S. HRG. 112–80, PT. 4

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

## HEARINGS

BEFORE THE

## COMMITTEE ON ARMED SERVICES
## UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

ON

**S. 1253**

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

**PART 4**
**AIRLAND**

APRIL 5 AND MAY 24, 2011

Printed for the use of the Committee on Armed Services

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# AIRLAND

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# CONTENTS

## CHRONOLOGICAL LIST OF WITNESSES

### ARMY MODERNIZATION

APRIL 5, 2011


| | Page |
|---|---|
| Chiarelli, GEN Peter W., USA, Vice Chief of Staff of the Army; Accompanied by LTG Robert P. Lennox, USA, Deputy Chief of Staff of the Army (G–8); and LTG William N. Phillips, USA, Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Director, Acquisition Career Management | 5 |


### TACTICAL AIRCRAFT PROGRAMS

MAY 24, 2011


| | |
|---|---|
| Carlisle, Lt. Gen. Herbert J., USAF, Deputy Chief of Staff for Operations, Plans, and Requirements, U.S. Air Force | 45 |
| Robling, Lt. Gen. Terry G., USMC, Deputy Commandant for Aviation, U.S. Marine Corps; Accompanied by RADM David L. Philman, USN, Director, Warfare Integration/Senior National Representative, U.S. Navy | 51 |

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

**TUESDAY, APRIL 5, 2011**

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

## ARMY MODERNIZATION

The subcommittee met, pursuant to notice, at 2:31 p.m. in room SR–232A, Russell Senate Office Building, Senator Joseph I. Lieberman (chairman of the subcommittee) presiding.

Committee members present: Senators Lieberman, Blumenthal, Brown, and Sessions.

Majority staff member present: William K. Sutey, professional staff member.

Minority staff member present: John W. Heath, Jr., minority investigative counsel.

Staff assistants present: Hannah I. Lloyd and Brian F. Sebold.

Committee members' assistants present: Christopher Griffin, assistant to Senator Lieberman; Jeremy Bratt, assistant to Senator Blumenthal; Anthony Lazarski, assistant to Senator Inhofe; Lenwood Landrum, assistant to Senator Sessions; and Charles Prosch, assistant to Senator Brown.

### OPENING STATEMENT OF SENATOR JOSEPH I. LIEBERMAN, CHAIRMAN

Senator LIEBERMAN. The Subcommittee on Airland will come to order.

I thank everyone for being here, particularly, of course, our witnesses.

We meet today to receive testimony on Army modernization, as we do every year, before we go into the markup on the National Defense Authorization Act (NDAA).

Just by way of context, which obviously our witnesses appreciate every moment of every day, there are about 100,000 American servicemembers in Afghanistan today, and some 50,000 more of our troops are in Iraq. Others, obviously, are deployed elsewhere around the world, including in response to the tragic natural disaster in Japan; and in North Africa now, our Armed Forces have come to the aid of the people of Libya.

So, after almost 10 years of war, I must say, first, how much we appreciate both the quality and courage of our servicemembers, and how inspiring their resilience is to all of us. Even for those who don't really think about it every day, as it's our job to do; how much I know that their service and your leadership contributes not only to our security, but to the freedom that is our blessing and birthright as Americans.

Last week, I made a visit to the Bethesda Naval Medical Center and met with a 22-year-old marine from Connecticut who's recovering from really serious damage to his arm that he suffered in combat in Afghanistan. As always, I asked him if there was anything I could do for him. Of course, he said, "Sir, what I most want to do is go back to my unit in Afghanistan." Every time I've been at Walter Reed or Bethesda, I hear the same thing. It is inspiring beyond my ability to describe, and it just adds to the gratitude that we all ought to have to men and women of our military.

That brings me to Army modernization. What's Army modernization about? It's really about how we're going to make sure that these soldiers—that I've just talked about—have everything they need to do what we ask them to do for our country, and to do it in a way that protects them best.

The topics that we're going to discuss today run the gamut from the Army's programs, policies, and priorities, to the challenges concerning modernization of the fiscal year 2012 budget request and the Future Years Defense Plan (FYDP).

Given the state of the national economy and the determination of Secretary Gates to reform the business practices of the Department of Defense (DOD), the proceedings today merit particular attention and provide the opportunity for our witnesses to update the subcommittee, particularly in the context that we're living through right now, here, of the debate about the Continuing Resolution (CR) keeping the government going for the rest of the fiscal year and the various ways in which different people are dealing with the Defense budget.

There have been quite a few developments in the Army's ongoing modernization efforts over the past few years. I'd say, over the last year or 2, particularly, they have been, in my opinion, extremely positive. I want to compliment the Army's leaders, including the three of you who are before us.

General Chiarelli, I particularly want to thank you for the efforts that have been made to work through all the programmatic issues you face and to thank you for the progress that you've made toward establishing a cost-effective and stable modernization strategy.

We have begun, through your leadership, to learn from some of the mistakes that have been made, and also from some of the things that have worked.

In February of last year, Secretary of the Army McHugh directed the Under Secretary of the Army and the Vice Chief, General Chiarelli, to conduct a comprehensive review of the Army's investment strategies across the capabilities we need and expect the Army to have, a review of the Army's capability portfolios. The goal was to ensure that funds were budgeted, programmed, and obligated against valid requirements, with the results to inform some

of the hard decisions the Army will have to make during the budget cycles of the next 5 years.

From the written testimony submitted by the witnesses today, I am pleased to acknowledge that this work has identified a number of areas where we can achieve savings and eliminate redundancies. This subcommittee looks forward to hearing more about this in your oral testimony.

The top two modernization efforts identified by the Army's fiscal year 2012 budget request are the network, which will connect the various systems in applications used by the Army, and the ground combat vehicle (GCV), the replacement program for the armored fighting vehicles in the Army's heavy Brigade Combat Teams (BCT). Given the termination of the Future Combat Systems (FCS) in the Early-Infantry Brigade Combat Team (E–IBCT) effort, our subcommittee looks forward to the witnesses' discussions of the lessons that I've referred to that the Army has learned and now applied to current and future modernization efforts.

I'm very pleased, since this is the first of our subcommittee hearings this year, as we hone in on preparation of the NDAA for Fiscal Year 2012.

I'm very pleased to welcome our new ranking member of the subcommittee, Senator Scott Brown of Massachusetts, a fellow New Englander, but, unfortunately, a Red Sox fan. [Laughter.]

Senator Brown is a proud veteran of the Army National Guard (ARNG). He brings that special expertise, as well as the strength of his leadership and experience, to this subcommittee. I look forward very much to working with him in this session of Congress.

Senator Brown.

**STATEMENT OF SENATOR SCOTT P. BROWN**

Senator BROWN. Thank you, Mr. Chairman, for those kind words. I am honored to be here with you. Congratulations on your State's victory last night.

Senator LIEBERMAN. Thank you.

Senator BROWN. I watched. I had to turn down the volume, though, with all the clanks—[Laughter.]

—from the missed shots, but it was still good to see a New England team do well.

Generals, it's good to see you again. I also want to thank you for your continued service and leadership and guidance through these tough fiscal times and leading in your respective categories. Thank you.

Army modernization is a topic of considerable interest on Capitol Hill. I guess we've been forced into it sometimes. I've noticed, since I've been here, we have to be forced into doing things, versus just being a little bit more proactive. I am concerned that the Army has had inadequate models to assess how future weapons systems will perform during irregular conflicts and stability operations, and that casts doubt on the Services' justification for new platforms. It's something that I think concerns many of us.

I have plenty of questions, I'm sure that the chairman does as well. It's no secret that, between 1990 and 2010, the Army has terminated 22 major acquisitions programs, resulting in the loss of

billions of tax dollars that could have been potentially used in a better way.

However, the Army has made some recent progress in improving its acquisition oversight, led by you, sir, and we thank you for that. I know we've spoken offline a little bit about it.

The Army has rationalized its lines of efforts in major function areas; i.e., precision fires, air defense, and critical enablers, engineering support, force protection, et cetera. The analysis developed by this review process has led the Army to terminate or substantially reduce acquisition programs, like the non-line-of-sight (NLOS) launch system, the Surface Launched Advanced/Medium-Range Air-to-Air Missile (SLAMRAAM) that has underperformed, cost too much, and/or is redundant with other capabilities, and also has developed greater forethought by pulling back on the GCV request for proposals and scaling back the requirements for the program. I'm familiar with it. I visited the company that actually is involved in that process.

Both of the examples that I've discussed represent a move in the right direction. I'm certainly thankful for that, as somebody who serves and somebody who is a taxpayer, as well.

That said, I also feel that the Army has not demonstrated that it can successfully take a major acquisition program from the initial technology development phase through to the full-rate production and sustainment. Beyond controlling requirements, the Army must also show proficiency in cost estimation, budgeting, program management, and test evaluation. In recent history, from the cancellation of the E–IBCT increments to the decision to not field the Medium Extended Air Defense System (MEADS), suggests that the Army still has a long way to go.

In sharp contrast to the previous modernization attempts, the Army, going forward, will be significantly tested, because of the resource constraints that we're now faced with. First and foremost, the Army must develop and devote resources necessary to win the fights. As we step back from Iraq, the equipment returning from Iraq will need to be reset or recapitalized. Being a member of the ARNG, I know firsthand what was happening, not only in the Active Army, but in the Reserve and Guard units as well. We'll have to find efficiencies and outright cuts to support higher priorities inside DOD, and out. I know that's something that you're greatly concerned about.

During his speech at West Point, Secretary Gates warned that the Army will have difficulty justifying the cost of large heavy formations in future budgets, and the likelihood of another large land campaign, like Iraq or Afghanistan, appeared, at least in his view, to be dim.

So, facing that daunting challenge, I know that you're gearing up for the fight and able to tailor the force and also provide the tools and resources for our men and women so they can do their job and, ultimately, come home safe. That's the goal. Do the job, do it right, do it well, do it honorably, and then come home safe to your families. Your visions for the roles of the missions of the Army will be undertaken to really dictate that future. I know it's not an easy job.

In closing, before we get to our questions, I just want to say that I fought to get on this committee, and I'm honored to be here. I

look forward to playing an active and, hopefully, a thoughtful role in that regard.

Thank you.

Senator LIEBERMAN. Thanks very much, Senator Brown.

Let me just give a brief introduction of the three witnesses, and then we'll begin.

General Chiarelli is, of course, the Vice Chief of Staff of the Army. This is his third year serving in that position and, essentially, running the day-to-day administration of the Army.

General, I really want to thank you for your leadership across a remarkable diversity of issue areas. We're here to talk about Army modernization. I know you've really thrown yourself into that, with good effect. Of course, not so long ago, you were focused on a very different kind of problem, which is suicide prevention within the Army. I'm pleased that that has shown some good effect, as well.

So, we look forward to hearing from you first, then we'll go to Lieutenant General Robert Lennox, Deputy Chief of Staff for the Army, G–8, responsible for oversight and recommendations regarding requirements, priorities, and allocation of resources, and finally, Lieutenant General William Phillips, Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Director, Acquisition Career Management.

He has the longest title of any of the three today. [Laughter.]

As his title indicates, he provides oversight and recommendations in the areas of research, development, and acquisition for Army programs. I can't thank you enough for joining us today.

General Chiarelli, please proceed.

**STATEMENT OF GEN PETER W. CHIARELLI, USA, VICE CHIEF OF STAFF OF THE ARMY; ACCOMPANIED BY LTG ROBERT P. LENNOX, USA, DEPUTY CHIEF OF STAFF OF THE ARMY (G–8); AND LTG WILLIAM N. PHILLIPS, USA, PRINCIPAL MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY FOR ACQUISITION, LOGISTICS, AND TECHNOLOGY, AND DIRECTOR, ACQUISITION CAREER MANAGEMENT**

General CHIARELLI. Senator Lieberman, Ranking Member Brown, distinguished members of the subcommittee, I thank you for the opportunity to appear before you today to discuss the fiscal year 2012 budget request as it pertains to Army acquisition and modernization.

Since you, sir, have introduced both General Lennox and General Phillips, I will not repeat those kind introductions.

As you are all aware, our Nation's military continues to face a broad array of complex challenges as we approach the start of the second decade of a long struggle against a global extremist network. Today's uncertain and dynamic strategic and operational environments, coupled with current political and fiscal realities and the rapid pace of technology development, have made our outdated Cold War-era strategies no longer supportable. To be successful now and into the future, we require a strategy that takes a more focused and affordable approach to equipping our force.

Our evolved strategy, aligned with the Army Force Generation (ARFORGEN) Model, will allow us to incorporate lessons learned,

improve or maintain core capabilities, incrementally modernize to deliver new and improved capabilities, and integrate portfolios to align our equipment modernization communities, thereby enabling us to develop and field a versatile and affordable mix of equipment, ensuring our soldiers and units have the resources and capabilities they need to be successful across the full range of military operations today and into the future.

As part of the Army's modernization plan for 2012, we have prioritized our materiel programs to focus on capabilities which give our soldiers and units the decisive edge in full-spectrum operations. While considering cost and size, the emphasis is on capabilities critical to Army success and our ability to network the force, deter and defeat hybrid threats, and protect and empower soldiers.

I've talked about the importance of the network with members of this subcommittee on numerous occasions. I believe it represents the centerpiece of Army modernization. Today, I'm pleased to report we're making significant progress. The Army is past talking about concepts. We are making the network happen, delivering needed capability down range as we speak. Certainly, there's much more work left to be done, but I am confident we're headed in the right direction. Much of what we're trying to accomplish, in terms of improving the pace of Army acquisition, is derived from what we learned about the network and about the nature of rapid evolving technologies. However, the principles have application across the entire modernization program.

While the network represents our number one priority, running a close second is the GCV. We must first field this full-spectrum operations-capable vehicle within 7 years in order to address what is a critical capability gap across our formations. I am prepared to discuss in greater detail the specifics of the network, the GCV, and other fiscal year 2012 priority programs, as outlined in my statement for the record, during the questions and answers session.

The advanced technologies and added capabilities we are pursuing are vital to the success of our force. That said, we recognize that modernizing the force is not solely about buying newer, better equipment; it also has to do with spending money wisely and finding efficiencies wherever possible. I assure the members of this subcommittee that I and the Army's other senior leaders remain diligent in our efforts to be good stewards of scarce taxpayers' dollars.

Over the past year, through our ongoing capability portfolio review (CPR) process, we've identified a number of areas where we were able to make changes and eliminate redundancies or outdated requirements. In fact, as part of DOD's reform agenda, the Army has proposed $29 billion in savings over the next 5 years. We will not stop there. We will continue to pursue further efficiencies in the days ahead.

In the meantime, I respectfully request your support of the Army's proposed research, development, and acquisition budget of $31.8 billion for fiscal year 2012. We believe that this request allocates resources appropriately between fielding advanced technologies in support of soldiers currently in the fight and developing new technologies for the future.

Mr. Chairman, members of the subcommittee, I thank you again for your continued generous support and demonstrated commitment to the outstanding men and women of the Army and their families. We look forward to your questions.

[The prepared statement of General Chiarelli follows:]

PREPARED STATEMENT BY GEN PETER W. CHIARELLI, USA

INTRODUCTION

Chairman Lieberman, Senator Brown, distinguished members of the Subcommittee on Airland, I thank you for this opportunity to discuss the fiscal year 2012 budget request as it pertains to Army Acquisition and Modernization. I am pleased to represent U.S. Army leadership, members of the Army Acquisition workforce, and the more than 1 million courageous men and women in uniform who have deployed to combat over the past 9-plus years, and who have relied on us to provide them with world-class weapon systems and equipment to ensure mission success. On behalf of our Secretary, the Honorable John McHugh and our Chief of Staff, General George Casey, I would like to take this opportunity to thank the members of this committee for your steadfast support and shared commitment in this endeavor.

OVERVIEW OF ARMY MODERNIZATION

America's Army continues to face a broad array of complex challenges as the Nation approaches the start of the second decade of a long-term struggle against a global extremist network. The Army's responsibility remains dual-focused: we must achieve success in Iraq and Afghanistan, while also ensuring we are prepared for unexpected contingencies or future national security challenges across the full spectrum of operations. Recognizing that this era of persistent conflict, as it is characterized by General Casey, may very well require frequent and continuous commitment by the United States Army and our sister Services.

For the latter half of the last century, the U.S. Army faced a relatively certain future characterized by straightforward strategic and operational environments; obvious enemies; clearly identifiable threats to vital national interests; and adequate resources required to man and equip the Force. Under these circumstances, a tiered readiness approach and an equipping strategy that made large purchasing commitments based on long-range goals made sense. Today's uncertain, dynamic strategic and operational environments, current political and fiscal realities, and the rapid pace of technology development have made these Cold War-era strategies no longer supportable.

We recognize the Army's strategy to equip the force in the 21st century must change to meet the challenges of this new strategic, operational, and fiscal environment. No longer can the Army pursue a transformational equipping strategy focused on "game-changing", "leap-ahead" technologies intended to revolutionize military operations and create conditions that force opponents to fight the way we want them to fight as we did at the turn of the century. To be successful in current and future environments, we require a 21st century strategy that takes a balanced and affordable approach to equipping our Force. This strategy, aligned with the Army Force Generation (ARFORGEN) model, will allow us to improve or maintain core capabilities; incrementally modernize to deliver new and improved capabilities; and integrate portfolios to align our equipment modernization communities, thereby enabling us to develop and field a versatile and affordable mix of equipment to allow soldiers and units to succeed in full spectrum operations today and tomorrow to maintain our decisive advantage over any enemy we face.

ARMY FORCE GENERATION EQUIPPING

ARFORGEN Equipping synchronizes the distribution of equipment to units in accordance with the ARFORGEN model. It focuses on providing capabilities required for anticipated missions to soldiers in sufficient time and in sufficient quantities to enable them to prepare for those missions. ARFORGEN equipping allows us to tailor capabilities and resources to relatively certain near-term mission requirements without committing to extended production runs or maintenance programs for equipment that may be outdated or no longer relevant in future increments.

INCREMENTAL MODERNIZATION

Incremental Modernization enables us to deliver new and improved capabilities to the Force by leveraging mature technologies, shortening development times, planning growth potential, and integrating increments of those capabilities to give us the greatest advantage in the future while hedging against uncertainty. Incremental modernization does not neglect existing equipment. In addition to expanding or improving capability by developing and fielding new technologies, the Army will continue to upgrade, improve, and recapitalize existing capabilities while simultaneously divesting those capabilities deemed redundant or no longer required. By modernizing in an incremental manner, instead of purchasing equipment in quantities large enough to equip the entire force, the Army is able to provide the most relevant versions of capabilities available to units prior to deployment; then equip subsequent units in the "Equip" and "Train/Ready" phases of ARFORGEN with newer and more relevant versions based on the capability provided and cost.

INTEGRATED PORTFOLIOS

Integrated Portfolios, which the Army is still developing, will better align equipping stakeholders to achieve balance within and across capabilities required to execute the Army's Operating Concept. Equipment portfolios support continuous assessment across capability development, requirements, resourcing, acquisition, distribution, use, and divestiture. Each portfolio will have a strategy developed to provide context, outline objectives, methods, metrics and values against which to judge success, a description of required resources to execute the strategy over the life of the program, and a discussion of risk including operational impacts if portfolio capabilities are not met. Implementing these strategies will enable portfolio stakeholders to better assess current and proposed capabilities against requirements; fuse and align the modernization community to ensure integration across the separate requirements, acquisition, sustainment, and resourcing communities; and do so in an affordable manner. Continued Army examination and adjustment of our business processes will help us to meet equipping balance and affordability requirements.

The 2010 Army Modernization Strategy (AMS), published in April 2010, matched our overall modernization strategy to our strategic requirements. It described the ways and means to develop and field a versatile and affordable mix of the best equipment available to better enable soldiers to succeed in current and future operational environments. As evolved, the Army Modernization Plan 2012 (ModPlan12) envisions action along four lines of effort:

- Modernize: Develop and acquire new equipment or improve/upgrade existing equipment to meet identified capability gaps and to maintain dominance in core capabilities.
- Sustain: Extend the useful life of existing equipment to close or avoid creating capability gaps through another ARFORGEN cycle and by divesting equipment providing little value.
- Mitigate: Procure mission-specific equipment for immediate capability needs.
- Field: Provide equipment to soldiers and units in accordance with Army priorities and the ARFORGEN model to enable training, preparation, and employment for mission success.

The ModPlan12, which we anticipate being published this spring, supports the submission of the President's Budget Request for fiscal year 2012 Research, Development, and Acquisition funds and presents an overview of the Army's broader modernization strategy. The ModPlan12 incorporates lessons learned from almost a decade of conflict and provides details of what is required for developing, fielding and sustaining equipment in an affordable, incremental manner to ensure our soldiers and units have the capabilities they need to be successful across the full-range of military operations today and into the future.

As our Nation continues to work its way back from a serious economic downturn and military spending faces greater scrutiny and constraint, the Army continues our ongoing efforts to restore balance to the Force, while not losing the momentum gained over the past decade. Recognizing that to do this the Army must change the way it develops and delivers the capabilities required to both win current wars while simultaneously preparing for future contingencies.

The Army is better equipped now than ever before; and, we must maintain our combat edge while we work to reconstitute and rebalance the Force, recognizing that even after the eventual drawdown of Forces in Iraq and Afghanistan the Army's longstanding National Security Requirements will remain.

For nearly a decade, the Army has been operating at a tremendous and persistent pace. The demand for forces stressed our supply during most of this period. The result was an Army out of balance, fully committed with little strategic flexibility to respond to other contingencies. The Army is seeing significant progress in our efforts to rebalance the Force, and with the continued support of Congress, we are funded to largely meet our goals by the end of fiscal year 2012. We have done this through successful implementation of a 4-year plan centered on our imperatives. We continue to prepare forces for success in the current conflicts; reset returning units; and transform the Army, adapting to meet the demands of the second decade of the 21st century.

## CAPABILITY PORTFOLIO REVIEW PROCESS

We're all aware of the significant challenges we're facing in light of current fiscal constraints. We recognize we must reform our budget practices and assumptions and gain efficiencies wherever possible. I'm confident we're on the right path to do so.

