Tiger Pods, we have also added new Electronic Warfare (EW) and spectrum management capabilities across the MAGTF. Finally, the Department

is planning to recapitalize its fleet of C-2A COD aircraft with an extended range variant of the V-22 (CMV-22B). The decision closes a capacity gap in the COD capability within an existing Program of Record (POR) and introduces new interoperability with the Amphibious Forces.

In fiscal year 2017, the Navy and Marine Corps are recapitalizing and modernizing their vertical lift platforms while also participating in Joint Future Vertical Lift efforts to identify leverage points for future rotorcraft investment. The Department will do so with procurement of AH-1Z, and MV-22B, the continued development of the VH-92A (Presidential Helicopter replacement), and the continued development and initial production of the CH-53K. The 'Special Purpose Marine Air-Ground Task Force-Crisis Response' (SPMAGTF-CR), designed to support U.S. and partner security interests throughout the CENTCOM, EUCOM and AFRICOM Areas of Responsibility (AOR), leverages these vertical lift investments. The speed and range of the MV-22B, together with the KC-130J and joint tanker assets provides the SPMAGTF-CR with the operational reach to respond to crises throughout any AOR. The addition of the MV-22 Aerial Refueling System (VARS) will bring air refueling capability to the MV-22s and allow for a Roll-On/Roll-Off system to fill a critical air refueling capability of our sea-based forces, extending the reach and striking power of the MAGTF.

Within our fiscal year 2017 budget request, the Department implements our Cruise Missile strategy and continues investments in advanced strike weapons programs. These include Air Intercept Missiles (AIM-9X/BLK II and AIM-120D); Small Diameter Bomb II (SDB II); Tactical Tomahawk Cruise Missiles (TACTOM/BLK IV); the Long-Range Anti-Ship Missile (LRASM); Next Generation Land Attack Weapon (NGLAW); Offensive Anti-Surface Warfare (OASuW) Increment II; the Advanced Anti-Radiation Guided Missile (AARGM); Advanced Precision Kill Weapon System II (APKWS II) and the Joint Air-to-Ground Missile (JAGM).

Readiness recovery remains one of the key areas of concern in the Department. We continue to have lower than acceptable numbers of aircraft available to train and fight; our sailors and marines are getting less time flying the aircraft we do have, to be as proficient as we expect them to be. This is a major concern as we are in a fiscally challenged environment and the department is in the midst of transitioning a significant portion of its aircraft to more modern and lethal varieties. The Marine Corps alone is currently transitioning every single one of its Type/Model/Series aircraft. Increasing funding of the readiness accounts, to include spares, air systems support, repair parts, and support equipment, will be critical to ensure we can recover to an acceptable level of readiness. Given fiscal realities, our PB-17 submission represents an optimal balance of regaining an adequate level of current readiness while maintaining investment in new aircraft and capabilities—both of which are required to support current and enduring Naval Aviation requirements.

TACTICAL AVIATION

F-35B/F-35C Lightning II:

The F-35 Lightning II will form the backbone of U.S. air combat superiority for decades to come. Delivering this transformational capability to front-line forces as soon as possible remains a top priority. The F-35 will replace legacy tactical fighter fleets of the Navy and Marine Corps with a dominant, multirole, fifth-generation aircraft, capable of projecting U.S. power and deterring potential adversaries. The Fiscal Year 2017 President's Budget increases the procurement ramp and requests \$1.2 billion in Research, Development Test and Evaluation, Navy (RDT&E,N) and \$3.4 billion in Aircraft Procurement Navy (APN).

The F-35 program is executing relatively well across the entire spectrum of acquisition, to include development and design, flight test, production, fielding and base stand-up, sustainment of fielded aircraft, and stand up of a global sustainment enterprise. In February 2016, the F-35 reached 50,000 flight hours, including approximately 18,000 for the F-35B and almost 6,000 hours for the F-35C. Our overall assessment is that steady progress is continuing to be made on all aspects of the program. F-35 does continue to have its risks, including software development and integration, albeit less risk than was reported last year. The discipline instilled several years ago in the method by which software is developed, lab tested, flight tested, measured and controlled has resulted in improved and more predictable outcomes and we have begun to see positive results.

The program completed all flight tests for Block 2B software and the Marine Corps declared its Initial Operational Capability (IOC) for F-35B in July 2015. Block 3i software test for Low Rate Initial Production (LRIP) was completed and is anticipated to deliver all planned capabilities in support of the U.S. Air Force

(USAF) F-35A IOC later this year. The final system development and demonstration configuration, Block 3F, is now flying in developmental test and we are tracking toward a Navy F-35C IOC in fiscal year 2018. Block 3F, which has the most software development risk driven by data fusion, will build on the mission capabilities of Block 2B and add the remaining F-35 mission capabilities stated in the approved operational requirements document. Block 3F data fusion enables the aircraft to integrate onboard capabilities with information from multiple other sources, such as other F-35 aircraft, non-F-35 aircraft, satellites, and ground stations, in order to provide the pilot complete and accurate battlespace awareness. This multi-platform fusion is the most complex remaining developmental activity and is being closely monitored.

The program has delivered 170 aircraft to test, operational, and training sites, with the production line delivering F-35s per the contract schedule. Due to government/industry manufacturing initiatives, production deliveries improved from a three-month delay in early 2015 to be on contract schedule starting in December 2015.

Affordability remains a top priority. We continue to make it clear to the program management team and the F-35 industrial base that the development phase must complete within the time and money allocated; continue to drive cost out of aircraft production; and reduce life-cycle costs. To that end, the program has engaged in a multi-pronged approach to reduce costs across production, operations, and support. The government/industry team is reducing aircraft production costs through “blueprint for affordability” initiatives and reducing F135 engine costs via ongoing engine “war on cost” strategies. These efforts include up-front contractor investment on cost reduction initiatives mutually agreed upon by the government and contractor team. This arrangement motivates the contractors to accrue savings as quickly as possible in order to recoup their investment, and benefits the government by realizing cost savings at the time of contract award. The goal is to reduce the flyaway cost of the USAF F-35A to between \$80 and \$85 million dollars by 2019, which is anticipated to commensurately decrease the cost to the Marine Corps F-35B and Navy F-35C variants. The program has also set a goal of decreasing overall operating and support life-cycle cost by 30 percent.

F/A-18 Overview

The F/A-18 Hornet is challenged to meet current readiness and operational commitments. There are 30 Navy Super Hornet strike fighter squadrons and a total inventory of 547 F/A-18E/Fs. Deliveries and squadron transitions will be planned to continue through 2020. There are six Navy and 11 Marine Corps F/A-18 A-D Active strike fighter squadrons and a total inventory of 609 Hornets. Super Hornets and F/A-18A-D Hornets have conducted more than 219,454 combat missions since September 11, 2001.

F/A-18 A/B/C/D Hornet

The Fiscal Year 2017 President’s Budget requests \$371.7 million in APN to implement aircraft commonality programs, enhance relevant capability, improve reliability, and ensure structural safety of the inventory of 609 F/A-18 A-D Hornets. \$31.4 million is for the Service Life Extension Program (SLEP).

The F/A-18A-D was designed for, and has achieved, a service life of 6,000 flight hours. These aircraft have performed as expected through their design life. Service life management of this aircraft is extending the life of this platform beyond its designed 6,000 flight hours. Through detailed analysis, inspections, and structural repairs, the DON has been successful in achieving 8,000 flight hours for 171 aircraft and is pursuing a strategy to go as high as 10,000 flight hours on select aircraft, with the leading aircraft currently above 9,550 hours. Continued investment in SLEP, the High Flight Hour (HFH) inspection program, Program Related Engineering, and Program Related Logistics is critical for our flight hour extension strategy and the ability of operational units to meet training and operational mission requirements.

In order to maintain warfighting relevancy in a changing threat environment, we will continue to procure and install advanced systems such as the Joint Helmet-Mounted Cueing System (JHMCS), High Order Language Mission Computers, ALR-67v3, ALQ-214v5, Multifunctional Information Distribution System (MIDS), Joint Tactical Radio System (JTRS), APG-73 radar enhancements, Advanced Targeting Forward looking Infrared (ATFLIR) upgrades, and LITENING for the Marine Corps on selected F/A-18A-D aircraft.

F/A-18 E/F Super-Hornet

The F/A-18E/F will be a mainstay of Navy’s aviation CVW strike fighter force through 2035. The Fiscal Year 2017 President’s Budget requests \$184.9 million for

procurement of 2 F/A-18E/F aircraft with Overseas Contingency Operations funds; \$531.2 million in APN to implement aircraft commonality programs, enhance relevant capabilities, improve reliability, and ensure structural safety of the Super-Hornet fleet; and \$227.4 million RDT&E,N to support the Flight Plan spiral capability development of increased survivability, improved lethality, counter-electronic attack, and continuation of the F/A-18E/F Service Life Assessment Program (SLAP).

The F/A-18E/F significantly improves the survivability and strike capability of the CVW. The Super-Hornet provides increased combat radius and endurance, and a 25 percent increase in weapons payload over F/A-18A-D Hornets. The production program continues to deliver on-cost and on-schedule.

The Super-Hornet uses an incremental approach to incorporate new technologies and capabilities, to include Digital Communication System Radio, MIDS-JTRS, JHMCS, ATFLIR with shared real-time video, Accurate Navigation, Digital Memory Device, Distributed Targeting System, Infrared Search and Track and continued advancement of the APG-79 Active Electronically Scanned Array Radar. \$38.3 million of the 2017 RDT&E,N supports the F/A-18E/F SLAP requirement. The F/A-18 E/F fleet, on average, has flown approximately 45 percent of the design life of 6,000 flight hours. The remaining design service-life will not be adequate to meet anticipated operational requirements through 2035. In 2008, the Navy commenced a three phase F/A-18E/F SLAP to analyze actual usage versus structural test results and determine the feasibility of extending F/A-18E/F service life from 6,000 to 9,000 flight hours via a follow-on SLEP. The F/A-18E/F SLAP will identify the necessary inspections and modifications required to achieve 9,000 flight hours and increase total arrested landings and catapults beyond currently defined life limits. This extension is currently assessed as low risk. The Service Life Management Plan philosophy has been applied to the F/A-18E/F fleet at an earlier point in its lifecycle than the F/A-18A-D. This will facilitate optimization of Fatigue Life Expended, flight hours, and total landings, thereby better aligning aircraft service life with fleet requirements.

AV-8B Harrier

Since the beginning of the war on terror, the AV-8B Harrier has been a critical part of the strike fighter inventory for the Joint force. This aircraft has flown more than 54,000 hours in combat since 2003, an average of over 400 hours per aircraft, with zero losses from the enemy in the air, but six losses on the ground when the enemy broke through our perimeter at Bastion Air Base in 2012. The Fiscal Year 2017 President's Budget requests \$60.8 million in APN funds to continue the incorporation of Obsolescence Replacement/Readiness Management Plan systems, electrical and structural enhancements, inventory sustainment and upgrade efforts to offset obsolescence and attrition, LITENING Pod upgrades, F402-RR-408 engine safety and operational changes, and Digital Interoperability upgrades to include Link 16.

The Fiscal Year 2017, President's Budget requests \$33.7 million in RDT&E,N funds to continue Design, Development, Integration and Test of various platform improvements, to include Engine Life Management Program, Escape Systems, Joint Mission Planning System updates, Link 16 Digital Interoperability integration, Operational Flight Program (OFP) block upgrades to various mission and communication systems, navigation equipment, weapons carriage, countermeasures, and the Obsolescence Replacement/Readiness Management Plan.

The AV-8B continues to deploy in support of operational contingencies. Each Marine Expeditionary Unit (MEU) deploys with embarked AV-8Bs. The AV-8B equipped with LITENING targeting pods and a video downlink to ROVER ground stations, precision strike weapons, Intrepid Tiger II EW pods and beyond visual range air-to-air radar guided missiles, continues to be a proven, invaluable asset for the MAGTF and joint commander across the spectrum of operations. AV-8B squadrons, both land- and sea-based, have flown more than 3,400 hours of strike sorties against ISIS with an average combat radius of 900 miles. Digital Improved Triple Ejector Racks have allowed us to load up to six precision guided munitions per aircraft, with fuel tanks, guns, and LITENING Pods, exponentially increasing the combat viability of this platform. In fiscal year 2017 the Airborne Variable Message Format terminals will be installed in AV-8B to replace the current digital-aided close air support (CAS) technology. The program will continue development of the H6.2 OFP which will include initial integration of Link 16 message sets. Additionally, this OFP will integrate Federal Aviation Administration compliant Navigation Performance/Area Navigation capability, an update to the LITENING Common OFP to implement improvements to moving target tracking, and it will correct additional software deficiencies identified through combat operations. The program will also work on the H7.0 OFP which will integrate full Link 16 functionality. As an out-

of-production aircraft, the AV-8B program will continue its focus on sustainment efforts to mitigate significant inventory shortfalls, maintain airframe integrity, achieve full Fatigue Life Expended, and address reliability and obsolescence issues of avionics and subsystems.

Operations ODYSSEY DAWN, ENDURING FREEDOM, FREEDOM SENTINEL, and today's Operation INHERENT RESOLVE confirm the expeditionary advantages of Short Take-Off and Vertical landing (STOVL) capabilities. Placing the Harrier as the closest multi-role fixed-wing asset to the battlefield greatly reduces transit times to the battlefield and enables persistent CAS without strategic tanking assets. Airframe sustainment initiatives, capability upgrades, and obsolescence mitigation is essential and must be funded to ensure the AV-8B remains lethal and relevant.

Next Generation Air Dominance (NGAD) Family of Systems

The Department initiated a Next Generation Air Dominance (NGAD) analysis of alternatives (AoA) in January 2016 to address the anticipated retirement of the F/A-18E/F and EA-18G aircraft beginning in the mid-late 2020 timeframe. The Joints Chiefs of Staff have approved the Initial Capabilities Document that frames NGAD study requirements to support the full range of military operations from carrier-based platforms. The AoA will consider the widest possible range of materiel concepts while balancing capability, cost/affordability, schedule, and supportability considerations. It will assess manned, unmanned, and optionally manned approaches to fulfill predicted 2030+ mission requirements. Analyses will consider baseline programs of record (current platforms), evolutionary or incremental upgrades to baseline programs (including derivative platforms), and new development systems or aircraft to meet identified gaps in required capability. The fiscal year 2017 budget requests \$1.2 million in RDT&E,N to continue this AoA.

STRIKE FIGHTER INVENTORY MANAGEMENT

The Department remains challenged with end of life planning for F/A-18A-D and AV-8B aircraft that reach the end of their service life before replacement aircraft can be fully delivered into service. To keep pace with the issue and provide high-fidelity analytical rigor to decision makers, DON transitioned to the Naval Synchronization Tool in 2014. This inventory modeling and forecasting tool better informs Strike Fighter Inventory Management planning and the budget programming process.

The Strike Fighter inventory should be viewed in two separate and distinct phases. The near term challenge is managing a DON TACAIR force that has been reduced in capacity through a combination of reduced Strike Fighter aircraft procurement, higher than planned TACAIR utilization rates, under resourcing sustainment and enabler accounts resulting in inadequate availability of spare parts, and F/A-18A-D depot production falling short of the required output. As a result of aggressive efforts instituted in 2014 across the Department to improve depot throughput and return more aircraft back to service, fiscal year 2015 depot throughput improved by 44 percent as compared to fiscal year 2014, returning to pre-sequestration levels of production. TACAIR aviation depots are expected to continue to improve productivity through 2017, and fully recover the backlog of F/A-18A-D aircraft in 2019, at which time the focus will shift toward F/A-18E/F service life extension, F-35 repair, and the rest of the DON aircraft inventory. In a similar effort to increase Harrier aircraft availability, the Department conducted a Harrier Independent Readiness Review which identified a need for changes in the Harrier sustainment plan to achieve required flight line and inventory readiness. This year, with Congress' support, the Department is implementing the identified changes to return Harrier readiness to required levels.

In the far term, the Strike Fighter inventory is predominantly affected by new aircraft procurement: F/A-18E/F and F-35. COCOM-driven operations and Fleet Readiness Training Plan requirements are driving an increased Strike Fighter utilization rate that currently outpaces procurement. Mitigation strategies, such as reducing utilization on current aircraft, are being examined by Commander, Naval Air Forces. Nonetheless, the DON Strike Fighter force continues to meet Global Force Management operational commitments. We anticipate inventory pressure to remain relatively constant through the future as we experience peak depot inductions of F/A-18A-D aircraft reaching 8,000 hours HFH service life extension inspections, repairs and modifications, and later as depot inductions increase significantly due to required F/A-18E/F service life extensions. The continued efforts of the Naval Aviation Enterprise will define the necessary actions required to manage the end of life for aging F/A-18A-D and AV-8B aircraft, address further discovery of greater than expected fatigue and corrosion issues, maintain their operational relevancy, and en-

sure required availability of these aircraft until fully replaced by the Joint Strike Fighter.

The DON POR includes 680 F-35 aircraft; 340 F-35B and 340 F-35C. The Navy and Marine Corps will continue to modify transition plans to adjudicate F-35 procurement changes. Sustainment and modernization funding will be required to maintain the relevant operational capability of the F/A-18A-F and the AV-8B throughout the transition to the F-35.

A 1,240 aircraft Strike Fighter force is the projected DON inventory needed to support the anticipated operational demand through the 2030 timeframe. The Navy inventory requirement of 820 aircraft supports 40 Active Duty Strike Fighter squadrons composed of 440 aircraft (mix of 10-12 aircraft per squadron), and two Reserve squadrons with 22 total aircraft assigned. This requirement includes 260 F-35C aircraft in 18 operational squadrons and one training squadron. In order to maintain the operational aircraft, support aircraft are required for aviator training, flight test, attrition Reserve and depot pipeline. This inventory projection is estimated based on historical averages and assumes 100 percent squadron entitlement.

The Marine Corps TACAIR requirement is 420 F-35B/C aircraft in 18 Active, two Reserve, and two training squadrons. Integral to our current force structure reductions, our tactical aviation squadrons were restructured to optimize the support they provide to the MAGTF. The POR for Marine Corps F-35 includes four F-35C squadrons that are capable of being integrated with Navy carrier air wings and a fair share contribution of F-35C aircraft, pilots and maintainers to the Fleet Replacement Squadrons.

Airborne Electronic Attack (AEA) / EA-18G Growler

The Fiscal Year 2017 President's Budget request includes \$120.6 million in APN to implement aircraft commonality programs, maintain relevant capabilities, improve reliability, and ensure structural safety of the Growler fleet; and \$46.9 million in RDT&E,N for Flight Plan spiral capability development, design and integration of Jamming Techniques Optimization improvements, evolutionary software development and related testing.

In 2009, the Navy began the transition from EA-6Bs to EA-18Gs. The EA-18G is a critical enabler of the Joint force, bringing fully netted capabilities that provide electromagnetic spectrum dominance in an electromagnetic maneuver warfare environment. The first EA-18G squadron deployed to Iraq in an expeditionary role in November 2010 in support of Operation NEW DAWN, and subsequently redeployed to Italy on short notice in March 2011 in support of Operations ODYSSEY DAWN and UNIFIED PROTECTOR. The first carrier-based EA-18G squadron deployed in May 2011. Three Active component Navy expeditionary squadrons, nine carrier based squadrons, and one Reserve squadron have completed transition to the EA-18G. The nine carrier based EA-18G squadrons will fulfill Navy requirements for airborne electronic attack; six expeditionary EA-18G squadrons (five Active, one Reserve component) will provide the joint, high-intensity AEA capability required by the joint forces commander, which was previously fulfilled by the Navy and Marine Corps EA-6B. The Navy was divested of EA-6Bs in 2015; the Marine Corps will be by 2019, leaving the EA-18G as the only dedicated tactical AEA platform in the DOD inventory. The funded inventory is 160 EA-18G aircraft, of which 114 have been delivered. Since their initial deployment, Growlers have flown more than 4,970 combat missions, have expended approximately 16 percent of the 7,500 flight hour life per aircraft, and are meeting all operational commitments.

Next Generation Jammer (NGJ)

NGJ is a new EW capability that will replace the 44-year old ALQ-99, currently the only Navy and Joint airborne Tactical Jamming System pod. The ALQ-99 has limited capability to counter tactically and technically advanced threats, is increasingly difficult and costly to maintain, and has a vanishing industrial supplier base. The Navy and DOD require NGJ to meet current and emerging EW threats. NGJ will have the necessary power and digital techniques to counter increasingly advanced and sophisticated adversary EW search, surveillance, and targeting-radars and communications systems. NGJ will be DOD's only comprehensive tactical AEA capability, supporting all Services and joint/coalition partners, and will be implemented in three increments: Mid-Band (Increment 1), Low-Band (Increment 2), and High-Band (Increment 3). NGJ is designed to provide improved capability in support of joint and coalition air, land, and sea tactical strike missions and is critical to the Navy's vision for the future of strike warfare. Our fiscal year 2017 budget request of \$577.8 million RDT&E,N is vital to maintain Increment 1 schedule, allow the program to complete the Critical Design Review, and begin pod hardware procurement and assembly of the Engineering and Development Models. In addition, \$13.0 mil-

lion RDT&E,N will complete technology feasibility studies and initiate prototyping efforts for Increment 2, the lower frequency band capability, to validate the technology readiness levels of the major subsystems for Increment 2.

Airborne Electronic Attack (AEA) / EA-6B Prowler

The Fiscal Year 2017 President's Budget request includes \$15.4 million in RDT&E,N for EW Counter Response, \$20.8 million RDT&E,N for MAGTF EW, \$51.9 million in APN for AEA systems, and \$5.7 million APN for MAGTF EW.

Currently, there are 32 EA-6Bs which are distributed to three Marine Corps operational squadrons, one Navy flight test squadron, and one Marine Corps training squadron. Final retirement of the EA-6B from the DON inventory will be in 2019.

Marine aviation is on a path toward a distributed AEA 'system of systems' that is a critical element in achieving the MAGTF EW vision: A composite of manned and unmanned surface, air, and space assets on a fully collaborative network providing the MAGTF commander freedom of maneuver in and through the electromagnetic spectrum when and where desired. Included in this plan are the ALQ-231 Intrepid Tiger II communications jammer, integration of F-35s organic EW capabilities, planned UAS EW payloads, and the Spectrum Services Framework network to facilitate collaborative EW Battle Management.

Intrepid Tiger II development and procurement is in response to Marine Corps requirements for increased precision EW capability and capacity across the MAGTF and provides EW capability directly to tactical commanders without reliance upon the limited availability of the low density/high demand EA-6B Prowler or E/A-18G. Intrepid Tiger II is currently carried on AV-8B and F/A-18 A++/C/D aircraft, has successfully completed nine deployments, and is currently deployed with both the 13th, 15th, 26th and 29th MEUs. Integration on Marine Corps rotary-wing aircraft is scheduled to be completed by the second quarter of fiscal year 2016. Development of an Intrepid Tiger II counter-radar capability for the penetrating electronic attack mission will begin in fiscal year 2016.