Last February, Secretary of the Army McHugh directed the Under Secretary of the Army, Dr. Joseph Westphal and me to implement a Capability Portfolio Review (CPR) process for a 1-year period. Our goal in conducting these reviews is twofold: first, to ensure that funds are programmed, budgeted and executed against validated requirements and cost- and risk-informed alternatives, with the near term objective to inform POM 13–17; second, we want to revalidate portfolios through an examination of combatant commanders operational needs, wartime lessons learned, the Army Force Generation model, emerging technologies, affordability, interest, and opportunity.

Through the CPR process, in less than a year, we've identified a number of areas where we're able to make changes and eliminate redundancies or outdated requirements. In fact, as part of the Department of Defense's reform agenda, the Army has proposed $29 billion in savings over the next 5 years. The Army, per Secretary Gates' directive, will be allowed to reinvest this money in high priority capabilities and programs.

The CPR process represents the Army's most recent efforts to manage the requirements validation and revalidation processes, as well as the resourcing process. The Army is in the process of institutionalizing these reviews in order to ensure our resources are expended on our highest priority capabilities and unnecessary redundancies are eliminated, all while clearly identifying risks.

## ARMY PRIORITY PROGRAMS FOR MODERNIZATION

The Army has prioritized its materiel programs to focus on capabilities which give our soldiers and units the decisive edge in full spectrum operations. While considering program cost and size, the emphasis is on capabilities critical to Army success and our ability to Network the Force; Deter and Defeat Hybrid Threats; and Protect and Empower Soldiers.

This next section outlines the Army's critical fiscal year 2012 Priority Programs, providing an overview of the capability each program will provide our soldiers, as well as a current programmatic status.

## THE NETWORK

The Network represents the centerpiece of Army Modernization. Ultimately, it will connect leaders and soldiers at all levels, at every echelon of command, in any formation, and across the entire team—with the right information quickly and seamlessly. In doing so, it will make our various formations more lethal, faster, and survivable. It will literally redefine how we fight.

To work effectively, the Network must be a single, affordable, cost-effective network that will allow any system or application—whether developed by the Army, our Sister Services, allies, or some other agency—to 'plug and play' using a common operating environment that ensures the systems and applications are interoperable and user-friendly from the start.

Today, the Army is past talking concepts. We are making the Network happen, delivering needed capability down range as we speak. That said, there is still much to be done. In particular, we are very focused on doing everything we can to get more network capability into theater—faster. The key to doing so is leveraging mature commercial technologies through integrated network 'capability sets' aligned against the ARFORGEN model. Instead of buying the full acquisition objective upfront, the incremental modernization strategy will enable the Army to purchase an initial 'capability set' and then subsequent sets every 2 years that reflect changes in technology.

The Network represents a critical factor in almost every acquisition decision the Army will make now and in the future. While the Network represents our number one priority, running a close second is the Ground Combat Vehicle or "GCV." Before addressing the key individual components of the Network, I will change course briefly to discuss this most important Army modernization program.

GROUND COMBAT VEHICLE

The Army's Combat Vehicle Modernization Strategy represents a holistic approach to the development of the Ground Combat Vehicle; replacement of the M113 Family of Vehicles; and the incremental modernization of the Bradley, Abrams, Paladin, and Stryker. Modernization imperatives across the fleet include improved protection, mobility and sustainment, mitigation of existing Space, Weight and Power (SWaP) shortfalls and Network integration. The GCV will host the Network. As such, it must have enough SWaP to not only host the current version of the Network, but also future versions that may require significantly more power.

The Army re-released the Request for Proposals (RFP) for the GCV on 30 November. Industry proposals were received back on 21 January 2011, and we anticipate contract awards in the third quarter of fiscal year 2011. The RFP focuses on the "Big 4" imperatives: soldier protection; soldier capacity (squad plus crew); full spectrum; and timing (7 years to first production vehicle). We made it very clear in the RFP that we expect industry to leverage existing mature technologies. We do not want a vehicle that is dependent upon immature or emerging technologies because they induce risk we cannot afford. Timing is a key and critical imperative; and, our capability gap analysis shows we need an FSO-capable vehicle now. We cannot wait 10–12 years for the traditional requirements-based acquisition system to produce this vehicle. We are at war; and, our soldiers need this capability down range as soon as absolutely possible. Our initial goal was 5 years. However, after conducting a full analysis, the Acquisition Corps determined that to deliver a system meeting all the requirements in the capability development document under DOD 5000.2, will require a minimum of 7 years.

We must meet this self-imposed timeline and field an FSO-capable vehicle within 7 years in order to address what is a critical capability gap across our formations. While individual units maintain their traditional construct in accordance with MTOE in CONUS, when they deploy their formations end up looking much the same, although they may perform very different missions. Units frequently reorganize and 'fall in on' theater provided equipment (TPE) not traditionally assigned to their formations. This practice is necessary in order for our soldiers to be safe and effective in today's FSO environments. The reality is in theater there are no "Heavy" or "Light" brigades in the traditional sense. Stryker brigades are also modified to enhance their capability down range. Today, our light infantry soldiers are traveling around in Mine Resistant Ambush Protected (MRAP) vehicles. Meanwhile, only the marines and our allies (specifically Canadian and British forces) have tanks employed in Afghanistan. The U.S. Army relies almost exclusively on Strykers, MRAPs and MRAP–ATVs. Unfortunately, none of these vehicles represent the ideal solution for all contingencies.

We must build a vehicle that is able to adapt appropriately along the full spectrum of conflict dependent upon the threat level and the mission. The GCV represents this critically-needed capability. Modular armor will allow commanders the option to add or adjust vehicle protection armor based on the threat environment. The GCV will be designed with the capacity for SWaP growth to incorporate future technologies as they mature. Key among them are those technologies relevant to individual components of the Network. I will address several of them in greater detail below.

JOINT TACTICAL RADIO SYSTEM

Joint Tactical Radio System (JTRS) is the Services' future deployable mobile communications family of radios. Its primary components are a Wideband Data Radio, Handheld Manpack Small Form Fit (HMS) Manpack (MP) and Rifleman Radio. JTRS uses Internet Protocol-based technology to provide network routing; embedded information assurance; and, with multiple channels, provide simultaneous exchange of voice, data, and video. The Wideband Data Radio component supports legacy waveforms (Single Channel Ground and Airborne Radio System (SINCGARS), Enhanced Position Location Reporting System (EPLRS), Ultra-High Frequency Satellite Communications (UHF SATCOM) and High Frequency (HF)) for backward compatibility with current force radios and leverages the Wideband Networking Waveform (WNW) and Soldier Radio Waveform (SRW) to meet tactical networking requirements.

HMS Manpack and Rifleman Radio are the primary JTRS capability for battalion and below tactical operations. Both support the SRW waveform capability. HMS MP is a two-channel multiband, multimode communications system that supports not only SRW, but interoperates with legacy waveforms as part of its Increment 1 delivery (SINCGARS, UHF SATCOM). The Rifleman Radio is the dismounted soldier capability that utilizes the SRW waveform to connect the soldier to the leader. The system provides voice and individual location information, primarily serves the maneuver team formation, and provides a complimentary capability to the Nett Warrior-enabled Leader.

Lastly, we believe that the strategy we've developed for the procurement of these systems, along with the funding we've applied and intend to apply over the program, demonstrate our commitment to an open, competitive procurement process.

WARFIGHTER INFORMATION NETWORK-TACTICAL INCREMENT 1 AND 2

Warfighter Information Network-Tactical (WIN–T) provides the broadband backbone communications for the tactical Army. WIN–T Increment 1 (formerly Joint Network Node) began fielding in 2004 to provide a satellite based Internet Protocol (IP) network down to battalion level. WIN–T Increment 2 begins fielding in fiscal year 2012 to provide an initial On the Move (OTM) capability, extending down to company level for 65 select units, with larger throughput to battalion, brigade and division headquarters. WIN–T Increment 1 fields to 31 units in fiscal year 2011 and the remaining 25 units in fiscal year 2012. Increment 1 continues to upgrade the fleet to Ka band, exploiting the Wideband Global Satellite constellation rather than leased Ku band. Upgrades to Increment 1b occur in fiscal year 2011–2016 for interoperability with later WIN–T increment and strategic networks. WIN–T Increment 2 procures eight BCTs/one Division HQ and the training base in fiscal year 2011 and upgrades three Fixed Regional Hub nodes to complete LRIP as it prepares for IOTE in fiscal year 2012. Procurement of nine BCTs/two Division HQs is planned for fiscal year 2012. Plans are being further refined to cascade WIN–T Increment 1 equipment, displaced by WIN–T Increment 2 fielding, to meet emerging requirements, including Homeland Security missions, force structure changes, and requirements not addressed in the initial procurement. WIN–T Increment 1 is post Milestone C. Full rate production status decision is pending Beyond Low Rate Initial Production (LRIP) report and Information Support Plan, followed by a Defense Acquisition Executive (DAE) decision. WIN–T Increment 2 reached Milestone C in February 2010, and goes to Initial Operational test and Evaluation (IOTE) in the third quarter of fiscal year 2011.

JOINT BATTLE COMMAND-PLATFORMS

Joint Battle Command-Platforms (JBC–P) is a foundation for achieving information interoperability between Joint warfighting elements on current and future battlefields. As the next generation of Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT) technology, it will be the principal command and control system for the Army and Marine Corps at the brigade-and-below level, providing users access to the tactical information necessary to achieve information dominance on the battlefield. JBC–P consists of computer hardware and software integrated into tactical vehicles, aircraft, and provided to dismounted forces. The capability uses a product line approach to software development to save cost and promote a common architecture. Components include a core software module that provides common functionality required of all platforms and tailored software modules with unique capabilities for dismounted, vehicle, logistics, aviation, and command post elements. JBC–P software is designed for use over the Blue Force Tracking II transceiver and associated satellite networks, as well as ground-based networks. The new transceiver allows for a 10-fold increase in data throughput. Other key enhancements include a redesigned, intuitive user interface and faster mapping software to quickly process and display critical graphics. It will be the primary provider and user of digital battle command and situational awareness across the spectrum of operations and will allow warfighters to more effectively and consistently communicate critical information over networks that connect the most distant and remote locations.

DISTRIBUTED COMMON GROUND SYSTEM-ARMY

Distributed Common Ground System-Army (DCGS–A) is the Army's component of the DOD Distributed Common Ground/Surface System family of systems. DCGS–A provides commanders from tactical company-level to Army Service Component Command (ASCC)-level access to the Defense Intelligence Information Enterprise, and the tools required to leverage the entire National, Joint, Tactical, and Coalition In-

telligence, Surveillance, and Reconnaissance (ISR) community to satisfy their information requirements. The Army currently revising the DCGS–A acquisition strategy to comply with DOD's revised Information Technology Acquisition Process. This will ensure the program continues to develop enhanced analytic capabilities by exploiting emerging technologies and fielding these capabilities to the Force IAW the ARFORGEN process. The Army has incrementally fielded DCGS–A capabilities to deploying forces beginning in 2006. The program will reach Initial Operating Capability with the Army's first "cloud" architecture in Afghanistan in March 2011 and the Full Deployment Decision in the second quarter of fiscal year 2012.

BRIGADE COMBAT TEAM MODERNIZATION

The Army currently employs three Brigade Combat Team (BCT) formations—Infantry, Heavy and Stryker. Each type of formation brings unique capabilities to the battlefield and employs different equipment, which in turn requires unique modernization methodologies. The following seven items describe the main efforts in modernizing the Infantry BCT, Heavy BCT and Stryker BCT respectively.

ENHANCED-INFANTRY BRIGADE COMBAT TEAM INCREMENT 1

The Enhanced-Infantry Brigade Combat Team (E–IBCT) program was developed as an effort to accelerate iterative fielding of key network and sensor capabilities. Following an in-depth assessment of the E–IBCT program, the Army decided to continue Low-Rate Initial Production of two elements: the Small Unmanned Ground Vehicle (SUGV) and Network Integration Kit (NIK), and will transition the procurement of these systems to the respective Program Executive Offices. E–IBCT will be concluded as a program of record at the end of Low Rate Initial Production, a decision that carefully prioritizes military utility with system performance and affordability in order to best meet the immediate needs of our warfighters. Phasing out the E–IBCT program supports the Army effort to collapse redundant and competing network strategies into a single path forward with programs of record that provide more capability, quicker, and to more formations. E–IBCT investment provided the infrastructure that will enable the Army to grow the tactical network capability, while providing an opportunity for both large and small scale industry to support the Army's tactical network strategy. The NIK is a necessary bridge solution allowing the Army to continue evaluation and development of incorporated network technologies. Fielding of an additional brigade of NIK vehicles will allow the Army to continue to evaluate BCT communications capabilities and solutions. The E–IBCT program derived valuable information from warfighter evaluations regarding what network capabilities soldiers need and how they will be used in today's dynamic, evolving combat environment. The Army will retain the Army Evaluation Task Force, now a full operational brigade, located at Fort Bliss, Texas, with the mission of validating the operational relevancy of solutions and developing doctrine prior to fielding technologies to deploying forces to ensure proven capabilities reach the hands of our soldiers.

Our path forward supports fielding of a robust networking capability package to Afghanistan in fiscal year 2013. For the time being we are focused on replicating the deployed network and troubleshooting integration issues as we continue to fill capability gaps in theater with Commercial Off the Shelf (COTS) systems and ISR capabilities.

While the Network represents the bedrock of Army modernization; the reality is much of what we are trying to accomplish, in terms of improving the pace of Army acquisition to leverage both military development and private sector technologies, has application across the entire modernization program. Earlier I discussed the Ground Combat Vehicle (GCV). Below I will address several other relevant elements of our overall modernization effort.

PALADIN INTEGRATED MANAGEMENT

Paladin Integrated Management (PIM) is the Army's fire support modernization effort for the Paladin and Field Artillery Ammunition Supply Vehicle (FAASV) platforms to address obsolescence and sustainment through the integration of Bradley and Future Combat Systems (FCS) common components resulting in an upgraded firing platform. PIM replaces the current M109A6 Paladin and M992A2 FAASV with a more robust platform incorporating Bradley common drive train and suspension components. Due to the Secretary of Defense's decision to cancel the FCS Manned Ground Vehicle's Non-Line of Sight-Cannon, the PIM program is now a priority modernization effort. The program has completed contractor testing at Government facilities, and is expected to be designated as an Acquisition Category I Major Defense Acquisition Program.

STRYKER (DOUBLE-V HULL)

In January 2010, in response to an Operational Needs Statement (ONS), the Army decided to pull forward the Double-V Hull (DVH) existing technology from the Stryker Modernization program to increase the Stryker's underbelly protection from Improvised Explosive Devices. To meet the goal of providing 150 Stryker DVHs in Afghanistan by June 2011, the Army is conducting concurrent testing and production. Live fire data from December 2010 testing, as well as initial Reliability, Availability and Maintainability (RAM) testing data, informed a 2 March 2011 Configuration Steering Board (CSB) that recommended to keep the initiative moving forward. While we are currently engaged in producing 450 DVH to support combat operations in Afghanistan, the Army has not made a decision regarding incorporating the DVH into future Stryker production, and we have just begun to assess the potential to retrofit DVH onto existing Stryker vehicles.

M1 ABRAMS RECAPITALIZATION

The Abrams program will complete the Army's modularity objectives in fiscal year 2014. The current M1A2SEPv2 production contract ends in fiscal year 2012, which will yield the last fielding in fiscal year 2014. The current M1A1AIM SA production contract ends in fiscal year 2011, which will also yield the last fielding in fiscal year 2014. These procurements will allow the Army to reach its current Army Acquisition Objective of 1,547 M1A2 SEPv2 and 791 M1A1AIM SA. The Abrams recapitalization (RECAP) for the M1A2SEPv2 is anticipated to begin in fiscal year 2016 to address the average age of the Abrams fleet and insert applicable upgrades to minimize future obsolescence and sustainment issues. The following capabilities are under consideration to be addressed during RECAP: Power Generation and Distribution (Battery Monitoring System, 1000AMP Alternator and Slip Ring), Gun Turret Drives, Improved CITV, Auxiliary Power Unit, Special Armor Package installation, and integration of improvised explosive device Jammer/CREW 3.

M2 BRADLEY RECAPITALIZATION

The GCV represents the Army's planned replacement for the Infantry Fighting Vehicle variant of the Bradley. However, the Bradley is still expected to be employed as an important part of our vehicle fleet for the foreseeable future. Therefore, some recapitalization will be required to maintain the vehicle's relevancy. The Bradley program is expected to achieve the Army's modularity, two-variant fleet objectives by fiscal year 2014. The Army has not yet finalized its plans to recapitalize the Bradley fleet, as the average Bradley fleet age even by fiscal year 2013 will be less than 6 years. However, such a modernization plan would likely address shortcomings in its size, weight, power and cooling (SWaP–C) thresholds in order to increase protection, recover mobility and allow integration of the emerging network. It is possible the re-purposed Bradley could also be used as a replacement for some variants of the M113.

BLACKHAWK (UH–60 FAMILY)

The UH–60 Blackhawk supports the Army's air mobility doctrine for employment of land forces in the 21st century. The Black Hawk is used in the performance of the Air Assault, General Support, and Aeromedical Evacuation (MEDEVAC) missions. The Army is requesting $1.5 billion in fiscal year 2012 funding for the Black Hawk Multi Year Program. The funding allows the Army to procure 47 each UH–60M aircraft and 24 each HH–60M (MEDEVAC) aircraft. Fiscal year 2012 is the first year of a 5 year Multi-Year/Multi-Service VIII Contract.

APACHE BLOCK III (AH–64D BLOCK III)

The Apache Block III Modernization is an incremental integration of block modifications. The Block III provides new capabilities for the Longbow Apache to transition to the Future Modular Force, increase survivability and reduce the logistics footprint. The Army is requesting $800 million in fiscal year 2012 funding for the Apache Block III program. We remain on schedule for Apache Block III First Unit Equipped in fiscal year 2013.

KIOWA WARRIOR

The Army requires a next generation capability to satisfy its armed aerial scout attack, reconnaissance and security mission requirements within the current and future combat environments. The initial fleet of Kiowa Warriors (KW) was fielded in the late 1960s as OH–58As or OH–58Cs. Today, the average KW in the U.S. Army's

fleet is 40 years old. The demand on this aircraft has been especially high over the course of the wars in Iraq and Afghanistan. The theater cumulative average is 75 hours per aircraft per month with spikes as high as 110 hours per aircraft per month. In April of 2009, the Secretary of the Army approved a strategy to reinvest in the OH–58D KW helicopter to address obsolescence and sustainment until a viable replacement is procured. The fully funded Cockpit and Sensor Upgrade Program (CASUP) addresses system and armament obsolescence, aircrew survivability and overall aircraft weight to improve the helicopter's performance and update its Aircraft Mission-Design Series (MDS) to OH–58F. The CASUP is not a Service Life Extension Program (SLEP) and does not zero time the airframes. First Unit Equipped for the OH–58F KW helicopter is forecasted for fiscal year 2015. The CASUP is post-Milestone B, and has entered the Engineering and Manufacturing Development (EMD) phase of the program.

ARMED AERIAL SCOUT

The Army is seeking a next generation capability to satisfy its armed reconnaissance mission requirements in current and future combat environments. The intent of the Armed Aerial Scout program is to find a material solution to replace the current fleet of OH–58D Kiowa Warrior helicopters. On July 28, 2009, the Defense Acquisition Executive (DAE) approved a Material Development Decision (MDD) initiating the Armed Aerial Scout (AAS) Program. The DAE directed a comprehensive Analysis of Alternatives (AoA) to determine the appropriate materiel solution(s) to fill the capability gaps and meet Army requirements. Emerging study results are being briefed to TRADOC and the Army Staff in March 2011, with the final Senior Advisory Group briefing to OSD to follow in April. The Armed Aerial Scout AoA Study Report is expected to be released in May 2011.

SMALL ARMS PROCUREMENT

Three notable small arms acquisition efforts are underway leading into fiscal year 2012. First, the Army is holding a full and open Individual Carbine Competition in order to meet congressional intent to determine the best possible carbine for adoption by the Army. The purpose of this effort, which begins in fiscal year 2011, is to ensure the U.S. Army continues to enjoy a direct fire small arms overmatch into the foreseeable future. Second, the Army will also continue to improve its M4 Carbine Fleet with the following enhancements: (a) Changing to a heavy barrel to increase the sustained rate of fire, (b) Switching to a fully automatic trigger and selector switch to make the trigger pull more consistent, and (c) Adding ambidextrous controls to improve ergonomics and handling characteristics. Lastly, the continued development and procurement of the Counterdefilade Target Engagement Weapon—a revolutionary smart, direct-fire, airburst capability has been deployed to Afghanistan on a small scale as part of a limited user evaluation. This weapon demonstrated new precision engagement capabilities during this test in actual combat operations and was particularly effective in rapidly suppressing enemy machineguns and snipers.

TACTICAL WHEELED VEHICLE STRATEGY

The Army's current tactical wheeled vehicle strategy has four primary tenets. First, we are studying how best to reduce the TWV fleet by approximately 15 percent, in order to shape the fleet size and mix to ensure long-term affordability. This is necessary in part to accommodate integration of the MRAP vehicles into the fleet. Second, we will continue to increase the capability of our current fleet by procuring and recapitalizing armor-capable vehicles and armor kits to improve crew protection. Third, we will emphasize the recapitalization of vehicles to extend service life and improve capabilities at a cost savings over new procurement. Fourth, we will continue the development of the Joint Light Tactical Vehicle while leveraging advancements in that program for potential approaches to improve existing HMMWV crew protection.

CLOSING

In support of Army Acquisition and Modernization, the Army has submitted a Research, Development, and Acquisition budget request of $31.8 billion for fiscal year 2012. We believe the proposed budget allocates resources appropriately between fielding advanced technologies in support of soldiers currently in the fight and developing new technologies for the future. We are confident it will enable us to meet our intent to develop, field, and sustain equipment in an affordable, incremental

manner to ensure our soldiers and units have the capabilities they need to succeed across the full spectrum of operations in this era of persistent conflict.

These continue to be challenging times for our Nation and for our military. That said, I assure the members of this committee—your Army's senior leaders remain focused and working hard to address current challenges, while determining the needs of the Force for the future.

Mr. Chairman, members of the subcommittee, I thank you again for your steadfast and generous support of the outstanding men and women of the U.S. Army, Army civilians, and their families. I look forward to your questions.

Senator LIEBERMAN. Thank you, General.

General Lennox?