E-2D Advanced Hawkeye (AHE)

The Fiscal Year 2017 President's Budget requests \$363.8 million in RDT&E,N for continuation of added capabilities, to include Aerial Refueling, Secret Internet Protocol Router chat, Advanced Mid-Term Interoperability Improvement Program, MIDS/Joint Tactical Radio System Tactical Targeting Network Technology, Counter Electronic Attack, Sensor Netting, and Data Fusion, Navigation Warfare, Fighter to Fighter Backlink, ALQ217 Electronic Support Measures, and Crypto Modernization/Frequency Remapping. In the fourth year of a 26 aircraft Multi-Year Procurement (MYP) contract covering fiscal years 2014-2018, the budget requests \$1,041.5 million in APN for six Full Rate Production (FRP) Lot 5 aircraft and spares, and Advance Procurement for fiscal year 2018 FRP Lot 6 aircraft.

The E-2D AHE is the Navy's carrier-based Airborne Early Warning and Battle Management Command and Control system. The E-2D AHE provides Theater Air and Missile Defense and is capable of synthesizing information from multiple on-board and off-board sensors, making complex tactical decisions and then disseminating actionable information to Joint Forces in a distributed, open-architecture environment. E-2D is also a cornerstone of the Naval Integrated Fire Control-Counter Air (NIFC-CA) system of systems capability.

Utilizing the newly developed AN/APY-9 Mechanical/Electronic Scan Array radar and the Cooperative Engagement Capability system, the E-2D AHE works in concert with tactical aircraft and surface-combatants equipped with the Aegis combat system to detect, track and defeat air and cruise missile threats at extended ranges. IOC was achieved in October 2014 and VAW-125 accomplished the first Fleet Squadron Deployment with the USS ROOSEVELT from March 11, 2015, through November 23, 2015.

ASSAULT SUPPORT AIRCRAFT

MV-22

The Fiscal Year 2017 President's Budget requests \$174.4 million in RDT&E,N for continued product improvements, including development of an Engineering Change Proposal for the Navy variant, the CMV-22B; and \$1.3 billion in APN for procurement of 16 Lot 21 MV-22s. The funds requested in the Fiscal Year 2017 President's Budget fully fund Lot 21, the final production lot of the second Multi-Year Procurement (MYP II), and procure long-lead items for fiscal year 2018 Lot 22 V-22 aircraft. fiscal year 2018 begins procurement of the Navy CMV-22B variant in support of the Carrier On-Board Delivery mission. The APN request also includes \$141.5 million to support Operations and Safety Improvement Programs (OSIPs), including Correction of Deficiencies and readiness improvements, with an additional \$8.7 mil-

lion Overseas Contingency Operations requested for the Advanced Ballistic Stopping System.

MV-22 Osprey vertical flight capabilities, coupled with the speed, range, and endurance of fixed-wing transports, continue to enable effective execution of current missions that were previously unachievable. In November 2015, the V-22 fleet achieved its 300,000th flight hour milestone while executing at a high operational tempo consisting of multiple MEU deployments and two SPMAGTF-CR deployments in support of AFRICOM and CENTCOM. During 2015, the fourteenth of eighteen planned Active component squadrons became fully operationally capable. This is significant because while the platform the MV-22 is replacing, the CH-46, flew its final flight on August 1, 2015, the full complement of MV-22s have not yet been produced. The MV-22 Osprey fleet has continued world-wide growth with 269 of 360 MV-22s delivered. There are also 48 of 53 USAF CV-22s delivered.

The V-22 Program focus is on delivery of MYP II production aircraft, sustaining Fleet aircraft, improving aircraft readiness, reducing operating costs, and expanding the business base, both domestically and internationally. Both the MV-22 and CV-22 continue to meet all Key Performance Parameters, and cost and schedule performance remains within established thresholds. The DON has initiated planning in preparation for a third MYP procurement (fiscal years 2018-2022) that would support procurement of the Navy CMV-22B variant, continued Marine Corps procurements, as well as potential future domestic and International sales. The stability of continuing procurement under a MYP benefits the supplier base and facilitates cost reductions on the part of both the prime contractor and sub-tier suppliers; and provides an incentive for additional V-22 procurements by international customers. In June of 2015, the Program's first Foreign Military Sales case was established with an initial procurement of five V-22s by the Government of Japan.

Due to extremely high demand for MV-22 capability from the COCOMs, and resultant high operational tempo, the mission capability rates have not continued the year-over-year improvements seen from 2010-2013. This is primarily due to a shortfall in our ability to train enlisted maintainers in the numbers and with the qualifications necessary to sustain the high demand signal. Resources are being shifted and standup, transition, and training plans are being modified, but it remains challenging to keep pace with the COCOM demand signal. Despite the impact on readiness, the cost per flight hour has dropped by nearly 26 percent since 2010. The fiscal Year 2017 OSIP provides a necessary and stable source of crucial modification funding as the program continues to implement readiness and cost reduction initiatives.

Concurrent with our readiness and support initiatives, we are adding capabilities to the MV-22 that will make it even more valuable to the COCOMs. First, we are expanding the number of aerial refueling platforms that can refuel an MV-22, increasing the range of available options to support extended range missions. A mission kit to allow the MV-22 to deliver fuel to other airborne platforms is also being developed. This is a critical enabler for both shore and sea-based operations. Initial capability is planned to deliver by the summer of 2018. Finally, an important capability that is a priority for the entire aviation force is Digital Interoperability (DI). We are testing and deploying the initial configuration of an onboard suite of electronics that will allow the embarked troop commander and aircrew to possess unprecedented situational awareness via real-time transmission of full motion video and other data generated by multiple air and ground platforms throughout the battlespace. This DI suite will also be able to collect, in real-time, threat data gathered by existing aircraft survivability equipment and accompanying attack platforms, thereby shortening the kill chain against ground and air based threats.

In ongoing operations in the Middle East, the MV-22 has become the Tactical Recovery of Aircraft and Personnel (TRAP) platform of choice to rescue downed aircrew in hostile territory. Currently, marines are on alert in Central Command to recover American and Coalition aircrew executing strike operations. The speed, range, and aerial refueling capability have allowed the Osprey's to remain in strategic locations throughout the area poised for rescue operations. With an unrefueled mission radius of 423 nautical miles, the Osprey can reach greater distances around the battlefield to increase the likelihood of recovering isolated personnel as the speed and altitude envelopes provide better survivability for the TRAP force and recovered aircrew.

CH-53K Heavy Lift Replacement Program

The Fiscal Year 2017 President's Budget requests \$405.0 million in RDT&E,N to continue the Engineering Manufacturing Development phase of the CH-53K program and \$438.0 million in APN for LRIP Lot 1. The first Engineering Development Model (EDM) achieved first flight on October 27, 2015, and continues testing. The second EDM conducted its first flight on January 22, 2016, with the two remaining

EDM vehicles expected to begin flying in 2016. During fiscal year 2017, the program will continue to execute developmental test flights and assembly of System Demonstration Test Article aircraft, which will be production representative aircraft utilized for Operational Test.

The CH-53K will provide land and sea based heavy-lift capabilities not resident in any of today's platforms and contribute directly to the increased agility, lethality, and presence of joint task forces and MAGTFs. The CH-53K will transport 27,000 pounds of external cargo out to a range of 110 nautical miles under the most extreme operational conditions, nearly tripling the CH-53E's lift capability under similar environmental conditions, while fitting into the same shipboard footprint. The CH-53K, by providing unparalleled lift capability under high-altitude and hot weather conditions, greatly expands the commander's operational reach.

Compared to the CH-53E, maintenance and reliability enhancements of the CH-53K will improve aircraft availability and ensure cost effective operations. Additionally, survivability and force protection enhancements will dramatically increase protection for both aircrew and passengers. Expeditionary heavy-lift capabilities will continue to be critical to successful land and sea-based operations in future anti-access, area-denial environments, enabling sea-basing and the joint operating concepts of force application and focused logistics.

Over the past 13 years, the CH-53 community accumulated over 95,000 combat flight hours. During this period, we suffered fourteen aircraft losses; seven in combat and seven in training. As our CH-53E community approaches 30-years of service, these sustained and unprecedented operational demands have aged our heavy lift assault support aircraft, making it ever more challenging to maintain and underscoring the importance of its replacement, the CH-53K King Stallion.

The MH-53E continues to perform its primary mission of airborne mine counter measures as well as transport of cargo and personnel. Over the past 12 years the MH-53 community has accumulated 87,474 flight hours. It too is approaching 30-years of service life and continues to be a challenging asset to maintain. Mine countermeasures operations puts added stress on these airframes. These aircraft are planned to remain in service until viable follow-on airborne mine countermeasure systems are fielded.

To keep the CH-53E and MH-53E viable through their remaining services lives, the 2017 President's Budget requests \$46.4 million in APN and \$5.1 million in RDT&E,N. The requested funding provides for critical capabilities, to include: Condition Based Maintenance software upgrades; Kapton wiring replacement installations; Improved Engine Nacelles; Non-recurring engineering for upgrades to the MH-53E's antiquated cockpit; Area Navigation capability; Moving map and hover displays; Embedded Global Positioning System/Inertial Navigation System; T-64 Engine Reliability Improvements; Critical Survivability Upgrade; Satellite Communications kits; and a Smart Multi-Function Color Display. These critical safety and avionics upgrades will address obsolescence issues within the cockpit and increase overall situational awareness and mission effectiveness.

ATTACK AND UTILITY AIRCRAFT

UH-1Y // AH-1Z

Marine Corps Venom and Viper utility and attack aircraft have been critical for the success of the Marines in harm's way, and over the past 10-years these aircraft have flown over 162,000 hours. The Fiscal Year 2017 President's Budget requests \$27.4 million in RDT&E,N for continued product improvements; and \$817.0 million in APN for 24 AH-1Z aircraft. The program is a key modernization effort designed to resolve existing safety deficiencies and enhance operational effectiveness of the H-1 fleet. The 85 percent commonality between the UH-1Y and AH-1Z will significantly reduce life-cycle costs and the logistical footprint, while increasing the maintainability and deployability of both aircraft. The program will provide the Marine Corps with 349 H-1 aircraft through a combination of new production and a limited quantity of remanufactured aircraft.

The H-1 Upgrades Program is replacing the Marine Corps' UH-1N and AH-1W helicopters with state-of-the-art UH-1Y "Venom" and AH-1Z "Viper" aircraft. The new aircraft are fielded with integrated glass cockpits, world-class sensors, and advanced helmet-mounted sight and display systems. The future growth plan includes a digitally-aided, close air support system designed to integrate these airframes, sensors, and weapons systems together with ground combat forces and other capable DOD aircraft. Integration of low-cost weapons such as the APKWS II provides increased lethality while reducing collateral damage.

The UH-1Y aircraft achieved IOC in August 2008 and FRP in September 2008. The "UH-1Y Forward" procurement strategy prioritized UH-1Y production in order

to replace the under-powered UH-1N fleet as quickly as possible. The last UH-1N was retired from service as of December 2014. The AH-1Z program received approval for FRP in November 2010 and achieved IOC in February 2011. As of January 2016, 171 aircraft (124 UH-1Ys and 47 AH-1Zs) have been delivered to the Fleet Marine Force. An additional 72 aircraft are on contract and in production, to include the first three of 12 Pakistan Foreign Military Sales aircraft. Lot 1-7 (fiscal years 2004-2010) aircraft deliveries are complete for both the UH-1Y and AH-1Z. Lot 8, 9, and 10 (fiscal years 2011-2013) deliveries are complete for the UH-1Y, and Lot 11 UH-1Y deliveries are in progress and ahead of schedule.

The H-1 Upgrades program is in the process of integrating both the UH-1Y and AH-1Z into the Digital Interoperability environment being established across the MAGTF. With the integration of Intrepid Tiger II EW pod, the Marine Corps' Light Attack Helicopter Squadron community will be able to provide the MAGTF commanders with all six essential functions of Marine Air. Additionally, these aircraft will incorporate Software Reprogrammable Payloads (SRP) which enables utilization of diverse networks and waveforms, thereby enabling maneuverability within the EM spectrum. SRP will employ systems such as Link-16, Tactical Targeting Network Technology, Adaptive Networking Wideband Waveform, and the Soldier Radio Waveform.

MH-60 (Overview)

MH-60 Seahawks have consistently met readiness and operational commitments. There will be 38 Navy Seahawk squadrons, with 275 MH-60S and 280 MH-60R aircraft, when transitions from the SH-60B, SH-60F, and HH-60H are complete. The last MH-60S delivered in January of 2016 and MH-60R deliveries are projected to continue into fiscal year 2018. The production program continues to deliver on-cost and on-schedule. Over the last twelve years of combat operations, deployed ashore and aboard our aircraft carriers, amphibious ships, and surface combatants at sea, Navy H-60 helicopters have provided vital over-watch and direct support to troops in combat across multiple theaters of operation and a variety of mission areas; including support for special operations forces, air ambulance, surface warfare, anti-submarine warfare, mine warfare, logistics support and humanitarian assistance/disaster relief.

The MH-60R Multi-Mission Helicopter provides strike group protection and adds significant capability in its primary mission areas of Undersea Warfare and Surface Warfare; the latter including Fast Attack Craft/Fast In-shore Attack Craft threat response capabilities. The MH-60R is the sole organic air Anti-Submarine Warfare (ASW) asset in the Carrier Strike group and serves as a key contributor to theater level ASW. The MH-60R also employs advanced sensors and communications to provide real-time battlespace management with a significant, active or passive, over-the-horizon targeting capability. Secondary mission areas include Search and Rescue, Vertical Replenishment, Naval Surface Fire Support, Logistics Support, Personnel Transport and Medical Evacuation.

The MH-60S supports Carrier and Expeditionary Strike Groups, Combat Logistics Ships, and LCS in the mission areas of SUW, Strike Warfare, Combat Search and Rescue, Vertical Replenishment (VERTREP), and will soon be supporting the LCS Mine Counter Measures Mission Package.

MH-60R/S Budget

The Fiscal Year 2017 President's Budget requests \$52.3 million in RDT&E,N across the Future Years Defense Program (FYDP) for a Service Life Assessment Program (SLAP). SLAP is critical to sustaining this critical capability. This program will inform the Department on what will be required to extend the MH-60 airframe service life beyond 2030. The program will initially focus on the air vehicle and include a Fatigue Life Assessment, Dynamic Component, and Subsystem Analysis to inform Service Life Extension Program (SLEP) requirements.

The Fiscal Year 2017 President's Budget requests \$61.2 million in APN for ancillary, support equipment, and field activities in support of the final aircraft deliveries.

The Budget request also includes \$5.3 million in RDT&E,N to support the MH-60 test program and other improvements. The MH-60 test program consists of numerous system upgrades and Pre-Planned Product Improvements, to include the Digital Rocket Launcher with APKWS II, MIDS-Low Volume Terminal Block Upgrade 2, and the VHF Omnidirectional Ranging/Instrument Landing System. Other improvements under this RDT&E,N line item are for MH-60S active/passive aircraft survivability equipment and MH-60S fixed forward-firing weapon/rocket corrections of deficiencies. These investments continue to improve the overall lethality of the MH-60 which is a critical enabler to sea control and provides forward-de-

ployed capabilities to defeat area-denial strategies, allowing joint forces to project and sustain power.

EXECUTIVE SUPPORT AIRCRAFT

VH-3D/VH-60N Executive Helicopter Series

The VH-3D and VH-60N are safely performing the Executive Lift mission worldwide. As these aircraft continue to provide seamless vertical lift for the President of the United States, the DON is working closely with HMX-1 and industry to sustain these aircraft until a Presidential Helicopter Replacement platform (VH-92A) is fielded. The Fiscal Year 2017 President's Budget requests an investment of \$66.8 million of APN to continue programs that will ensure the in-service Presidential fleet remains safe and reliable. Ongoing efforts include a Communications Suite Upgrade (Wide Band Line of Sight) that provides persistent access to the strategic communications network, the continuing Structural Enhancement Program necessary to extend the service life, and Obsolescence Management needed to sustain and improve system readiness for both VH-60N and VH-3D platforms. The Cabin Interior and Environmental Control System upgrade is a critical obsolescence management effort for the VH-3D, reducing aircraft operational weight and improving maintainability. Where appropriate, technology updates for legacy platforms will be directly leveraged for the benefit of the VH-92A program.

VH-92A Presidential Helicopter Replacement Aircraft

The Fiscal Year 2017 President's Budget request includes \$338.4 million of RDT&E,N to fund the VH-92 Engineering Manufacturing Development contract and associated government activities. The Sikorsky S-92A aircraft will be used to execute the acquisition strategy of integrating mature subsystems into an air vehicle that is currently in production. Significant progress has been made in the past year, with completion of the System Preliminary Design Review in August, successful completion of the antenna co-site risk reduction ground and flight testing in September, and induction of two S-92A aircraft into the modification process. These will become EDM aircraft (EDM 1 and 2). Critical Design Review is planned for the 4th quarter of fiscal year 2016. Contractor ground and flight testing for airworthiness certification is planned for 2017 and Government ground and flight testing is planned to commence in 2018. The first four of the planned operational inventory of 21 aircraft are planned to achieve IOC in 2020.

FIXED-WING AIRCRAFT

KC-130J

The DON implemented plans to procure two KC-130Js per year starting in fiscal year 2016 and to continue product improvements. Targeted improvements include aircraft survivability through advanced electronic countermeasure modernization and obsolescence upgrades to the Harvest HAWK ISR/Weapon Mission Kit.

Fielded throughout our Active Force, the KC-130J brings increased capability, performance and survivability, with lower operating and sustainment costs for the MAGTF. Forward deployed in support of ongoing operations since 2005, the KC-130J continues to deliver marines, fuel and cargo whenever and wherever needed. In 2016, the KC-130J remains in high demand, providing tactical air-to-air refueling, assault support, CAS and Multi-sensor Imagery Reconnaissance (MIR) capabilities in support of Special Purpose MAGTFs and deployed MEUs.

First deployed in 2010, the roll-on/roll-off Harvest HAWK mission kit for the KC-130J continues to provide extended MIR and CAS capabilities. With almost 7,000 hours flown, 210 Hellfire missiles, 91 Griffin missiles, and six Viper Strike munition combat engagements, this expeditionary mission kit has proven its worth and made the KC-130J even more indispensable for marines on the ground. All six mission kits have been fielded, and funding included in the fiscal year 2017 budget request will be used to maintain operational relevance of this mission system through compatibility with additional Hellfire variants and an improved full motion video data-link.

The Marine Corps has funded 65 of the 79 KC-130J aircraft through the current FYDP. The three aircraft included in the fiscal year 2013 budget would have completed the Active Component (AC) requirement of 51 aircraft. However, in 2014 the Marine Corps began using the AC backup aircraft to accelerate the Reserve Component (RC) transition from the legacy KC-130T aircraft to the more capable and efficient KC-130J. The aircraft requested in the Fiscal Year 2017 President's Budget will continue to increase KC-130J inventory as we strive to achieve Full Operational Capability in the RC. Delays in procurement would force the Marine Corps to sustain the KC-130T aircraft longer than planned at an increased cost.

It is also important to note that the USAF C-130J procurement is anticipated to end in 2025. If the Marine Corps procure KC-130Js at a rate of two per year, we will have approximately six aircraft remaining to procure after fiscal year 2025 in order to reach the POR of 79 aircraft. The loss of USAF aircraft quantities and the uncertainty of additional Foreign Military Sales may result in a significant unit cost increase for these final few aircraft.

MARITIME SUPPORT AIRCRAFT

P-8A Poseidon

The P-8A Poseidon recapitalizes the Maritime Patrol ASW, Anti-Surface Warfare (ASuW) and armed ISR capability currently resident in the P-3C Orion. The P-8A combines the proven reliability of the commercial 737 airframe with avionics that enables integration of modern sensors and robust communications. The P-8A's first operational deployment was completed in June 2014, and continuous 7th Fleet operational deployments are underway. As of December 2015, five Fleet squadrons have completed transition to P-8A and a sixth is underway. All Fleet squadrons are scheduled to complete transition by the end of fiscal year 2019. The P-8A program is meeting all cost, schedule and performance parameters in accordance with the approved Acquisition Program Baseline.

The prime contractor (Boeing Company) has delivered 36 aircraft (LRIP I/II/III/IV) to the Fleet as of December 2015, and four remaining LRIP IV aircraft are scheduled to deliver by May 2016. FRP 1 (16 aircraft) is under contract and will start delivering in May 2016. FRP 2 and 3, which consist of nine Navy and four Royal Australian Air Force (RAAF) aircraft in FRP 2 and sixteen Navy and four RAAF aircraft in FRP 3, awarded in August 2015. The Fiscal Year 2017 President's Budget procures 47 P-8As over the FYDP and sustains the P-3C to P-8A transition. In fiscal year 2017 the warfighting requirement remains 117 aircraft; however, the fiscally constrained inventory objective for 109 aircraft will provide adequate capacity at acceptable levels of risk.

The first upgrade under P-8A Increment 2 added a broad-area, multi-static acoustic ASW capability to the aircraft. This capability, referred to as "MAC (Multi-Static Active Coherent)" significantly increases the P-8A's ASW search rates in harsh littoral environments. The capability is scheduled to receive regular incremental enhancements and upgrades over the next seven years in order to pace the ASW threat. MAC completed Follow-on Operational Test & Evaluation in April 2015 and has been delivered to the Fleet.

The Navy is on track to field additional Increment 2 MAC capabilities to include improvements to the Operator-Machine Interface in 2016. Separately, Increment 2 integration of a High Altitude ASW Weapons Capability continues under a contract awarded in December 2014, in support of a planned 2017 Fleet introduction.

P-3C Orion

The aging P-3 fleet will continue to provide critical ASW, ASuW and ISR support for joint and naval operations worldwide until the Fleet completes transition to P-8A. The fiscal year 2017 budget request provides \$2.8 million in funding required to manage P-3C aircraft mission systems obsolescence during the transition. As of December 2015, 61 P-3 Special Structural Inspection-Kits have been installed (one remaining); 89 Zone 5 modifications completed (last aircraft in work); and 26 Outer Wing Installations completed (last three aircraft in work).

The P-3 aircraft is well beyond the original planned fatigue life of 7,500 hours for critical components, with an average airframe usage of over 18,700 hours. The fiscal year 2017 request of \$1.9 million continues to fund the P-3 Fatigue Life Management Program so the Navy can maintain sufficient capacity to successfully complete the transition to P-8A.