General LENNOX. Sir, no opening statement. Thank you for the opportunity.

Senator LIEBERMAN. General Phillips?

General PHILLIPS. Sir, nothing further to add. Thank you.

Senator LIEBERMAN. Good enough. I'm glad you're here to participate in the answering of the questions.

Incidentally, of course, we'll enter all your statements in full in the record of this hearing.

General Chiarelli, let me begin with you.

I know you've worked with Under Secretary of the Army Westphal through this subjective and detailed series of CPRs that, as I've observed them and their results, have gone a long way toward rationalizing and stabilizing the Army's modernization strategy and programs.

But, let me ask you a few questions, by way of context. Senator Brown referred to some numbers, and I believe they may come from the study done by former Assistant Secretary of the Army Decker and retired Army General Wagner that found that, since 2004, the Army has spent, annually, between $3.3 billion and $3.8 billion on weapons programs that have been canceled. I want to invite your response, overall, to the Decker-Wagner report and its critique. If you would, put your work on the CPR in the context of the criticisms in that report.

General CHIARELLI. Senator, no one is proud of those numbers. Those numbers represent canceled programs, but I will tell you, in many cases, we've seen technologies from those programs. It sounds counterintuitive to say there's a right way and a wrong way to cancel a program. But the best way to do it is, when you realize that the requirement is no longer valuable, to harvest as many of those technologies as you can so they can be used later on.

I'd give you an example of one, in particular. One of the FCS manned ground vehicles, you remember, was the NLOS cannon.

Senator LIEBERMAN. Right.

General CHIARELLI. We've harvested many of the technologies off of that canceled program and integrated them into the Paladin Integrated Management (PIM) program. I think that shows that, if you do this properly, when you have what is an unsatisfactory situation of having to cancel a program, there are technologies and dollars that are saved that can be integrated into new systems.

We're doing the same thing with SLAMRAAM. You mentioned it. SLAMRAAM is a program that we're going to put $29 million more in over the next 2 years but so we can get it to a position where we can take that technology and put it on the shelf. Should the

threat increase in the future and the need for that weapon system be a requirement, it will be there for us to harvest.

MEADS is my final example, albeit we are faced with a dilemma here. We have program termination costs that are estimated to be somewhere around $800 million, or we can continue investment into the program, so that we can, in fact, harvest some of those technologies to use in the upgrade of the Patriot. No one likes that $800 million pricetag. But, if there is any good that comes out of it, we know that some of the technologies that have been developed for MEADS could be integrated into the Patriot at a later date.

Senator LIEBERMAN. Just go into a little more about the process you've followed in the CPR, and how you relate that to what you've just said about the spending on canceled programs.

General CHIARELLI. Well, I will air the dirty laundry. But, air and missile defense was a beautiful example.

Senator LIEBERMAN. Yes.

General CHIARELLI. We had a number of programs in air and missile defense that were based on requirements that were years old, where the threat had changed. Because we had so many programs, we were spending a minimal amount of money on each. In spending that minimal amount, we were dragging out even those that we were procuring over many, many years, which causes the cost of individual weapons systems to go up. We looked at the entire portfolio and realized that the NLOS missile, once envisioned to be a $100,000 missile designed to hit a moving target, was going to cost $300,000. Based on a requirement from a linear battlefield and not a nonlinear battlefield, we decided we didn't need it.

When we looked and we saw the SLAMRAAM that was based off the Air Force's Advanced Medium-Range Air-to-Air Missile although we've canceled the SLAMRAAM, the missile will continue to be made, and the Air Force will continue to buy it, because they control the missile. The cost of that missile, in order to put some of the improvements that they have put on it, had risen from $300,000 a missile to over $1 million a missile. When we looked at 276 launchers with 6 missiles apiece and a threat in this particular area, which we believe there are joint systems that can help us answer that threat, we realized that this was another program that we had to take a hard look at and cancel.

At the same time, we looked at what is affecting our troops today. Just the other day, we had 12 soldiers, 2 who were killed and 10 who were wounded with a rocket attack in Afghanistan. We realized that where we really needed to be spending money was on the threat that is, in fact, affecting our soldiers and civilians down range today. That was to get after indirect fire and rocket attacks. There are programs that the Army is investing in, and it's going to use the money we have harvested from these other programs to meet that threat.

Senator LIEBERMAN. Okay. Those are good examples. Now, let me ask you a question about the new GCV program. Let me state it in a devil's advocate form. Secretary Gates spoke recently at West Point and had some really interesting things to say, including a focus on the Army's challenge, which he issued in a way to justify its heavy force investment. When we think of that challenge, in your view, how would you justify the Army spending $20 to $30 bil-

lion on a new GCV that some people say may only be marginally better than the Bradley variant that it's intended to replace? Did I set that one up well enough for you, General?

General CHIARELLI. You did, sir.

Senator LIEBERMAN. Thank you.

General CHIARELLI. First of all, the example I always like to use when I'm talking about GCV is the tank. We're not buying a tank. We're, quite frankly, not buying a heavy vehicle. We're buying a vehicle that will have a range of different weights, based on the capability packages that we're able to hang on it, using some of the new technologies in ceramics that are available. But, when the decision was made to build the M1 tank, in 1978, and we bought a tank with an extra road wheel, we didn't know exactly what that decision meant. It meant that we had built into the very first model of this tank, which was delivered about 7 years after the cancellation of the last tank, not unlike the FCS which was delivered. When we did that we built size, weight, and power into that vehicle. That vehicle today has moved from a 105-millimeter gun to a 120-millimeter gun. It is a commander's weapon station that makes each tank worth, some people think, two tanks. It has been able to incrementally change over time.

That's what we want to do with the GCV. Rather than reach deep, we want to look at technologies that can be delivered in 7 years, ensure that they are included on this vehicle and that we incrementally improve the GCV over time so that we have the same effect of the tank which was built in 1978 and is the finest tank in the world today, and will be, I submit to you, well into the future.

Senator LIEBERMAN. Good enough. Thank you.

My time's up. A vote has gone off. I'm going to head over, rather than recess right away. Just to show how meteoric Senator Brown's rise has been on this subcommittee, he's now in charge. [Laughter.]

Senator BROWN. Just get back before the vote stops, sir.

Senator LIEBERMAN. I will.

Senator BROWN [presiding]. Thank you.

Just to continue on with the GCV. I understand the fact that we're spending $462.0 million in fiscal year 2011, $884.0 million in fiscal year 2012, and $1.2 billion up to the three fiscal year 2012 contracts. That's a $40 billion ultimate effort, or more. The way I'm seeing things being done around here lately, it's 40-plus, pick a number, because there are cost overruns and the like. We are going to be replacing every infantry fighting vehicle.

Are you concerned that we're putting all our eggs in one basket with this new vehicle, since we're replacing all the infantry fighting vehicles?

General CHIARELLI. I'm not. I think it's exactly what we have to do, because the Bradley has reached a point where its size, weight, and power won't carry the network in all instances. The Bradley loses a lot of its problems if you take the turret off of it. It loses a lot of weight, it gains a lot of power, and that Bradley can be used for other uses that the Army might have. We see it as a possible competitor to replace the M113. We see those Bradley hulls as something that can be used.

It points to the fact that, as we developed our plan for the GCV, we just didn't look at a single vehicle, we looked at the entire portfolio of combat vehicles we had and what we could afford, and what we needed the most to find a new vehicle. We felt that the GCV was the critical piece where a new development was warranted. It will provide the protection our soldiers need. We want to ensure it's in their hands in 7 years. We want to be able to carry that nine-man squad from point A to point B on the battlefield. We want to ensure that, at a minimum, it has the ability to conduct full-spectrum operations with capabilities packages that can be added or subtracted from the vehicle, based on the enemy threat.

One final point I would make, there's a tendency to look at the force today and say that it doesn't have heavy vehicles. A mine resistant ambush protected (MRAP) all-terrain vehicle (ATV) down range today, that's carrying four infantrymen, weighs 17 tons. To move a squad in Afghanistan today, of the 181st or the 82nd, is 51 tons of armor going down the road. So, in order to get the protection that you need for these soldiers—and protection matters—we have to find a way to ensure that our next combat vehicle provides a minimum—and, we think, better—protection than the MRAP provides today, understanding, at some point, physics takes over; it becomes a much more difficult problem for the enemy if you can provide that protection.

Senator BROWN. I know you're upgrading the Abrams, obviously. Based on what you just said, do you believe that you can continue, or should be trying, to upgrade the Bradley, as you're doing with the Abrams?

General CHIARELLI. We have very good uses planned for the Bradley. There are many Bradleys that serve on forces that are not GCVs. They are serving as other variants. We have a requirement today to replace the 113. The 113 replacement very well could be a variant of the Bradley, where we're able, without having to put a larger engine in it, to be able to take the turret off and have a very suitable replacement for the 113, at a much reduced cost.

Senator BROWN. I'm sorry, I have a couple more minutes, then I'm going to have to shift gears and just go into a brief recess, if possible.

If we could just shift to M1 Abrams, as the budget stands now, there'll be a break in upgrades to the Abrams tank in 2013. I'm looking at the funding schedule, we go along in fiscal year 2011, $521 million, 2012 is $358 million, producing upgrades of 22, 21, and 21. Then in fiscal year 2013 we go down to zero across the board until, potentially, 2016, then we ramp up again from $200 million to $737 million.

Are you concerned at all that it's, number one, cost effective, and number two, that you're mitigating the costs, and that the entity that's actually doing these things will have the working knowledge? Because basically you're shutting down production in the factory, and I can't imagine that all the worker bees, the people who'd actually have the institutional knowledge how to do this stuff, will actually be there to do it.

General LENNOX. Senator, I think it's a great question. Basically, what we're doing is, we are finishing up the procurement of a two-variant fleet, for the Active Force and for the Guard Force, of the

very most modern Abrams tanks. In fact, you'll find that our average age of the Abrams fleet is around the 4-years-of-age mark. So, we have a very fit and complete fleet that we'll have at this time. That's what has caused us to stop buying something that we no longer need.

Now, your other question, which I think is very important, is about the industrial base and the implications. Yes, we are concerned. When we talk to General Dynamics (GD) and others, the amount that we've been given, that it would take to keep those plants open, is extraordinarily large. So, it was something that we had to address, in prioritization, about whether or not you could afford to buy more of something that we already have enough of or put our scarce resources against something else. That was the logic that led us to stop the production at this time.

Senator BROWN. I'm deeply concerned that the base will be there. Instead of going from 21 to 0, is there a more scale-up/scale-down proposal that will be more cost effective?

So, with that, unfortunately, I'm going to take a brief recess. We'll be back in about 5 minutes. Thank you. [Recess.]

Senator LIEBERMAN [presiding]. Sorry for the recess. Hopefully, that's the last vote for a while.

It's my honor and pleasure now to call on my colleague from Connecticut, Senator Blumenthal.

Senator BLUMENTHAL. Thank you, Mr. Chairman.

I want to thank each of you, and the men and women working under you, for your extraordinary service to our Nation. I apologize that we kept you waiting. There was a point in my life when the thought of keeping one general waiting would have mortified me beyond words. The thought, even now, of keeping three generals waiting certainly is somewhat disquieting. But, I thank you very much for your patience.

I want to, if I may, go back to the conversation we were having before we were interrupted. I think the public fails to understand this idea of abandoned weapons systems, and so, they often feel that the reason for abandoning them is that they just plain didn't work or the people who were developing them calculated wrong. But, I think that a part of your answer has been that the nature of the threat changed. In other words, that we understood better what the weapon system was designed to do, and, in a fast changing world, we had to adapt the weapon system to meet that threat.

I think that's very important for us, in this body, to understand, and even more so for the public to understand, because it is at the core of the credibility that we all have in supporting the military, which we all want to do, and especially when you're doing the kind of work that you're doing, which is so essential to the Nation.

So, I wonder if there are examples that you could give us now or in the future, if you want to supplement these answers, that would give us, for lack of a better word, the ammunition to use when we're confronted with that kind of question or challenge.

General CHIARELLI. I'll let my two colleagues add to this, but you've hit just such a critical point. I do not want to say we are not without fault. What we should have been doing is reviewing the requirements more often. That's what we've done with the CPRs. It's not a one-time look across air and missile defense, with

a decision to cancel some programs and add to some programs. I've just scheduled a second one. We're going back again and look at air and missile defense, after a year, to see if the requirements that we've laid out are still valid requirements, the numbers we say we need are still valid numbers, and if the threats that we felt we had a year ago are still valid threats.

We believe, if we do this and we institutionalize this across the Army, and we don't just come up with a requirement for a capability gap and then throw it over there to Bill Phillips, who's the acquisition guy, and say, "Bill, build this." He enters into the 5000.2 system and process of acquisition that takes 10 to 12 years to come up with a major program on the other end, and then, at the end of that, he comes to us with something, and we look at it and we say, "We don't need that anymore."

So, what we're doing with the CPR process is going back, on a very frequent schedule, to review all those portfolios, to make sure the threat is the same, the number we thought we needed is what we need, and the requirement remains valid.

General PHILLIPS. Sir, I would add just a couple of comments. We take our fiduciary responsibility to the American taxpayers and Congress very importantly. Every dollar that you give us, we want to make sure that we absolutely use that dollar in the most efficient, effective way. I think the CPRs that General Chiarelli mentioned are a tremendous step forward for us to get our hands around requirements resourcing and then an acquisition strategy.

I'll give you one example on the threat and affordability: Comanche. I was a captain in 1986 when I first went on the Comanche program. First unit equip was 1996, and the threat obviously changed over time as the program grew and grew. There's a host of other requirements behind that but we determined that the threat had changed and the aircraft had grown so much that we needed to do something else with Comanche. So, the Army decided to terminate Comanche, partly by affordability and partly because of how the threat had evolved over a series of years. So, we invested $14.2 billion back into aviation today.

So, the results of that have been very positive for the Army. Number one, we harvested technology from Comanche. Number two, we have over 500 aircraft flying in theater today; as a result of the Comanche decision, flying at readiness rates above what we could even imagine back in 2003 and 2004, because the Army made the right decision to terminate Comanche and reinvest those dollars.

Senator BLUMENTHAL. General?

General LENNOX. Senator, I don't know how much time you have. There are so many examples. The one I was going to use is about the Scorpion anti-tank mine that we canceled as a part of the CPR that we conducted last year. That's freed up probably $500 million total over the course of the program, that we're investing right now into counter-improvised explosive device (IED) capabilities. So, that was an anti-tank mine system we don't think is relevant. In turn, we're taking that money and investing it in technologies to buy more of the Buffalo and Husky vehicles that soldiers are using in Afghanistan today, some of the mine detectors and some of the

technologies that we're using to modernize an engineer portfolio that was pretty woefully out of date.

General CHIARELLI. I would just add one final point. A secondary effect that we didn't fully understand when we got into CPRs is what we have been able to do to rationalize the entire portfolio, such as combat vehicles. It's hard for me to talk to you about the GCV without talking to you about the other Army combat vehicles, because we now look at it as a package that looks at affordability.

PIM is a great example. The PIM is a replacement for the A6 Paladin. But we realized we couldn't afford a new start with the GCV and the other things we needed to do. So, here we have a weapon, where we've imported the technologies off that canceled NLOS cannon onto an improvement of the A6 with a brand new body, new engine, but the same 155-millimeter gun to fire some of our new munitions.

But, you really can't talk about the GCV as a single vehicle without talking about the entire portfolio. I think one of the huge benefits of this strategy is in rationalizing all the systems, both from a standpoint of requirements and affordability.

Senator BLUMENTHAL. Would there be a way for you to get me some more examples? Because I think what you have just outlined has been very, very helpful, and I can't speak for the subcommittee, but I think, for myself, it would be a very constructive aid. Thank you.

General PHILLIPS. Senator, if I could add one comment.

We're doing an analysis of the 22 programs that were mentioned earlier, why they were canceled, in support of the study done by the Decker-Wagner team, so we can do that analysis, learn from it, and make sure we don't make the same mistakes in the past. We'll take that action and get back with you, sir.

[The information referred to follows:]

Three other examples of programs where viability was influenced by a change in the threat environment are the Up-Armored High Mobility Multi-Wheeled Vehicle, the Surface Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM) and the Scorpion networked munition.

The Army's decision not to continue procurement of the uparmored HMMWV was influenced by the inability of the vehicle to adequately balance protection, payload and performance in a threat environment characterized by Improvised Explosive Devices. Regarding SLAMRAAM, the Army has decided to complete its development and testing, but cancelled its procurement given threat mitigation provided by other capabilities. The Army determined that the threat for which Scorpion was designed to defeat is unlikely to materialize, and was assessed as a lesser priority than originally envisioned. In all three cases, the funding for these programs was reinvested in higher priority needs.

Senator BLUMENTHAL. Thank you.

Senator LIEBERMAN. Thanks, Senator Blumenthal.

The whole subcommittee would benefit from having that information, as well.

We'll do a second round, another 7 minutes.

Let me ask a question about the Stryker. I know that the Army's been testing an improved version of the Stryker with a double-V hull for deployment to Afghanistan. I wonder if you could give us a status report on how the testing is going and whether it's proceeding as planned.

General CHIARELLI. It's been excellent. We are very excited about getting the double-V hull with the added protection into the field.

There are a couple of issues that come up during testing. Most of them are in the driver's station, not from a protection standpoint; but, some of the changes to the structural portion of the driver's compartment have made it a cramped station that we're working to try to fix in later models. We've also really reached the weight limit of the chassis. We have really come out on the top end now and have to look at that.

But, from the standpoint of protection for the entire crew, to include the driver, we are very pleased and are moving those vehicles to theater as we speak.

Senator LIEBERMAN. Good. This was a real problem. That is, protection of people in the Stryker, with all the capabilities that it has. Am I right?

General PHILLIPS. Yes, sir, exactly. This actually significantly increases the protection level. It gives you MRAP ATV-level protection, or even greater. The latest, Senator, is we've accepted 79 vehicles, as of last Friday, of the double-V hull, and we have 9 postured at the Port of Charleston for shipment over to Afghanistan.

Senator LIEBERMAN. Good.

General PHILLIPS. Our intent is to get at least 150 ready in the next couple of months, for fielding. This has been very positive for the Army, and it will help protect our soldiers in theater.

Senator LIEBERMAN. The fiscal year 2012 budget request for Strykers includes 100 new nuclear, biological, and chemical reconnaissance vehicles (NBCRV), so it raises the question of why you'd want to buy any more of the flat-bottom Strykers if the double-V is the new standard.

General LENNOX. Great question, Senator. It's one that we wrestled with, frankly. The technology in the NBCRV we thought would take us a number of years to integrate into a double-V-shape platform. Since a number of these vehicles will be useful for homeland defense, we thought we'd progress with those that would not operate in an IED environment. We thought it was a prudent thing to do to minimize the risk, but still get this capability out to the field relatively quickly. But, we did wrestle with it. I think that's a good question.

Senator LIEBERMAN. So these will be moved out to the field, but then their aim will be to get the double-V hulls on all of them over time or as quickly as you can?

General LENNOX. First, let me thank this committee for their support, because this has really been remarkable, I think, in 18 months, this teamwork from Congress and industry and the Army. We have fielded, and will field, one BCT to Afghanistan. That's the current plan. We're looking at possibilities for the future. We're also looking at an overall Stryker modernization plan, that won't go into place for a number of years yet, but we will be informed by this effort on the double-V hull.

General CHIARELLI. I would say, Senator, there are some other efforts in underbody protection that are looking very promising that we may want to even meld with the double-V hull or possibly may even surpass it. We don't know for sure. But, there is a lot testing right now with different forms of underbody protection that are proving to be very exciting.

Senator LIEBERMAN. Let me ask you to step back a little bit and use the experience with the Strykers as an example.

As you look back at the development of the Stryker, which has, as I said, remarkable capabilities that have really worked very well in Afghanistan and Iraq, obviously experience showed that the bottom of the vehicle was not giving adequate protection to the crew. I know this is Monday-morning managing, or Tuesday-morning managing, but, as you look back at the process, is that something that should have been foreseen?

General CHIARELLI. If you understand the requirement came for the Stryker before we ever saw our first IED, it's kind of interesting. Yesterday marked the 7th anniversary of the uprising in Sadr City, when I was in Iraq; we lost 8 soldiers and had over 60 wounded. But, not a single IED went off on April 4, 2004, when that occurred. There was no requirement for underbody protection at that time, except for our larger combat vehicles. But, over time, this has evolved. Based on the nature of the threat, we've gone back, on Stryker and a number of vehicles. We're doing the same for the Humvee today and we're looking at ways that we might be able to provide additional underbody protection for our soldiers to those vehicles.

Senator LIEBERMAN. So, bottom line, this was a threat that didn't exist at the time Stryker was designed.

General CHIARELLI. That's exactly right. That's why we're excited about the GCV with capability packages. What we want to do is to build a vehicle that you can hang capability packages on that could provide passive protection or reactive protection, as those technologies improve over time, that will give that crew additional protection. The one thing we've been chasing for 10 years, in both theaters, is protection for our soldiers.

Senator LIEBERMAN. Right.

General CHIARELLI. I mean, we've been chasing it. I can go through the litany of the improvements we tried to make to the Humvee, to the MRAP, and now the MRAP ATV to get us additional mobility. It's basically road-bound in Afghanistan.

Senator LIEBERMAN. Correct.

General CHIARELLI. When you put anything on a common path all the time, that's when you run into problems with an enemy that knows you have to go from point A to point B on a certain route.

Senator LIEBERMAN. Let me ask you a related question about the MRAP vehicles. The Army owns about 12,000 of these now. As the forces draw down in Iraq in the months ahead, I know that many of these vehicles are going to be returned to Army installations across the country. Secretary Gates has made it clear that he wants these MRAPs incorporated as an assigned capability in the current force structure. I have heard that Army staff is currently working to figure out how the vehicles will be incorporated into the tactical wheeled vehicle fleet and unit distribution plans.

General Lennox, what's the Army's thinking, at this time, about how to integrate the MRAP vehicle fleet, and all its variations into the current force structure?

General LENNOX. Senator, we've done quite a bit of work in the area of integrating of MRAP vehicles, in protection of convoys, for example. That's one area that we'll incorporate them into our for-

mations. Another one is as a carrier of equipment. So, as a carrier for some of our signals intelligence equipment, we're going to use an MRAP vehicle platform for that.