EP-3 Aries Replacement/Sustainment

The EP-3E Aries is the Navy's premier manned Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (ISR&T) platform. The Joint Airborne Signals intelligence (SIGINT) Common Configuration includes Multi-Intelligence sensors, robust communication, and data links employed by the flexible and dependable P-3 air vehicle to ensure effective Maritime ISR&T support across the full Range of Military Operations. The fiscal year 2011 National Defense Authorization Act directed Navy to sustain EP-3E airframe and mission systems relevance to minimize SIGINT capability gaps until the systems are fully recapitalized with a platform or family of platforms that in the aggregate provide equal or better capability and capacity.

Navy ISR family of systems approach shifts focus from platforms to payloads. The future force will rapidly respond to changing threats with modular, scalable, netted

sensors and payloads on a range of sea and shore-based manned and unmanned systems, establishing persistent Maritime ISR when and where it is needed.

Navy's ISR&T transition plan will deliver increased capacity and persistence by the end of the decade. However, due to fiscal and end strength constraints, the Department will accept some risk in near term capability and capacity. The EP-3 fiscal year 2017 budget request of \$22.2 million (baseline and OCO) reduces risk compared to the previous fiscal year and the Navy continues to work with Joint Staff, DOD, and the Fleet to optimize the ISR transition plan. The transition plan remains largely unchanged from fiscal year 2016.

UNMANNED AIRCRAFT SYSTEMS (UAS)

The DON has placed a priority on the development of unmanned systems leading to a fully integrated manned and unmanned fleet. Unmanned technology will not replace our sailors and marines, instead it will unlock their full potential as we integrate this technology with our total force.

MQ-4C Triton UAS

The Fiscal Year 2017 President's Budget enables MQ-4C Triton to continue production with four LRIP aircraft in fiscal year 2016 and two LRIP aircraft in fiscal year 2017.

The Fiscal Year 2017 President's Budget requests \$111.7 million in RDT&E,N to continue Triton development activities, \$181.3 million in RDT&E for Triton modernization, and \$579.2 million of APN for procurement of the second lot of LRIP aircraft and spares; and for procurement of long lead materials for the first lot of FRP aircraft.

Triton will start establishing five globally-distributed, persistent maritime ISR orbits beginning in fiscal year 2018, as part of the Navy's Maritime ISR&T transition plan. MQ-4C Triton test vehicles have completed 57 total flights as of February 2016 and are continuing sensor flight testing this spring. An Operational Assessment was completed in December 2015. This rigorous integrated flight test program will support Milestone C planned for fiscal year 2016. The MQ-4C Triton is a key component of the Navy Maritime Patrol Reconnaissance Force. Its persistent sensor dwell, combined with networked sensors, will enable it to effectively meet ISR requirements in support of the Navy Maritime Strategy.

The Navy currently maintains an inventory of four RG-4A Global Hawk Block 10 UAS, as part of the BAMS Demonstrators, or BAMS-D program. These aircraft have been deployed to CENTCOM's AOR for over seven years. BAMS-D recently achieved over 18,000 flight hours in support of CENTCOM ISR tasking. These assets are adequate to address Navy needs through fiscal year 2018.

MQ-XX

In 2015, the Office of the Secretary of Defense conducted a comprehensive Strategic Portfolio Review (SPR) of DOD ISR programs. The results of the SPR, and a subsequent ISR portfolio review, as reflected in our Fiscal Year 2017 President's Budget, is the restructure of the UCLASS program. This new program, MQ-XX, will deliver the Navy's first carrier-based unmanned aircraft. The MQ-XX program will deliver a high-endurance unmanned aircraft that will replace today's F/A-18E/F aircraft in its role as the aerial tanker for the Navy's CVW, thus preserving the strike fighter's flight hours for its primary missions. MQ-XX will also leverage the inherent range and payload capacity of high endurance unmanned aircraft to provide critically-needed, around the clock, sea-based ISR capability in support of the Carrier Battle Group and the joint forces commander. The Navy envisions that the open standards to be employed in the MQ-XX design will enable future capabilities to be introduced to the aircraft after it has been fully integrated into the CVW. The Fiscal Year 2017 President's Budget requests \$89.0 million in RDT&E,N for MQ-XX developmental activities.

Ongoing Carrier modifications to prepare Mission Control Spaces and integrate UCLASS architecture will be leveraged for MQ-XX, as will the Control System and Connectivity segment and the Common Control System programs currently in development.

MQ-8 Fire Scout

The MQ-8 Fire Scout is a rotary-wing air system that includes two airframe types, the MQ-8B and MQ-8C. The MQ-8C is a larger, more capable and more cost-effective airframe that uses the same ground control station, avionics and payloads as the MQ-8B. The system is designed to operate from any suitably-equipped air-capable ship, carry modular mission payloads, and operate using the Tactical Control System and Line-Of-Sight Tactical Common Data Link. The Fiscal Year

2017 President's Budget requests \$26.5 million of RDT&E,N to continue development of the MQ-8C endurance upgrade, to include integration of ISR payloads and radar, and studies for future payloads such as short range air to surface weapons and mine counter measures. Funding will also be used to continue payload and LCS/FF integration with the MQ-8B and MQ-8C. The request for \$92.9 million in APN procures one MQ-8C air vehicle; MQ-8 system mission control systems; ancillary, trainers and support equipment; technical support; modifications based on engineering changes; and logistics products and support to outfit suitably-equipped air-capable ships and train the associated Aviation Detachments.

The MQ-8B has completed ten operational deployments and flown more than 15,000 operational hours, including: deployments to Afghanistan from May 2011 until August 2013 for more than 5,100 dedicated ISR flight hours in support of U.S. and coalition forces; more than 8,100 hours on Navy Frigates; and 160 hours aboard LCS performing more than 2,000 autonomous ship board take-offs and landings in support of Special Operations Forces and Navy operations. The MQ-8B is deployed today with HSM-35 in a composite aviation detachment with a MH-60R on USS FORTH WORTH (LCS 3), and will deploy with a maritime search radar capability this Fiscal Year. Integration with the Coastal Battlefield Reconnaissance and Analysis Mine Countermeasures capability is underway.

The MQ-8C Fire Scout has flown more than 765 flight hours conducting developmental testing, and completed 84.2 flight hours during its successful completion of a land based Operational Assessment in the first quarter of Fiscal Year 2016. The Navy is executing efforts for integration of a radar capability into the MQ-8C, and is planning to integrate the APKWS II and Mine Countermeasures payloads. The Fire Scout program will continue to support integration and testing for LCS-based mission modules.

Tactical Control System (TCS)

The Fiscal Year 2017 President's Budget requests \$8.4 million in RDT&E,N for the MQ-8 System's Tactical Control System (TCS). TCS provides a standards-compliant open architecture with scalable command and control capabilities for the MQ-8 Fire Scout system. In Fiscal Year 2017, TCS will continue transition of the Linux operating system to a technology refreshed mission control system, and enhance the MQ-8 System's Automatic Identification System and sensor track generation integration with ship systems. The Linux operating system conversion overcomes hardware obsolescence issues with the Solaris based control stations and provides lower cost software updates using DOD common application software. In addition, the TCS Linux upgrade will enhance collaboration with the Navy's future UAS Common Control System.

RQ-21A Blackjack

The Fiscal Year 2017 President's Budget requests \$14.6 million in RDT&E (\$5.1 million USN, \$9.5 million USMC); \$70.0 million in APN for four Navy systems to support Naval Special Warfare; and \$80.2 million in Procurement, Marine Corps for four expeditionary RQ-21A systems (which includes 20 air vehicles) to address Marine Corps ISR capability requirements. This Group 3 UAS will provide persistent ship and land-based ISR support for expeditionary tactical-level maneuver decisions and unit level force defense and force protection missions. Blackjack entered LRIP in 2013, completed Initial Operational Test & Evaluation in the second quarter of Fiscal Year 2015, and reached IOC in January 2016. FRP is planned for the fourth quarter of Fiscal Year 2016.

The RQ-21's current configuration includes full motion video, communications relay package and automatic identification systems. The air vehicle's payload bay allows for rapid deployment of signal intelligence payloads. The Marine Corps is actively pursuing technological developments for the RQ-21A system in an effort to provide the MAGTF and Marine Corps Forces Special Operations Command with significantly improved capabilities. Initiatives include over-the-horizon communication and data relay ability to integrate the system into future networked digital environments; electronic warfare and cyber payloads to increase non-kinetic capabilities; and change detection radar and moving target indicators to assist warfighters in battlespace awareness and force application.

Common Control System (CCS)

The Fiscal Year 2017 President's Budget requests \$36.5 million in RDT&E,N for the Common Control System (CCS). The primary mission of CCS is to provide common control across the Navy's unmanned systems (UxS) portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost con-

trol, and enable rapid integration of UxS capabilities across all domains: Air, Surface, Sub-Surface, and Ground. CCS leverages existing Government owned software to provide UxS Vehicle Management (VM), Mission Management (MM) and Mission Planning (MP) capabilities. CCS uses an open and modular business model and is being developed initially as Government Furnished Information/Equipment for the MQ-XX and for follow-on use with Triton and Fire Scout. In Fiscal year 2017, CCS Increment I will continue to perform software design, development, integration and test for VM. Concurrently, CCS Increment II will conduct MM/MP requirements development and software design.

STRIKE WEAPONS PROGRAMS

Cruise Missile Strategy

The Department's Cruise Missile Strategy has been fully defined with the Fiscal Year 2017 budget submission. Developmental and sustainment efforts of this strategy include; support of Tomahawk Land Attack Block III and TACTOM Block IV through anticipated service lives, integration of modernization and obsolescence upgrades to TACTOM during a mid-life recertification program (which extends the missile service life an additional 15-years), fielding of the LRASM as the OASuW Increment 1 material solution to meet near to mid-term threats, and development of follow on Next Generation Strike Capability (NGSC) weapons to address future threats and targets in time to replace or update legacy weapons while bringing next generation technologies into the Navy's standoff conventional strike capabilities. NGSC includes capabilities for both the air-launched OASuW Increment 2 capabilities to counter long-term anti-surface warfare threats, and a surface and sub-surface-launched NGLAW to initially complement, and then replace, current land attack cruise missile weapon systems.

Tactical Tomahawk (TACTOM) BLK IV Cruise Missile Program

The Fiscal Year 2017 President's Budget requests \$186.9 million in Weapons Procurement, Navy (WPN) for procurement of an additional 100 TACTOM weapons and associated support, \$71.0 million in Other Procurement, Navy (OPN) for the Tomahawk support equipment, and \$71.3 million in RDT&E,N for capability updates of the weapon system. WPN resources will be for the continued procurement of this versatile, combat-proven, deep-strike weapon system in order to meet ship load-outs and combat requirements. OPN resources will address the resolution of Tactical Tomahawk Weapons Control System obsolescence, interoperability, and information assurance mandates. RDT&E,N resources will be used to develop navigation system improvements and communications upgrades to improve TACTOMs performance in Anti-Access/Area Denial environments, as well as development of a seeker to enable TACTOM to engage maritime targets.

Tomahawk provides an attack capability against fixed and mobile targets, and can be launched from both Ships and Submarines. The current variant, TACTOM, preserves Tomahawk's long-range precision-strike capability while significantly increasing responsiveness and flexibility. TACTOM's improvements include in-flight retargeting, the ability to loiter over the battlefield, in-flight missile health and status monitoring, and battle damage indication imagery—providing a digital look-down "snapshot" of the battlefield via a satellite data link. Other Tomahawk improvements include rapid mission planning and execution via Global Positioning System (GPS) onboard the launch platform and improved anti-jam GPS.

Tomahawk Theater Mission Planning Center (TMPC)

The Fiscal Year 2017 President's Budget for TMPC requests \$13.2 million in RDT&E,N and \$40.1 million in OPN. TMPC is the mission planning and strike execution segment of the Tomahawk Weapon System. TMPC develops and distributes strike missions for the Tomahawk Missile; provides for precision targeting, weaponeering, mission and strike planning, execution, coordination, control and reporting. TMPC provides COCOMs and Maritime Component Commanders the capability to plan and/or modify conventional Tomahawk Land-Attack Missile missions. TMPC is a Mission Assurance Category 1 system, vital to operational readiness and mission effectiveness of deployed and contingency forces. RDT&E,N efforts will address National imagery format changes, update Tomahawk navigation and accuracy algorithms—to include operations in the maritime and/or Anti-Access Area Denial environments, upgrade obsolete Tomahawk Cruise Missile Communications and initiate a Tomahawk seeker integration into the TMPC mission planning environment. OPN resources will enable the Navy to continue software engineering effort associated with Tomahawk Missile Modernization, upgrade unsupported and obsolete TMPC software to ensure compliance with DOD cybersecurity mandates, and implement the TMPC Enterprise Network to allow for rapid delivery of security policies,

cybersecurity software patches and anti-virus definitions. All of these upgrades are critical for the support of over 180 TMPC operational sites worldwide, afloat and ashore, to include: Cruise Missile Support Activities (inclusive of STRATCOM), Tomahawk Strike and Mission Planning Cells (5th, 6th, 7th Fleet), Carrier Strike Groups, Surface and Subsurface Firing Units and Labs/Training Classrooms.

Offensive Anti-Surface Warfare (OASuW) Increment 1 (Long Range Anti-Ship Missile (LRASM))

The Fiscal Year 2017 President's Budget request contains \$250.4 million in RDT&E,N and \$29.6 million in WPN for OASuW Increment 1 (LRASM). RDT&E,N funding will support the completion of technology maturation and initiation of the integration and test phase of the program; WPN funding will procure the initial 10 All-Up-Round weapons. OASuW Increment 1 (LRASM) leverages the Defense Advanced Research Projects Agency (DARPA) weapon demonstration effort. This program will provide COCOMs the ability to conduct ASuW operations against high-value surface combatants protected by Integrated Air Defense Systems with long-range Surface-to-Air-Missiles and deny adversaries the sanctuary of maneuver. The OASuW Increment 1 (LRASM) program has nearly completed transition from DARPA to Navy leadership and is scheduled to achieve Early Operational Capability on the Air Force B-1 by the end of Fiscal Year 2018 and Navy F/A-18E/F by the end of Fiscal Year 2019.

Next Generation Strike Capability (NGSC)

To ensure Navy maintains its strike capability in the next decade and beyond, the Department is pursuing an NGSC as part of the overarching Cruise Missile Strategy. NGSC will be a family of more lethal, survivable, and affordable multi-mission standoff weapons employable from multiple platforms. The family of NGSC weapons will be capable of attacking land, maritime, stationary, and mobile targets while supporting two of the Navy's primary mission areas: power projection (land attack from the air/sea/undersea) and sea control against enemy surface action groups and other combatants (ASuW). To the maximum extent possible, the Navy plans to utilize common components and component technologies (e.g. navigation, communications, seeker, guidance and control) to reduce cost, shorten development timelines, and promote interoperability. Based on performance requirements and launch parameters, it is likely the missile airframes and propulsion systems will differ between the air-launched and sea-launched weapons. NGLAW is planned as the follow-on surface/sub-surface launched long-range strike capability to address the 2028 and beyond land attack and maritime threats and gaps. NGLAW is envisioned to complement, and then eventually replace, the Tomahawk Weapon System, which will be operational until the mid-late 2040s. OASuW Increment 2 is planned to address the long-term 'air-launched' anti-surface warfare requirements for employment within advanced anti-access environments. The Fiscal Year 2017 budget requests \$9.9 million for NGLAW and \$2.0 million for OASuW Increment 2.

Sidewinder Air-Intercept Missile (AIM-9X)

The Fiscal Year 2017 President's Budget requests \$56.3 million in RDT&E,N and \$70.9 million in WPN for this joint DON and USAF program. RDT&E,N will be applied toward the Engineering Manufacturing Development phase of critical hardware obsolescence redesign and Developmental Testing of Version 9.4 missile software; both part of the AIM-9X/BLK II System Improvement Program (SIP III). Navy also continues the design and development of Insensitive Munitions improvements in accordance Joint Chiefs of Staff direction. WPN funding is requested to procure a combined 152 All-Up-Rounds and Captive Air Training Missiles and associated missile-related hardware. Fiscal Year 2017 will be the first year the Department procures the Block II+ configuration which delivers survivability enhancements to launch platforms. The AIM-9X Block II/Block II+ Sidewinder is the newest in the Sidewinder family. It is the only short-range infrared air-to-air missile integrated on Navy, Marine Corps, and USAF strike-fighter aircraft and will be integrated on Marine Corps attack helicopters. This fifth-generation weapon incorporates high off-boresight acquisition capability and increased seeker sensitivity through an imaging infrared focal plane array seeker with advanced guidance processing for improved target acquisition; data link capability; and advanced thrust vectoring capability to achieve superior maneuverability and increase the probability of intercept of adversary aircraft.

Advanced Medium-Range Air-to-Air Missile (AMRAAM/AIM-120D)

The Fiscal Year 2017 President's Budget requests \$40.4 million in RDT&E,N for continued software capability enhancements and \$204.7 million in WPN for 163 All-Up-Rounds and associated missile-related hardware. AMRAAM is a joint USAF and

DON weapon that counters existing aircraft and cruise-missile threats. It uses advanced counter-electronic attack capabilities at both high and low altitudes, and can engage targets from both beyond visual range and within visual range. AMRAAM provides an air-to-air first look, first shot, first kill capability, while working within a networked environment in support of the Navy's Theater Air and Missile Defense Mission Area. RDT&E,N will be applied toward software upgrades to counter emerging Electronic Attack threats for AIM-120C/D missiles.

Small Diameter Bomb II (SDB II)

The Fiscal Year 2017 President's Budget requests \$97.6 million in RDT&E,N for continued development of the USAF-led Joint Service SDB II weapon and Joint Miniature Munitions Bomb Rack Unit (JMM BRU) programs. Using multi-mode seeker and two-way data-link capabilities, SDB II provides an adverse weather, day or night standoff capability against mobile, moving, and fixed targets, and enables target prosecution while minimizing collateral damage. SDB II will be integrated into the internal carriage of both DON variants of the Joint Strike Fighter (F-35B/F-35C) and Navy's F/A-18E/F. The JMM BRU (BRU-61A/A) is being developed to meet the operational and environmental integration requirements for internal bay carriage of the SDB II in the F-35B/F-35C, and external carriage on F/A-18E/F. JMM BRU completed Milestone B and entered Engineering Manufacturing Development in August 2015. Both SDB II and JMM BRU will use a Universal Armament Interface architecture to enable more efficient/less costly future weapon/platform integration.

Advanced Anti-Radiation Guided Missile (AARGM) & AARGM Extended Range

The Fiscal Year 2017 President's Budget requests \$4.2 million of RDT&E,N for Block 1 follow-on development and test program, \$43.1 million of RDT&E,N for AARGM Extended Range (AARGM-ER) development, and \$178.2 million of WPN for production of 253 All-Up-Rounds and Captive Training Missiles. The AARGM cooperative program with the Italian Air Force transforms the High-Speed Anti-Radiation Missile (HARM) into an affordable, lethal, and flexible time-sensitive strike weapon system for conducting Destruction of Enemy Air Defense missions. AARGM adds multi-spectral targeting capability and targeting geospecificity to its supersonic fly-out to destroy sophisticated enemy air defenses and expands upon the HARM target set. The program achieved IOC on the F/A-18C/D aircraft in July 2012, with forward deployment to PACOM; integration is complete for AARGM with release of H-8 System Configuration Set for F/A-18E/F and EA-18G aircraft. The AARGM-ER modification program, involving hardware and software improvements, began in Fiscal Year 2016. This effort will increase the weapon system's survivability against complex and emerging threat systems and affords greater stand-off range for the launch platform. AARGM-ER will be designed to fit internally to both F-35A and F-35C, thereby increasing the capability and lethality of the Lightning II weapon system.

Joint Air-to-Ground Missile (JAGM)

The Fiscal Year 2017 President's Budget requests \$17.9 million in RDT&E,N to continue a five year integration effort of JAGM Increment 1 onto the Marine Corps AH-1Z and \$26.2 million in WPN for production of 96 All-Up-Rounds. JAGM is a Department of the Army-led, joint ACAT-1D Major Defense Acquisition Program. JAGM is a direct attack/close-air-support missile program that will utilize advanced seeker technology to provide fire-and-forget, simultaneous target engagement against land and maritime targets. JAGM will replace the HELLFIRE and TOW II missile systems for the DON. In November 2012, the Joint Chiefs of Staff authorized the JAGM incremental requirements and revalidated the DON's AH-1Z Cobra aircraft as a threshold platform. JAGM Increment 1 achieved Milestone B approval in Fiscal Year 2015, a Milestone C (LRIP) is planned for the Fiscal Year 2017 and AH-1Z Cobra/JAGM IOC is planned for Fiscal Year 2019.

Advanced Precision Kill Weapon System II (APKWS II)

The Fiscal Year 2017 President's Budget requests \$36.7 million in Procurement of Ammunition, Navy and Marine Corps (PANMC) for procurement of 1,060 APKWS II Precision Guidance Kits. APKWS II provides an unprecedented precision guidance capability to DON unguided rocket inventories, improving accuracy and minimizing collateral damage. Program production continues on schedule, meeting the needs of our warfighters in today's theaters of operations. Marine Corps AH-1W and UH-1Y achieved IOC in March 2012 and the Marine Corps AH-1Z platform was certified to fire APKWS II in June 2015. These platforms have expended more than 190 APKWS II weapons in combat thus far. The Navy successfully integrated APKWS II on the MH-60S for an Early Operational Capability in March 2014 and

fielded a similar effort on the MH-60R in March 2015. A variant of APKWS II has been integrated onto the AV-8B and F-16 aircraft, and has been fielded in support of Operation INHERENT RESOLVE.

Direct Attack Weapons and General Purpose Bombs

The Fiscal Year 2017 President's Budget requests \$91.7 million in PANMC and \$40.4 million in OCO for Direct Attack Weapons and General Purpose bombs to include the Joint Direct Attack Munition (JDAM). In eighteen months of OPERATION INHERENT RESOLVE, DON aircraft have expended more than three times the number of 500lb JDAM kits than we have procured during the same period. This significant warfighter demand has forced the Navy to reduce the number of 500lb JDAM available for training in order to preserve warfighting inventory. The OCO request for Fiscal Year 2017 replaces the ordnance expended in the first six months of 2015. While OCO replenishment is helpful, it does not overcome the remainder of the year's expenditures which will continue to exacerbate the current inventory shortfall. Fully funding the General Purpose Bomb line item is critical to sustaining the DON's inventory for ongoing combat operations and replenishing it for future contingencies.

CONCLUSION

The Department of the Navy continues to instill affordability, strive for stability, and maintain capacity to advance capabilities and meet mission requirements. We remain an agile strike and amphibious power projection force in readiness, and such agility requires that the aviation arm of our naval strike and expeditionary forces remain strong. Mr. Chairman, and distinguished committee members, we request your continued support for the Department's Fiscal Year 2017 budget request for our Naval Aviation programs.

Senator WICKER. Thank you very much, sir.
Lieutenant General Davis?

General DAVIS. Sir, I have got no statement.

Senator WICKER. Admiral Manazir.

Admiral MANAZIR. The same with me, sir. I stick by Admiral Grosklags' statement. Thank you, sir.

Senator WICKER. Very good.

Let us just make sure, Admiral Manazir, that I am pronouncing your name correct.

Admiral MANAZIR. Sir, perfectly. Thank you very much.

Senator WICKER. Thank you very, very much. We are having a little debate back here.

Well, let us see. General Davis, let us talk about aviation readiness, spare parts, things like that. Aviation readiness is said to be in a crisis. How did we get there? What are you doing to improve readiness? What are the biggest challenges to overcome?

General DAVIS. I thank you for the question, Senator.

The Marine Corps is the Nation's force in readiness. The aviation component is a big part of how we fight and how we project power. The Marine Corps is designed as a relatively small force, but a high state of readiness.

I will tell you that we are getting our forces out the door for our scheduled deployments that we call T2.0 readiness. It is the bench. It is the next-to-deploy guys and units that do not have the airplanes they need to fly those airplanes.

Just a case in point, if you look at F-18's in the Marine Corps, I have got 12 gun squadrons of F-18's and trained squadrons. Design for the Marine Corps F-18 squadron is 12 flying squadrons and 30 training airplanes. It should be about 174 airplanes. 18 months ago, because we did not have the inventory, we were worried that the bench was not going to be able to train. We degraded the F-18 squadrons to 10-plane squadrons from 12. That will be

156 airplanes we need to go run state operations on a degraded front.

I pulled up our readiness data just yesterday. We had 87 aircraft that are mission-capable in the F-18's. Out of those 87 airplanes, I put 30 airplanes in the training squadron and 40 airplanes forward deployed. There is not a lot left for the units to train with during the day, and that leads to low flight time and short training progression. More importantly, that bench that is on a schedule to deploy is not as ready as it should be. We get them airplanes at the very last bit right before they deploy, and then they work up to readiness. But the bench is not ready to go.

How did we get here? There are multiple ways we got here, sir. I would say 15 years of solid service and heavy fighting. We have got a very high op tempo. Before 9/11, we were 1-to-3 deployment-to-dwell ratio in the Marine Corps. Now we are operating on 1-to-2. The numbers of aircraft have reduced as well.

The aircraft, while they were overseas, have been over-utilized. We have flown them a lot, a lot more than they were originally designed to fly. While we had them overseas, we kept some airplanes overseas maybe longer than we should have. We reset them in theater. We rolled new units in on top of those airplanes vice bringing them home because we needed those airplanes over there.

At the same time, our overseas contingency operations funding was decreasing and our O&M [operations and maintenance] budgets were decreasing as well. From 2011 to 2013, the numbers of airplanes I had on the bench reduced by 35, and from 2013 to 2015, reduced by a further 76. For a small force, it is dwindling the number of airplanes we have to make our readiness goals, and that is what is impacting us in the Marine Corps.

What are we doing about it? That is the problem, sir. Not enough inventory, not enough airplanes up on the flight line to go train. We are fixing—basically we attacked that problem. We are trying to fix our readiness. Ran a couple of independent readiness reviews starting 18 months ago, and with your help, we are funding those readiness recovery efforts. Harrier was the first one. We are actually tracking back about 75 percent of the actions have completed that you have helped us fund is bringing Harrier back to full life.

We saw CH-53 echo. I know of concern to everybody here. A very low rate. It is probably the worst readiness in the Marine Corps with a heavy lift helicopter. With your help, we did a full reset for the first aircraft. Got there. That is complete and flying. We are going to do that with another 140 airplanes, about 48 per year. It takes about 100 days to do that, but a major effort to bring CH-53 numbers back to full readiness.

Then outside of that, sir, what we are doing to do the range recovery for the legacy platforms is the new procurement. These are old airplanes. We have got an F-18 on the line that flew in the Libya strike. Our oldest F-18 was purchased on the 9th of March 1985. It is 31 years old. If we ran that airplane all the way in, it would be 45 years old by the time we retired it.

There is a recapitalization effort out there that is imperative, and the F-35 is the key for us on the TACAIR [tactical air support] side. Both F-18's and Harriers and EA-6B Prowlers will go to the F-35, and we are very excited about that.

I want to say thank you to your committee for the support, making sure we got the range recovery money we have got, but we got a big hole to dig out of. As you know, I am concerned about that, sir.

Senator WICKER. Well, thank you very much.

I think we are just going to stick to our 5-minute rounds.

Before I recognize Senator Hirono, I would simply observe that I think it is actually very positive that she and I have expressed concerns about the same things not only today but in our previous hearings, that we are very much into the idea of lessons learned from experts at the other end of this table and doing what we can to make sure that we are fully ready while we are trying to modernize. I want to congratulate my ranking member for being such a great teammate and recognize her for 5 minutes.

Senator HIRONO. Thank you very much. Does that mean I can get everything I want?

[Laughter.]

Senator HIRONO. Thank you very much.

I want to talk about the C-40's which is on your unfunded priority list. This is for General Davis and Admiral Manazir. I understand that the Navy has a requirement for 17 C-40's, and the Marine Corps needs two C-40's. Each service is two aircraft short of that objective. The Chief of Naval Operations unfunded priority list includes buying two C-40 aircraft, and the Marine Corps Commandant's unfunded priority list includes buying two C-40 aircraft.

Could each of you describe how you use the C-40 aircraft and what having them contributes to supporting your forces, especially in the Asia-Pacific AOR?

Admiral MANAZIR. Ma'am, thanks for the question.

The C-40 is a derivative of the 737, as you know, a very, very capable airplane. We have 14 delivered already of the 17 aircraft requirement and an additional one is coming, a total of 15. That is why the request for two.

The Navy C-40 provides what is called Navy unique fleet airlift, and those numbers of C-40's are tied to the major contingency operation plan, particularly in the Pacific. We move great amounts of cargo and gear with the C-40 and move that in between the areas and those long distances of the Pacific to be able for us to operate.

During non-wartime, they are used to move logistics around. A good vignette is when we change crews out on our SSBN [ballistic missile submarine] force or our LCS [Littoral Combat Ship], we can take an entire crew and all their gear on the C-40 and move them out, and it is very efficient.

The C-40 is the only airplane that you can simultaneously carry HAZMAT, hazardous material, and passengers inside the same fuselage. That allows us to have only one airplane for the full complement.

The Navy has already replaced the aging C-9 aircraft with C-40's, and we look to replace the C-20G's that are getting old. The C-40 is less than half the cost per hour of the C-20G and can carry eight times more cargo, hence the request for the C-40 to fill out the wartime requirement.

General DAVIS. Ma'am, we use the aircraft the same way.

Right now, we have no C-40's. We have two C-9's. I think we are the only Military Service that operates the C-9. Right now, that airplane's cost per flight hour is skyrocketing. It is almost prohibitively expensive to operate it. One of my Intrepid aviators landed one pretty hard, and it is going to cost me a lot more to fix that airplane than it would be to replace it with something else.

Bottom line, we use the C-40 for logistics sustainment throughout the United States and throughout overseas, and also in times of war, for moving logistics.

The other airplane we have is a C-130, and those will be tankers, to include gunships out there with the Harvest Hawk model. Those are in high demand. One of our highest op tempo aircraft is the C-130J right now. The C-40's reduce the burden on moving logistics around inside the continental United States and gets out of a very old airplane, the C-9.

Senator HIRONO. Speaking of aging C-20's, we have two of them at Kaneohe Bay. They are already beyond their expected life expectancy of 20,000 flight hours. I am wondering what the Navy plans to do with the need that is going to arise at Kaneohe Bay. Our reservists fly these planes, and I am wondering whether if we provide the funding for the C-40's to you, that maybe they could be part of the replacement for the C-20's at Kaneohe Bay.

Admiral MANAZIR. Yes, ma'am. That is exactly the objective. We are operating under a flight extension for the C-20G right now. It is being maintained. As discussed, it has a very, very high cost per hour. We are paying a premium to do that. If these C-40's are delivered to the United States Navy, we would place them in Hawaii to replace the C-20G's. That is exactly where they will go.

Senator HIRONO. That is music to my ears.

I will have a second round of questions, but for now, I will stop with that. Thank you.

Senator WICKER. Senator Rounds?

Senator ROUNDS. Thank you, Mr. Chairman.

Gentlemen, thank you for your service.

The recent Fox News story on the U.S. Marine Corps' aviation readiness was very disturbing, and I note also I would suspect that some of the same challenges are found not just in the Marine Corps but also in the Navy. Let me just read a couple of items out of this just to highlight what the concerns are here, and then I would like if you could both respond to this in terms of what the challenges are that you are finding.

This was published on April 17th of this year. It was identified as Budget Cuts Leaving Marine Corps Aircraft Grounded. Out of 276 F/A-18 Hornet strike fighters in the Marine Corps inventory, only about 30 percent are ready to fly. Similarly, only 42 out of 147 heavy lift CH-53 Super Stallion helicopters are airworthy.

It goes on to say that in one case to get a Hornet flying again, marines stripped a landing gear door off of a mothballed museum jet. The door was found on the flight deck of the World War II era USS Yorktown, was manufactured over a decade ago. I suspect that is one of the reasons why you need a C-40 is to get that where it has got to go.

Maintaining the high performance of Hornets challenge it with over 30,000 fewer marines now than what we had before.

Sometimes it takes marines 18 months to get parts for early model F/A-18 jets, whose production was halted in 2001.

I noticed also that there was a note on here that the average flight time per pilot—and I think this is very disturbing. In the last 30 days, our average flight time per pilot was just over 4 hours, according to one of the individuals quoted. Compare that with what the Chinese and Russian pilots are doing right now. We are falling behind. But not only that, you are finding that your aviators are also—they want to fly. If they cannot fly when they are not being deployed, they are going to go someplace else and get the flying in even if it means leaving and going to the airlines, which is what I suspect you are probably having some problems with.

As I looked this over, I would suspect that we are going to hear from both of you the same thing.

I think the chairman hit it on the head when he indicated earlier, and what are we going to do about. I think we also have to point to the fact that you did not do it, but Congress did and that is, that in 2010, U.S. military spending was \$691 billion. In 2015, it was \$560 billion, \$131 billion less. I know that you are not here to tell us that. We should know that already, but gentlemen, if I could, would you please expand? To either one of you two, to begin and perhaps you would like to confirm or add to what this particular message is sending to us.

General DAVIS. I think it kind of dovetails with what Admiral Manazir said about the strike fighter shortfall in the Department of the Navy, the Buford, Miramar, and Japan for the Marine Corps in our forward-deployed locations.

We do have about 276 F-18's assigned, and our requirement on the flight line, like I said earlier, sir, is 174. That is what we should have to have the full-up fighting Marine Corps that you are supposed to have. About 100 of those airplanes, which are pipe and attrition airplanes. I am more focused on—I talked to Paul about those, how they are working through the rework. But the issue is we do not have the ones we are supposed to have on the flight line.

That young—I think it was a squadron commander talking about 4 hours a month. I track that very closely and I do have some units out there, because they do not have the number of airplanes they are supposed to have, that they are somewhere, 4 to 5 to 6 hours a month in some of those type model series that have a depleted bench right now. We are getting squadrons going out the door—their airplanes—and getting them trained at the very last minute, but the bench does not have what they need.

There is frustration out there on the part of the young guys and gals that joined the Marine Corps. They joined the Marine Corps to fly and fight. They joined the Marine Corps to be marines. I will tell you we have got the very best young enlisted marines and officers out there, phenomenal talents, phenomenal human capital. They work themselves to the bone to try to get the airplanes up and make their operational commitments to make as much training as they can. But it is getting harder and harder as they do that, especially for those next-to-deploy forces. That is where the risk is for the United States Marine Corps.

The key for the fewer marines is maintaining the best quality of marines and giving our marines the best training and education we can. We are working on that, sir.

I would have to come back to you and talk about components that take 18 months to find. We do occasionally look for parts on older airplanes to scavenge a part out there. In this case here, we actually made that part—we found it was not scavengeable. We made it with a 3-D printer. Some of the airplanes are down not because they are stuck in depot, but because they do not have the spare parts they need to go fly. It is not as much of a problem in an F-18 as it is in, say, CH-53 and in some cases the V-22 airplanes we have overflowed our supply support and in 15 years of hard fighting. It is a complicated problem, but the three of us are working very hard to solve that problem with the resources we have available to us.

Admiral MANAZIR. Sir, have to echo what General Davis said about the readiness challenges. They are similar in the United States Navy. Each type model series has specific challenges. You referenced the F-18A-D, which we fly with the Marine Corps, and the CH-53, which we fly an MH-53. You go into each type model series and you see different challenges.

From the strike fighter perspective, it is evident that we were running hard. The United States Navy in the 15 years of war that we have been in—we have had 8- to 10-month cruises, sometimes 11-month cruises. We came back in 2013 from those cruises, and sequestration hit us. We got behind on—in a hole on repairing those airplanes.

We are getting out of that hole now. I will talk more about strike fighter inventory management later on. But the path from—

Senator WICKER. Why do not go ahead and do that?

Admiral MANAZIR. All right, sir. Thank you.

What the Congress has given us in money between President's Budget 2016 and President's Budget 2017 actually decreases the shortfall now to below that manageable number of 65. I know we will reach that unmanageable number of 65 until 2024 now. It has pushed it to the right.

That increase is a combination of three levers. We briefed this last year to this committee. These witnesses briefed to this committee three things.

One was to improve the depot throughput down in our fleet readiness squadrons, and that has improved over fiscal year 2015 by 44 percent. It takes a long time to dig out of this. We are not going to get out until the end of fiscal year 2018, which is what we have been briefing. But the depot is coming back up on step.

The second lever is to get our service life extension program for the F-18 Super Hornet in good shape as we approach the 2020s. Right now, we have funded the assessment to do that, and we have a good idea that that airplane, through engineering analysis with Boeing, is going to do better than the F-18A and C did. We have confidence that we can limit the shortfall through the 2020s.

Then the third lever is buying F-18's and F-35C's. Congress was very good to us in PB-17. We bought F-35C's in the base budget. We bought a couple of F-18's. Those new procurements, coupled with the mitigation strategies we have in the Super Hornet, cou-

pled with the improvement in the depot throughput, has taken our projected shortfall now with the assumptions we have and moved it up to within the manageable level in the rest of this decade.

That still does not exacerbate the current flight line challenges that we have in both the United States Navy and United States Marine Corps. That is literally getting those airplanes, mostly the A's to D's, out of the depot. The Marine Corps is more exposed on legacy Hornets than the Navy is. That is why the Marine Corps has deeper problem with the F-18C's than we do. We have less squadrons. We have more Super Hornets than we do legacy. When we get those airplanes out of the depot, then we will be able to improve that readiness.

There is a good news story, by the way, to that museum piece. Sometimes some of those parts literally exist on airplanes that we have on sticks somewhere. But as General Davis mentioned, we found a 3-D printer capability to be able to go manufacture a part that, because of obsolescence, is not manufactured anymore. A lot of the parts for the older lot Hornets—the companies went out of business because there is no business for them. The good news part of that is the troops went out and found a way to manufacture the part.

Sir, to the other point that you made, the morale on a Navy ship and a Navy flight line is very good right now. If you go out to one of the carriers, the USS Dwight D. Eisenhower is right now conducting the COMPTUEX [Composite Training Unit Exercise] exercise off the coast of Florida, and they are operating hard. We fund that advanced training and our deployers to the maximum level of readiness. We are able to tier our readiness, right readiness, right cost at the right time. Those deployers are operating with the resources we need to.

Regrettably, if you go to a squadron way down in the training phase, you are going to see pilots that are not flying very much. Right now, for the United States Navy, the minimum number of hours a pilot can fly per month is 11. We call that the tactical hard deck. Studies have been done by the safety center that says if pilots fly less than 11 on a regular basis, the chance of mishap will go higher. Down on either side, the lower levels of training, we do not have enough resources to keep those flying at the right level. The Marine Corps generates their readiness at a top level all the time as the force in readiness, the 9/11 force. That is why he has to stay highest, and the United States Navy can tier our readiness down so that 65 is a manageable number because we put the right airplanes in the right place at the right time.

We see the same challenges, and we are very concerned. That is why I have to underline what Admiral Grosklags said about stable funding in all of the readiness lines. We cannot come off of that. We have to keep that going so that our recovery plan, which right now is very fragile, has got to continue.

Senator ROUNDS. Thank you, Mr. Chairman.

Senator WICKER. Thank you, Senator Rounds.

Let me just say with regard to the news stories that you mentioned in recent days, I read them and listened to them with interest. I hope there is no one listening or watching that is upset that that somehow got out and was told to our public. I think it actually

is helpful for the American public to hear the truth. I celebrate a system where there is an open press that is willing to go and dig and find out some information and ask the right questions and get the public informed. I for one salute whoever worked with the press and answered their questions in an unclassified manner to get the public informed.

Senator Shaheen?

Senator SHAHEEN. Thank you, Senator Wicker. I share your view that transparency is important for the public, especially when we are talking about such critical security issues for the country.

Thank you all very much for your service and for being here today.

Admiral Manazir, I want to pursue a little bit more of the conversation that you and Senator Rounds were engaged in because what is the long-term impact of our continued inability to provide more training hours, and what does that do long-term to the readiness of those pilots, to our capabilities to defend this country, and do what we need to do around the world?

Admiral MANAZIR. Ma'am, we have a system of training in both the Navy and the Marine Corps that relies on what we call a training and readiness matrix. The matrix has a number of missions in there that a strike fighter pilot, any pilot of our airplanes in the Navy and the Marine Corps, has to fly to maintain the currency and the proficiency to conduct any mission we send that person out to do.

The training and readiness matrix is actually graded in a 4.0 scale, and we call them C1, C2, C3, or C4. For instance, an F-18 training and readiness matrix—the full set of missions flown per month might encompass about 25 to 27 flight hours for one pilot per month. Those flight hours are indexed against specific missions.

When we send our pilots, our squadrons out on deployment, they are resourced and flown to a C2 readiness level. That is full 80 percent proficiency an currency for the missions that they are supposed to be trained in. On an exercise like the Dwight D. Eisenhower is conducting right now, there is oversight and certification processes that make sure that our squadrons are able to perform at that level.

In the United States Navy, if squadrons are not performing that that 80 percent level, they will not be sent on deployment. We resource the deployers to do that so the people in deployment on Truman right now are at a C2 readiness level are able to execute any mission we call on whether it is against ISIS [the Islamic State of Iraq and Syria] or China or Russia, air-to-air, air-to-surface, or anti-submarine warfare, full capability complement on our aircraft carriers, carrier strike groups, and from the shore.

The lower tiered squadrons that are waiting to go to advanced training and deploy are not as ready. They would be down around the C4 level. When you get that squadron ready to go, you have to work them up to the C2 level. The impact of the lower readiness down here is actually fiscal, and it requires us to spend a lot more money to bring that pilot back up in proficiency.

But I will guarantee to you, as the CNO has directed and our fleet commander, Admiral Davidson and Admiral Swift, we will not

send a unit on deployment without being fully tasked. It is actually a fiscal challenge and we need money to do that.

General DAVIS. Ma'am, if I could, could I add a little bit to that? Senator SHAHEEN. Please.

General DAVIS. Some of the same challenges, a little bit different since we do not do a tiered marines construct. We really need to be ready all the time as a force in readiness as mandated by Congress. We do not have the inventory to do that with the bench squadrons. We get our units ready to go right at the last minute and get them out the door trained to a T2.0 readiness, which is a C2 or better.

I will tell you the morale and the folks that are trained and overseas doing great work for us right now makes everybody proud. They are doing phenomenal work.

But I worry about the ones that are getting ready to deploy. With the dep-to-dwell of 1-to-2, that means you are home for a year and you are gone for 6 months. That year, if you do not have the airplanes to train and you are on the tape to deploy, what is going to happen is you are not going to have the qualifications and experience you need to get out the door trained like you need to be.

I worry about—not right now, but I also worry about the years to come where these young pilots do not get the experience and they do not get the qualifications they need. They come in. Now they are the supervisors, the trainers, and they do not have the experience that I had as a junior officer. I think that is a critical delta for us right now that we need to be very concerned about and work on. The only way to do that is to basically get new metal on the line, new flying machines for these marines to fly and fight with.

Admiral Manazir talked about improving depot throughput. That helps in F-18, but for me I am flying F-18's, Harriers, and F-35's. I worry very much about spare parts accounts in Harriers and F-35's. That is the critical delta. We got these brand new, great airplanes, but sometimes we do not have the parts we need to get full readiness and marines will find parts, but they will find them in another airplane and cannibalize. We do not want them doing that.

Then bottom line is taking best care of the airplanes we do have. You should expect us to get every airplane that we got in the depot or do not have a spare part on in the air and fighting and flying as quickly as we can. But is very difficult to do that right now.

Admiral MANAZIR. Senator, there is a deeper, larger challenge to this that is implicit in your question. The CNO and the Commandant have both testified that we can resource the fighting force. What is lacking is the surge behind it. The United States Navy will not recover the surge force behind it until about 2020.

Senator SHAHEEN. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Let me ask both of our admirals about the next generation jammer. I will start with you, Admiral Manazir. The Navy is currently developing an advanced electronic warfare system, the NGJ [Next Generation Jammer], currently planned to be carried only by the EA-18G Growler. How does the Navy envision operating these jammers? Is the currently planned number of

Growlers sufficient to effectively employ the next generation jammer?

Admiral MANAZIR. Senator, the United States Navy has procured 160 EA-18G Growlers. We feel that sources the Navy requirement for airborne electronic attack. When the Marine Corps retires the EA-6B in 2019, the Growler will be the only DOD airborne electronic attack platform that will be flying. We are still conducting the study that determines whether the number of Growlers is sufficient to cover all of the missions across the joint force.

The next generation jammer will be flown on the EA-18G Growler, just like the current ALQ-99 podded system, which has been flying now for about 40 years, is being flown on the 18G.

The reason we are purchasing the next generation jammer, which its first increment will initial operational capability around 2021, is that the threat is getting more and more advanced. That threat is in the electromagnetic spectrum. The next war is going to be fought in the electromagnetic spectrum. Ability to use RF energy by us to assure our systems and to deny the use of enemy systems is going to be the predominant measure by which we will succeed.

The next generation jammer podded system is designed to go after those advanced threats, and it is designed to continue to track and outmatch the threat as we go forward. We have evolved from a system of just barrage type of electromagnetic energy that just would saturate a system now to very, very smart digital systems that we can put in the next generation jammer to fight against any of the high-end threats that are out there.