We've also come up with a plan to stage them in our overseas contingency stocks, so that they're available, because we only have small numbers, about 12,000. We have about 200,000 tactical wheeled vehicles. We plan to stage some so that we can use them in cases of contingency, as well.

So, they'll be integrated into our formations, and we'll have them staged to be used in case of deployments, as well.

Senator LIEBERMAN. Very good. My time's up.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman.

Thank you, to our witnesses, for being flexible with our votes.

On the radio procurement, certain vendors have complained about the lack of competition in the Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) program. Specifically, they note the lack of competition for the Rifleman Radio, or the Manpack Radio, until fiscal year 2014, prior to the start of a full-rate production. For example, I'm noting here on the schedule, when I reviewed it, that you're using the incumbent boxes, which is the actual hardware. Then you're encouraging the competitors to develop software, which ultimately, I know, you get to keep.

Does that make sense, for the competitors to fully develop a cost-effective product when they need to actually rely on General Dynamics (GD) original boxes? Does that give GD a competitive advantage and why wouldn't you move it up to the low-rate initial production (LRIP)–2 phase in 2013?

General CHIARELLI. The key to JTRS and its business model is what we have done with nonproprietary wave forms for our radios. A key and critical piece here is $179 million that we have in research, development, test, and evaluation (RDT&E) to complete the development of those wave forms so that we can then open up all the JTRS radios for free and open competition. Industry has made a lot of money on us over time because we have not owned our wave forms. A nonproprietary wave form would mean that every time we wanted to go and change that wave form, we would have to go and pay integration costs and additional money to the industry.

Senator BROWN. I understand that. But, I'm saying why wouldn't you move it up a year and let it go under the LRIP–2 phase, save an extra year and make it a little bit more competitive earlier?

General CHIARELLI. I will sure take a look at doing it in 2013, but we have to complete the development of the wave forms in 2012 and the integration onto the Shadow in 2012. That's why that RDT&E money is so important, in order to allow us to have free and open competition. We have to have these wave forms completed and ready to go before we can open it up to all the competitors out there and say, "Build us the best box for the cheapest price point you can." That's what I find exciting about what we're doing here. We are changing the paradigm on how we buy. It's not really fair to even call them radios any more, into the future.

Senator BROWN. Sure. Thank you. I'm excited too. You can tell. [Laughter.]

But, I'm just asking, we're using an incumbent box. We're opening up to competition at a certain stage. I think it gives one entity a competitive advantage. Potentially, instead of getting the best product possible, we may be hitting the 70 percent threshold, but we're not quite there because we haven't opened it up. I would, if there's a way to consider moving it up a year. Could you get back to the committee on that, please?

General CHIARELLI. I will investigate that immediately, sir.

[The information referred to follows:]

The Program Manager (PM) for Handheld, Manpack, Small Form Fit is reviewing production schedules. The PM will only exercise the Low Rate of Initial Production (LRIP)-2 option if the program does not go into full-rate production in fiscal year 2013. We believe that General Dynamics does not have a competitive advantage because a second vendor will always be producing the same amount of radios during LRIP.

Senator BROWN. I know. Thank you, sir.

On the MEADS, this is probably the third hearing I've had on that particular program. I'm just flabbergasted by the person who signed the contract to say, "Oh yeah, this is a great deal. By the way, you can't get out of it; and if you do, you have to pay $800 million." Are you kidding me? I'm at the point now that I'm thinking of, potentially, with other members, just putting something in the authorization bill saying, "You know what? We're out, sue us," and taking our chances and seeing what happens.

General CHIARELLI. Mr. Kendall is quoted in the paper the other day as saying he's working with our international partners to do exactly that.

Senator BROWN. It was a conversation, actually, that we had. I remember that, as well.

General CHIARELLI. I'm sure it is, because we came as prepared as we could to answer your question and, in our research, we found that the MEADS contract was put together in 1996.

Senator BROWN. Yes.

General CHIARELLI. It was an international memorandum of agreement. The high termination costs were thought to be a requirement in order so that international partners would not renege on the deal. I'm sure that we've learned a lot about that today. If there is a silver lining in any of this, we see the possibility that there is some of the technology that would be developed with that $800 million, that could be integrated into the Patriot at a later time.

Senator BROWN. That was my next question. Are you hopeful that the money that we've actually invested will not be wasted and we'll be able to get in use that type of information?

General CHIARELLI. There is a distinct possibility that that will be the case.

Senator BROWN. When do you think we'll know that?

General LENNOX. Sir, we're looking at a couple of things. First of all, I just want to let you know that it was the Army that recommended as part of the CPRs that we cancel this program.

Senator BROWN. That's great.

General LENNOX. So, we agree with you completely.

Senator BROWN. Right.

General LENNOX. We think there are some potential technologies in the surveillance radar, the exciter, the coolant, the phased-array face on the surveillance radar, we think that our potential candidates look at. The program's building a near-vertical launcher. That's one of the areas we might be able to look at. It'll be cost-benefit to see whether these are worth adapting as we see what the program develops. So, we can't say, today; but, as we see how the program develops, we'll do a cost-benefit analysis about whether or not this is worth incorporating in the Patriot fleet.

Senator BROWN. Great.

The Warfighter Information Network-Tactical (WIN–T), what's the status of increments 2 and 3 of the WIN–T?

General CHIARELLI. We're moving 2 as fast as we possibly can, but it's a key and critical piece of what we're trying to do to push the network down to the individual soldier.

Senator BROWN. What are the major technical hurdles in completing the program?

General LENNOX. I don't see any, Senator. I think our fiscal year 2012 request helps us finish up increment 1–B, which will make sure that it is compatible with increment 2 so that the units in the field can actually talk, and then begins fielding increment 2. So, I think we're on a path to field this system.

Increment 2, I think, as you're aware, starts to give us the capability to do battle command on the move. So, it's one of our key objectives. It's really a transport layer that brings down the capability to soldiers in command posts all the way down to the company level. So, it's a key and critical program, and we ask your support.

General CHIARELLI. I'd like to push WIN–T increment 2 out as fast as we can. I'd like to see if we can't do some of the testing as operational testing, thereby saving money and getting a capability into the hands of the warfighter that the warfighter doesn't have right now. So, we're working very hard to see if there are ways that we might be able to do that and do some of that testing down range. The worst case scenario is, you don't have it now and if it doesn't work you won't have it then.

Senator BROWN. Right.

General CHIARELLI. But, we have all indications that it will work.

Senator BROWN. The Chairman's given me a little flexibility to just wrap up this particular thought process.

If the warfighter actually has that piece of technology and they're actually caught, as an enemy, how would it affect the remaining network, the ability to basically intercept and understand?

General LENNOX. There are secure devices, Senator, on each of these pieces of equipment, like a lot of the equipment that we have out there today. Your old-fashioned radios that you probably used in the Guard and that I used growing up, had secure devices on them. They have to be updated.

Senator BROWN. So, it'd be a short-term potential vulnerability.

General LENNOX. Yes, sir.

Senator BROWN. Once you know that soldier's been captured——

General LENNOX. It can be sequestered.

Senator BROWN. Thank you.

Senator LIEBERMAN. Thanks, Senator Brown.

Senator Sessions.

Senator SESSIONS. Thank you, Mr. Chairman.

Thank you all for being here. We appreciate your service, and I couldn't be prouder of the military and our Army.

General Chiarelli, I enjoyed visiting with you a number of times in Iraq. I know how many months you spent there away from family. I know how many hours each day you worked and how many days a week, because you were, every day, trying to effectively carry out the mission you were given, and do so at the most minimum loss of life to the great soldiers that you led. So, I want to thank you for all that.

I do truly believe we have the greatest military the world has ever known. We have a fabulous combination of equipment, training, capability, and motivation. We have warriors who have the courage to go and fight. Whatever we do as we work through this, Mr. Chairman, we don't need to break that. We don't need to somehow save dollars here and dollars there and end up damaging the great military that we have.

However, I have another hat to wear, which is ranking Republican on the Senate Budget Committee. It's not good. This year we spent $3.7 trillion and we took in $2.2 billion. The interest over the next 10 years is projected to grow from $200 billion last year on our debt to $940 billion in 10 years, which is way above the Defense budget, it's way above Medicare.

So, we're on a course that we have to change. When I talk about frugality, the first question I'm given is, "Are you going to cut DOD too?", knowing that I tend to be a defender of DOD. Obviously, everybody is going to have to look at it. Something has changed. I just want you to know that. The world has changed. It's not anything we can dismiss. Everybody's mind has to be a little different.

Let's talk about the GCV briefly, General Chiarelli. What do you see it looking like? How will it be configured? What uses do you tend to make of it? How critical will it be to the Army's future?

General CHIARELLI. Senator, I think it's absolutely essential. I think what we have done with the GCV has taken 10 years of lessons of war and created a vehicle that is going to be full-spectrum, with a series of capability packages that will be allowed to be added to that vehicle, both passive and reactive, and different kinds of armors to give it different protection, based on the enemy threat. We've been chasing protection levels throughout this 10 years.

It will carry a nine-man squad. Right now, a nine-man squad is carried around, down range in Afghanistan, in three wheeled vehicles that weigh a total of 51 tons. Even our lightest forces are having to use these vehicles to move from point A to point B and dismount the squads out of three vehicles. Commanders have told us they want to do that out of one vehicle. They want one vehicle to move, because that is how they can most effectively employ their squad.

We want to ensure that it has, at a minimum, MRAP-type protection, with a capability over time to improve the protective capability over the vehicle, because we've built into it size, weight, and

power. We want it to accommodate the network, and the network takes power.

The final thing is, we want this vehicle in 7 years. We have lowered the requirements so that we can incrementally improve the vehicle over time, not unlike what we did with the M1 tank. We started out with a 54-ton vehicle, with a 105-millimeter gun, and a commander's cupola that was a joke. We used to joke, as a tanker, that we ran out of money when we got to the commander's cupola. Well, we did. When I met the person who designed the M1 tank, he said, "You know what? That's exactly what happened." But, over time, because we built into that tank size, weight, and power, and we put a sixth road wheel on it so it could grow over time, since 1978 it is still the number one tank in the world. It will be, we believe, through 2050, because it was incrementally improved over time.

That's what we want to do with the GCV. We think it will play a critical role in our combat vehicle portfolio.

Senator SESSIONS. That's a good explanation and I thank you for it.

Let me just say that I was stunned at what the MRAP eventually cost us, almost $1 million a copy. I know we were in a rush. We had quick demands, we had lives at stake. I supported that, and I know all of us did. But, these vehicles don't seem to me to be so particularly costly and expensive. Is there some way we can break this cycle of the extraordinary cost that these vehicles have? It seems to me a lot of what you would have on this vehicle are commercial capabilities or proven stuff that we've used in the military before. Would you have any comments on that? How can we keep the cost down?

I just want to follow up with Senator Brown's comment. I truly believe that we're making a mistake when we pay to develop and research a new weapon system and then we allow the contractor to keep that patents and rights to it, and then, when we want to change it a little bit, only they have the capabilities of doing it. Can we break that cycle?

General PHILLIPS. Senator, I would answer your question this way. Yes, we looked hard at affordability and executability. The reason we pulled back the request for proposal (RFP) on August 25 of last year, for the GCV was because, when we looked at all the requirements that we had in the original RFP, there were over 900 that were essentially tier-1, must-have requirements. When we really pulled it back and, in a collaborative environment, with the requirements and resourcing and acquisition folks in the room for about an intensive 60-day period, we came up with about 140 or so requirements that were mandatory to meet the big 4 that General Chiarelli described so eloquently.

Now, when we went back and we looked at the original cost of the GCV for the first RFP, it was over $20 million. Then, through that collaborative effort, we came to understand, and validated, that we could build this vehicle for somewhere between $9.5 million and $11 million per vehicle. That's almost a 50 percent reduction in what we expected the cost of it to be. We think we continue to drive affordability down.

We looked at two things when we went and addressed it with Dr. Ashton Carter, the Under Secretary of Defense for Acquisition, Technology, and Logistics. We wanted an affordable program that the Army could afford within the combat vehicle portfolio. Then we wanted to make sure that we could execute a medium-risk strategy to get this vehicle within 7 years.

Sir, we think we have an affordable, executable strategy going forward.

Senator SESSIONS. Thank you for your work.

General Chiarelli, we talk about procurement, and that's what gets a lot of our attention. We complain about it. I know you're watching it. But, what is the total procurement budget of the Army compared to its overall total budget?

General CHIARELLI. Our total research, development, and acquisition budget for fiscal year 2012 submission, sir, is about $31.8 billion. The total budget in the request is in the neighborhood of $150 billion, not including wartime supplemental.

Senator SESSIONS. I would just say that we have to have new equipment. We have to have new capabilities. If all of our cuts and reductions and everything come from procurement, we're leaving our soldiers with less than the quality equipment that they need. As you wrestle with where to reduce spending and contain the growth of spending, I hope that you'll look at the whole budget. We can't take it all out of procurement of the new weapon systems that we need.

General CHIARELLI. We think that's absolutely critical. Quite frankly, that's why we are going through the planning we're going through right now. Should an end strength decrease be required in 2015 and 2016, as the Secretary has laid out, we are going through the necessary planning to say that we want to ensure that we have a balanced portfolio, across the board. Our tendency is always to hang onto our people. If we do that, at the cost of all our procurement accounts, the exact thing you say, Senator, will occur.

So, we're going through now in that area, personnel, reversible planning. Should the situation change, should we not be out of Iraq, should we not begin a solid drawdown coming out of Afghanistan, should some other requirement pop up—hopefully, it will not—for large numbers of ground forces, and as long as we have access to the Reserve components, we feel that that kind of planning is prudent now. It allows us to ensure that, as we do that planning, we take a look at personnel accounts with procurement accounts to ensure whatever size force we have, it is a balanced force. Not one that's heavy in people and light in equipment, or heavy in equipment and light in people.

Senator LIEBERMAN. Thank you, Senator Sessions. That was a good exchange.

Senator Blumenthal.

Senator BLUMENTHAL. Thank you, Mr. Chairman.

Thank you again for your testimony, which has been very helpful.

I want to change the subject slightly, from the ground to the air. We discussed it a little bit. But, taking your remark, General Chiarelli, that the enemy can respond much more easily to transporting materials by road when it knows we have to go from point

A to point B. I know that the Army is doing some very exciting work with payloads delivered by air, particularly unmanned helicopters, and, at the Natick Center, has just successfully tested the K–MAX helicopter, the unmanned version that's delivered a certain number of payloads. I'm not sure exactly how many or what weight. But, perhaps you could comment on the potential and the promise for developing that technology, whether it's the K–MAX or another version of the unmanned helicopter.

General LENNOX. Senator, the Army has invested heavily in unmanned aerial vehicles (UAV), in its fiscal year 2012 submission and throughout the program. It's a need that we cannot seem to meet. The demand always seems to outpace our ability to meet it. The demand is for full-motion videos to enhance situational awareness on the ground. One of the key lessons learned, in addition to protection, over the last 10 years, is that you can't get enough situational awareness to soldiers on the ground. So, UAVs are a big area.

We have invested in some pilots; the Long Endurance Multi-Intelligence Vehicle, which is essentially a blimp that we can hang a series of payloads underneath. In the vertical launch capability, we're looking at the A160, as possibilities that we'd like to pilot in Afghanistan and then see whether or not we want to adopt these technologies to long-term programs, or not.

General PHILLIPS. Sir, I would just add one comment. We've seen an exponential growth in UAVs over the last 10 years. It's incredibly important for our soldiers that are in harm's way today. We'll certainly take a look at the K–MAX and what capabilities it brings. But, I would share with you also that UAVs have flown over 1.1 million combat hours in theater, and we're always looking at ways to improve unmanned aerial systems across the board. So, we'll take a look at that.

Senator BLUMENTHAL. I assume that these developments and the new technologies are being developed among the Services working together, not just by the Army.

General CHIARELLI. The Marine Corps has a very active program and, in many ways, is leading in unmanned aerial delivery of supplies, a requirement that they feel its time has come. We're looking very hard at the work that they are doing, also.

Senator BLUMENTHAL. Going back to the questions that Senator Sessions was asking about, the patents and the rights to use technology. I know you've talked a lot about harvesting these technologies. Are there legal barriers? I recognize you're not here as lawyers, but do you find in your work that you encounter legal barriers that maybe we can be helpful in addressing?

General CHIARELLI. I know I'm Italian and my emotion sometimes gets away with me, but that is why I'm so excited about what we're doing with the JTRS model. Nonproprietary wave forms, wave forms that the U.S. Government owns, in an operating environment where we've set the left limit and the right limit, will allow us to duplicate what has occurred in the cell phone industry. We will have applications that we will tell people, "You write it to work on our operating environment or we don't want it."

So, everything that goes into that operating environment, not only will it work without us paying integration costs, but it will

also allow different applications to pass data amongst themselves, because you've made that possible by dictating what the operating environment's like; not unlike what you would see with the applications on an iPhone or a Droid or anything else.

This is a total change for the Army. When you update your computer program, whatever that might be, you have to go back and pay a fee for that update. The idea here is, we make the improvement to the wave form, but the government does it, spending the amount of money it wants to make the improvements it needs. It comes out the other end, everything that rides in that common operating environment is able to talk to one another.

There are those who would rather not have us go there, because there will be money lost in integration costs that we've had to pay in the past. So, we're excited about this, and see a great opportunity to save money over time for our government.

Senator BLUMENTHAL. Providing a model for other weapons development.

Thank you.

Senator LIEBERMAN. I have just a couple more questions.

First, I want to state for the record that, in this subcommittee, we welcome the expression of emotions by Italian-Americans or any other kinds of Americans. [Laughter.]

Let me ask about the UH60 multiyear procurement. The budget for the next fiscal year request includes a legislative provision giving the Army authority to enter a multiyear procurement contract for various models of the Black Hawk. The last multiyear procurement projected that cost savings of 5.3 percent would be realized by a multiyear buy. But, in fact, only 4 percent savings were realized. There were real savings, but not as high as expected. The projection for savings that accompanies the request for fiscal year 2012 is now 10.5 percent from a multiyear. So, I wanted you to talk a little bit about the basis of that 10.5 percent, and whether there's a Cost Assessment and Program Evaluation (CAPE)-approved estimate that the Army can actually achieve a 10 percent savings through multiyear procurement authority for the Black Hawk.

General PHILLIPS. I have a couple of comments. One, is that the Black Hawk program is incredibly important for the Army. It's the highest density aircraft down range today flying in Iraq and Afghanistan. There's over 300 aircraft that are flying there, with extraordinarily high readiness rates. So, we see the Black Hawk program and the UH60M as critical for supporting warfighters down range.

To answer your question directly, we're highly confident that we will achieve the 10 percent savings associated with a multiyear. We've gone forward to Dr. Carter and laid out the case for that multiyear savings. When working with CAPE, in the original assessment that they did back in September, the assessment they validated was about 8.5 percent. But, we went back after that and worked with the president of Sikorsky, Jeffrey Pino, and his team. As a matter of fact, Sikorsky has put in writing that they will achieve at least a 10 percent savings in the multiyear for the Black Hawk aircraft. If you look at the amount of money that we are going to spend over time for the Black Hawk, exceeding $7 billion to buy this aircraft, a 10 percent savings is significant.

Senator LIEBERMAN. It sure is.

General PHILLIPS. It is upwards of about $700 million. So, sir, we're excited about the multiyear effort, and we strongly support its approval.

Senator LIEBERMAN. Good.

Obviously, part of the reason why I asked the question is because it is a significant number. Also, I think you know that there are some members of our full committee who are skeptical of the multiyear procurement savings that are claimed. Do we have any tools available to us, once we enter into a multiyear contract, to hold the contractor to the projections?

General PHILLIPS. Yes, sir. When we work the contract and sign the bilateral agreement with a company through that contract, they're held accountable for the savings that are documented within the contract itself. As we move forward with the UH60 contract, we will do the same with Sikorsky. We've seen the same for the Chinook program.

Senator LIEBERMAN. Right.

General PHILLIPS. That's also one that we track very closely. As a matter of fact, savings are beyond 10 percent for the Chinook program. We're doing the same for the Apache today. It's important, sir, and we will track that closely.

Senator LIEBERMAN. Good.

General Chiarelli, one last question from me. There is a natural tension between testing and evaluation on the one hand, and development of programs, cost, and efficiency on the other hand. There's a natural tension there, where all the testing requirements begin, obviously, because both the Army and Congress were concerned about money being thrown in at a system being used before it was ready, and therefore not being effective; at worst, obviously jeopardizing the safety of our soldiers. On the other hand, it's possible that you can test to a point where you're delaying the availability of the system unnecessarily to soldiers to protect their safety and make them more effective, and perhaps adding to the cost.

As I'm sure you know, the Weapon System Acquisition Reform Act had the intention to have developmental test activities earlier in the program, monitored by users as well as developers and oversight agencies. I wanted to invite you to do two things. One, is to give me your own sense of what the state of this balance between development and testing is. Maybe we should start with that, because that's a big enough question.

General CHIARELLI. If you start with a program that's going through the 5000.2 series you have a very elongated testing requirement. What most people don't understand is, with a Joint Urgent Operational Needs Statement (JUONS) that comes from the field, when the field requires an immediate capability to get down range we don't test or collect hardly any data on it at all.

Senator LIEBERMAN. Yes.

General CHIARELLI. We see both of those as a problem. In the JUONS area, you end up with a system being sent down range because a commander thinks he needs it; but, when he realizes some of the integration requirements that have to take place, he goes, "Wait a second. I didn't know that. I didn't understand that," because the proper testing hasn't been done.

What we have done is establish at Fort Bliss, TX, an Army brigade that will be filled up with soldiers fresh from the field and theater, that has just about every single piece of equipment in the Army. We are putting them on, initially, a 6-month testing cycle that will go to a 4-month testing cycle. So, we can take civilian off-the-shelf pieces of equipment the commanders have requested because of JUONS or some of the helicopters, like the A–160 UAV, and be able to put it in the hands of real soldiers on a very quick testing program, every 6 months, so we can work through many of those integration issues, even on those things requested for immediate deployment by commanders. We think this is going to change the paradigm. It's also going to allow industry, using their own developmental money, to build something that they feel meets an Army requirement and bring it to us, allow us to test it, and, if it meets a capability gap, we will look at employing it in the force.