We are currently purchasing enough next generation jammers to source the number of Growlers that we have. We tightly couple the number of next generation pods that we buy with the number of Growlers that we buy. Right now, it is sufficient to address the threat that we know. But we continue to do the study on the joint missions.

Senator WICKER. When do you think you are going to have the results of the study as to the appropriate number?

Admiral MANAZIR. Sir, there are two things in play with the Office of the Secretary of Defense. The first one is a study, along with the Joint Staff, on specifically the Growler. The second is overall in the Department of Defense an examination of airborne electronic attack. There are different ways to do it. We continue to talk to OSD and the Joint Staff about how much information we need to determine how many Growlers that we need to go forward. We are still in discussions about that, sir. I would say in the next year, in the next portion of a year that we would have enough information to be able to go forward with a definable number as to whether 160 is enough.

Senator WICKER. Admiral Grosklags, let us talk about acquisition process. The NGJ has been designated the first program in the Skunk Works pilot program that seeks to streamline the process. Can you describe the elements of this pilot program and how the NGJ will benefit?

Admiral GROSKLAGS. Certainly, sir. When we sat down and finally made the decision that NGJ was going to be the pilot project, the first thing we did was sit down between the Navy secretariat's

staff and AT&L [Acquisition, Technology, and Logistics] staff and identified a very limited core group of individuals who are going to have oversight over that program and the ability to participate in decision meetings.

Typically what we see with a major defense acquisition program is it is kind of all-comers get together around the soccer ball and get their input into the decision process. What we identified was a very select group of individuals starting with Secretary Kendall who have all the right skill sets, all the right knowledge, all the right subject-matter expertise in order to make the right decisions for that program, but it is a very select group of individuals.

That very narrow focused group enables the program manager to not have to deal with repetitive briefing cycles to work his way through a myriad of staff reviews for every decision that he or she has to get. As an example, they just had their milestone B decision about a month ago. They moved into the engineering, manufacturing, and development phase, a big step for the program. Instead of going through literally months of staff work and briefings for that milestone decision, what they ended up doing was a single-day meeting with that small core group of individuals representing OSD [the Office of the Secretary of Defense] folks, representing the Navy staff, representing the Navy secretariat. They went to the contractor facility. They had a 1-day meeting. The program manager led that discussion. He did not have to do pre-briefs. At the end of that day, he got a decision. That is the way we need to operate all of our programs, and we need to make this pilot program the standard vice the exception.

On the Navy side, what we are trying to do with the MQ-XX program is to take that a step farther and take that streamlining not only from the acquisition oversight perspective but also drilling it down into the engineering requirements and the test and evaluation requirements and streamlining those activities as well so that we can truly get new capabilities out to the fleet in a much quicker fashion. It is still getting them the capability they need but getting it to them in a timely manner.

We think the Skunk Works is a great initiative. We need to do more of it.

Senator WICKER. Any resistance, naysayers?

Admiral GROSCLAGS. The only naysayers that I saw were people that potentially had their feelings hurt because they were not included as principal members in that core group of decision-makers.

Senator WICKER. Senator Blumenthal?

Senator BLUMENTHAL. Thanks, Mr. Chairman. Thank you for having this hearing—to you and the ranking member.

Thank you, gentlemen, for your extraordinary service to our Nation.

I have a few questions about the F-35B and F-35C. I note from your joint testimony that you feel that basically things are going pretty well. The F-35 program, to quote you, is executing relatively well. Some problems in software and in cost, problems meaning continuing challenges that are surmountable.

I wonder if you could tell me how the software aspect of the aircraft is going at this point. I know there have been some issues along the way.

Admiral GROSSEKLAGS. Sir, I will start with that.

First of all, the Marine Corps is flying the 2B software, and they have one additional release for the 2B coming that gives them some additional capabilities. They also, as the General just noted, have some 3I aircraft, and that is what is coming off the production line today.

One of the challenges that we are seeing with the 3I is a software stability concern. That software stability has primarily to do with the radar system onboard the aircraft, but as things are very intertwined on this platform, it affects the overall system. We were seeing system resets, system anomalies much more often than we could accept.

General Bogdan, the program executive, took a step back. He chartered a red team to take a deep dive at some of these issues because he wanted to make sure that we nailed down the problems on 3I and not wait till 3F, which is the final fleet release for the Navy and for all the services once we get through operational test.

We believe, based on information and testing that has just been completed very recently and is continuing through the end of the month, that the majority of those software stability issues have been resolved. We still have a few flights to verify that to ourselves, but we seem to be on a good path.

The implication for 3F is now that we took a bit of a pause in the development of 3F. The timeline for 3F to actually get to the fleet has probably been delayed by another couple of months based on making sure we get it right in 3I. We think that was a prudent step on his behalf, General Bogdan's behalf, but we seem to be on a good path at this point.

General DAVIS. Sir—

Senator BLUMENTHAL. Sorry. Go ahead.

General DAVIS. We are flying that software now, 2B, some 3I. What we did not do—I think that was later at the last iteration of the 3I software that we have had stability problems with. We did not load that. We are not having those problems in the Marine Corps right now. We are operating 2B, 3I, and we are not having the radar resets and problems that they have seen with the latest software load. We are tracking, doing very well with that software load, and flying the airplane really well.

Right now, the VMFA-121 is out there in Yuma. They are flying a lot. Is the training squadron 501, and we are going to stand up VMFA-211 here this June. It is tracking very well.

The popularity of the program—we have got a lot of captains and majors and lieutenants that are signing up to fly the airplane. Right now, of all the Marine Corps flying assets that we have out there, the guys who are making their flight hours is the F-35 program. They are tracking. They are getting good training. In fact, the first three students are going through the WTI [Weapons and Tactics Instructors Course] class in Yuma, Arizona right now and bringing that fifth generation capability to the Marine Air Ground Task Force in a big way.

We are not seeing the problems with software right now for what we are doing. We are very pleased with what we got and every day learning a little bit more about how to operate this airplane and bring additional capabilities to the fight.

You asked about cost, sir. I think we are actually seeing the total cost going down a little bit, but then they looked at their lifecycle cost going up by 2 percent. That is a bad news story but I think also a good news story. I think they actually said we are going to fly the airplane another couple decades. They rolled in additional time there.

The good news about the F-35—it is an 8,000-hour airplane. I would love to have that with some of my legacy airplanes right now because that is 2,000 hours additional life that I do not have to do a reset or a depot event on. That is a great capability out there. We are very pleased with what we are seeing from the airplane.

Everything costs too much. We would like it be cheaper. I think one of the ways to make it cheaper is to get more of these airplanes and put more on the flight line. The Marines are very happy, not satisfied. We are happy. We always want better and always want more, but this has been a great program for us and a very exciting time.

Senator BLUMENTHAL. That is a great answer to a couple of the next questions that I was going to ask. I want to thank you.

I notice in, again, your joint testimony you talk about the incentives to the manufacturers, all of the contractors for this airplane to reduce their costs to \$85 million a copy. You alluded to the point that I was going to raise. To what extent will the cost come down if we accelerate production? I assume that would be one way of bringing down costs in this program.

Admiral GROSCKLAGS. Yes, Senator. I will touch on that.

Just very quickly, what General Davis alluded to in terms of sustainment costs, in the selected acquisition report that they just submitted this year to the Congress, the sustainment costs on a cost-per-hour basis, the cost per aircraft per hour actually came down anywhere from 2.2 percent for the Air Force to I think 4.2 percent for the Navy and the Marine Corps. The F-35B was in the middle of that.

The total sustainment cost lifecycle went up because primarily the Air Force added 2 years to the lifecycle of the aircraft. That kind of overrode the fact that the actual cost-per-hour is coming down. In my view, that is not a bad news story.

In the same report, what they show is that the procurement costs were reduced by a total of \$7.5 billion over the life of the program. The cost of buying the aircraft.

One of the initiatives that all the services, as well as our partner nations, are looking at to further reduce the cost of the aircraft is the potential for starting a block buy concept where we would request permission from the Congress to procure some of our long lead materials via an economic order quantity, do that in advance of several lots of aircraft. Different from a multiyear in that we are not committing to a certain number of aircraft each year. We would still have an annual appropriation that would guide that decision, but it would allow industry to invest a little bit more upfront and get some of those cost savings.

Eventually we would love to get a multiyear program for the F-35, which we think would really drive costs down. Obviously, we have to get through IOT&E [Initial Operational Test and Evaluation] and a full-rate production decision before we can do that.

Senator BLUMENTHAL. Well, I would encourage you to think along those lines. I am speaking only for myself. But multiyear production and contracting, obviously, are a way to bring down costs, and this aircraft is our future. It is transformational. It is going to be, as General Davis remarked, for decades to come what maintains and secures our air superiority around the world. The quicker—I do not want to use the word “cheaper” but less expensively, more cost-effectively we can produce it, the better.

Thank you very much. Your testimony has been very instructive and valuable. Thank you.

Senator WICKER. Thank you, Senator Blumenthal.

Senator Sullivan?

Senator SULLIVAN. Thank you, Mr. Chairman.

Gentlemen, thank you for being here.

I apologize for not being here at the beginning, and I fear I am going to tread a little ground that you have already covered about readiness.

You know, there was a Fox News article—I am sure you saw it, General Davis, recently. To be honest, I think in the eyes of Americans, the terms “low readiness” and “the United States Marine Corps” is kind of an oxymoron. It is not normally what we equate when we think about the Marines. Actually “high readiness” is usually the description I think that most people would equate with the Marine Corps.

I know you have already talked about it, but if we have not asked the question, is there anything we can do?

I know the Commandant talked about this in his confirmation hearing, but I mean, how did this come about? You have talked about how it came about, but was this kind of a gradual thing that the Marine Corps has been talking about for years, or was this something kind of a little bit more abrupt? Becoming a low readiness designation is a pretty significant thing. I know I am not being very articulate here, but did it come about very quickly or slowly? I am just trying to think through how to make sure it does not happen again.

General DAVIS. Sir, that is for me. That is my job and General Neller’s job to make sure it does not happen again.

I would say it happened over a period of time. I think in many ways, we are making our operational commitments. We are making our deployments to go fight in Afghanistan and Iraq and around the world, but the Marine Corps is designed for the big fight as well, the force in readiness for the low-end fight, the high-end fight. I think while we are making our operational commitments, making our deployments, what was not being done and gradually over time is our inventory was driving down the number of airplanes we had available to train to get our bench trained that General Dunford talked, General Neller talked about it. The number of airplanes out there to train the bench was not there and was decreasing in numbers to the point now where it is—you know, marines will always get the job done. They do not complain. They go out there. If you were down in Buford or forward-deployed anywhere, marines are always getting the job done out there, as the rest of our naval service brothers and sisters.

But the number of resources over time was getting lower and lower and lower. Our dep-to-dwell went from 1-to-3 because of reduced inventory and also increased tasking to 1-to-2. Lower inventory, high dep tempo. You know, you got a 1-to-2 dep-to-dwell, and you got that period to train out there and you do not have the assets to do it. I think it happened over a period of time. I testified to it last year because we have been talking about this.

But I think we have been involved now in this range recovery model and we also know how to fix some of this. With your help, we have been doing that funding. Making sure the funding stays whole is the biggest thing that you can do to help us, making sure that the President's Budget gets executed and also, too, that we keep our recapitalization projects on track. There is only a certain amount of life we can get out of these old airplanes, and we are doing that. We are extracting every ounce of capability out like we should, but we do need to recapitalize. I think those things are the things we need to focus on, sir, and allow us to execute that range recovery model. It did not happen overnight and multiple reasons for it. But we are diligently working our way out of it right now.

Senator SULLIVAN. Well, one of the things—and this is a bit of an advertisement, but one of the things in terms of your getting back to readiness, I certainly would encourage the Marine Corps to take a look at the JPARC [Joint Pacific Alaska Range Complex] training complex up in Alaska, which as you know, the Air Force considers it certainly the best air-to-air and even CAS training in the world. Given that there is going to be a lot of an Asia-Pacific focus, we certainly would welcome the Marines up there. There were some ANGLICO [Air Naval Gunfire Liaison Companies] units up there last year at Red Flag, and I know the Marines have been up there to some degree. But with the F-35's being based, two squadrons, at Eielson in Alaska, having the Marines up there training and fighting against the Air Force would be a healthy competition.

Let me ask one final question. This is more just educational for me. When you talk about the STOVL capabilities of the F-35B and you look at those capabilities, is the B variant unable to do some things, whether it is bomb capacity, whether it is legs in terms of the ability to travel? Obviously, Harriers did not have the capability that, say, F-18's did, but they had the STOVL ability. Did we lose anything in terms of capability with the B variant that the other F-35's have because the B variant has that vertical lift capability?

General DAVIS. To the short takeoff, vertical land capability, sir, we lose a little range, but also we add the basing flexibility. You can go off of every amphibious ship to include the British ships if we so choose, the Queen Elizabeth and Prince of Wales. Anywhere wood floats you can base an F-35B. In conjunction with—I think also, too, as we as a naval force, how we fight that fight better as we fight as a naval force, it will include both F-35B's and F-35C's working in concert from the sea base.

But most of our stuff, about 75 percent of our airplanes, will flow from the sea base ashore. There is a great strategic advantage to being able to base in a 3,000-foot runway. We took the airplanes up to Twentynine Palms, and that squadron operated out of a

1,500 foot of that runway very easily in support of the marines up there at Twentynine Palms. A little bit of tin allows us to basically go anywhere that there is a short bit of strip out there. Actually there is a lot of demand for that kind of capability around the world. The Marine Corps is a light force, a middle-weight force. To us, it makes great sense to have an airplane with that basing agility to put that airplane closer to the guy on the ground. That is what it is all about for us.

Senator SULLIVAN. No munitions capability?

General DAVIS. The airplane will carry more ordnance if we go in the low observable configuration. It carries all the ordnance inside when we get 3F software and the 3F capabilities. More than software, it is also hardware. We get pylons. The airplane will carry 14,000 pounds of ordnance, which is 3,000 pounds more than the F-18 will today. It has got a little better legs than our legacy F-18. Actually it is a great capability.

If you could watch what the young officers are doing operating this airplane up and away, it is a qualitatively different machine. I would love to show you all the stuff they are doing. It is very, very different than anything I have seen before, and it is really exciting.

A few thousand pounds more ordnance than an F-18 can carry, about the same legs, and I can base on a 3,000-foot strip anywhere in the world or an amphibious ship. To me that is a great capability for the Marine Corps. It is kind of what we expect from our Corps.

Senator SULLIVAN. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Senator Kaine?

Senator KAINE. Thank you, Mr. Chair.

Thanks to the witnesses.

The President's Budget, I believe, has a recommendation that we would decommission a carrier wing, and I gather that that is kind of a re-rationalization of some of the aircraft used. But I was hoping that you could just walk us through the logic on that.

Admiral MANAZIR. Senator, as you know, we deploy our carrier air wings with our carriers. As part of the President's budget 2017, I proposed to the CNO that we look at the air wing force structure, and it was based on a couple of things.

The first one is as we look at the threat—and we discussed, China, Russia, North Korea, Iran—and we look at the global force management plan out through 2025—that is, we know what the President and the Secretary of Defense want us to do for deployment from a carrier strike force, and we also understand the load from the proposed operations plans for a major contingency operation, and we apply that out on sort of a map. We looked at the carrier maintenance schedules and the predictability of the nuclear maintenance schedules for our CVNs [aircraft carriers], which keeps them at top condition, and also the predictability of our optimized fleet response plan. It turns out when you lay the predictability of the carrier schedule—and, of course, every carrier that deploys and operates has an air wing on top of it—and you lay the predictability of those turnaround plans and the maintenance out through 2025, the number of operational carriers that you have is

no more than nine at any one time because one is in long-term retro complex overhaul, as you know, sir, and the other one is in a 16-month dry-docking. The maximum number of air wings that you would need over that time is nine.

If the world got a vote and something changed from predictability, there is enough time that is between each of those turnaround periods to extend an air wing and ship team to cover that contingency until they come over. There is some flexibility built in.

Additionally, when we apply the 10 air wing force to our current operational tasking, what has happened over the last couple of years is the number of air wings that have spent too much time in port, not training and not deployed, has gone up. We had an air wing recently that had 83 months—83 months—between deployments. There is not enough work to go around. What started out as a fiscal imperative on my part to the CNO, it turned out the analysis actually supported it, and the CNO called it a good business decision.

That air wing is actually an administrative air wing. The way that we tier our readiness—that is the model 10th air wing. It is not a full air wing. A fully resourced air wing is out and deployed and in advanced training. The airplanes that are populating a portion of the air wing go out to different squadrons and reduce the requirement. The people that are in those air wings would go to different squadrons and reduce the accessions. We are able to use that capacity across the nine air wings.

While it appears as if we are getting rid of force structure, we are actually getting rid of a flagpole that holds that force structure and we are moving the assets out. That is the business case, sir.

Senator KAINE. I think that is a great answer. I figured that there was a really good answer behind that and I am very glad I asked that question.

Let me ask a question. Senator Sullivan was asking about 35B, that variant. I am curious about the 35C. Both the Marines and Navy are using the F-35C, I guess the carrier variant, and you are doing some kind of joint procurement. Talk to me a little bit about how that procurement is going along and the way the Navy and Marines structure the sharing of that procurement.

Admiral MANAZIR. We have shared the transition plan for the F-35C between the Navy and the Marine Corps. Thank you very much for the airplanes. In the President's budget 2017, they start to get at the ramp that we need to IOC the Navy's first squadron in August of 2018, then IOC the Marine Corps' first squadron the year after, and then alternate squadrons such that we will have the right number of squadrons in the mid-2020s to address the high-end threat.

The F-35C, with some risk, as we have talked about, in software and mods is on track to IOC [Initial Operational Capability] in August of 2018, and we will operate that airplane together as we go forward. Right now, our plans are commingled. The number of airplanes—we have to get a ramp of the aircraft such that we are buying 20 F-35C's and 20 F-35B's per year starting in 2020. Right now, the ramp is on track to do that with the President's budget 2017. Thank you very much. We are on track.

Senator KAINE. Please, General Davis.

General DAVIS. Yes, sir. The Marine Corps will operate four squadrons of F-35C's, and when they are not on the carrier, they will be just like we do with our F-18's. If they are not assigned to a carrier, if there is a lull out there, they will be able to go deploy to a unit deployment program. Our unsinkable aircraft carrier out there in Ohakune—we flow about three F-18 squadrons and a Harrier squadron out there right now. We also share with the training squadrons.

Right now, we have already bought—I think we purchased 10 airplanes. I think five or six have delivered and they are down there in the training squadron right now. I think the executive officer of that squadron is a marine major right now. We are all in and, bottom line, ramping up. I think we actually get up a little bit north of 20 with the F-35's.

Again, the key for us is getting the F-35B's. We will have 16 squadrons of F-35B's when we are done, two Reserve and in Active Duty. Getting those airplanes on the line is an imperative for us, replacing the old with the new. I am very excited about that. We will get along just great with the C's and B's out there in the United States Marine Corps. We look forward to working with our Air Force counterparts as well. It is a great capability.

Senator KAINE. Super.

Thanks, Mr. Chair.

Senator WICKER. Senator Tillis, Senator Hirono has been poised four times now for her second round. While you catch your breath, would you mind yielding and allowing her to proceed with her questions?

Senator TILLIS. It would be, indeed, my honor.

Senator HIRONO. That is kind of you. It is always really great when members come to our hearings. I do not want to dissuade anybody of that behavior.

[Laughter.]

Senator HIRONO. Thank you so much for updating us on the F-35 program. Admiral Grosklags, I think that you mentioned that at some point you would want the F-35 program to become a multiyear contract program so that we can lower the cost, which I think is a good thing.

That is why I did bring up the concern that I have about the V-22 multiyear contract. I do not need to go into it right now, but I just wanted to express the concern that we are not meeting the requirements of that particular multiyear contract.

Let me turn to the unmanned carrier aviation program. This is for Admiral Manazir.

Last year, the Navy was pursuing the unmanned carrier-launched airborne surveillance and strike, or UCLASS, program to develop an autonomous aircraft carrier base unmanned combat area vehicle to provide an unmanned intelligence and strike asset to the fleet.

This year, the Navy is pursuing a program called the carrier based aerial refueling system, or CBARS. As I understand it this program is primarily developing a tanker, but it may have surveillance and limited strike capabilities.

I would like to get a better understanding of what the differences are between the two programs. Admiral, could you describe the

CBARS program and how it differs from the older UCLASS program?

Also for General Davis, are there any Marine Corps interests in the new CBARS program?

Let us start with you.

Admiral MANAZIR. Ma'am, I am excited that you were anxious to ask about this program. I will describe it to you.

The United States Navy has been anxious to get an unmanned capability on to our CVNs for quite a while. Back in 2009 actually Admiral Roughead pounded a table in a secure space and said, I want unmanned on a carrier by 2018. That started a series of conversations in the Pentagon about unmanned capability off the aircraft carrier.

The UCLASS program you are familiar with was the subject of a strategic portfolio review by the Office of the Secretary of Defense conducted over the last year. That, coupled with a look at our ISR [intelligence, surveillance, reconnaissance] capabilities in the maritime, resulted in the restructure of the UCLASS program to what we currently call the MQ-XX. CBARS is now gone. UCLASS is gone. We talk about the MQ-XX. We are working with the authorities that do the aircraft designations.

That MQ-XX is going to have two primary missions. The first, as you noted, is in-flight refueling. It will be able to take fuel and also give fuel. We primarily use that as an overhead recovery tanker, organic to the aircraft carrier. Right now, that mission is conducted by F-18E and F Super Hornets. If we offload that mission to an unmanned system, then we can use those six tankers, those configured airplanes. We can reconfigure the tanks and use them for fighters. That will limit the hours on the airplane.

The second mission it will have is ISR. What we expect to do with that airplane is to put non-developmental systems into—key, non-developmental systems. Lower the technology risk by putting non-developmental ISR systems into this air platform, and then send it out and conduct critical maritime domain awareness missions around the carrier strike group. With its long endurance, it will be able to give that maritime domain awareness not only to the striker commander but also to the fleet commander.

The reason that the Secretary of the Navy agreed with the Secretary of Defense and the Chief of Naval Operations on this new mission set is because we can accommodate those two missions on an unmanned system coming off the aircraft carrier more rapidly. You know that we use the X-47B UCAS [Unmanned Combat Air System] system to demonstrate landings and takeoffs and in-flight refueling. We have gotten everything out of that platform that we have needed. Now what we are going to do is show that we can use a platform to do two basic meat and potato missions on the aircraft carrier using the MQ-XX, and that will also provide a platform for us to go forward and do additional, more advanced capabilities in the future.

Senator HIRONO. General Davis, does the Marine Corps have any interest in the MQ-XX program?

General DAVIS. We have tremendous interest, ma'am. But it is a little bit different requirement. We would be going looking for

something to go off an amphibious ship vice a carrier. A little bit different design.

Right now, with our 22nd MEU [Marine Expeditionary Unit], the MQ-21 is a Group 3 UAS [Unmanned Aerial Systems] that is going out with that ship. Right now, it has to be caught on a tether when it comes in to recover. It gets launched and recovers on a tether. It limits the payload that we have on the airplane. It is a great capability for us, but we are looking for a Group 4 and a Group 5 UAS that have long dwell, long duration, manned/unmanned teaming concepts out there, to include—we think the future could be like an airplane with a future vertical lift. It will be a manned, optionally unmanned capability. If it is fly-by wire, we think we should be able to go off with a manned platform or an unmanned platform for multi-mission platforms.

We are borrowing some MQ-8 Charles from the United States Navy for a period of time to kind of grow into kind of taking a larger airplane off an amphibious ship in an unmanned platform out there to go provide ISR and fires as need be. We are pretty excited about that.

We have got a requirements document study that is going on at Quantico to go tell us exactly what they want us to go pursue. But there are several projects out there that give us a long-range, long-duration, multi-mission platform for UAS. We think UAS could deliver people. It could deliver ordnance. It could deliver fires. It could deliver surveillance, all those things. We are looking for a wide aperture for what we can do with these platforms in the future.

Senator HIRONO. Thank you. I just have one clarifying question that I want to ask.

Both of us talked about the strike fighter shortfall. I just need to know—this is probably for Admiral Manazir—what is the Department of the Navy's current estimate of the strike fighter shortfall because we have had different numbers over different years. What is the most recent shortfall number?

Admiral MANAZIR. Ma'am, I am going to caveat the shortfall number. If you manage your inventory, the number is going to be dependent upon several sets of assumptions. You have to categorize those assumptions in supply of the airplanes, the demand of the airplanes, the utilization rate of those airplanes.

With my current data, which is valid now, we have a shortfall this year of 92, and I go well below the manageable rate of 65, which we have testified to, all the way until 2024 when the shortfall under the current set of assumptions is 77. Then I go below that gain until I get out into the 2030s when a different set of assumptions will be the case.

Ma'am, I want to emphasize we talk now about management of the inventory, not the shortfall number. As I testified earlier, the things that you all have provided us in the PB17 budget reduces our shortfall down to below the manageable level in the near term. Now, that again requires us to get through the depot output, and we have some assumptions for depot output that General Davis and I have already talked about, and that has got to stay on track for us to stay below a manageable level. That is overall strike fighters.

Senator HIRONO. Thank you for clarifying for us. This is not a set number, that there are things you can do to reduce the shortfall.

General DAVIS. Ma'am, if I could. Like Admiral Manazir said, it is not just depot when we talk about Harrier and supply. There are Harriers. There are F-35's. There are F-18's in that mix. The depot really deals with the—each of these type model series are kind of like a child. They are all different and they all require a different strategy to recover and basically take best care of them. With the Harrier, it is supply. We have worked on that really hard, done a good job with that. Now F-35 would be—we are trying to avoid a supply problem with the spare parts for F-35 to make sure that when we bring that airplane in, we have got adequate supplies out there to go fight that thing and surge, if required.

Senator HIRONO. Thank you.

Thank you, Mr. Chairman.

Senator WICKER. Thank you, Senator Hirono.

Senator Tillis?

Senator TILLIS. Thank you, Mr. Chair. I apologize. I have got some competing meetings, and I have actually got another SASC [Senate Armed Service Committee] subcommittee meeting I have got to run off to. I am going to ask one or between questions of you, General Davis.

I have been down to Lejeune, Cherry Point. We were down at Cherry Point talking about some of the facility's needs for the F-35 long term. I came back with the impression that some of the stuff for the lift fan facility would become a part of your priorities. I am kind of curious. In fact, I think it was November I reached out to talk to the F-35 Joint Program Office and asked them is the lift fan facility a part of their priorities. I thought that the answer was yes, at least based on the letter that I got from them, and now it is not. I am trying to get an idea of what the future of the F-35 operation is at Cherry Point, particularly in light of these lack of resources or moving the availability of these resources down at Cherry Point to the right.

General DAVIS. Sir, if I could. I think Paul could be part of that as well—Admiral Grosklags.

But the lift fan facility is an important part of Cherry Point and getting that built and making sure that gets built on time to make sure we got that capability down there. I think right now we are just finding out how to pay for that facility.

We have done the security improvements we need to with Cherry Point. That is going to be one of our major F-35 bases in the Marine Corps.

Senator TILLIS. Well, that is one of the reasons for my concern because we came away from Cherry Point advocating in the NDAA for the security fence component. We got that. I wanted to make sure I was not asking for something that is not going to follow through on things that you felt like you no longer need or just get some sense of certainty of when we are going to get it and when I should prioritize it as somebody who hails from that area.

General DAVIS. Absolutely needed, sir, and it needs to get built. We are just working on where we find the funding for that right now, sir.

Admiral GROSSELAGS. Yes, sir. I do not have a whole lot to add. It is absolutely critical. The only other place we will be able to do that we do today the production and sustainment that that vertical lift fan is at the Rolls Royce factory in Indianapolis. By the early 2020s, they will have reached their current capacity in terms of the ability to deliver new, as well as repair the stuff that in service. The VLF facility is absolutely critical. There is nobody changing tune in terms of moving it away from Cherry Point. At this point, it is simply a question of the funding has not made it into our budget request.

Senator TILLIS. Well, maybe I can catch up with you all outside of the committee. But I am just concerned. We are in 2016. 2020 is not too far away. Getting the funding and then moving forward and getting the facility available—if you want to stay ahead of that curve of Indiana being at capacity, then it seems like this is something we have got to be talking about sooner rather than later.

Admiral GROSSELAGS. Yes, sir. I concur.

Senator TILLIS. Thank you. That is all the questions I have.

Senator WICKER. Gentlemen, I am guessing Senator Tillis will catch up with you outside the committee.

Let me just ask one thing, General. Admiral Manazir said the Navy minimum hours flown per month is 11. What is the minimum hours for the Marines?

General DAVIS. Sir, we are a force in readiness, our targeted T2.0 readiness. It varies from about 15.4 hours per month to about 22 hours per month. We do not have a tier readiness model. We are under-executing in the flight hours in many of our type model series with the exception of F-35. I think C-130 is getting it right now, too. We are not in a good spot.

Senator WICKER. You are under-executing. Is that because of safety concerns?

General DAVIS. No. There are not enough airplanes on the line to fly. We talked about that ready bench. We do not have the airplanes to go fly all the pilots to their training and readiness manual numbers to be at T2.0. We do not have a minimum number.

What we do make sure is that we are not putting anybody in an unsafe—what I would say where we are suffering is in the tactical proficiency that we need to be a force in readiness. You should not have to wait until right before deployment to get yourself up to speed to be ready to go. You would expect the Marine Corps to be ready tonight. Those bench forces out there are not ready to the degree they need to be.

Senator WICKER. Gentlemen, we thank you very much.

The record will be left open for questions submitted for the record for 5 days.

Thank you very much for your testimony and your service.

[Whereupon, at 3:28 p.m., the hearing was adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN MCCAIN

DOD BUDGET

1. SENATOR MCCAIN. The President's budget request is approximately \$17 billion less than what last year's budget declared was required. How has the reduced budget affected Naval and Marine Corps aviation? What would be the effects of a lower topline budget?

Admiral MANAZIR AND ADMIRAL GROSKLAGS. Overall, the 2017 President's Budget request prioritizes capability development over capacity and readiness. This tradeoff is apparent in the particularly challenging budget submission for naval aviation investment accounts. The budget request includes funding for 94 aircraft, the lowest number in fourteen years and well below the average annual procurement quantity of approximately 140 aircraft over the last 20 years. While the adequacy of the budget cannot be judged solely on the basis of procurement quantities given the wide range of aircraft types and their disparate costs and capabilities, it does provide some useful context. The Department of Navy aviation force structure requires an inventory in excess of 4,000 aircraft. An annual procurement rate of 140 aircraft enables aircraft to be replaced after 30 years on average. Where aircraft experience higher than expected operational tempo, they are likely to reach service life limits well before 30 years. If annual procurement quantities remain below the historical average, the Navy and Marine Corps aircraft inventory will inevitably become smaller, older and less capable.

In addition to the capacity constraints, the budget also presents challenges for aviation readiness. Funding available for operations and maintenance directly impacts the operational availability of aircraft to meet current mission tasking. Roughly 80 percent of the various type/model/series of aircraft in the inventory are currently below the Fleet Readiness Training Plan (FRTP) requirements due to the number of aircraft that are out of reporting (e.g., undergoing scheduled depot level maintenance) or non-mission capable (e.g., awaiting repairs). Lastly, investments in future capabilities on our aviation platforms to pace the threat and investments in our weapons inventories will continue to fall behind with a lower topline budget.

General DAVIS. The reduced budget topline directly affects Marine Corps' Aviation in readiness and procurement. Additionally, it negatively impacts our ability to recover the readiness of our legacy fleet; and it hampers the procurement of the new aircraft which allows the Marine Corps to transition from its legacy platforms that are rapidly running out of service life. The Marine Corps does not have enough serviceable, ready aircraft to meet its training requirements, much less its warfighting commitments. We have roughly 50 percent of what we need. The Marine Corps is on a path to recover our readiness, but we must keep our funding for readiness recovery and new procurement on track. Average reduction to our topline further delays our ability to meet our mission requirements.

Furthermore, competing funding requirements, during a period of reduced topline budget, necessitates difficult and challenging decisions to guarantee current readiness for today's fight while simultaneously planning for modernization to ensure dominance in the future. Modernization of current and procurement of new aviation assets is a two-pronged approach in the Marine Corps' readiness recovery program and resetting our entire fleet. Our top priorities are the recapitalization of TACAIR and heavy lift helicopters. These represent that greatest delta in meeting OPLAN requirements. Along with the purchasing of new aircraft, continuing to fund depot maintenance and increasing the throughput of F/A-18 A-D, KC-130's and MV-22's aircraft will maintain an executable readiness recovery program that is currently on-track, but fragile. Together with modernization, procurement, and all funding intact, the Marine Corps is on pace to recover our required readiness in June of 2020. A significant reduction in topline budget places our recovery at substantial risk.

INDUSTRIAL BASE

2. SENATOR MCCAIN. How would you describe the state of the industrial base that supports Navy and Marine Corps aviation programs? What must this subcommittee be particularly mindful of related to the industrial base?

Admiral GROSKLAGS. There has been a steady decline in the number of defense development programs for fixed-wing and rotary-wing aircraft. While modernization and depot programs will help sustain select capabilities, it will not provide opportunities for major design, development and integration work. With the approaching end of development programs, and an absence of new requirements in the next five to seven years, sustainment of critical aviation industrial base capabilities and competencies are at risk.

Of particular concern, design/engineering workforce shortfalls are also projected to occur because a significant segment of the defense aerospace workforce is close to retirement and the pool of young engineers available to replace them is not keeping pace. As such, opportunities for hands-on, real-time transfer of knowledge will be limited. Future technical challenges are likely to be addressed by an industry engineering staff with significantly less experience than the generation before. While the exact consequences are still to be determined, potential impacts may include longer developmental costs and timelines to field naval aviation capabilities.

It is critically important that existing and future efforts targeted at maintaining the engineering skill-sets and knowledge base are supported. Examples include joint efforts such as the comprehensive Future Vertical Lift effort and Aerospace Innovation Initiative, as well as the Navy's Next Generation Air Dominance Analysis of Alternatives—which will engage industry design teams as part of their analysis.

MODERNIZATION PRIORITIES

3. SENATOR MCCAIN. What are the Navy and Marine Corps' top aviation modernization priorities?

Admiral MANAZIR. The Navy's aviation modernization priorities are focused on integrated maritime warfighting initiatives, weapons capability improvements, and training and operational support programs that strengthen naval power at and from the sea. Program Objective Memorandum budgeting priorities include carrier air wing investments in 4th generation upgrades to ensure near-term capability overmatch; integration of 5th generation platform capabilities for long-term sustainable air superiority; and recapitalization of the aircraft carrier fleet through the FORD-Class carrier replacement and refueling and complex overhaul programs to maintain a stabilizing American naval presence.

In line with *The Vision for Naval Aviation 2025*, future priorities focus on transformational warfighting requirements including electromagnetic maneuver warfare, network resiliency, increased range and depth of aviation weapons, manned-unmanned integration and live, virtual, constructive training simulation opportunities. These focus areas invoke high velocity learning in acquisition, readiness, and warfighting and improve the family of core capabilities centered on the aircraft carrier and its embarked carrier air wing, augmented and supported by maritime patrol platforms that extend the reach of deterrence and sea control.

General DAVIS. Marine Corps Aviation's priority is modernizing our aging fleet in order to maintain a ready, relevant, and agile force.

1. Top priority—Recapitalization of TACAIR and Heavy lift helicopter (F-35B/CH-53K)
 - a. These are the two T/M/S where there is the greatest delta in meeting OPLAN requirements.
2. Follow-on priorities
 - a. KC-130
 - b. MV-22
 - c. H-1
 - d. MQ-21
3. Modernization projects which enable relevancy or maintain the capability gap of our legacy and new aircraft over near peer competitors.
 - a. Readiness improvements to improve reliability.
 - i. Intrepid Tiger II, Block X
 - ii. Receiving the Small Diameter Bomb (SDB) II and integrating it on the F-35B
 - b. Enhancements through Digital interoperability (i.e. LINK-16, FMV, etc)
 - i. LINK-16 on every platform
 - ii. Software Reprogrammable Payload (SRP) Radios
 - c. Addressing how our force will be required to fight in the future (V-22 amphibious based air refueling).
4. Readiness enhancements (common configurations and electrical upgrades).

All these are what the Deputy Commandant for Aviation has testified to and can be found in our 2016 AVPLAN regarding current readiness, future readiness, and digital interoperability.

MULTIYEAR PROCUREMENT OR BLOCK BUY AUTHORITIES

4. SENATOR MCCAIN. Are there programs that would benefit from cost reduction initiatives, such as Multiyear Procurement or block buys, that do not currently have these authorities? If so, please explain.

Admiral GROSKLAGS. The F-35 and P-8A programs would benefit from a block buy as a cost reduction initiative. The V-22 program is currently benefiting from

the Congressional approved fiscal year 2013– fiscal year 2017 Multi-Year Procurement (MYP) II contract. Given the lower costs, stabilization of contractor work force and continuity of production facilitated by MYP contracts, V-22 will be requesting fiscal year 2018 Congressional authorization of a MYP III strategy through the established certification process. The E-2D program also plans to continue using multi-year contracting and realizing the benefits of lower costs, stabilization of contractor work force, and continuity of production.

FUTURE CARRIER AND FUTURE CARRIER AIR WING

5. SENATOR MCCAIN. The fiscal year 2016 NDAA mandated a study on alternative aircraft carrier designs. Can you comment on the status and interim conclusions of this study, as well as your vision for the future of aircraft carriers and the carrier air wing?

Admiral MANAZIR. The study was conducted by the RAND Corporation, with oversight provided by OPNAV Director of Assessments (N81) and an Executive Steering Committee. The final version of the report has been delivered to Navy and is undergoing a final, thorough review by multiple Navy stakeholders.

RAND developed four notional variants: 20,000, 40,000, 70,000 and 100,000+ tons displacement and assessed the expected capabilities of each variant in approved Defense Planning Scenarios to evaluate warfighting impacts. RAND focused on the operational aspects of employing each variant in the future fleet architecture, specifically sortie generation, overall weapons magazine capacity, and the flow of carrier forces into various theaters of operation.

The RAND study concludes that the two smaller variants (40K and 20K) would have significant operational shortcomings, requiring new aircraft types and new operating concepts and fleet design to execute the mission. The larger variants (70K and 100K+ tons) raise significant concerns regarding the feasibility of the proposed engineering requirements.

The Navy continues to examine these four alternatives as part of Force Structure Analysis and Future Fleet Architecture studies.

6. SENATOR MCCAIN. The Air Force Research Laboratory's Loyal Wingman program seeks to pair unmanned aircraft with a fifth generation fighter. How do you envision such manned-unmanned teaming manifesting in naval aviation and with strike-fighters in particular?

Admiral MANAZIR. The Navy is at the forefront of integrating unmanned autonomous systems into the Naval Aviation force. In some ways, the current era reflects the development of the aircraft carrier and carrier aviation of the 1920s and 1930s. As a result, we are just starting to understand the capabilities and limitations of systems like the MQ-25A, what relevant mission areas unmanned systems will operate within, and how the Navy can integrate these platforms into the carrier air wing (CVW). The Navy's priority is to field the MQ-25A, and related autonomous capabilities, into the hands of the warfighter so that the Navy can test, operate, and learn early in its capability development. The question is not whether unmanned systems will replace manned systems, but rather how the Department can leverage the unique benefits of each system in a teamed approach to generate optimal operational effects.

To assure power projection at and from the sea, the embarked CVW of the future will necessarily evolve to a learning system which senses, evaluates, acts, and adapts continuously, leveraging our human strengths enhanced by both manned and unmanned platforms and payloads. Manned-unmanned integration (MUMI) will generate a true military advantage in speed of decisions. Applying the speed of learning machines to better observe, orient, decide, and act will accelerate the ability to traverse the effect-web, ultimately enabling warfighting success.

The Department has entered a Next Generation Air Dominance (NGAD) Analysis of Alternatives (AoA) to evaluate options for recapitalizing and improving the required capabilities of the future CVW. This AoA will consider the widest possible range of trades to balance capability, affordability, lethality, and survivability across a potential family of systems. The analysis will evaluate manned, unmanned, optionally manned, and "teamed" options to fulfill mission requirements and meet predicted threats in the 2030 timeframe. It will leverage the full breadth of knowledge and experience across the aviation enterprise to generate revolutionary warfighting concepts and materiel capabilities. Our study team is integrated with the Air Force. The Air Force's experience with Loyal Wingman, and related science and technology initiatives, help the Navy better understand the challenges to integration of manned and unmanned combat aircraft performing coordinated operations in a contested environment. The AoA will consider these existing programs in evaluating future

materiel solution(s) concepts as we explore options for future CVW warfighting capabilities.

ADVANCED ARRESTING GEAR

7. SENATOR MCCAIN. In February, you directed a revision of the requirements for the Advanced Arresting Gear (AAG). Among other changes, the operating envelope has been reduced to the existing MK-7 operating envelope. What drove these changes? What has been sacrificed?

Admiral MANAZIR. The February 2016 memorandum revised Advanced Arresting Gear (AAG) requirements in light of evolving program costs, schedule and performance, while preserving current and future carrier air wing (CVW) interoperability requirements. Specifically, the revision focuses on testing requirements to deliver AAG Initial Operational Capability to support current CVW requirements and allows for iterative test expansion to address future CVW recovery energy growth and future CVW interoperability requirements. To that end, there is no sacrifice to current air wing requirements, and the ability to test for future air wing requirements has been retained.

8. SENATOR MCCAIN. What is the path to attain the original requirements, and the associated cost and schedule?

Admiral MANAZIR. The capability to expand in support of future CVW requirements has been retained, and it is expected that the path to test to the original requirements will be executed in an incremental manner, with the associated cost and schedule based on future CVW requirements currently under development.

STRIKE-FIGHTER SHORTFALL

9. SENATOR MCCAIN. Please provide the subcommittee an update on your current assessment of the Navy's strike-fighter shortfall, current efforts to alleviate the shortfall, and the biggest challenges to overcome.

Admiral MANAZIR. The Department of the Navy (DON) remains challenged with end of life planning for legacy F/A-18A-D aircraft that reach the end of their service life before replacement aircraft (F-35) can be delivered into service. With the support of Congress, the Department has established a recovery plan to overcome the Strike Fighter Inventory Management challenge, but risk to recovery remains volatile. Each phase of the plan presents unique challenges in addressing the gap between aircraft supply and the Department's Master Aviation Plan demand over time.

In the near-term, the Department's focus is on maximizing F/A-18A-D availability. Critical Chain Project Management implementation and additional engineering/artisan hiring has resulted in a year-over-year increase in F/A-18A-D depot production. The 2017 President's Budget (PB17) request builds on these gains by incorporating targeted investments in program related engineering and program related logistics accounts (1A4N) to continue to improve throughput. Furthermore, the Department has partnered with Boeing and L3 to incorporate additional maintenance capacity and accomplish required High Flight Hour inspections and repairs outside of organic depot facilities. Commander, Naval Air Forces is also evaluating a means to reduce utilization rates to ensure more aircraft are available to operational units. Finally, the Navy is procuring additional F/A-18E/F aircraft to pace Combatant Commander demand and assure aircraft with useful life into the 2030s.

The Department's focus in the mid-term is decreasing risk in F/A-18E/F service life extension efforts to sustain inventory capacity to meet warfighting requirements. The F/A-18E/F will be the mainstay of the Navy's carrier air wing strike fighter force into the 2030's, but the fleet, on average, has already consumed 46 percent of its designed 6,000 hour expected service life (ESL). Consequently, the DON initiated a service life extension assessment earlier in the F/A-18E/F's life, funding two "early-look" aircraft in an attempt to gauge the level-of-effort and cost associated with repairing yet unknown airframe corrosion and fatigue—the same type of unplanned work that currently hampers F/A-18A-D service life extension efforts. Furthermore, PB17 incorporates funding to accelerate the Service Life Assessment Program (SLAP) analysis by six months and enables earlier kit procurement. Finally, the DON has requested the continued procurement of F/A-18E/F aircraft to simultaneously maintain operational readiness and achieve a fully executable and sustainable F/A-18E/F Service Life Extension Program (SLEP).

In the far-term, the Department is focused on "overmatching the threat" by sustaining inventory capacity with new aircraft procurement (F/A-18E/F and F-35), and incorporating capability improvements to maintain combat relevancy. Current

sustainment and procurement investment profiles assure both capability and capacity to meet warfighting requirements.

UNFUNDED PRIORITY LIST—F/A–18E/F REQUEST

10. SENATOR MCCAIN. The CNO's Unfunded Priority List has 14 additional Super Hornets as the Navy's #1 priority. Given the strike-fighter shortfall and concerns about aviation readiness, why were these aircraft not included in the President's budget request?

Admiral MANAZIR. The 2017 President's Budget request represents the best balance of competing warfighting priorities across all warfare domains. The Department prioritized investments in advanced capabilities that, under budget controls, required trade-offs in capacity and readiness. Although the Department recognizes the need for additional F/A–18E/F aircraft to close the gap between strike fighter inventory capacity and Master Aviation Plan demand, the Navy was unable to procure additional F/A–18E/F aircraft in 2017 due to fiscal constraints.