Because technology is moving so quickly, we have to get quicker and more agile in our ability to get pieces of equipment to theater. We have to look at ways of compressing testing, while always ensuring the safety of our soldiers is paramount in everything we do. We may be excessive in some of the requirements that we have coming out of the testing community, delaying programs and delaying getting things to soldiers. But, at the same time, on the other end, we have to ensure that we don't send the integration problems down range to commanders to figure out.

I lived through that in 2006, when somebody in the building said, "We can have an active jammer for the Marine Corps because they're in the west, and the Army's in Baghdad, north and south," and gave us a passive jammer. They sent them over, thinking that the two forces would be separated, when, in reality, they were passing each other all the time.

Senator LIEBERMAN. Right.

General CHIARELLI. We had to do the integration requirements down range. We want to take that burden off commanders.

Senator LIEBERMAN. Okay. It's an interesting and a good question. So, right now, you'd say that perhaps there's a little too much testing at different points. You're trying to move it back along the spectrum; but, again, you stated the obvious primary concern you have is the safety of the soldiers.

I wonder, General Phillips, if you want to add anything about how the Army's going to incorporate appropriate developmental tests earlier in its program?

General PHILLIPS. Sir, I absolutely agree. I think we should do developmental testing as early as possible, because, as soon as you can find out the issues and problems and fix them, the better chance of that program to be successful at the end, to get into production.

I would only add that we're excited about the capability that we're standing up at White Sands Missile Range.

Senator LIEBERMAN. Right.

General PHILLIPS. If we can take a program like Paladin PIM or another program, and look at the test strategy and better integrate it or test the network out at White Sands Missile Range and reduce something that might be a 9-month test down to a 6-month test and it's two-thirds of what it used to be by synchronizing and inte-

grating better, that saves us money. It saves us time. We get capability faster. So, I think it's a balance, sir. But, we have to look harder in each program at the test program and the test strategy.

I'll use Paladin PIM as another example. We looked at, hard, the testing requirements for this program over the last 3 or 4 months. We think we can save anywhere from around 6 to 9 months, in terms of testing for that program, going forward. So, we might be able to pull milestone C, which is currently scheduled for June 2013, to the left so we can get that capability sooner.

Senator LIEBERMAN. That would be great.

Are defense manufacturers cooperating in your attempt to do the testing earlier in the developmental cycle?

General PHILLIPS. Yes, sir, absolutely. It's a team effort and a partnership. In the case of the Paladin PIM, we've worked closely with BAE to get the prototypes where they need to be, out at White Sands or Yuma, so we can execute the testing quickly. The Army Test and Evaluation Command (ATEC) is also involved in that. So, that partnership has to be strong to be able to accomplish this.

Senator LIEBERMAN. Good. Thank you.

General CHIARELLI. Senator, for statutory and regulatory requirements, we've put a wall up between operational and developmental testing. Maybe it's time to lower that wall a little bit and allow some of the work that's done in developmental testing to move over to operational testing so we are not repeating some of the exact same things in operational testing we did in developmental testing, thereby saving us some money.

Senator LIEBERMAN. That makes a lot of sense to me. Is that something you need statutory help with, or would you just do that on your own?

General CHIARELLI. I can't tell you that right now. I don't believe we do.

Senator LIEBERMAN. Yes.

General CHIARELLI. I think we need to have a little bit of a cultural change between the developmental guys and the operational guys.

Senator LIEBERMAN. Great. Thank you.

Senator Brown.

Senator BROWN. Thank you.

Having Natick Labs in my district, I've visited there many times. One of the things that I know that they're trying to do, and I've heard from individual soldiers, is to get new weapons systems in the field and let the soldiers, the people that are actually using it, make the determination and recommendations as to how to make it lean and mean and actually functional. Some of the best suggestions actually come from the troops on the ground. So, just a thought on that.

I just want to go through a checklist of things that I wanted to ask. Is there any guidance as to where the Army is going, or will be going, with a next-generation carbine?

General PHILLIPS. Sir, we have a dual-strategy for the M4 carbine. Number one, we are going to continue to improve. Right now, we have done about 62 different improvements to the M4 over time. It's a world-class weapon. There's over 600,000 of those that exist today. We're going to continue to improve it. The next phase

will be a heavier barrel, an ambidextrous trigger, and also a selector switch that will allow it to also operate on automatic. So, we will continue to improve the M4. At the same time, we've improved the ammunition that they're using in Afghanistan today, the 556.

At the same time, we want to make sure that our soldiers get the best individual carbine that we can deliver.

Senator BROWN. Right.

General PHILLIPS. So, we're going through a full and open competition for the next individual carbine. We just had an industry day, about a week ago, where 38 industry partners were there. We're excited about what industry may come and offer, in terms of what might be the next individual carbine.

But, I also qualify that, because the requirement for an M4, in terms of reliability, is about 600 mean rounds between failure. The experience that we have in combat today is about 3,600. So, the M4 is performing very well with our soldiers down range, and we're getting very good feedback on what it does.

Senator BROWN. What about taking it down a notch? Is the Army planning on buying any more Berettas, or is there going to be a competition for a new pistol in the future? What's the status there?

General PHILLIPS. Sir, I'll open up and let General Lennox, my colleague, respond as well, but we have about 240,000 in terms of the number of M9 pistols that the Army requires. We're right at the end of getting that quantity. The last 146 will be delivered by June.

Meanwhile, there's another requirement for the Air Force and for foreign military sales (FMS) customers that we're also working towards. There is a RFP on the street today that's in source selection, where we will put in place a 5-year indefinite delivery/indefinite quantity to buy M9 pistols for the Air Force and for potential FMS customers that we might have. But, none of that requirement is in support of the Army's requirement for means and sustainment for the M9.

Senator BROWN. General Lennox, have there been a lot of complaints with regard to the Beretta and its performance, or not?

General LENNOX. Senator, we have heard some complaints about stopping power.

Senator BROWN. That's what I've heard, as well.

General LENNOX. The threat today, though, is much longer range than pistol range. We're really hearing much more requests for weapons that reach out to the 500-, 600-, and 700-meter range.

So, we have no plans, at this time, to purchase additional pistols.

Senator BROWN. Okay.

What's the status of the report on the Army compliance with the Berry Amendment? If it's out, and I'm not quite sure if it is, were there any major findings?

General PHILLIPS. Sir, you're relating that to the use of metals from foreign countries that are included in programs executed for DOD?

Senator BROWN. Yes.

General PHILLIPS. There have been some issues in the past for the Berry Amendment. None of them have risen up that I've heard of in the last several months. Some of those in the past go back to aviation programs, like transmissions for the Chinook, where we

found that some metals that remained overseas, that fall under the Berry Amendment, were actually being used by manufacturers. We'll take that question back for the record, sir, and do more research to see if there are any current issues on the Berry Amendment.

[The information referred to follows:]

The only report related to Army compliance with the Berry Amendment that we know of is a congressionally-mandated report in accordance with section 821 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011. That section requires a Comptroller General report on the supply chain of fire resistant fiber for the production of military uniforms for all of the Department of Defense. The summary of that report was briefed to this committee by the Comptroller General on April 27, 2011. The Comptroller General has not yet released the official version of that report but preliminary communications indicate no issues with Army compliance with the Berry Amendment.

Senator BROWN. I don't want reinvent the wheel if it's something that you feel you can just pick up the phone.

General PHILLIPS. Okay, sir.

Senator BROWN. Does the Army have enough in its Guard and Reserve equipment accounts to meet the obligations at home and abroad?

General LENNOX. Sir, I think you'll find now that we have better equipped the Guard and Reserve, commensurate with their deployments and their employment in Iraq and Afghanistan. The overall level of equipment in the Active Force is 92 percent. It's 92 percent in the Guard. It's about 91 percent in the Reserves. The percentage of modernized equipment—all the equipment's useful, but the most modern equipment—is in the 70s, equivalent in both the Active and the Reserve components. So, I think, with Congress' help, we have really, over the last 5 years in particular, made dramatic improvement in equipping the Nation's Reserve components.

Senator BROWN. What's the Army's plan to incorporate the MRAP vehicle into its permanent inventories of equipment for Army combat units?

General LENNOX. Sir, we have a plan of including it both into units in integral roles, such as convoy escorts for our combat support units, and for carrying equipment on the back of it, as a secondary load. So, we have those roles for incorporating that equipment. We also have planned for using it as overseas storage to be employed in the case of a deployment, since we only have about 12,000 MRAP vehicles and another 6,000 MRAP ATVs. We don't have enough for every single unit to be employed. Some of it will be secured and ready to be employed, if needed by the threat.

Senator BROWN. The Government Accountability Office recently released a quick-look weapons assessment. Three major weapons programs since 1997 have cost overruns as much as 50 percent of the original projections. What will the Army do to improve its acquisition workforce, particularly with regard to cost estimating systems, and engineering and developmental testing, to reform its requirements, instill budget and financial discipline, source selections, and clear lines of authority with regard to acquisition? How do we make sure this stuff doesn't keep happening?

General PHILLIPS. Senator, great question. Much of what you just described is embedded within the Decker-Wagner study, which we are taking very seriously. As a part of its recommendations and

building the acquisition workforce, we will look hard at bringing in additional cost analysts and other analysts that can help us get our hands around acquisition programs, source selection processes, and cost accountability. I think you'll see the Army make great strides, now and in the future, in terms of affordable programs going forward. We will implement the necessary changes and bring the acquisition workforce into play.

Let me also add that in the acquisition workforce we have already brought in 1,310 interns, some of which are cost analysts. Our target is 1,885. Some of those interns that are coming in will certainly fill what might be considered gaps, in terms of cost analysts and others.

Senator BROWN. You're talking paid interns?

General PHILLIPS. Paid, sir.

Senator BROWN. Are these people that have a history of dealing with these sorts of things?

General PHILLIPS. Yes, sir. We are actually looking at folks coming out of colleges and universities that have the skills that are necessary to bring them in and train them in cost analysis and areas such as that.

Senator BROWN. So, I can put out a feeler and tell them that you have job openings?

General PHILLIPS. Sir, we are recruiting. The standards that the Army uses to bring in an intern today, with a grade point average of 3.5, are pretty high. We are really excited about the quality of the interns that have come in the Army today.

Senator BROWN. Okay. First of all, thank you. I've learned a lot and I appreciate the honest answers. I actually feel like I've gotten some good answers, finally, on a whole host of things.

So, thank you, Mr. Chairman, for holding this hearing and including me.

Thank you.

Senator LIEBERMAN. Thank you, Senator Brown.

Senator Blumenthal.

Senator BLUMENTHAL. I have just one last question. I know that you've noted the good partnership that you have with private industry. Are you satisfied that there is a sufficiently prompt and adept procedure, in the event there is not cooperation or if you want to remedy problems that may occur in contractors, with addressing those problems?

General PHILLIPS. Sir, absolutely. Through our contracts that we have with our industry partners, and through a day-to-day dialogue that we also have, from the highest levels of leadership within industry down to those that actually execute the programs, it's important that we have a continual dialogue, because industry is incredibly important to our mission to field the best capability possible for our soldiers. So, when we have a contract with an industry partner, if there's an issue that arises, we want to address that issue as quickly as possible with the industry, whoever that might be, have them address it and remedy the situation quickly. If it can't be remedied, we want to raise it up to the right, appropriate level—and it might be to my level, it might be to General Chiarelli's level, or the Army acquisition executive—to be able to resolve that issue with industry.

One thing that Dr. O'Neill and I have taken on over the past year is to have a stronger dialogue with industry. He is down in Atlanta today, meeting with a host of industry partners at the Atlanta Conference, and will continue that strong dialogue with industry over time.

General CHIARELLI. Secretary McHugh, since coming to be Secretary of the Army, has instituted some get-togethers with industry, where we bring them into the building and sit down and talk. I would be less than truthful if I didn't indicate to you, I wish I had the ability to talk to industry a little more openly in my role as Vice Chief of Staff of the Army, without falling too close, in some instances, to what the lawyers would indicate is a place that I shouldn't be. I don't know if that makes any sense. [Laughter.]

Senator BLUMENTHAL. I can understand what you're saying.

Senator LIEBERMAN. You have two lawyers, even two attorneys general, so it makes a lot of sense.

Senator BLUMENTHAL. Two admirers of what you're doing. Thank you for your testimony today.

Senator LIEBERMAN. Thanks, Senator Blumenthal. I can't agree more, that this was a very good hearing.

The three of you are the leadership of what might be called the business side of the Army. Obviously, the Army's involved in very serious manners on our behalf, in fact, to fulfill our constitutional responsibility to provide for the common defense. But, to do that effectively requires really good business practices.

I'm impressed by the quality of your leadership and by the extent to which you're doing exactly what a successful business would do, which is, number one, to try to apply the most significant advances in technology around you to what your business is, which are what the goals of the Army are; and number two, to understand that things often don't work quite as you want them to, and then work quickly to fix them. I think that's what you're doing.

I appreciate the directness of the process that you've been leading, General Chiarelli, with the assistance of General Lennox and General Phillips involved. My own feeling is that we have begun to accept a perennial problem of overspending; of starting big programs and canceling them. Even though I know we still pick up some of the capabilities in those programs I think we're turning the corner. I appreciate that it didn't happen automatically, so I appreciate the leadership that you've all shown. It will matter a lot, most important of all to our security, but also really, just right alongside that, to the safety and effectiveness of the men and women of the Army.

The record of the hearing is going to be held open until this Friday to allow for the submission of additional statements or questions. I hope, insofar as there are questions, you can try to answer them in as timely a way as possible, because Chairman Levin and Senator McCain are starting to actually talk about moving to a markup of the NDAA.

Is there anything else you'd like to say? [No response.]

If not, I thank you again.

The hearing is adjourned.

[Questions for the record with answers supplied follow:]

## QUESTIONS SUBMITTED BY SENATOR KIRSTEN E. GILLIBRAND

### JOINT TACTICAL RADIO SYSTEM

1. Senator GILLIBRAND. General Chiarelli, I support the Joint Tactical Radio System (JTRS) program concept of a nonproprietary waveform. I also appreciate that some of the research, development, test, and evaluation (RDT&E) funding you are requesting for fiscal year 2012 will be spent to help develop the software to port the waveform; however, I am troubled that we are spending such a large amount without adequate time to work out the kinks. Given past problematic developmental testing results for JTRS Handheld, Manpack, and Small Form Fit (HMS) that required extensive modifications, is it realistic to believe that the program can move from developmental testing to low rate initial production (LRIP) in only a few months?

General CHIARELLI. Yes, it is realistic to believe the program can move from developmental testing to LRIP in only a few months. The hardware design is stable and the remaining testing involves the software. The JTRS HMS program conducted a network excursion, a developmental test (DT) event, in March 2011 demonstrating improved situational awareness and small unit effectiveness using the Army's network. The network excursion also assessed the JTRS radios and waveform's ability to support tactical data requirements. The excursion demonstrated integration between HMS Warfighter Information Network-Tactical, and Force XXI Battle Command Brigade and below. The network excursion also successfully demonstrated connecting the dismounted force to the Global Information Grid (GIG).

The HMS will participate in a series of DT and operational test (OT) events to build program decision data and confidence over the next 7 months. The decision data accumulated through these test-analyze-fix series of DT events will ultimately support a decision to proceed (or not) with procurement under LRIP at a production decision brief yet to be scheduled.

The HMS is currently undergoing a formal DT event at Fort Huachuca, AZ. It will be further tested in the Army's Network Integration Exercise (an additional DT event) scheduled June-July fiscal year 2011, the Network Integration Rehearsal (an additional DT event) scheduled October fiscal year 2012, and the Rifleman Radio Initial Operational Test and Evaluation (IOT&E) (an additional OT event) scheduled November fiscal year 2012.

These five test efforts will result in metrics and decision data accumulation, to support independent assessment of the capability provided by the HMS for the warfighter. In addition, the tests will also provide the Department of Defense the data necessary for any further acquisitions regarding the HMS.

2. Senator GILLIBRAND. General Chiarelli, the senior Director, Operational Test and Evaluation personnel have briefed my office that the timing is unusual for a major acquisition program. Given these concerns, does it make sense to support the entire programmatic request for the development and production in fiscal year 2012?

General CHIARELLI. Yes, support is warranted for the entire fiscal year 2012 request. Development efforts in fiscal year 2012 funding are driven primarily by the Office of the Secretary of Defense/Service initiated enhancements. These include waveform porting and/or software upgrades for interoperability and management of the radios. Fiscal year 2012 production events are related to Rifleman radio and Manpack LRIP efforts. Development and production activities will be worked concurrently in fiscal year 2012.

3. Senator GILLIBRAND. General Chiarelli, I was pleased to hear that you will speed the time to competition. I am a strong proponent of an open and fair competitive process to ensure we are procuring the best radio possible for our soldiers. My understanding is thousands of General Dynamics radios will be purchased and fielded well before the next scheduled competition. For the IOT&E scheduled in the coming months, I would like to know what other radios have been offered the opportunity to participate in the IOT&E, and of those which ones have indicated they want to participate?

General CHIARELLI. The HMS development was competitively awarded to General Dynamics with Thales, Rockwell Collins, and BAE as their subs. Leading to LRIP, the Program Manager (PM) solicited industry partners to assess the potential for competition in LRIP leading to IOT&E. No other soldier radio waveform capable radio that met size, weight, and power requirements were available to support government developmental test in November 2010 or the operational test held in February 2011. As such, the PM is currently planning to purchase the LRIP units off

of the existing contract, with General Dynamics and Thales splitting the production. Once through IOT&E, the PM plans to obtain a full-rate production decision in second quarter fiscal year 2012 and release a full and open competition request for proposals at that time.

[Whereupon, at 4:17 p.m., the subcommittee adjourned.]

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

**TUESDAY, MAY 24, 2011**

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

## TACTICAL AIRCRAFT PROGRAMS

The subcommittee met, pursuant to notice, at 2:34 p.m. in room SR–232A, Russell Senate Office Building, Senator Joseph I. Lieberman (chairman of the subcommittee) presiding.

Committee members present: Senators Lieberman and Brown.

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

Minority staff members present: David M. Morriss, minority staff director; Christopher J. Paul, professional staff member; and Michael J. Sistak, research assistant.

Staff assistants present: Brian F. Sebold and Breon N. Wells.

Committee members' assistants present: Christopher Griffin, assistant to Senator Lieberman; and Charles Prosch, assistant to Senator Brown.

### OPENING STATEMENT OF SENATOR JOSEPH I. LIEBERMAN, CHAIRMAN

Senator LIEBERMAN. The subcommittee hearing will come to order. I want to welcome our witnesses and thank each of you for appearing before the subcommittee today.

It's against the backdrop of the extraordinary service, bravery, and sacrifices of the men and women of our Armed Forces that we convene this session of the Airland Subcommittee to discuss tactical aviation programs, an important part of our jurisdiction of this subcommittee, and one on which we will attempt to counsel the full committee as it develops the National Defense Authorization Act for this year.

Every year we're challenged to make decisions balancing competing demands for resources, including resources for current operations and investment in future modernization. This year is no different, except maybe it's more difficult than normal because of the increasingly constrained budget environment in which we're operating.

Last Thursday the full Senate Armed Services Committee heard from several witnesses on the current status of the F–35 Joint Strike Fighter (JSF) program. I think it was important and necessary that the full committee discuss the JSF program because the cost, schedule, and performance of the JSF are central to so many questions of how we achieve the balance I just talked about between the demands of maintaining readiness in the near term and modernizing for the future.

Today we want to focus following on the hearing last week on how the services are responding to the most recent JSF delays and what effects those delays are having on our forces. There are worrisome prospects for the future of tactical air (TACAIR) programs, particularly in terms of having the numbers of aircraft we need to keep from hollowing out our tactical aviation forces.

I will say to the witnesses that we've been following your attempts to mitigate or close those gaps, and I look forward to hearing about them and discussing them with you. For instance, the Department of the Navy has made continuing attempts to reduce the strike fighter shortfall to manageable levels. Three years ago, the Navy was estimating that we would be facing a shortfall in 2017 that optimistically would amount to 125 tactical fighters needed to outfit our 10 aircraft carrier wings and 3 Marine Corps air wings. Two years ago, based on further analysis, the Navy was estimating that the maximum shortfall could be nearly twice that large or roughly 250 aircraft. Last year the estimate was that, absent certain actions by the Department, the shortfalls could reach 267 aircraft. However, the Navy believed, it said then, that with certain actions, such as reducing squadron size, conducting service life extension programs (SLEP) on some aircraft, and reducing time aircraft spend in the depots, the Navy could reduce the gap to roughly 150 aircraft.

In this year's budget submission, Navy is estimating that with additional new production of F/A–18E/F aircraft in the Future Years Defense Program (FYDP) and with a SLEP for 150 existing F–18s, the shortfall would actually go down to 65 aircraft. The Navy has now characterized that expected shortfall as manageable.

Since the budget was submitted, the Navy was provided an additional nine F/A–18 E/Fs in the 2011 Department of Defense (DOD) Appropriations Act, the one that we just passed a month or so ago. Those additional aircraft, alongside some other measures, have now lowered the Navy's estimate of the gap to 52 aircraft, which is quite a remarkable change over the years that I've cited.

Admiral Philman, in light of the significant changes in the Navy's estimated shortfall in recent years, I'm going to be interested in hearing you discuss how confident you are in the current estimate, how it would be affected by any additional delays in the JSF program, and whether the continued acquisition of the F/A–18 E/F aircraft will ultimately reduce the Navy's long-term requirement for JSF aircraft.

There's a similar story regarding the Air Force. Previous Air Force witnesses at our aviation hearings have projected a potential shortfall of Air Force tactical fighters in excess of 800 aircraft around 2025, which was a jarring number to hear when we heard it here. This year, General Carlisle, in your statement you indicate

that the Air Force is now facing a shortfall between 3 and 5 percent through the FYDP years. With a total Air Force requirement of some 2,000 aircraft, I'm assuming that that shortfall goes somewhere between 60 and 100 aircraft.

General, as I mentioned to the Admiral, in your testimony you describe the Air Force's investigation into ways to extend the service lives of A–10, F–15, and F–16 aircraft to help mitigate the gap between requirements and aircraft that it foresees. In your prepared testimony you state that "actions to extend and modernize the legacy fleet are a bridge to fifth-generation capabilities and are not considered replacement actions." That's an important statement, which I would like to discuss with you in the question and answer period.