EA–18G GROWLER REQUIREMENT

11. SENATOR MCCAIN. The Navy has completed its planned procurement of 160 EA–18G Growlers. Secretary Mabus has testified to Congress that 160 fulfills the Navy requirement for Growlers, but the number needed to fulfill the joint requirement is still being evaluated. Do you believe the Navy requires more Growlers to fulfill the needs of the joint force?

Admiral MANAZIR. The current funded inventory of 160 EA–18G aircraft supports nine carrier air wings with seven aircraft assigned to each squadron, five expeditionary squadrons with five aircraft assigned to each, and one Reserve squadron with five aircraft. Following a thorough analysis of the Navy's assessment of joint warfighter demand, we have determined that eight EA–18G aircraft per carrier air wing squadron would be required to meet joint demand in the most stressing scenarios. Consequently, the Department is currently exploring solutions to meet the demand signal.

ELECTRONIC WARFARE—NEXT GENERATION JAMMER

12. SENATOR MCCAIN. The Navy is currently developing an advanced electronic warfare system, the Next Generation Jammer, currently planned to only be carried by the EA–18G Growler. How does the Navy envision operating these Jammers?

Admiral MANAZIR. The Next Generation Jammer (NGJ) system is a new procurement replacing the 40 year old Airborne Electronic Attack (AEA) mid-band capability of the ALQ–99 Tactical Jamming System (TJS) on the EA–18G Growler. The NGJ Increment 1 system, a podded system, will provide improved AEA capabilities against both conventional analog and high-end advanced digital systems in the electromagnetic spectrum. The primary mission of NGJ Increment 1 will be to provide robust jamming at significantly greater standoff ranges, enabling safe engagement of modern Integrated Air Defense Systems (IADS) radars, communications, data links, and other Radio Frequency-based adversary systems. NGJ Increment 1 will also provide improved AEA in conventional and irregular warfare by addressing non-traditional RF targets. The NGJ system will apply advanced digital techniques to outmatch the high-end threats, and feature growth capability in cognitive electronic warfare to respond to emerging threat capabilities. NGJ Increment 1 will assist Major Combat Operations by gaining operational access, denying enemy battlespace awareness, denying enemy freedom of action, and disrupting the enemy's ability to command and control his forces.

13. SENATOR MCCAIN. Is the currently planned number of Growlers sufficient to effectively employ the NGJ?

Admiral MANAZIR. Yes. The current funded inventory of 160 EA–18G aircraft supports nine carrier air wings with seven aircraft assigned plus expeditionary, Reserve, and training squadrons. Current plans are to procure sufficient number of Next Generation Jammers (NGJ) to outfit all Primary Aircraft Authorized (PAA) which includes training plus attrition Reserve. This will be a sufficient number of Growlers to tactically employ the NJG and meet all Navy Airborne Electronic Attack (AEA) demands.

14. SENATOR MCCAIN. The Next Generation Jammer (NGJ) has been designated the first program in a "SkunkWorks" pilot that aims to streamline the acquisition process. Can you describe the elements of this pilot and how NGJ will benefit?

Admiral GROSCLAGS. As first identified in Better Buying Power (BBP) 2.0 and further emphasized in BBP 3.0, USD(AT&L) laid the groundwork for a "Skunk Works"

approach to streamlining acquisition oversight. USD (AT&L) wanted to pilot this idea on a program with a small, highly competent Government and industry team working together on a new product that was early in its development cycle and planned for a cost plus development approach with strong government and industry interaction.

USD(AT&L) and ASN(RDA) selected the Next Generation Jammer Increment 1 program as the first Skunk Works program in April 2015 following the program's Development Request for Proposal Release Decision Point. The program was formally chartered on September 17, 2015, and the Skunk Works management construct has been implemented. The goal of this management approach is to maximize the probability of program success by empowering a small, highly qualified core team to execute substantive program tasks and streamlining oversight, processes and documentation to enable high quality, timely decisions. Documentation tailoring includes elimination of some regulatory requirements and delegation of some document approvals to the lowest appropriate level. Milestone process tailoring includes elimination of the traditional OSD Defense Acquisition Board process and the Navy Gate Review process, including associated preparatory reviews such as Overarching Integrated Product Teams. These are replaced with a program execution review process overseen by an Executive Management Board (EMB). The EMB brings together key leadership from the Navy and OSD to review program execution at relevant, and more frequent, program knowledge points, rather than just the traditional milestones. The EMB is supported by a 'core team' of empowered subject matter experts from the EMB offices. The core team actively participates in the program in order to transform traditional external oversight and influence into hands-on insight. EMB reviews are conducted directly and concurrently with both ASN(RDA) and USD(AT&L), eliminating multiple pre-briefs at both the Navy and OSD levels, therefore allowing the program to focus on program execution.

Since September 2015, this Skunk Works approach has been effectively implemented on the NGJ Increment 1 program. Two EMBs have been held: a Post Preliminary Design Review and a Technical Deep Dive/Milestone B held at the contractor site. This approach has allowed the program team to more effectively focus on program success and provided greater insight to EMB leadership on the program at appropriate knowledge points.

MARINE AIR GROUND TASK FORCE ELECTRONIC WARFARE (MAGTF EW)

15. SENATOR MCCAIN. When the last EA-6B Prowler squadron sundowns in 2019, the Marine Corps will no longer have a dedicated airborne electronic attack aircraft. How will the MAGTF EW systems of systems replace the electronic surveillance and electronic attack capabilities of the Prowler?

General DAVIS. Currently, the Marine Corps is ensuring we can conduct electronic warfare across the ROMO after the EA-6B sundowns. We will provide the MAGTF Commander continued access to organic electronic warfare assets that are adaptable, scalable, and collaborative. Most importantly, we cannot afford to have a HDLD EW capability that only serves a portion of the MAGTF—we need it to be present for ever scenario. We will accomplish this by integrating EW capability across every type/model/series. There are several initiatives that will be used to meet and modernize the Corps' capacity and capabilities for electronic warfare support (ES) and electronic attack (EA). These initiatives will be complementary to our sister Services' programs, providing the Joint force with diverse, capable, and flexible options for electronic warfare.

1. The Intrepid Tiger II (IT-II) pod is carried on AV-8B Harrier and F/A-18 Hornet airframes, and will be integrated onto the UH-1 aircraft in 3QFY16. The IT-II pod provides electronic attack against communications targets. This is a capability previously only available to the MAGTF commander from the EA-6B, but now available on multiple platforms. Future platforms for IT-II integration are MV-22, CH-53, KC-130, AH-1, as well as UAS variants, dramatically increasing the flexibility and EW options available to the commanders in the field.
2. IT-II Block X was funded for technology development starting in fiscal year 2016 and is funded through the FYDP. This variant will provide electronic attack against radar targets, increasing the MAGTF commander's flexibility with this critical EW mission.
3. The F-35 Joint Strike Fighter possesses inherent electronic warfare capabilities and the Marine Corps is exploring options to further expand these abilities.
4. Tactical demonstrations and proofs-of-concepts continue to develop the Marine Corps' vision for the Electronic Warfare Services Architecture. The EWSA is

a network that enables collaborative integration of electronic warfare assets to best attack and defeat modern spectrum threats.

Intrepid Tiger II These four initiatives will provide the MAGTF commander and modern, better EW capability for the future than the EA-6B.

16. SENATOR MCCAIN. Will the lack of a dedicated airborne electronic attack aircraft community create a center of excellence void for the Marines?

General DAVIS. The Marine Corps intends to retain its existing airborne electronic warfare expertise to the maximum extent possible. We are offering in-service transitions to EA-6B Prowler aircrew so they may continue to contribute to the operating forces and supporting establishments. We currently have two EA-6B pilots transitioning to the F-35B platform and recently selected an additional four. The personnel structure currently allotted to the EA-6B community will be re-allocated to a mixture of operational and support billets, in the F-35 (pilots) and the UAS community (Pilots and Electronic Countermeasures Officers (ECMOs)).

- The MAGTF EW Transition Plan reallocates 106 pieces of personnel structure from the EA-6B community to staff and operational billets. The intent is to create a more permanent electronic warfare representation on MAGTF staffs and to transition electronic warfare expertise to growth communities.
- In addition to the MAGTF EW Transition Plan, the Marine Corps is standing up a UAS Fleet Replacement Detachment (FRD) aboard MCAS Cherry Point. This FRD will train new UAS officers in a number of core skills, one of which will eventually be electronic warfare. This ensures resident electronic warfare expertise in the UAS community as our Electronic Warfare payloads on UAS field.
- To equip the UAS community with the material solutions to conduct electronic warfare, the Marine Corps has fully funded in POM-18 through the FYDP an electronic warfare payload for the RQ-21. Future Marine Corps Group 4/5 UAS platforms are planned to be key electronic warfare nodes in the MAGTF EW system of systems.
- To date, 30 EA-6B aircrew have been selected for MOS transition (Pilots: F-35B, F/A-18, MV-22, KC-130J), (Electronic Counter Measures Officer: F/A-18 Weapon Systems Officer, Student Naval Aviator, UAS). EA-6B aircrew MOS transitions will continue to be offered for the foreseeable future.
- Any remaining structure reductions from EA-6B sundowns are consistent with the drawdown of the Marine Corps end strength.

JOINT STRIKE FIGHTER OPERATIONS

17. SENATOR MCCAIN. Could you provide an update on F-35B operations since IOC declaration last August?

General DAVIS. Since we declared IOC, our first F-35 squadron has participated in numerous Marine Corps and Joint exercises. These include multiple—and continuing—Forward Air Controller training exercises, numerous Large Force Exercises (LFE) focused on 4th and 5th generation fighter integration, numerous Close Air Support (CAS) exercises in 29 Palms, and we will be supporting Red Flag in July of this year.

December of 2015, we deployed 8 F-35's to our expeditionary airfield in 29 Palms to support a combined arms exercise named Steel Knight. The squadron spent 15 days in the field. All take-offs and landings were conducted in Short Take Off and Vertical Landing (STOVL) mode, demonstrating the reliability of the lift system. The squadron executed operations from a small 1500 foot Expeditionary Airfield (EAF) at Red Beach aboard Camp Pendleton to demonstrate Forward Arming and Refueling.

On 7 May 2016 we graduated our first three students from our Weapons Tactics Instructors course. This is the first time we have graduated students from the program in a 5th generation aircraft and the aircraft exceeded expectations. In the final exercise 4 F-35's integrated with 4th generation fighters contributed to 24 Red Air kills and zero friendly losses—the first time this has been accomplished. When this same scenario was presented solely to 4th generation aircraft, we lost more than half of the 4th generation aircraft and did not kill the targets.

Facts:

AGILE LIGHTNING in support of STEEL KNIGHT

- Deployed 8 F-35B to 29 Palms Marine Corps Air Ground Combat Center
- 14 Pilots and 162 maintenance and support personnel, along with the required spares, tools, and support equipment (SE), were deployed from 2 to 16 December 2015 to support flight operations (9 to 15 December 2015).

- Executed CAS with simulated and live ordnance
- All Takeoffs and Recoveries were conducted in STOVL mode, demonstrating the reliability of the lift system
- Executed operations at Red Beach EAF to examine Mobile Forward Arming and Refueling issues.
- *“In a CAS role, the aircraft and pilots integrated seamlessly with the Forward Air Controllers . . . The aircraft was able to effectively employ precision munitions from a sanctuary altitude outside the known threat weapons engagement zone with greater accuracy than any other.”—CO, 1st Battalion, 1st Marine Regiment*

MAWTS-1 / WTI Support

First two instructors validated the WTI curriculum from Sep-Oct 2015

- Class 1-16: 6 F-35B, 119 hours, 58 sorties

First 3 WTI students graduated the Mar-April WTI Class on 7 May 2016

- Class 2-16: 6 F-35B, 210.7 hours / 94 sorties
- F-35 fully integrated into the WTI construct. Major evolutions validated 4th/5th Generation fighter integration and gained valuable lessons learned in preparation for F-35 PWTIs.
- Integrated F-35 into the MEUX evolution where F-35s escort V-22s during a long range mission, then provide CAS after insertion.

MAGTF / Exercise Support

- Desert Talon—FAC(A) development
- EWTF(PAC) support—Expeditionary Warfare Training group (Pacific)—FAC and JTAC Training
- Numerous LFE’s in support of Marine Air Groups (MAGs), primarily focused on fighter integration
- Talon Reach—CAS Exercise in 29 Palms March 2016
- Supported Joint Exercise at Nellis AFB, May 2016
- Red Flag—Jul 2016
- WTI 1-17—September-October 2016
- Developmental Test Period 3 aboard USS America, October-November 2016

18. SENATOR MCCAIN. VMFA-121 will move to Iwakuni, Japan next year and deploy aboard ship in 2018, marking the first O-CONUS and shipboard deployments of the F-35 respectively. Can you provide an update on planning for those deployments and what you view as the biggest risks?

General DAVIS. We are on track to meet our timeline for VMFA-121’s permanent move to Iwakuni in January 2017 and the F-35B’s first shipboard deployment in early 2018. We continue to plan and execute our milestones with the F-35 Joint Program Office, the Navy, the Government of Japan and other stakeholders for both events in the same manner that led to the Marine Corps’ successful IOC. The Marine Corps is working through the inherent challenges of moving the nation’s first 5th generation fighter squadron to be forward deployed in the Pacific AOR. Spares funding and procurement continue to be the biggest challenge to our first shipboard deployment but we are developing mitigation plans to ensure parts are available when and where they are needed. Together with our Navy counterparts, we are on schedule to conduct both safe and combat effective shipboard deployments of the F-35B and distributed STOVL operations throughout the Asia-Pacific.

19. SENATOR MCCAIN. The F-35B brings new capabilities and operational possibilities to the Marine Expeditionary Unit and you have discussed the vision of linking Marine Expeditionary Units (MEUs) more closely into the joint force. However, those new capabilities and operating concepts require investment in shipboard infrastructure to include upgraded data links. Please discuss your vision for L-class ship connectivity and current plans to achieve that vision.

General DAVIS. The Marine Corps’ capstone operating concept, Expeditionary Force 21, imposes an operational requirement to increasingly command and control (C2) the Marine Air Ground Task Force (MAGTF) from the seabase during operational maneuver from the sea and distributed enhanced MAGTF operations. To meet this requirement for enhanced C2 while embarked, and exploit the improved capability of the F-35B, we must improve the capability of the LHD/LHA to send, receive, and distribute C2 data. This includes shipboard integration of weapons coordination / control and status reporting with remote land, air, surface, and sub-surface units.

The F-35B provides great potential for increased capability within the MAGTF, Naval and Joint Force, but only if it is appropriately integrated. Over the past decade, we have carefully identified, in forums, councils, wargames, and concept of operations development, current and future requirements that will ensure integration

between the F-35B, our MAGTF Tactical Data Systems, and L-class ships. These requirements outline the human / system interfaces for commanders and decision makers to access the operational environment and information network in order to enable effective C2 of all fires and aviation assets, to include the F-35B, in support of the MAGTF afloat and ashore.

Five main area of improvement are identified to achieve system level digital interoperability:

1. Improved Link-16 capabilities to support C2 in a digital environment, track data exchanges, electronic warfare, mission assignment, target engagement order/status, imagery, and free text messages.
2. Improved Variable Message Format (VMF) to support digital C2 track data, mission assignment data (e.g. Close Air Support, Airspace Control, and Fire Support Control Measures, Call for Fires), imagery, and free text messages.
3. Ability to send/receive Intelligence, Surveillance, Reconnaissance (ISR) Full-Motion Video/Still Imagery Photograph (FMV/SIP) receipt via Common Data Link (CDL).
4. Integrated Combat Systems and local area networks cross-domain solutions to support exchanges of track, targeting, electronic warfare, cyber, ISR and C2 data to supporting systems and functional agencies.
5. Sufficient network and communications capacity to provide increased throughput and reachback to facilitate F-35B pre-flight data upload, in-flight information exchange, and post flight mission data downloads and ISR/FMV/SIP on-board and off-board distribution.

The overall end-state is to elevate the ARG/MEU capability to, at a minimum, match the information exchange capabilities of today's Carrier Strike Groups and ideally would be elevated to match the F-35B's 5th Generation sensing and fusion capability in order to effectively command and control the amphibious force in the future operating environment.

Beginning in 2018, the F-35B will represent the nation's only forward deployed, advanced (5th generation), counter Anti-Access/Area Denial (A2/AD) capability for a period of several years. The requirement to implement the solutions identified is valid, compelling, and urgent. Additionally it is critical that ship upgrades and deployment schedules are closely synchronized and tracked to ensure no gap in capability.

20. SENATOR MCCAIN. What do you view as the biggest challenges to successful integration of the F-35 into the carrier air wing?

Admiral MANAZIR. The greatest operational challenges to fully integrate the F-35C into the carrier air wing include at sea sustainment and network interoperability. The Global Support Solution (GSS) is an innovative approach to sustaining aircraft at sea, and blending this new approach with legacy naval sustainment models will be challenging to accomplish. Additionally, the F-35 will bring revolutionary capabilities in data fusion to the integrated warfighting concept of operations. To achieve the full benefits of 5th generation capability integration, our networks will require capacity and resiliency unprecedented in past concepts of employment.

Furthermore, the F-35 presents other challenges and opportunities in the training environment. As the future carrier air wing becomes more interdependent, the integrated approach to naval warfare will require evolutionary high-fidelity integrated training to prepare for operational employment. The Department plans to leverage live, virtual, and constructive training opportunities to accomplish revolutionary training requirements.

21. SENATOR MCCAIN. Navy leaders have testified regarding their concerns about the sustainment model and costs for F-35C. Have those concerns been sufficiently addressed?

Admiral MANAZIR. The Department of the Navy's sustainment and cost concerns are being adequately addressed through the Global Support Solution (GSS) development process and the program's "blueprint for affordability." Over the course of the past year the Joint Program Office has made significant strides in developing, refining and implementing its GSS for the F-35. The Department remains committed to this architecture as outlined in the "Hybrid Product Support Integrator" (HPSI) initiative.

General DAVIS. The Marine Corps' concerns are being addressed as it remains engaged throughout the Global Support Solution (GSS) development process and the program's "blueprint for affordability." Over the course of the past year the Joint Program Office (JPO) has made significant strides in developing, refining and implementing its GSS for the F-35. The USMC remains committed to this architecture as it has been outlined in the "Hybrid Product Support Integrator" (HPSI) initiative.

The Marine Corps is watching with interest the continued implementation of the GSS. Simultaneously, select subject matter experts from various Marine Corps competencies have been participating in its development which is now categorized as a “best of breed” construct. This new GSS concept contains elements from both the JPO and USAF proposed models. We are confident that our concerns are being addressed and that the program is headed in the right direction for sustainment.

F-35 FOLLOW-ON MODERNIZATION

22. SENATOR MCCAIN. The follow-on modernization for the F-35 is estimated to cost the DOD nearly \$3 billion over the next 6 years alone, easily surpassing the statutory and regulatory levels for a Major Defense Acquisition Program (MDAP). Do you feel the Follow-on Modernization program for the F-35 should be managed as a separate MDAP? Why or why not?

Admiral MANAZIR. The follow-on modernization effort is best managed as a continuation of the baseline F-35 program. The existing oversight mechanisms, management structure, and decision processes are more than adequate to continue to manage the modernization program.

General DAVIS. The follow-on modernization effort is best managed as a continuation of the baseline F-35 program. The existing oversight mechanisms, management structure, and decision processes are adequate to continue to manage the modernization program. Because of past delays associated with the F-35 program, we will deliver a System Development and Demonstration (SDD) compliant aircraft several years behind the threat baseline for the aircraft. The warfighter cannot afford further delays in this program and I believe a separately managed MDAP would only delay the progress of the program without enhancing oversight or efficiency. Any change to the path forward for follow-on-modernization management may delay delivery of added capability to the warfighter which is already delayed in fielding.

F-35 PROGRAM MANAGEMENT

23. SENATOR MCCAIN. The Joint Program Office was established when the three variants were envisioned being 70–90 percent common rather than the 20–25 percent they are. From your position, does the Joint Program Office management structure properly align responsibility and accountability?

Admiral MANAZIR. The Joint Program Office structure, under the direction of the Office of the Secretary of Defense, adequately aligns responsibility and accountability to deliver a complex weapons system to the U.S. military and partner nations. As the program matures, the management structure is also expected to mature commensurately to ensure the most capable weapons system is delivered according to each F-35 user’s unique operating requirements.

Although there are significant structural differences between the three variants of the Joint Strike Fighter, they are similar from a weapons system capability perspective. Given that follow-on modernization is almost solely focused on capability additions and global sourcing solution refinement, the importance of centralized program management to develop the required capabilities at the greatest value remains vitally important. Currently, no single service or partner nation is equipped to assume this role, therefore a joint service management group will be required for the foreseeable future.

General DAVIS. Although there are significant structural differences between the three variants of the F-35, from a weapon system capability standpoint, they use similar weapons, loading systems, and training. The importance of centralized program management to develop the required capabilities at the greatest value remains vitally important. Currently, no single service or partner is equipped to assume this role, and an independent management group will be a requirement for the foreseeable future. Accordingly, under the direction of the Office of the Secretary of Defense, the Joint Program Office structure adequately aligns responsibility and accountability to deliver a complex weapon system to the U.S. military and our partner nations. However, as the program matures the management structure is also expected to mature commensurately to ensure the most combat capable weapon system is delivered to the warfighter, at the right price, and on time.

24. SENATOR MCCAIN. What are your views on alternative management structures for the F-35 program, such as establishing separate service or variant program offices rather than maintaining a joint program office?

Admiral MANAZIR. The Department of the Navy seeks to develop, procure, and deliver the most combat capable weapon system to the warfighter in accordance with operational requirements. While the Joint Program Office handles overall program

management well, it is incumbent upon each service and partner nation to recognize challenges to Fleet integration and adapt to overcome those concerns.

Accordingly, the Chief of Naval Operations recently announced the establishment of the Navy's Joint Strike Fighter Fleet Integration Office (FIO) which will ensure unity of command and effort in F-35C Fleet integration. The FIO, under the leadership of an operationally-experienced flag officer, will be responsible for developmental, operational, and sustainment lines of effort across the DON as the Navy moves toward delivering this revolutionary aircraft into its combat inventory. One component critical to FIO success is an external architecture that facilitates communication and coordination between the DON, program participants, and the vendors in order to align requirements and maximize the value of allocated resources.

General DAVIS. Ultimately, the Department of the Navy seeks to develop, procure, and deliver the most combat capable weapon system to the warfighter in order to meet operational requirements. While the Joint Program Office handles overall program management well, it is incumbent upon each service and partner nation to recognize challenges of fleet integration and requirements definition and adapt to overcome these concerns. Much like other USMC aircraft programs, under my direction and supervision, Headquarters Marine Corps has a team dedicated to driving and managing Marine Corps requirements for the F-35. Today, it is critical to our success to have an external program management structure which coordinates and focuses the requirements of the services and partners and manages vendors in order to maximize efficiency and effectiveness of the program. In the future, the Marine Corps supports the concept of exploring alternative management constructs provided that they can deliver better combat capability to the warfighter at a lower cost.

Efficiencies in program management would be lost if each service produced its own program manager. While direct cost and accountability would be managed within the DON, it would leave Lockheed Martin too much of a central view and the ensuing private company prioritization would make Joint and International fair share responsibilities more complex.

AIRBORNE DATA LINK PLAN

25. SENATOR MCCAIN. You both have talked about the importance of networks to your visions of Naval and Marine aviation. The committee is concerned that the Department of Defense's ideas for airborne data links have lacked vision and been disjointed. Please discuss your efforts in this area and how you are ensuring that the Navy and Marine Corps are interoperable not only with each other, but with the Air Force and Army as well.

Admiral MANAZIR. Our vision is to provide warfighters with information and knowledge that they need, when they need it, in order to produce warfighting effects that deter and defeat our adversaries. Naval Aviation's vision for data links; nested within the Joint Force doctrine carefully evaluates information requirements. Navy and Marine Corps aviation networks are designed to optimize Joint warfighting effectiveness at the best cost.

Interoperability, a key principle, is the condition achieved among communications systems when information or services can be exchanged directly and satisfactorily between them and/or their users. Joint doctrine describes three levels of interoperability:

- Integrated—Systems are able to merge seamlessly and are interchangeable,
- Compatible—Systems are able to interact with each other in pursuit of a common mission, and
- De-conflicted—Systems can co-exist but not interact together.

A completely integrated force or netted navy is an objective in our vision. However, the highest level of interoperability also tends to come with the highest cost and most challenging requirements. Therefore, we tend to focus those efforts where the impact returns the greatest results, as exemplified by F-35 to F-35 communication over the Multifunction Advanced Data Link (MADL) or Tactical Targeting Network Technology (TTNT) on the EA-18G and E-2D beginning in 2020. No single network is able to handle every mission, all of the time, across every frequency. The physics and cost of such a network would be unaffordable as well as vulnerable to our adversaries.

To overcome these challenges, compatible systems such as Link 16 bridge the capabilities of integrated systems such as F-22 and F-35 so that the largest possible joint force has the greatest capability. Link 16 is a military standard data link that has been widely fielded across the Department of Defense (DOD) for more than 20 years, to include all tactical aircraft platforms. Over 10,000 Link 16 terminals are in use throughout the world. All of the Services abide by DOD-wide Link 16 standards, which ensure that all Link 16 terminals are compatible. In addition to the

joint force, the Link 16 standard has been adopted by the North Atlantic Treaty Organization, allowing us to communicate effectively with over 45 partner nations and allies. All of the Services abide by DOD-wide Link 16 standards, which ensure that all Link 16 terminals are compatible. To ensure interoperability requirements, all platforms must achieve interoperability certification from the Joint Interoperability Test Command. Interoperability certification and the establishment of architectural standards will be key facets of future advanced networking.

The Navy is in the process of developing a long range (2020 – 2045) strategic plan for tactical data links beyond Link 16 and TTNT. Communicated with our Air Force and Joint partners through several venues beyond doctrinal, requirements, acquisition, and test venues mentioned previously, our data link strategy is interoperable to provide the most cost effective joint force for the best cost. Our long range strategy recognizes ongoing research on waveforms, algorithms, and computer processing power that may increase the effectiveness of fully integrated systems. Throughout our current and future system lifecycles, the Navy and our Joint partners have several means to quickly respond to threats and opportunities to improve our ability to provide warfighters with the right information at the right time in the right format.

General DAVIS. The United States Marine Corps is leveraging the capability of a software reprogrammable payload radio, which will be hosting waveforms from the Joint Tactical Networking Center DOD Waveform Information Repository. This will enable an infrastructure of air data links that leverages the standardized DOD waveforms, while giving us the flexibility to adjust to new waveform capabilities via the inherent reprogrammable framework. Additionally, we are maturing a gateway technology that enables our service to exchange data between dissimilar networks. This is analogous to how we can all access the same internet via different equipment, i.e., Windows computers, Apple Computers, or Android devices, only this will be on a tactical network framework. Marine Aviation is working closely with NSA to overcome the challenges of handling the multi-level security challenges that this approach levies. Our efforts to date have been promising and we've taken significant steps forward in our gateway development.

USMC AVIATION READINESS

26. SENATOR MCCAIN. Marine Corps aviation readiness appears to be in a crisis. How did we get here, what are you doing to improve readiness, and what are the biggest challenges to overcome?

General DAVIS. Marine aviation support to OEF and OIF utilized aircraft at war time surge rates for over a decade. We were still operating at surge rates in 2013 when sequestration was implemented. The loss of skilled artisans, a shrinking force and continued deployments combined with fiscally challenged budgets helped to create the conditions today. This resulted in a reduction in contract services and a lack of funds resulted in an aviation force that was not reset and combined with the loss of many experienced marines on the flight lines. Since 2014 with the end of OIF and a major force reduction in Afghanistan, the Marine Corps has continued to respond to the Nations requirements with our Marine Expeditionary Units and, without ships available, as a land based crisis response force ready to protect our Nation's interests at a moment's notice. Our leadership has learned from the prioritization of funds within DOD and after 2014 and 2015 realization of our current readiness, improved funding readiness enabler accounts to begin readiness recovery. 2016 is a transitional year, and while some efforts for recovery of funding have been directed, a majority of efforts for long term recovery begin in 2017.

Beginning in 2014, Marine Aviation initiated several Independent Readiness Reviews (IRRs). Thus far AV-8Bs, CH-53Es, and MV-22s have completed. These reviews are led by leaders outside the Naval Aviation Enterprise to provide different perspectives, independent assessments and COAs to achieve our readiness requirements. These studies have enabled us to begin implementing changes as early as 2015 for AV-8B. In 2016, we started resetting CH-53Es and these lessons are being applied to all other aircraft in the 2017 budget. Since implementation, we have seen more Ready Basic Aircraft (RBA) to the flight line proving we have identified and implemented a good course change in readiness. In the past year, we have recovered 54 aircraft—a 12.7 percent improvement in RBA. The continued support of readiness funding will enable Marine Aviation force training by fiscal year 2020 and our ready bench by fiscal year 2022.

Key Points:

There are many reasons for these reduced readiness numbers.

1. Budget constraints lowered readiness funding.
2. Deployments continue.

3. Aging aircraft have not been replaced.
4. Aircraft inventory should be 1373 and is 1272.
5. RBA aircraft is 478 and should be 589 for T-2.0 and 690 for a ready bench.
6. We have begun implementing our plan and seen a 12.7 percent increase in RBA.
7. Continued support of readiness and FHP is critical.
8. Procurement to replace over-age and aging aircraft is critical to maintaining our capability over near peer competitors.
9. Spares—Aircraft Not Mission Capable Supply rates are 25+ percent.

Issues/Amplification:

The flight hour metric, while not the only measure of capability, is an indicator of the depth of our material bench and of our ability to surge if the Nation called. Our Marine aviators and crew are in high-tempo environments, flying increasingly complex mission profiles, the time between operational deployments is decreasing, the inventory of aircraft to train with is decreasing and they are not getting enough “looks at the ball” to ensure they are as trained as they should be.

Current Readiness:

In 2014, the Marine Corps initiated a series of Independent Readiness Reviews (IRRs) to discover root causes to the readiness dilemma and highlight corrective actions.

1. AV-8B Harrier Independent Readiness Review (HIRR)
2. CH-53E Super Stallion Independent Readiness Review (SSIRR)
3. MV-22B Osprey Independent Readiness Review (OIRR)
4. H-1 Independent Readiness Review (Pending)

Four main components surfaced within each IRR (with different combinations in each Type/Model/Series): People, Parts, Process, and Funding. The Marine Corps is tackling these components head-on and our numbers are starting to trend up, with a full recovery planned for 2019 (as long as we keep these initiatives funded and stay on track with recapitalization).

Future Readiness:

The real key to reducing risk in capacity and recovering readiness is in transition. We are 54 percent through our transition (recapitalization) of every aircraft in our inventory and must constantly balance current readiness and modernization to maintain and increase our operational advantage as we buy a newer force. We have just started our TACAIR recapitalization with the F-35 B/C and will soon begin our transition to the CH-53K.

Future Initiatives:

- Exploring MV-22B options to add weapons (precision guided, ramp mounted, and forward firing) and increase both maintainability and availability through common aircraft configuration.
- Our KC-130J Harvest Hawk is currently receiving sensor and fire control system upgrades to include LINK-16 capability. We are also increasing the reliability and capabilities of our sensors and restoring the usability of the left external wing tank (18,000lbs of fuel). Future growth will include Full Motion Video (FMV), Beyond Line of Sight (BLOS) communications and integration of the AN/ALQ-231 “Intrepid Tiger” electronic warfare pod.
- The USMC UAS Family of Systems (FoS) will expand MAGTF ISR capacity while developing enhanced multi-mission capability over the next 10 years.
 - On the road to the Group-5 seabased MUX, the USMC will field 9 RQ-21A Blackjack systems per Active Duty VMU to expand the organic ISR capacity of the Marine Corps.
 - The first RQ-21A MEU deployment is with the 22nd MEU in July 2016.
 - In parallel, the USMC will leverage MQ-24 KMAX aircraft to add a Group 4 VTOL capability that has a beyond line of sight (BLOS) antennae, MX-10 sensor with ID capability and a 6,000 pound payload, to inform the MUX program and develop both sea based and weapons capability.
 - The USMC plans to spiral upgrade the RQ-21 BLOS data link and improve the RQ-21’s optics. Additionally, EW payloads on the RQ-21 to ensure every MAGTF can employ organic EW from both manned and unmanned platforms.

V-22 OSPREY

27. SENATOR MCCAIN. The President’s budget request includes procurement of 16 V-22 Ospreys, 2 fewer than the current multi-year contract called for. What effect will this reduction have on the current and future contracts?

Admiral GROSSEKLAGS. The quantity reduction of two aircraft in fiscal year 2017 would breach the terms and conditions of the MYPII contract in its final year. This would effectively create a partial termination for convenience of the contract to which Industry would have the ability to seek compensation. Principal areas of impact that would require evaluation and negotiation via a termination proposal include overhead/labor rates, direct/indirect labor and material, and termination costs for: economic order quantity (EOQ) components, long lead components, and suppliers.

Two mitigation strategies to avoid breach of contract are in-work. The first is an fiscal year 2017 USMC Unfunded Priority List (UPL) request for two aircraft. Second is the opportunity to replace the two aircraft with pending international orders from Japan and/or an fiscal year 2016 CV-22 plus up aircraft by the Air Force. The Government of Japan's case acceptance for four aircraft was received June 9, 2016, and the program office exercised the MYPII Fiscal Year 2016 Variation in Quantity (VIQ) contract clause on June 30, 2016. The contractual commitment for full funding of the fiscal year 2017 MYPII procurement is due by December 31, 2016.

NAVY AND MARINE CORPS AIR-LAUNCHED MUNITIONS

28. SENATOR MCCAIN. In your judgment, are your air-launched munitions inventories sufficient to support current operations and the Defense Strategic Guidance writ large? Are there individual air-launched munitions whose inventories, either present or projected, are insufficient to meet requirements? If so, what are they and what is being done to address the shortfalls?

General DAVIS. Air-launched munitions inventories are sufficient to support Defense Strategic Guidance. However, inventory risk of some air-launched munitions has grown due to expenditures in support of Operation Inherent Resolve (OIR) and a prioritization of future weapons capability over current weapons quantity.

One example of an air-launched munition at significant inventory risk is the KMU-572 tail kit for the 500-pound Joint Direct Attack Munition (JDAM). KMU-572 tail kits procurement is managed by the USAF (lead service) and is limited by industrial capacity. The USAF has invested additional funding in order to increase future production capacity which allows additional baseline and OCO funding to be leveraged against the inventory issue.

USMC Aviation is relying upon OCO funding to maintain adequate inventory levels during the high operational tempo of OIR. Both training (readiness) and contingency operations require live expenditures that cannot be replaced using baseline funding alone.

A further detailed listing of weapons with insufficient inventories requires discussion above this classification level.

Admiral MANAZIR. The air-launched munitions inventories are at risk for the Joint Direct Attack Munition (JDAM), Laser Maverick, and Air-to-Air weapons. All other air-launched weapons have sufficient inventories to support the Defense Strategic Guidance.

JDAM: Combat expenditures associated with OPERATION INHERENT RESOLVE (OIR) have significantly reduced our 500lb JDAM Tail Kit inventories. To address this issue, the Department is coordinating with the U.S. Air Force (JDAM Lead Service) and the prime contractor (Boeing Company) to increase production and reallocate the percentage of weapons coming off the production line for Navy/Marine Corps use commensurate with warfighter needs. However, as JDAM tail kit procurement is currently limited by industrial capacity, the Department will not see higher production quantities being delivered to the warfighter until the mid-Fiscal Year 2019 timeframe. In the interim, expanded use of GBU-12 (Laser Guided Bombs/Paveway II), while slightly less effective than JDAM, provides the warfighter a precision guided bomb alternative.

Laser Maverick: Laser Maverick missile inventories levels are being depleted due to increased combat expenditures with OIR, coupled with a lack of follow-on capability as Laser Maverick is no longer in production. To address these issues, Navy is leveraging Overseas Contingency Operations (OCO) funding to convert the remaining legacy 'Infrared and Optically Guided Maverick Weapons' into the AGM-65E2 Laser Guided Maverick missile. The Department is also evaluating long-term capability solutions, including an assessment of the feasibility of a potential future variant of the Joint Air-to-Ground Missile (JAGM) for fixed-wing aircraft. As a mitigating strategy to address insufficient inventories, warfighters are being encouraged to employ GBU-54 (Laser JDAM) for moving targets.

Air-to-Air Weapons: The Department of the Navy (DON) has an adequate inventory of legacy air-to-air weapons. However, the DON faces a challenge in inventories of the most capable air-to-air weapons to fight in a protracted anti-access/anti-denial

environment. Specifically, there are limited inventories of the latest short-range AIM-9 missile (AIM-9X/BLK II) and the Advanced Medium Range Air to Air Missile (AMRAAM/AIM-120D). The Department is currently evaluating procurement profiles to address inventory shortfalls in this area.

LONG RANGE STRIKE WEAPONS

29. SENATOR MCCAIN. In recent conflicts, the United States has enjoyed little challenge to its command of the air, allowing the use of shorter range, direct attack munitions, such as the Joint Direct Attack Munition (JDAM) to prosecute ground targets. In your judgement, will future engagements allow for such unfettered use of these weapons? If not, what are the Navy and Marine Corps doing to ensure they maintain the required combat effectiveness?

Admiral MANAZIR. Future engagements may allow unfettered use of direct attack munitions when conducting contingency operations in areas with limited conventional defense capabilities. When facing strategic competitors with robust Integrated Air Defense Systems (IADS), the Department will be increasingly challenged by technological advances and weapon system proliferation. Strategic competitors are pursuing advanced weapon systems at levels and a pace of development that our Nation has not seen since the mid-1980s. This requires investment in advanced capabilities that increase Navy long range strike capabilities and lethality for both the current and future force. In major combat operation scenarios significant use of short-range 'Direct Attack' weapons will still be required after longer range threats are neutralized.

As part of the Navy's Cruise Missile Strategy, the Department is investing in long-range Tactical Tomahawk cruise missile improvements, developing the Offensive Anti-Surface Warfare Increment 1 (Long-Range Anti-Ship Missile), and planning new starts for the Offensive Anti-Surface Warfare Increment 2 and Next Generation Land Attack Missile (NGLAW). Additional Navy investments include the suppression and destruction of enemy air defenses at longer ranges with an extended range version of the Advanced Anti-Radiation Guided Missile (AARGM-ER). Standoff area defense and strike weapon improvements are resident in the Small Diameter Bomb II and inventory sustainment of all variants of the Joint Standoff Weapon (JSOW).

The Navy's strategy encompasses the investment and sustainment of a balanced weapons portfolio including advanced long-range strike weapons, standoff area defense and strike weapons, and direct attack weapons to provide the capability and the capacity for the Navy and Marine Corps to meet campaign and contingency munitions requirements for the foreseeable future.

General DAVIS. The JDAM family of weapons will continue to be a vital part of the Marine Corps inventory due to their low cost, flexibility, and capability against a full range of targets. The Marine Corps is developing weapons in concert with the Joint services (Small Diameter Bomb (SDB) II and Joint Stand Off Weapon (JSOW) C-1) which are able to engage targets at extended ranges, through a wide range of threat and weather environments, and are net-enabled. Future engagements will require that F-35 and other emerging technologies be utilized in conjunction with a balance of high-end weapons in restrictive threat environments and lower-cost weapons like JDAM in permissive threat environments.

It is important to also consider the political will of our civilian leaders. Development of expensive long range air launched weapons reduces the requirement to penetrate sovereign air space. While near peer competitors continue to develop anti-access systems, non-escalation and the direction to remain a conventional force requires a balanced approach that provides both standoff and penetration options.

30. SENATOR MCCAIN. Do we have sufficient numbers of longer range weapons to ensure adequate combat effectiveness?

General DAVIS. Yes, based on our validated models, the Naval Munitions Requirement Process, the current inventory of High-speed Anti-Radiation Missile (HARM), Advanced Anti-Radiation Guided Missile (AARGM), and Joint Stand-Off Weapon (JSOW) C/C-1 is adequate to ensure USMC combat effectiveness. However, in the long term, as near peer competitors field increasingly more capable systems, advanced weapons with extended ranges such as the AARGM ER (IOC fiscal year 2023) in conjunction with the F-35 will be required to maintain the Joint Force's freedom of maneuver.

Admiral MANAZIR. The Department of the Navy has sufficient capacity of longer range weapons to ensure adequate combat effectiveness. Through the Naval Munitions Requirements Process (NMRP), the Navy assesses the long-range strike weapons inventory risk as low. However, as strategic competitors field weapon systems

with improved capabilities in higher numbers, the Navy will encounter increased risk to the warfighter, particularly during an extended engagement. Projected competitor threat systems are anticipated to affect the stand-off ranges of U.S. Navy launch platforms, both at sea and in the air, which may preclude the launch of legacy naval weapons from sanctuary. Naval strike fighter aircraft or Vertical Launch System (VLS) equipped ships will be driven to operate within the competitor's threat envelope in order to launch weapons against enemy targets. While the Navy will employ countermeasures and tactics to disrupt the threat, friendly forces will operate at additional risk to platform survivability.

To offset mid/long-term long-range weapon risks, the Navy has developed a Cruise Missile Strategy for 2019 and beyond. While integrating modernization and obsolescence upgrades to Tomahawk Cruise Missiles during a mid-life recertification program, the Navy intends to field the Offensive Anti Surface Weapon (OASuW) Increment 1 (Long Range Anti-Ship Missile) in 2018, the Offensive Anti Surface Weapon Increment 2 in 2024, and the Next Generation Land Attack Weapon (NGLAW) in the 2028–2030 timeframe. The Navy is also pursuing an extended-range version of the Advanced Anti-Radiation Guided Missile (AARGM–ER), which is planned to field in 2023. AARGM–ER will enable Naval Aviation forces to suppress Integrated Air Defenses with increased platform and weapon survivability.

USMC UNMANNED ROADMAP

31. SENATOR MCCAIN. Please discuss the roadmap for Marine Corps unmanned systems, and in particular L-class ship-based unmanned systems.

General DAVIS. The Marine Corps' family of unmanned systems (FoUAS) will play a key role in all USMC missions across the range of military options to include forward presence, security cooperation, counter-terrorism, crisis response, forcible entry, prolonged operations, and counter-insurgency. The family approach delivers capacity and capability to tiered echelons of command from small units (squad) to large combat formations (MEF).

The small UAS (Group 1) are organic to the ground combat element (GCE) and provide real-time battlespace situational awareness from simple man-portable systems. These systems include the RQ–21B Raven, RQ–12A Wasp and RQ–20A Puma. Vertical Take-Off and Landing (VTOL) and nano-VTOL small UAS will complement the capabilities of the current family of UAS in urban terrain and other confined environments.

The larger Group 3 UAS systems are organic to the aviation combat element (ACE). The USMC is transitioning into the RQ–21A Blackjack UAS, which provides UAS support to the Marine Expeditionary Unit, regiments, and Marine Special Operations Forces (MARSOC). The RQ–21A enhances the capabilities of Marine Expeditionary Unit (MEU) and regimental-sized units by providing a long-endurance, expeditionary, multi-mission platform that is ship-board capable. Characterized by its runway independence and iterative payload capabilities RQ–21A will enhance the MAGTF commander's battlespace awareness and influence the electromagnetic spectrum. The RQ–21A will deploy this summer with the 22nd MEU from a San-Antonio LPD–17 class ship and be resident in all CONUS based MEUs. Recognizing the need to operate with a disaggregated Amphibious Ready Group (ARG), the RQ–21A will also be integrated into the LHA amphibious ships. Additionally, VMU–2, RQ–21A, will support a MARSOC deployment in the summer of 2016. The RQ–7B Shadow remains a key component to the Marine Corps family of UAS and will support large combat formations such as a Marine Expeditionary Brigade (MEB) or Marine Expeditionary Force (MEF) from expeditionary locations ashore.

Recognizing our current recapitalization toward a more diverse, amphibious and middle-weight expeditionary force, the Marine Corps requires a UAS that is network-enabled, digitally-interoperable, and built to execute responsive, persistent, lethal, and adaptive full-spectrum operations. The MAGTF Unmanned Expeditionary (MUX) initial capabilities document (ICD) will inform a system that provides the MEF/MEB-sized MAGTF with an advanced multi-mission platform. This capability has a target IOC of 2024 and will be organic to the Marine Expeditionary Unit (MEU) ACE aboard L-class amphibious shipping, to compliment the MV–22 Osprey's operational capabilities.

MQ–25 STINGRAY (CBARS)

32. SENATOR MCCAIN. The Navy has restructured the UCLASS program to focus on aerial refueling and limited ISR. How does the Navy plan on leveraging all the work accomplished during the UCLASS program to ensure an accelerated deployment of an unmanned vehicle aboard the carrier at a reasonable cost?

Admiral GROSCLAGS. Data developed for and infrastructure planned for UCLASS will be directly leveraged by the restructured MQ-25 program and will help accelerated developmental timelines. For example, ongoing Carrier modifications to prepare Mission Control Spaces and integrate UCLASS architecture will be utilized for MQ-25; as will the Control System and Connectivity segment and the Common Control System programs currently in development. In addition, feedback from industry in response to the recently released Concept Refinement Request for Proposal will leverage previous design efforts to fully assess the tradespace of design concepts, cost, schedule, and performance attributes for the MQ-25 program.