So this is a very timely, very important conversation we're going to have, and we have exactly the right people here to have it, and I thank you for that.

Senator Brown.

**STATEMENT OF SENATOR SCOTT P. BROWN**

Senator BROWN. Thank you, Mr. Chairman, for holding this important hearing. It's good to see you again.

Senator LIEBERMAN. Thank you.

Senator BROWN. I thank the witnesses also for their attendance.

Just listening to your opening statement, I also am deeply concerned about the shortfalls and how that relates to our tactical advantage or disadvantage when it comes to upcoming conflicts. Without a doubt, for me combat tactical aviation presents some of the most significant challenges, I think you'll agree, for all the Services. Perhaps chief among them are the gaps between the fighter aircraft and the strike fighter aircraft capability in the Air Force and the Navy respectively.

Critical to the military departments' ability to fill these capability gaps is how successfully they hedge. It seems like we're getting close to that point where potentially the safety and security of not only our men and women serving, but our country, may be at stake. I want to just see what's fact and what's fiction in that. I want to make sure that we avoid schedule slips and cost growth to extend the service lives of aging aircraft. One way to avoid that is to do what you're doing, which is to try to get every last flying hour out of these aircraft. I don't know if I want it to be manageable. I want to make sure we're at an advantage and there's no question whatsoever that we are going to be ready for whatever task is at hand.

It's our responsibility, through your leadership, Mr. Chairman, to make sure that DOD and the prime contractor, Lockheed Martin, execute the JSF program so that it provides tactical capability as needed, on time, and on budget. Obviously, we're having some very serious issues with that, and the hearing last week I found very informative.

So I'm going to be asking, for example, what's your plan B if the F–35 is delayed further, either in terms of material or force structure solution? Specifically, given the incredible cost—I know Senator McCain touched on that as well—the cost growth of producing, not to mention owning and maintaining, the JSF, where does that

leave us? Have we started to reexamine high-low mixes amongst its oldest strike fighters, as the Navy has with its continued purchase of FA–18 Hornets?

With regard to the Hornet program, I understand in order to maintain a tactical advantage with these jets, the Navy wants to continue buying the advanced Multifunctional Information Distribution System (MIDS). I'm a little bit concerned about the assessment by the Pentagon's chief independent weapons tester that it's not operationally suitable yet and should not be fielded until the deficiencies are identified and fixed. I want to understand the Navy's position, so I'm going to obviously ask that question as well.

As for the Air Force, I'm very concerned, as many others are, at the costs associated with operating and maintaining our legacy fleet of F–22 Raptors. I know the President's asking for $2 billion this year, even though we're not buying any new aircraft. So I'd like to see where the breakdown of that is. Is it all just maintenance and upgrades and things like that? If it is, then the latest hardware and software upgrades are over budget and behind schedule. I'd like to ask the Air Force about that as well.

Then I'm keenly aware, that the Marine Corps needs to start replacing their aging combat aircraft as well. The AV–8B Harrier jet is on its last legs. I think we all know and understand that. Yet the Marine Corps variant of the F–35 has the most difficulty in development so far and is facing a 2-year probation. So what does that mean for the Marine Corps? Where are they? They're traditionally the first to go into battle and we want to make sure that they have the proper equipment that they need to do their job and complete the mission safely and successfully.

Of all the Services, the Marine Corps faces the most dramatic consequences of any further delays or costs as a result of the age of their aircraft. I'd like to hear the perspective of the Marine Corps on that particular issue.

Also, two-thirds of the total cost of the major weapons system over its entire life cycle goes to maintainability or operations and support (O&S) costs. Poor reliability can lead to varying O&S costs, so those systems must be reliable. Last June the chief independent tester was concerned about the reliability of our newest weapons system. Earlier this year, a directive was issued that established a set of procedures that sought to enhance the reliability immediately. I'd like to hear from witnesses as to how this directive is being implemented in programs in your portfolio.

Then finally, Mr. Chairman, with your indulgence, China has been in the press a lot lately for its fighter development and Russia has been exporting fighter aircraft and related technology for years. I'd like to know what each of our witnesses feel and believe are the threats for military aviation in the United States. In other words, what keeps you up at night and how do we respond and are we responding properly, and if not what tools and resources do you need from us, to keep us in that tactical advantage which is so vital to our Nation's security?

So with that, Mr. Chairman, I look forward to the witnesses' statements and testimony.

Senator LIEBERMAN. Thanks, Senator Brown, for that thoughtful statement.

We'll go to the witnesses. First will be Lieutenant General Herbert J. Carlisle, Deputy Chief of Staff for Operations, Plans, and Requirements at the U.S. Air Force. Welcome. Good to see you again.

**STATEMENT OF LT. GEN. HERBERT J. CARLISLE, USAF, DEPUTY CHIEF OF STAFF FOR OPERATIONS, PLANS, AND REQUIREMENTS, U.S. AIR FORCE**

General CARLISLE. Thank you, sir. It's good to see you as well.

Chairman Lieberman, Ranking Member Brown, thank you for the opportunity to provide you with an update on our tactical aviation programs and the U.S. Air Force. Engaged around the world in overseas combat operations, supporting the combatant commanders, our Nation's airmen greatly appreciate your continued support. Our Air Force is continuing to organize, train, and equip our airmen so they can successfully operate across the entire spectrum of military conflict.

The 2010 Quadrennial Defense Review (QDR) set four objectives to guide current and future action and planning: prevail in today's war; prevent and deter conflict; prepare to defeat adversaries and succeed in a wide range of contingencies; and preserve and enhance the All-Volunteer Force.

Today I'd like to focus on preventing and deterring conflict and preparing to defeat our adversaries. As I look at these objectives and consider equipping the future military, I couldn't help but look at history a bit. Opposing militaries have long relied on technological advances to change the course and even the nature of war to their advantage. At the outset of World War II, the Mitsubishi A6M Zero was the best carrier-based airplane in the world. It was lightweight and highly maneuverable. It was not surpassed in the Pacific until the F–6 Hellcats, F–4U Corsairs, and P–38 Lightnings arrived en masse in the latter half of the war.

The Mikoyan-Gurevich MiG–15 was a Soviet swept-wing jet fighter that dominated early stages of the Korean War. It had significant advantages over U.S. jets, including a higher ceiling, faster acceleration and rate of climb, better turning radius, and a more powerful machine gun, until the F–86 came along and generated a 12-to-1 kill ratio against the MiGs.

Development of miniaturizing technologies in the 1980s and 1990s led the Air Force to invest heavily in remotely piloted aircraft technology that provided an unprecedented intelligence, surveillance, and reconnaissance (ISR) advantage in capabilities and an asymmetric advantage over our adversaries.

So as we look to the TACAIR of the future, the Air Force is working to ensure we maintain our Nation's freedom of action in the most effective and efficient way.

As the subcommittee specifically requested, I have detailed how we are going to deal with the delay in the planned delivery of the F–35 JSF program in my written testimony. Because these delays do increase our reliance on our legacy fighter fleet and our ability to maintain that fleet. We have looked at ways to extend the service life of that fighter fleet and modernize combat capability.

The F–16 SLEP is but one example of that effort to mitigate the fighter force shortfall, and I stand ready to address any of those mitigation efforts during testimony.

As we look at the QDR and what is required of us now and in the future, the Air Force is committed to working with our partners to determine the right procurement, sustainment, and retirement of our tactical aircraft to ensure we will be successful across the full range of military operations in the future.

I thank the subcommittee for allowing me to appear before you today, for your continued support for all of your airmen around the world. I ask that my written statement be accepted into the written record and I look forward to your questions today. Thank you, sir.

[The prepared statement of General Carlisle follows:]

PREPARED STATEMENT BY LT. GEN. HERBERT J. (HAWK) CARLISLE, USAF

I. INTRODUCTION

Chairman Lieberman, Ranking Member Brown, and distinguished members of the subcommittee, thank you for calling this hearing, and for the opportunity to provide you with an update on Air Force modernization efforts and other matters important to our Air Force and to the Nation. The Air Force is fully engaged in operations across the globe, including overseas contingency operations, supporting the combatant commanders, and enabling them to successfully execute their missions. In the coming year, we will assess how the fiscal year 2012 budget request aligns with standing operational requirements and future needs of the entire Air Force. The Secretary of Defense, in the recent 2010 Quadrennial Defense Review (QDR), set four objectives to guide our current actions and future planning: prevail in today's wars, prevent and deter conflict, prepare to defeat adversaries and succeed in a wide range of contingencies, and preserve and enhance the All-Volunteer Force. The Air Force is vectoring to meet these objectives, balancing risk appropriately, and preparing to prevent, prevail, and preserve well into our Nation's future.

We frame our decisions and recommendations using the 2010 QDR and the Air Force's top five priorities, established by the Secretary and Chief of Staff of the Air Force. I understand your focus for this hearing will be the F–35 program and Air Force programs and plans to accommodate delays in the F–35 program. Our rapidly aging aircraft fleet drives our urgent need to balance between acquiring new inventory and sustaining our current fleet, while ensuring that conventional strike and air superiority are adequate for executing the National Military Strategy with an acceptable level of risk. I look forward to discussing how we can match the requirements with available resources in order to execute the National Military Strategy.

II. CONTRIBUTIONS OF OUR AIR FORCE

Today, the Air Force flies and fights in air, space, and cyberspace—globally and reliably—as a valued member of our joint and coalition teams. Nearly 37,000 airmen are deployed to 135 locations across the globe, with over 29,000 in and around Afghanistan and Iraq, as we unwaveringly do whatever it takes to prevail in today's wars. Airmen, soldiers, sailors, and marines who cross outside the wire do so with the asymmetric advantage of armed overwatch, globally integrated intelligence, surveillance, and reconnaissance, combat search and rescue, and aero-medical evacuation. Last year the Air Force conducted more than 45,000 sorties supporting Operation Iraqi Freedom/New Dawn and almost 101,000 sorties supporting Operation Enduring Freedom, delivered over 1.78 million passengers and 712,000 tons of cargo, and employed almost 2,580 short tons of munitions. Additionally, we have transported nearly 86,000 patients from the U.S. Central Command area of responsibility. An additional 57,000 total force airmen are forward stationed overseas providing capabilities in direct support of our combatant commander requirements. From home stations here in the United States, approximately 218,000 airmen provide daily support to combatant commanders' worldwide operations, including standing nuclear alert, commanding and controlling our satellites, controlling remotely piloted aircraft, analyzing intelligence, surveillance and reconnaissance data and much more. On the home front, since September 11, 2001, the Air Force has flown over 60,700 total sorties under Operation Noble Eagle, including 43,000 fighter sorties, 11,800 tanker sorties, and 1,900 early warning sorties. As a testament to the total force, the Air National Guard has flown more than 65 percent of these

sorties and currently operates 16 Air Sovereignty Alert sites. As we continue to accomplish our current mission sets and plan for future threats, we must remain mindful of the increasing age and costs of operating our air fleet. Our Air Force leadership is scrutinizing programs and budgets to find acceptable solutions to meet growing demands that are competing for limited funds.

III. FIGHTER AIRCRAFT SHORTFALLS

During the fiscal year 2012 program review, the Air Force delivered to the Office of the Secretary of Defense (OSD), Cost Analysis and Program Evaluation the Service's moderate risk fighter force structure requirement of 1,200 primary mission aircraft and 2,000 total aircraft. A comprehensive review of the current and projected force structure revealed a total aircraft shortfall of approximately 3–5 percent through the Future Years Defense Program. This shortfall will be mitigated through aggressive management of F–35 production, legacy fleet review and sustainment, along with selected service life extension program (SLEP) and modernization program. F–35 program status remains the key variable in the fighter force structure forecast as the Air Force transitions to a fifth-generation fighter capability. Current Air Force mitigation options preserve decision space as we carefully monitor program status and impending decision points.

The Air Force performs regular, comprehensive fighter force structure reviews that incorporate information from fleet viability boards, ongoing and scheduled full-scale durability tests and the latest real-world aircraft engineering data. A review is currently underway and will provide modified fighter shortfall numbers within the next several months. Shortfall mitigation will include executing funded sustainment and fleet management actions for older F–16 Block 25, 30, and 32 aircraft, newer F–16 Block 40/50 service life extension and targeted modernization, and examination of the overall force structure to ensure viable warfighting capabilities are maintained.

IV. STATUS OF COMBAT AIRCRAFT ACQUISITION

*Fighter Force*

The average age of all Combat Air Force aircraft is 21.3 years. The assessment of our aircraft's longevity is complicated by the fact that we are currently flying the oldest Air Force fleet in our history and using them longer and more frequently than was envisioned during their design as a result of over 20 years of continuous combat operations. This presents considerable challenges in a difficult fiscal environment.

As we fulfill, and in some cases extend, the service lives of our aircraft it is important to ensure not only the structural integrity of the airframe, but also the aircraft's viability to perform mission tasks. Modernization will be a key piece of any force structure forecast due to the proliferation of technology and ever changing mission environment. Actions to extend and modernize the legacy fleet are a bridge to 5th generation capabilities and are not considered replacement actions.

*A–10*

The A–10 provides our Joint Force Commanders lethal, precise, persistent, and responsive firepower for close air support and combat search and rescue. It has performed superbly in Operations Desert Storm, Allied Force (OAF), Enduring Freedom (OEF), and Iraqi Freedom (OIF). However, the A–10's age and high operations tempo have taken a toll on the fleet. The A–10 fleet's aircraft availability for fiscal year 2010 was 52 percent.

The Air Force plans to retain the venerable A–10 fleet beyond 2030 based on implementation of the proper care, investment, and fleet management recommendations specified by a 2006 Fleet Viability Board. The fiscal year 2012 President's budget (PB) invests approximately $500 million across the Future Years Defense Program (FYDP) for funding modernization, sustainment, and life extension programs for the A–10. In fiscal year 2007 the A–10 fleet began a robust depot-level modification. This year we begin installing "thick-skin" wings on 230 A–10s—nearly two-thirds of the fleet, and begin improving the fuselage structure. The Air Force is also modernizing 347 A–10s to the 'C' configuration anticipating completion by June of 2011. This upgrade includes precision engagement modifications to integrate targeting pods and digital data links into the aircraft avionics, enabling use of global positioning system-aided munitions such as the Joint Direct Attack Munition (JDAM) and Wind Corrected Munitions Dispenser. We also integrated a digital data link and advanced targeting pods with video downlink and replaced monochrome cockpit displays with color multi-function displays, installed new pilot throttle and stick controls, a moving map capability and a mass-memory upgrade. Finally, we

integrated beyond line of sight radios for faster communication with ground units, forward controllers, and command and control centers. Together, these modifications will allow the A–10 to excel at close air support for the next two decades.

*F–15 C/D*

The F–15 C/D air superiority fighter averages over 25 years of age. The fiscal year 2012 President's budget (PB) invests approximately $1.1 billion for the modernization and sustainment of the F–15C/D fleet. We project the F–15C/D fleet will remain viable until 2025–2030 with potential for an airframe service life extension following full-scale fatigue testing. This test is underway and will conclude in fiscal year 2014. The Air Force manages the fleet through scheduled field and depot inspections under an individual aircraft tracking program. For fiscal year 2010, the F–15C/D's aircraft availability was 64 percent.

We continue to modernize our F–15 fleet with Active Electronically Scanned Array (AESA) radars, and a more capable aircraft mission computer. We expect these efforts to enable the 176 F–15C/D "long-term fleet" to operate safely and effectively through at least 2025 as determined by the full-scale fatigue test. We may extend "long-term" status to the entire 250 aircraft inventory based on requirements of the future force structure.

*F–15E*

The F–15E fleet, with an average age of over 16 years, continues to provide support for ongoing operations in Afghanistan and Iraq. Like the A–10, the F–15E performed superbly in Operations Desert Storm, OAF, OEF, and OIF. In 2009, F–15Es delivered 54 percent of the 2,000 lb. JDAMs and 29 percent of the 500 lb. JDAMs employed in that area of operations. Aircraft availability for the F–15E in fiscal year 2010 was 62 percent.

The Air Force will maintain and improve the F–15E's ability to rapidly engage and destroy time-sensitive targets. The fiscal year 2012 President's budget investment across the FYDP is approximately $1.3 billion for F–15E modernization and sustainment. This includes adding secure radios for faster communications with ground units and forward controllers, integrating the latest precision weapons to hit targets accurately and reduce collateral damage, and adding a helmet mounted cueing system that will reduce the F–15E's time to engage a target by up to 80 percent. Finally, we are adding the state-of-the-art AESA radar system that advances capabilities to identify and engage targets as well as share information with other aircraft. The Air Force expects the F–15E to be an integral part of the Nation's force through at least 2035. A full-scale fatigue test, due to be complete in 2015, will provide useful data regarding the feasibility of a service life extension.

*F–16*

Our multi-role F–16 comprises the majority of the fighter fleet. The fiscal year 2012 President's Budget invests approximately $858 million across the FYDP for F–16 modernization, sustainment, and life extension. F–16 fleet aircraft availability has dropped 5.5 percent since fiscal year 2005. Drivers include the Falcon STAR (all blocks) structural integrity program, engine inlet ram (all blocks), lower wing skin cracking (blocks 25/30/32), and aft cockpit corrosion for two seat aircraft. We expect these drivers to continue to impact aircraft availability through fiscal year 2015. F–16 fiscal year 2011 aircraft availability to date is 66.6 percent. Extensive flight hours and stressing mission profiles resulted in the need for the FalconStar structural modification to the F–16. This upgrade program scheduled to complete in fiscal year 2014, replaces known life-limited structural components and maintains the original design airframe life of 8,000 flight hours. Structural upgrades in the F–16 SLEP include rework and replacement to extend airframe structural service life by 25 percent (6–8 years).

In other inspections, maintainers have found bulkhead cracks in approximately 67 percent (428 of 642) of our Block 40–52 F–16 aircraft. 285 aircraft have been repaired and 82 aircraft had the bulkheads replaced with 1 more in progress. An additional 54 aircraft continue to fly with increased inspections to measure crack growth. Similar to the F–15, the Air Force will start conducting a full-scale durability test for the F–16 in fiscal year 2011 to enable F–16 Block 40–52 airworthiness certification to be extended from the current 9,000 actual flight hours to 11,000 plus actual flight hours. The fiscal year 2012 budget request adds $15 million in fiscal year 2012 to begin design and development of structural and avionics capability modifications for the Block 40–52 fleet to be responsive to the Air Force's total fighter requirement. This funding is in addition to the $10.6 million requested to continue the full scale durability test.

*Fifth-Generation Fighters*

Fifth-generation fighters like the F–22A and the F–35 are key elements of our Nation's defense and deterrent capability. Hostile nations recognize that U.S. airpower can strike their vital centers with impunity which enhances all other U.S. Government instruments of power. This is the timeless paradox of deterrence; the best way to avoid war is to demonstrate to your adversaries that you have the capability and will to defeat them. The F–22A and F–35 represent our latest generation of fighter aircraft. Both aircraft are necessary to maintain a margin of superiority that permits our air and ground forces freedom of maneuver and attack. The F–22A and F–35 each possess unique, complementary, and essential capabilities that provide the synergistic effects across the spectrum of conflict. OSD-led 2006 QDR Joint Air Dominance study underscored that our Nation has a critical requirement to recapitalize TACAIR forces. Legacy 4th generation aircraft simply cannot survive to operate and achieve the effects necessary to win in an integrated, anti-access environment.

*F–22A Future Capabilities & Modifications*

The F–22A Raptor is the Air Force's primary air superiority fighter providing unmatched capabilities for air supremacy and homeland defense for the Joint team. The multirole F–22A's combination of speed, stealth, maneuverability and integrated avionics ensures this remarkable aircraft accesses and survives high-threat environments. Its ability to find, fix, track, and target enemy air- and surface-based threats ensures air dominance and freedom of maneuver for all joint forces.

Similar to every other aircraft in the U.S. inventory, there is a plan to regularly incorporate upgrades into the F–22A to ensure it remains the world's most dominant fighter in the decades to come. The F–22A modernization program consists of two major efforts that will ensure every Raptor maintains its maximum combat capability: the Common Configuration Program and a pre-planned product improvement program which includes Increments 2, 3.1, and 3.2A, 3.2B, and 3.2C.

As of 6 May 2011, the Air Force had accepted 170 F–22A aircraft out of a programmed delivery of 187. We will continue to upgrade the F–22A fleet under the Joint Requirements Oversight Council-approved Increment 3 upgrade designed to enhance both air-to-air and precision ground attack capability. Increment 3.1 is undergoing FOT&E right now. This upgrades the APG–77 AESA radar for synthetic aperture radar ground mapping capability, provides the ability to self-target JDAMs using on-board sensors and allows F–22As to carry and employ eight Small Diameter Bombs (SDBs). The Air Force is fielding Increment 3.1 this year.

Responding to current threat assessments, the next upgrade will be Increment 3.2 A which will complete development in fiscal year 2014. Increment 3.2 A is a software-only upgrade and provides significant additional Electronic Protection, Link 16 improvements, and a better Combat Identification capability. In the future, F–22As will receive the Increment 3.2B and Increment 3.2C upgrades which feature improved SDB employment capability, improved targeting using multi-ship geo-location, additional Electronic Protection and Combat ID, Automatic Ground Collision Avoidance System (Auto GCAS) and the capability to employ our enhanced air-to-air weapons (AIM–120D and AIM–9X). Increment 3.2B should begin to field in fiscal year 2017. The current F–22A modernization plan will result in final fleet composition of 34 Block 20 aircraft used for test and training, 63 Block 30s, 86 Block 35s, and 2 Edwards AFB-test coded aircraft. Both Block 30 and Block 35 aircraft will accept Increment 3.1 and beyond.

*F–22A Procurement Plans*

The F–22A production program is currently delivering Lot 9 aircraft ahead of scheduled contract delivery dates at a rate of about two per month. When the plant delivers the last Lot 10 aircraft in 2012, we will have completed the program of 187 Raptors. The average unit cost for the 60 aircraft in the multiyear procurement was $142.6 million. The Lot 10 unit flyaway cost is estimated at $153.2 million. This is $10.6 million higher than under the multiyear procurement due to higher materiel costs for a much smaller lot buy, loss of the multiyear procurement savings in parts and labor and inflation.

*F–35A*

The multi-role F–35A is the centerpiece of the Air Force's future precision attack capability. In addition to complementing the F–22's world class air superiority capabilities, the F–35A is designed to penetrate air defenses and deliver a wide range of precision munitions. This modern, fifth-generation aircraft brings the added benefit of increased allied interoperability and cost-sharing across Services and partner nations. It will also serve to fulfill our commitment to NATO's dual-capable aircraft

mission. The fiscal year 2012 budget includes $5.3 billion for continued development and procurement of 19 F–35A Conventional Take-Off and Landing (CTOL) production aircraft.

The F–35A program team achieved a number of accomplishments during 2010, including the first flight of the first mission systems aircraft, arrival of the first four F–35A test aircraft at Edwards Air Force Base, CA, completion of F–35A static structural testing 5 months ahead of schedule with no failures, delivery of the first Low Rate Initial Production (LRIP) F–35As to Edwards AFB, roll-out of the second lot of LRIP F–35As, completion of 410 total F–35 test flights in 2010 of which 171 were F–35A flights, negotiation of the first fixed price type production contract (LRIP Lot 4–10 CTOL aircraft), and the signing of a Letter of Offer and Acceptance to procure the F–35A by Israel. Good progress continued in 2011, with the arrival of AF–7 (the second production F–35A) at Edwards AFB on 6 May, F–35A test flights tracking ahead of the plan, the beginning of LRIP Lot 5 contract negotiations, and preparing for training at Eglin AFB which is scheduled to start in late summer 2011.

The Air Force also announced the preferred alternatives for F–35A operational and training bases. Those bases are Hill Air Force Base, UT, and Burlington Air Guard Station, VT, for operational squadrons and Luke Air Force Base, AZ, for training. The program continues to experience challenges as it transitions from development to production despite the significant accomplishments. The Secretary of Defense announced a program restructure in February 2010. The restructure resulted in increased funding for development and production in accordance with Joint Estimate Team II estimates, reduced procurement by 122 aircraft over the FYDP in the fiscal year 2011 PB, upgraded the Program Executive Officer position from a two-star to three-star flag rank, extended development by 13 months, added an additional LRIP lot prior to entering full rate production, and reduced the ramp rate to less than 150 percent of the previous year's production. Program cost growth, including growth from the restructure, resulted in a critical Nunn-McCurdy breach in March 2010. The Under Secretary of Defense for Acquisition, Technology, and Logistics subsequently certified the program in accordance with the Nunn-McCurdy statute, allowing the F–35 program to continue. The Department of Defense (DOD) tasked the program office to perform a bottom-up review of the remaining development effort after the program Nunn-McCurdy certification. This Technical Baseline Review (TBR), completed in November 2010, became the basis for additional program restructuring within the fiscal year 2012 PB. The TBR called for an additional $4.6 billion to complete the Joint development effort. To fund this new development effort, and recognizing a continued lagging performance in production, the DOD reduced procurement by 124 aircraft over the FYDP in the fiscal year 2012 PB, 57 of which were F–35As.

The Commander, Air Combat Command (COMACC) remains the Air Force's decision authority for declaring the F–35A's initial operational capability (IOC). His decision will be based on achieving sufficient levels of readiness in both capability and capacity, and will not be driven by a specific date. Last June, COMACC detailed the specific capability and capacity criteria required for F–35A IOC. These included validation and acceptance of the F–35 Operational Requirements Document-compliant Block 3 mission system software through the Initial Operational Test and Evaluation process. This will demonstrate the Air Force's ability to employ the F–35A in Offensive Counter Air and Suppression/Destruction of Enemy Air Defense missions in Anti-Access/Area Denied environments. In addition, Air Force pilots and maintainers must be validated as trained and ready to conduct operations, with all operations and logistical support elements ready and in place. Last June, based on this criteria, COMACC estimated the Air Force would be able to declare the F–35A IOC in 2016.

The Air Force's position on IOC remains unchanged. We will declare IOC for our F–35As based on achieving the required ORD-compliant capability and capacity criteria, and not on a specific date. We are currently analyzing the impacts to program delivery timelines due to the most recent program restructure, and the results of this analysis will be available later this year. When this analysis is complete, the Air Force will reevaluate our IOC estimate, but we currently expect up to a 2-year delay.

*Joint Strike Fighter (JSF) Alternate Engine Program*

The Air Force's position regarding the JSF alternate engine program is that a second engine is unnecessary, too costly, and risks diverting resources from production. The fiscal year 2012 President's Budget does not request funding for the development and procurement of the F136 alternate engine. The Air Force and Navy con-

tinue to execute the funding appropriated by Congress in the previous budgets to continue the F136 program.

The Office of the Secretary of Defense for Cost Assessment and Program Evaluation estimated that DOD will require approximately $2.9 billion to take the F136 engine to competition in fiscal year 2017, including development, directed buys, and the necessary logistics support. Continued funding for the F136 engine carries cost penalties to both the F135 and F136 engines in the form of reduced production line learning curves and inefficient economic order quantities. The department concludes that maintaining a single engine supplier provides the best balance of cost and risk. We believe the risks associated with a single source engine supplier are manageable due to improvements in engine technology and do not outweigh the investment required to fund a competitive alternate engine.

V. AVIATION SAFETY

The Air Force continues to pursue safety excellence in order to preserve the assets required to execute our mission. The Secretary of Defense goal for 2012 is to reduce by 75 percent the 2002 statistics for Class A mishaps and fatalities, and the number of aircraft destroyed. Last year, the Air Force incurred 14 Class A mishaps, the fewest in the last decade, and as of May 17, 2011 has incurred 8 Class A mishaps. In 2010, the Air Force incurred eight aircraft losses, and one to date in fiscal year 2011. The Air Force will continue to place a heavy emphasis on safety in order to meet or exceed the established goals.

VI. CLOSING

The Air Force stands ready to win today's joint fight and plan for tomorrow's challenges. We are committed to working together to determine the right procurement, sustainment and retirement strategy to remain prepared for the current fight as well as posturing for future demands. Dominance of air, space, and cyberspace continues to be requisite to the defense of the United States. USD/AT&L, Ash Carter testified that: "I support, as does the Secretary, the initiatives Congress directed when it unanimously passed the Weapon Systems Acquisition Reform Act (WSARA) of 2009. Acquisition reform is one of the DOD's High Priority Performance Goals presented in the Analytic Perspectives volume of the President's fiscal year 2011 budget. The Department is moving out to implement these initiatives." The Air Force TACAIR Program actions described above are consistent with WSARA implementation and DOD's Acquisition Reform goal. We appreciate your continued support and look forward to working in concert to ensure our decisions enable us to strengthen our Air Force to meet future requirements.

Senator LIEBERMAN. Thanks, General Carlisle. Your statement and that of the others will be entered into the record in full.

Next we're going to go to Lieutenant General Terry Robling, Deputy Commander for Aviation, U.S. Marine Corps. Thanks, General, for being here.

**STATEMENT OF LT. GEN. TERRY G. ROBLING, USMC, DEPUTY COMMANDANT FOR AVIATION, U.S. MARINE CORPS; ACCOMPANIED BY RADM DAVID L. PHILMAN, USN, DIRECTOR, WARFARE INTEGRATION/SENIOR NATIONAL REPRESENTATIVE, U.S. NAVY**

General ROBLING. Chairman Lieberman, Ranking Member Brown, on behalf of Rear Admiral Philman and with your permission, I'll do a combined statement.

Senator LIEBERMAN. Good.

General ROBLING. It's a privilege for us to appear before you today to discuss the 2012 budget submission as it relates to Navy and Marine Corps tactical aviation. Thanks to the consistent support of the U.S. Congress, your marines and sailors are performing their missions around the clock and around the world knowing that their country is behind them.

The Navy is dedicated to the F–35 program. The JSF is vital to our national security. It will be an integral element of our Navy's

persistent presence and multi-mission capability and to the Marine Corps' ability to conduct expeditionary and carrier operations. Continued funding and support from Congress for this program is of utmost importance.

The Commandant of the Marine Corps and the Chief of Naval Operations (CNO) strongly support the actions that Vice Admiral Venlet and his team have taken over the past year to keep this program on track. They have conducted a rigorous assessment of this program, the technical baseline review, and a team of more than 120 experts determined the F–35 systems, development, and demonstration (SDD) phase should be restructured, variants of the F–35 aircraft decoupled, and the production ramp reduced while the final assembly process in Fort Worth is still maturing.

DOD now has a greater insight into the contractor's production performance. We took the prudent course in delaying additional procurement, ensuring that engineering fixes are identified and incorporated early into the production cycle. During the next 2 years of F–35 scrutiny, Admiral Philman and I will be personally involved with the program and closely supervising it.

The Navy is taking delivery of four B model and two C model SDD F–35s to test, with two more expected this summer. All three variants of this aircraft are in testing now and this testing is going extremely well. The B model has completed more than 200 short takeoffs and more than 100 vertical landings and 150 slow landings, and we are moving steadily toward preparation for shipboard trials of that aircraft in the fall of this year. The C model JSF is also proceeding smoothly towards shipboard integration and this summer the F–35C team will begin carrier suitability testing at Lakehurst, New Jersey.

The F135 engine now has more than 1,300 hours in the air and more than 17,000 hours in test. Overall, the Navy is very pleased by the changes Vice Admiral Venlet has implemented in the program and his personal approach towards transparency, realism, and strict engineering discipline is very much appreciated.

As we plan for the arrival of the extraordinary new warfighting capability of the JSF, we are taking careful and systematic steps to manage our current TACAIR assets. This includes a process of assessment, inspection, and investment in those legacy aircraft we have today. Our use of the inventory forecasting tool, high flight hour inspections, and the F–18 service life management program will keep those aircraft flying safely.

By managing our program of investment in current assets and with the help of Congress, our predictions for a strike fighter shortfall have fallen by half from last year's estimate of around 100 aircraft to a current estimate of 52. The Navy assesses and the Office of Cost Assessment and Program Evaluation agrees, that this is a manageable number as we work to extend the service life of up to 150 of our A through D legacy Hornets out to 10,000 hours in anticipation of the arrival of the JSF.

The Navy and Marine Corps are maximizing those planes in daily operations. This month we signed a new tactical aircraft integration memorandum of agreement updating and revalidating our commitment to sharing fighter attack aircraft in forward deployments. That has proven a remarkably effective model for the plan-

ning and execution of worldwide tactical aviation employment and we are pleased to continue as a team to maximize these assets.

In the defense of our maritime Nation, the Navy and Marine Corps team have maintained a forward-deployed seaborne presence for 235 years. An example of the need of these naval aircraft is action in Libya just 2 months ago. Six of our Harriers, flying as part of a Marine expeditionary unit aboard a Navy amphibious ready group just off the North African coast, were up and flying sorties from the first hours of that campaign. This is a demonstration of the value of forward naval forces and of the flexibility of tactical naval aviation.

Now in our 10th year at war, your Navy-Marine Corps team is poised to meet future challenges at sea and around the world. The significant achievements of naval aviation are always focused on and are in support of our men and women in combat. On behalf of the more than 40,000 marines working hard on the aviation side of our air-ground team and of the 80,000 sailors working hard for the U.S. naval aviation enterprise, thank you for your dedication and oversight. We are doing what America wants us to be doing, providing forward presence with agile and capable forces.

Thank you for this opportunity to speak with you today. We look forward to answering any questions you may have.

[The joint prepared statement of General Robling and Admiral Philman follows:]

JOINT PREPARED STATEMENT BY LT. GEN. TERRY G. ROBLING, USMC, AND RADM DAVID L. PHILMAN, USN

NAVAL AVIATION

Mr. Chairman, Senator Brown, 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) tactical aviation programs. Our testimony today will provide background and rationale for the Department's fiscal year 2012 budget request for tactical aviation programs.

The United States is a maritime nation with global responsibilities. For 235 years, our Navy and Marine Corps' persistent presence and multi-mission capability have been the representation of U.S. power across the global commons. Our naval tradition informs our decisions today, as we remain today firmly in a forward posture for engagement and action. We continue to build on our ability to come from the sea to conduct our missions rapidly across the range of military operations. We are an agile and amphibious power projection force in readiness, and such agility requires that the tactical aviation arm of our naval expeditionary forces remain strong.

The fiscal year 2012 President's budget requests funding for 223 aircraft including 13 F–35 Joint Strike Fighters for both the Navy and the Marine Corps, 28 F/A–18 E/F fighter attack planes and 12 EA–18G to continue replacing the EA–6B. The Department has also requested funds for the demonstration of the Navy Unmanned Combat Aerial System. The DoN fiscal year 2012 aircraft program budget is funded for planned program execution throughout the Future Years Defense Program (FYDP).

TACTICAL AVIATION (TACAIR)

*TACAIR Inventory Management*

The fiscal year 2012 President's budget request includes a DoN reduction of 67 F–35B/C aircraft, the addition of 41 F/A–18 E/F aircraft and the service life extension of 150 F/A–18 A–D aircraft. In 2010, we estimated the DoN Strike Fighter Shortfall (SFS) to be about 100 aircraft; however, the President's budget for 2012 reduces the DoN's projected shortfall to a manageable level of 65 aircraft, with a peak in 2018. On April 15, 2011 in the Department of Defense and Full-Year Continuing Resolution Appropriations Act 2011, Public Law 112–10, Congress added nine F/A–18 E/F to the program of record of 556 aircraft shown in the fiscal year

2012 President's budget request, further reducing the shortfall to 52 aircraft, with a peak in 2018.

This reduction in the shortfall projection is primarily the result of the Navy plan to transition three additional squadrons from F/A–18Cs to F/A–18Es and then redistribute the F/A–18C aircraft to requirements across the DoN. The plan was made possible with the procurement of 41 additional Super Hornets, the redistribution of existing aircraft, and careful management of aircraft service life. These efforts will allow the DoN to have the operational tactical aviation strength required to meet our service commitments.

The DoN continues to balance carefully our investment portfolio, managing meticulously the flight hours and fatigue life of our tactical aircraft while we monitor new aircraft coming online. Since 2004, we have provided fleet users guidance and actions to optimize aircraft utilization rates while maximizing training and operational opportunities. The Inventory Forecasting Tool (IFT) is used to project the combined effects of TACAIR transition plans, attrition and pipeline requirements on the total strike fighter aircraft inventory. The IFT has been updated with the most recent data to provide a current forecast of the strike fighter inventory compared to the existing requirements. Critical variables used in the tool include F–35 deliveries, force structure, usage rates, life limits, depot turnaround time, Fatigue Life Expenditure (FLE), arrested and field landings and catapult launches. Our latest shortfall prediction of 52 aircraft is manageable and is based on fiscal year 2012 President's budget.

We continue to perform High Flight Hour (HFH) inspections to extend the service life limits of the F/A–18 A–D aircraft from 8,000 to 8,600 flight hours. Engineering analysis completed in 2009 revealed that extensive areas of the legacy F/A–18 airframe would require Service Life Extension Program (SLEP) inspections and modifications in order to reach the service life goal of 10,000 hours. The F/A–18 A–D SLEP engineering development phase completes in 2012 and the induction of aircraft begins. The fiscal year 2012 President's budget includes a request to SLEP 150 aircraft throughout and beyond the FYDP. The HFH and SLEP efforts are designed effectively to extend the F/A–18 A–D service life to 10,000 hours, thereby mitigating the impacts of the SFS. Continued investment in Program Related Engineering and Program Related Logistics funds within the Operations and Maintenance, Navy (O&M,N) accounts is critical for sustaining the combat relevancy of the DoN's legacy platforms through the TACAIR transition.

*F–35/Joint Strike Fighter*

The DoN remains strongly committed to both the F–35B Short Take-Off and Vertical Landing (STOVL) and F–35C Carrier Variants of the Joint Strike Fighter, as they are essential to our long-term Naval and Marine Corps aviation strategy and to the Nation's security. Despite the recent program challenges, we believe there is no program, or combination of programs, that can provide more affordably to the combatant commanders the warfighting capabilities they will need to protect the Nation's global interests. F–35 is planned to supersede the Department's aging TACAIR fleet by replacing the Navy and Marine Corps' legacy F/A–18 A–D Hornets, the AV–8B Harrier and EA–6B Prowler aircraft. The integration of F–35B and F–35C aircraft will provide the dominant, multi-role, fifth-generation capabilities needed across the full spectrum of combat operations to deter potential adversaries and enable future Navy and Marine aviation power projection.

The Department of Defense (DOD) has recently completed the most in-depth, bottoms-up technical review of the program to date. The F–35 Technical Baseline Review (TBR) involved more than 120 technical experts investigating all aspects of the program. Based on this review, the Secretary of Defense determined the F–35 Systems Development and Demonstration (SDD) phase should be restructured; variants of the F–35 aircraft decoupled; and the production ramp reduced to mitigate concurrency risk in design and production. The fiscal year 2012 President's budget requests $1.3 billion in Research, Development, Test, and Evaluation (RDT&E) and $3.1 billion in Aircraft Procurement, Navy (APN) for 13 F–35 aircraft (6 F–35B and 7 F–35C) with associated aircraft hardware and spares. These resource requirements align with the Secretary of Defense's F–35 program restructure.

The TBR identified program challenges affecting all variants of the F–35, to include software development, flight test progress and production delays. The Navy's F–35C is progressing satisfactorily while select F–35B-unique systems, such as the auxiliary air-inlet doors and roll post actuator heating, require additional engineering. The Secretary of Defense is imposing 2 years of additional government and industry scrutiny to overcome these challenges to ensure the Marine Corps is delivered the warfighting capabilities needed to defend the Nation. The Commandant of the Marine Corps is personally engaged in the oversight of the STOVL variant

progress, and since January 2011 we have experienced substantial improvements in flight test and resolution of the STOVL technical challenges that have exceeded the TBR predictions. The Department's leadership is assessing continually F–35B progress, and will make an informed decision regarding the F–35B development and production as early as possible, but no later than the 2-year limit directed by the Secretary of Defense.

With the restructure and technical challenges before us, the DoN is assessing the implications to F–35B and F–35C Initial Operational Capability (IOC). The Navy and Marine Corps require that the aircraft attain service-specific mission oriented capabilities, as defined in the F–35 Operational Requirements Document (ORD), prior to considering declaration of IOC. The Marine Corps requires a Block 2B weapon system capability and the Navy requires a fully ORD-compliant Block 3C capability. Implementation of the TBR findings and development of detailed test schedules are still in progress. Once the findings have been assessed, test schedules further matured, and all information incorporated into a new Integrated Master Schedule, the services will then assess and establish IOC dates for each F–35 variant based on program progress and the Joint Program Office's ability to meet our service requirements.

F–35 technical reviews have identified two critical technologies that were rated below the threshold for MS–B. One, the lift fan anti-icing system, has now been matured adequately to the necessary technical readiness level (TRL–6). The other, the Helmet Mounted Display System (HMDS), continues to experience technical difficulties. The program is implementing a dual-path strategy to reduce risk and inject competition into the HMDS development. The dual path has not alleviated the requirements of the ORD but will provide an interim warfighting capability while the ORD-compliant solution is matured.

Developmental aircraft of all three variants are now in flight testing. The program now has 10 test aircraft operating at 3 test sites, with 2 more Navy/Marine Corps developmental test aircraft planned to be delivered this year (BF–5 and CF–3). Each of the Patuxent River Naval Air Station (NAS) F–35B test assets (BFs 1–4) have flown effectively in the conventional take-off, short take-off and vertical landing modes. BF–2 and BF–4 are currently undergoing a modification period in preparation for ship based testing later this year. Another F–35B completed tests in February to expand its speed envelope to 1.2 Mach. To date the F–35B has completed over 100 vertical landings, over 200 short take-offs and over 150 slow landings, and has completed 97 percent of the unique vertical landing test points required for ship trials and ready-for-training certification.

The Navy's CF–1 test aircraft ferried to NAS Patuxent River in November 2010 and has been completing early flying qualities envelope expansion. CF–2 completed its first flight in April and recently ferried to Patuxent River. CF–3 is undergoing final preparations and ground testing for a ferry later this summer. Drop testing of Navy's CG–1 aircraft, to simulate carrier landings of up to 26.4 feet per second, has been completed and has enabled detailed analysis and model validation. This same test article has been reconfigured for static testing and has conducted nearly 70 percent of the required static testing. These ground tests support our early efforts for ship integration and lay the foundation for jet blast deflector and other ship suitability testing this summer at Naval Air Engineering Station Lakehurst.

As of May 15, 2011, the F135 engine program had completed a total of 16,055 hours of engine ground testing, and 1,362 flight test hours, for a SDD total of 17,417 hours. In 2010, the F135 propulsion contractor delivered the final flight test engine and the first 12 production engines, which includes all the Low Rate Initial Production (LRIP) 1 engines and the start of LRIP 2. Notwithstanding this significant progress, there have been technical and cost challenges. In 2010, the program began implementing plans to modify test aircraft to rectify an F135 afterburner "screech" problem, which prevents the engine from sustaining full thrust. These issues are now understood and modifications are in work for the flight test aircraft to complete flight envelope expansion on planned schedules.

Contributing to the F–35B 2-year probation decision were STOVL-unique propulsion system challenges, including those associated with roll-post thermal capabilities, driveshaft spacers, and clutch temperatures. Engineering solutions and incorporation plans will correct each of these propulsion system issues. With regard to engine affordability, the Secretary of Defense chartered a 2010 F–35 Engine Joint Assessment Team to investigate F135 propulsion costs and provide a 'should-cost' objective. The propulsion team is implementing the recommendations with a focus in the coming year to ensure the engine manufacturer and the government continues to make the necessary investments to achieve F135 cost reduction goals.

In support of the Secretary of Defense's position that the interests of the taxpayer, the military, and our partner nations, and the resource integrity of the overall F–

35 program, are served best by not pursuing a second engine, the F136 Joint Strike Fighter engine contract was terminated on April 25, 2011.

F–35 has been challenged this past year, and additional developmental challenges may arise, but we've seen flight test progress improve dramatically beyond expectations and technical challenges have been resolved quickly. Together, Navy and Marine Corps, we strongly support the F–35 program. It is essential to our long-term national security as the future backbone of our air superiority force and as the core of Navy and Marine aviation.

*F/A–18 Overview*

There are 21 Navy Super Hornet squadrons totaling 420 F/A–18 E/Fs. There are 16 Navy and 13 Marine F/A–18 A–D squadrons totaling 628 legacy A–D Hornets. Super Hornets and legacy Hornets have conducted over 148,000 combat missions in support of Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF) since September 11, 2001. While deployed both ashore and at sea aboard our aircraft carriers, F/A–18s have brought significant precision ordnance and laser-guided munitions to the fight, and have employed thousands of rounds of 20 millimeter ammunition supporting forces during strafing runs. These aircraft continue to provide vital overwatch and direct support to our troops on the ground. The F/A–18 fleet continues to meet operational needs in the current conflicts. DoN Hornets have consistently met readiness and operational commitments. Naval Air Systems Command (NAVAIR) uses a Health of Naval Aviation database to store and track the actual utilization data of all the F/A–18s. Both the Legacy and the Super Hornet were procured with an objective of 20 years' time in service. The average legacy Hornet has just now reached that goal, while the Super Hornet is at almost 30 percent of its expected 20 year life. It is reasonable to conclude that most aircraft will exceed substantially their 20 years in service, based on current trends.

*F/A–18 A/B/C/D (Legacy) Hornet*

The fiscal year 2012 President's budget request is $364.6 million in APN for the continuation of the SLEP, systems upgrades and obsolescence programs for the F/A–18 platform. As the F/A–18 program transitions to the F/A–18 E/F and F–35, today's inventory of 628 F/A–18 A/B/C/Ds will continue to comprise more than half of the DoN's strike fighter inventory until 2013. The funds requested will procure and install center-barrel modifications and SLEP kits, which will be a major contributor to extending the service life of select candidate aircraft from the F/A–18 C/D fleet to 10,000 flight hours. The Service Life Management Program (SLMP) continues to monitor and improve the health of the legacy F/A–18 A–D fleet through analyses of TACAIR inventories and the management of usage rates at the squadron level. The F/A–18 A–Ds have flown approximately 75 percent of the total flight hours available at the 8,600 hour limit. Approximately 70 percent of the fleet is over 6,000 flight hours, with 18 aircraft over 8,000 flight hours. SLEP of approximately 150 of these aircraft, to extend their service life to 10,000 flight hours, will be required to meet operational commitments out to 2023.

In order to maintain a tactical advantage, we will continue to procure and install advanced systems ((Joint Helmet-Mounted Cueing Systems (JHMCS); Multi-Function Information Distribution System (MIDS); and LITENING for the Marine Corps) on selected F/A–18 A/B/C/D aircraft.

The Marine Corps is upgrading 56 Lot 7–9 F/A–18As and 30 Lot 10/11 F/A–18Cs to a Lot 21 avionics capability with digital communications, a tactical data link, JHMCS, MIDS and LITENING. The Marine Corps will also upgrade 72 F/A–18 A–D model APG–73 radars with the Expand 4/5 upgrade, providing an enhanced Synthetic Aperture Radar (SAR) capability and improving further its all-weather capabilities. The Marine Corps anticipates these upgrades will enhance the current capabilities of these aircraft with the digital communications, tactical data link and situational awareness required for them to remain viable and relevant. The Marine Corps expects the F/A–18 (A++/C/D) to remain in the active inventory until fiscal year 2022 and in the Reserve inventory until fiscal year 2023. The Marine F/A–18s are also employing the LITENING targeting pod in expeditionary operations including OEF. When combined with data link hardware, the LITENING pod provides real-time video to ground forces through Remotely Operated Video Enhanced Receiver (ROVER) and Video Scout ground workstations.

The F/A–18 A–D Service Life Assessment Program (SLAP) is now complete and has identified that extensions of the airframe are possible with inspections and modifications. Based upon those results, SLEP, a three-phased program, has begun. SLEP Phase A is complete; it identified the critical safety of flight locations that needed immediate inspection and identified notional repair concepts to enable rough order of magnitude (ROM) cost estimates. SLEP Phase B is currently in work with

NAVAIR and the original equipment manufacturer (OEM); this phase categorizes parts by criticality, develops tracking algorithms to define recurring inspection intervals, conducts vertical tail failsafe solutions and upgrades analytical tools necessary for the NAVAIR and OEM engineers to design repairs. Phase B is currently 90 percent complete and should conclude in August 2011. SLEP Phase C, in planning, will finalize all remaining Phase B work and develop modifications and inspections as required. The Phase C estimated contract award date is summer 2011. The life extension of the F/A–18 A–D's major subsystems and avionics is independent of the airframe, but progressing as well.

The fiscal year 2012 President's budget request includes SLEP requirements for 150 airframes; modifications begin in 2012. The technical risk in developing modification kits to achieve the goal of 10,000 flight hours is assessed as low. Current assessments have determined that the Fleet Readiness Centers have the capacity to execute the required number of HFH inspections and SLEP modifications. Material availability and engineering disposition turn-around times influence depot efficiencies.

*F/A–18 E/F Super Hornet*

A multi-year procurement (MYP) contract for 124 F/A–18 E/F Super Hornets and EA–18G Growlers was signed on September 24, 2010 for fiscal years 2010 through 2013. In December 2010, the Secretary of Defense added 41 E/F aircraft to the fiscal year 2012 President's budget request in fiscal years 2012 through 2014 and Congress added 9 E/F aircraft to PB–11. The total planned procurement is now 565 Super Hornets and 114 Growlers.

The fiscal year 2012 President's budget requests $2.4 billion in APN–1 for 28 F/A–18 E/F Block II (Lot 26–38) aircraft. The F/A–18 E/F continues to transition into the fleet, improving the survivability and strike capability of the carrier air wing. The Super Hornet provides an increase in combat radius, endurance and weapons payload over the legacy Hornet. The program will complete procurement of the 565 programmed aircraft in 2014. Production line shutdown will begin in fiscal year 2014 with the final shutdown occurring in fiscal year 2016. The Super Hornet uses an incremental development approach to incorporate new technologies and capabilities—JHMCS; Advanced Targeting Forward Looking Infra Red with shared real-time video; Shared Reconnaissance Pod System; and MIDS data-link. The F/A–18 E/F fiscal year 2012 budget request includes $172.6 million in APN to implement commonality, maintain capabilities and improve reliability and structural safety.

The APG–79 Active Electronically Scanned Array (AESA) radar system was installed in all production F/A–18 E/Fs and EA–18Gs beginning with Lot 30 in fiscal year 2006, and a retrofit program exists to modify 133 Lot 26–29 Block II aircraft with APG–79 radars. The Navy plans to equip all 428 Block II Super Hornets with AESA radars, providing the Super Hornet a significant increase in detection range, lethality and survivability over the legacy Hornets. AESA squadrons have been successfully deploying since 2007 and are highly valued by fleet commanders. The AESA squadrons are considered force multipliers because of their ability to share battlespace management data with other non-AESA tactical aircraft in the carrier strike group.

The F/A–18 E/Fs have flown approximately 30 percent of the total flight hours available at the 6,000 hour limit. Force structure analysis has shown that this will not be adequate to meet operational commitments out to 2035. As a result, the F/A–18 E/F Service Life Assessment Program commenced in 2008 and will last through 2015. The goal is to analyze actual usage versus structural test data to identify the feasibility of extending F/A–18 E/F service life from 6,000 flight hours to 9,000 flight hours via a follow-on SLEP. Extending the airframe to 9,000 hours through both inspections and modifications is currently assessed as a low risk effort. The fiscal year 2012 President's budget includes a request for $100.4 million RDT&E (fiscal years 2012–2016) to support the F/A–18 E/F SLAP study requirement. One of the F/A–18 E/F SLAP goals is to define the necessary inspections and modifications required to achieve 9,000 flight hours.

Other goals in the SLAP study relate to increasing total landings, arrested landings and catapults beyond currently defined life limits. Phase A is currently underway and is developing methodologies to be used in assessing airframe, flight controls and subsystems. Phases B and C will continue those assessments along with landing gear and multiple fleet teardowns. The F/A–18 E/F SLAP is incorporating lessons learned from the F/A–18 A–D analysis. E/F SLAP was started sooner in its life cycle than the F/A–18A–D SLAP and encompasses the entire weapon system vice just the airframe. The F/A–18 E/F SLAP also has the advantage of having a third lifetime of test cycles completed on multiple test articles providing detailed information on high fatigue areas early in the program. The SLMP philosophy has

also been applied to the F/A–18 E/F fleet much sooner in its lifecycle than the F/A–18 A–D, which will optimize FLE, flight hours and total landings so that they all converge at approximately the same time, which should align aircraft service life with fleet requirements.

*Airborne Electronic Attack/EA–18G Growler*

The fiscal year 2012 President's budget request is $1.1 billion in APN for 12 Full Rate Production (FRP) EA–18G aircraft and $17.1 million in RDT&E, N for correction of deficiencies. The program completed Operational Test and Evaluation in May 2009 and was deemed Operationally Effective and Operationally Suitable. IOC was achieved in September 2009 and a favorable FRP decision was obtained in November 2009. The first EA–18G squadron deployed in an expeditionary role in November 2010 to Iraq. EA–18Gs in-service have flown approximately 5 percent of the 7,500 total flight hours per aircraft and are meeting all operational commitments.

The EA–18G began replacing expeditionary and carrier-based Navy EA–6Bs in 2009. These transitions will continue through 2015. A total of 78 EA–18Gs have been procured to date. As directed by the Quadrennial Defense Review in 2009, the Secretary of Defense added 26 EA–18G aircraft to the program of record across the FYDP to increase joint force capacity to conduct expeditionary electronic attack. The additional aircraft will fill the Navy's four expeditionary electronic attack squadrons currently using the legacy EA–6B Prowler. As reflected in the fiscal year 2011 President's budget, the program of record is now 114 aircraft.

The Navy has completed an Analysis of Alternatives (AoA) to determine the best path forward for the Next Generation Jammer (NGJ). The NGJ system will replace the ALQ–99 electronic warfare pods currently flown on the EA–18G and EA–6Bs and will provide DOD with the advanced comprehensive electronic attack capability to outpace the threat. The NGJ is planned for integration initially on EA–18G aircraft, and may later offer integration opportunities on F–35B and F–35C aircraft.

CONCLUSION

The Department of the Navy supports fully the F–35 Joint Strike Fighter program. While the Navy and Marine Corps await completion of F–35 SDD, our current fleet of F/A–18 aircraft remain ready and relevant through a portfolio of assessments, inspections, improvements, and investments.

Thank you for this opportunity to discuss Navy and Marine Corps tactical aviation and the F–35 program. We look forward to answering any questions you have.

Senator LIEBERMAN. Thanks, General. I appreciate the statement.

We'll do a 7-minute round for questions.

A while ago, Secretary Gates said that in the budget discussions going on now everything's on the table, and I presume that therefore means even the overall JSF program. Before we get into the detailed questions about where we are on the delay, I just want to ask the baseline question, General Carlisle. I'll ask it from a skeptic's point of view, although I'm not as much of a skeptic as the question, which is: in a world in which we're involved in two wars that are unconventional and in which our security is now threatened by remarkably unconventional means, such as cyber attack, and, as you mentioned parenthetically, unmanned aircraft are playing an increasingly significant role, what's the argument for a fifth-generation fighter?

If I can be more specific and urge you to be specific, who are we preparing the fighter to defend us against?

General CARLISLE. Thank you, Mr. Chairman, for that question. Clearly your initial point is we are engaged in a conflict, and a priority of DOD and certainly all the Services, is to win today's conflict, and we are full in doing everything we can in that.

Having said that, there is a proliferation of anti-access, area denial capabilities out there. Specifically in the Pacific, there's a lot of them with respect to the People's Republic of China (PRC).

Senator LIEBERMAN. We're thinking of China?

General CARLISLE. Yes, sir. They have the ability in their latest generation air defense systems, as well as the J–20 that rolled out, the PAC–FA that rolled out from Russia, as well as what they're doing in advancing their Su–30s and those type airplanes and their surface-to-air missiles.

It's not just a question of what's there, but also what they proliferate; where they sell those things to. As you well know, the PRC is selling things, as are the Russians, to just about anywhere in the world. There's other countries besides the PRC that would provide us with an anti-access, area denial threat. Certainly Iran is one as they continue to upgrade their systems and they spend money on buying those.

Senator LIEBERMAN. With the case of Iran, it would be both their own development of capabilities, but also the fact that they would perhaps acquire?

General CARLISLE. Yes, sir, I think that's the case. If you look at their surface-to-air systems, their anti-aircraft, and their integrated air defense systems, they're buying those from the Russians predominantly right now, and those are the systems that we'd have to be able to penetrate if we ever wanted to do anything in reference to any of the activities going on inside Iran, nuclear activities or anything.

Senator LIEBERMAN. So in the case of China, for instance, or some of the Russian capabilities, would you say that they make our current TACAIR vulnerable?

General CARLISLE. Sir, I would. I would say that if maintaining influence in the Pacific region, which everybody believes we definitely need to do, and our ability to protect our allies and friends in that part of the world, we would have to travel and go to their systems. If we go to their systems and they'd have those anti-access capabilities, they have their surface-to-air systems, they have their surface fleet, the SA–N–9, HQ–9s, rather than the SA–N–20s, aboard their surface combatants in and around the Pacific. Clearly it would put our current legacy fighters in a fight where it would be difficult for us to penetrate those kind of areas.

Senator LIEBERMAN. General Robling and Admiral Philman, would you like to add anything to that?

General ROBLING. Sir, General Carlisle did an excellent job of answering that question for you. I would add that both General Carlisle and I just came from the Pacific region, in my case as the commander of the 3rd Marine Expeditionary Forces in Japan. So our worry is the weapons that China is developing in the Pacific case, where those would proliferate, particularly in North Korea's case.

But in the Iran case, it's not just the surface-to-air threat. It's also the surface-to-surface threat. It's not just why do we need this stealthy aircraft with these very capable precision weapons; it's the ability to go in and neutralize those surface-to-surface threats as well.

Senator LIEBERMAN. Got you.

Admiral?

Admiral PHILMAN. Thank you, sir, and thanks for the opportunity to be before the subcommittee.

Senator LIEBERMAN. Thank you.

Admiral PHILMAN. Sir, the anti-access and the area denial piece that was mentioned before, we want to be there in the three major regions: the PRC, the North Korean scenario, and the Iranians. As you alluded to, whether they develop those capabilities themselves or acquire it, there is a real belief that will be something we will have to face in the future.

If we are unprepared for that, then the follow-on efforts that would be in any campaign would be woefully inadequate. So if you're able to invest in those more advanced, fifth-generation fighters, not only to deliver weapons but to loiter in contested air space, to have the ISR piece is very important.

Senator LIEBERMAN. Okay. I think that establishes a baseline.

Let me ask you if you would respond to the numbers that I cite in my opening statement, which are a really quite significant drop in the estimates of a shortfall. Help me understand how you were able to achieve that drop and whether you're confident now, because there's been such a significant variation in recent years in the predicted shortfall, that the numbers you've given as part of this budget will hold up.

Admiral Philman, why don't we start with you this time.

Admiral PHILMAN. Yes, sir. As we first uncovered or we realized the strike fighter shortfall several years ago, it was really precipitated by the initial delays in the JSF program. So those initial numbers were an estimate based on when will the aircraft be delivered, and then what is the existing aircraft viability?

Early on we had flown the F–18 to its maximum. We learned more about how the life is expended, and the good engineers at Patuxent River were able to go back in and figure out what was left on the airplane. So the initial estimates certainly are high and with good reason. But the more we've learned, the more we understand how we fly the airplane, the mitigation measures that we have on a daily basis at the flight line on how to extend the life of existing airplanes. Then the confidence we have now, gaining confidence in the F–35 program, it gives us good reason to be confident.

The F–18 E/F legacy fleet is very important to us to get us to that fifth-generation fighter. So we figure we have about 150 aircraft that are the best population from which we could extend. That allows us to keep the flight decks viable, helps the Marine Corps with their fighter population, to get us to the fifth-generation fighter, the F–35 B/C.

So yes, sir, we've learned as we've gone. The engineers have been very diligent in understanding what they see when they open up airplanes, the high flight hour inspections and the predictions of what can be repaired in a SLEP. So all those things combined give me confidence that we're on the right path.

Am I satisfied? Certainly not. As was mentioned earlier, we want to maintain our advantage in every case possible.

Senator LIEBERMAN. Some people would characterize the existing projected shortfall or have characterized it as manageable. Is that a word you'd use, or how would you describe it?

Admiral PHILMAN. That was a word that was used in previous testimony, and I believe that to be true. The other piece, that I failed to mention earlier, was the 41 aircraft that are in the 2012

budget and the 9 that became available when the budget was passed for fiscal year 2011. That gives us 50 airplanes that we did not have before. That changes the calculus in a big way.

So all those things combined, and you consider the way we're flying the aircraft, we're preserving the life, whether there are carrier-arrested landings, whether they're flying off the beach in different ways, all those things combined give a calculus to be confident that we can get to the F–35C. Manageable? Yes, sir. Again, I'm not satisfied that that's where we should be. We have the senior leadership from the Commandant of the Marine Corps and the CNO on down that charges us on the flight line to schedule the aircraft properly, maintain them properly, get them into repair and out as quick as we can.

Senator LIEBERMAN. So it's not desirable, but it's manageable, or you can deal with it?

Admiral PHILMAN. Yes, sir. That's a shorter answer to the same question.

Senator LIEBERMAN. No problem.

General Carlisle, tell me about how the Air Force has reduced the shortfall and whether you're confident now that the numbers you're giving us this year are going to hold up?

General CARLISLE. Yes, sir. Pretty much the same discussion as my friend. The analysis that is ongoing, and as we continue to look at these airplanes, we have a program called the Aircraft Structural Integrity Program that continually looks at the airplanes. As part of that, we look at how we fly them, as was mentioned earlier. We call it a severity code of what kind of payload we put on and what environment we fly in, how it's flown, and record all that data, and continually update the look at the airplane.

We also do fleet viability boards. We get experts from industry and the Navy and the Air Force and all the Services and we look at airplanes and look at the viability of that airplane over time. That does affect what the service life of those airplanes are.

The other thing I think probably changed from before was, as we continue to do analysis of what's asked of us, how are we going to use these airplanes and what kind of airplanes do we need? Today our number, we believe, given the current National Military Strategy, is we need about 2,000 total fighters including 1,200 primary mission fighters. Those numbers are slightly different than they were when we were reporting a larger shortfall.

So there was a little bit of analysis continuing. To be perfectly frank, as we look at the comprehensive strategy review today and where we're going to go in the future we will continue to look at those numbers and make sure we're going to fulfill the Nation's commitment and what they want us to do with this fleet.

So as we continue to look at the airplane, we determine the life of that airplane.

The other thing, Mr. Chairman, that we had not anticipated before based on the original delivery of the F–35 was doing a SLEP and modernization of the F–16s. We had always planned to do the A–10s, the F–15Es, but we had not planned it. Given the situation we're in now, we are we going to do a SLEP as well as a modernization program to some of our F–16s.

Senator LIEBERMAN. Okay, thanks. I'll come back with some other questions on your answers. Thank you.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman.

I'm wondering, though, General, does that affect our training and the skills of the individual pilots, the way that you're kind of shifting the actual usage of the aircraft?

General CARLISLE. Senator, that's a great question. What we face in our fleet today is our aircraft are maintaining a fairly consistent availability. Our biggest shortfall is air crew training. If they spend a lot of time in Afghanistan and Iraq as they are now in continuous rotations, their ability to do the other type of training for the full spectrum operations to deal in an anti-access, area denial environment, and to do maritime ops in support of the Navy, all of that training is kind of relegated to after we do the primary fight today.

So with respect to training our folks to do the mission, we have seen a degradation in that training just because of the current conflict we're in.

With respect to the aircraft, the aircraft availability, and the aircraft's mission capability across the full spectrum, the aircraft are maintaining pretty even availability and mission capability rates. So that part is less of an issue than the time we have to train the air crews in the different types of missions they're going to be asked to perform.

Senator BROWN. Great, thank you. I'm wondering if any of you can comment on the fact that in the last hearing we had Dr. Carter's assessment that as of today the cost of operating the JSF would be unaffordable, estimated at being $1 trillion when adjusted for inflation. I'd like to know, is there a plan B for the Air Force, Marine Corps, and Navy? Is there a plan B in the event that the JSF program is delayed even further?

Admiral PHILMAN. Thank you, Senator. Our plan as it's stated right now is to get to the fifth-generation fighter, with some confidence that we'll get there. The good news from the U.S. Navy side is we have a hot line. The last procurement of the F–18 E/F will be procured in 2014 and delivered in 2016. That is not our primary plan A, certainly, but that is certainly a plan B that could be considered if the F–35 continues to slide.

But I am given good confidence by Admiral Venlet that, with the now two F–35C aircraft at Pax River, that testing is going, and it'll pick up at a good clip. The third one should arrive here in just a month or 2 and we can start doing the aircraft carrier tests as well.

Senator BROWN. General Robling, given that the AV–8B Harrier is running out of time, what's the Marine Corps' thinking as to the F–35B in particular?

General ROBLING. Senator, we've been on this track for the last 15 years to downsize to a minimum number of type-model-series and really on the TACAIR side to reduce the EA–6B, the AV–8B, the Harrier that you speak of, and the F/A–18 to the JSF–B model. So we believe that's the aircraft that we need.

I think without the B model this Nation's not going to have the capability to have 22 capital ships out in the global commons providing the security for this Nation and for the other nations that depend on the United States. So our plan B is to make this work.

I hope that doesn't sound flip, but we've put ourselves into a big hole and I think, as Dr. Carter, Ms. Fox, and Admiral Venlet testified, they see good reason to believe that we can get the costs under control and get this aircraft flying.

In fact, the testing of this aircraft has gone extremely well. This year we've actually gotten back on track for this year, and we're well ahead of the test points that we need as we work toward ship integration at the end of this year.

Senator BROWN. I know that the 2-year probationary period for the F–35B has, in fact, happened and as a result the Air Force and Navy variants have been allowed to move ahead. So I think there seems to be an acknowledgment that these are now, obviously, three different aircraft, but three separate developments proceeding at different rates.

So now that the testing is well under way and procurement has started, why shouldn't we, at a minimum, break these three models into different programs so they can be managed discretely or separately? Any thoughts?

General ROBLING. I wouldn't say that they weren't now. I would say that General Carlisle and the acquisition folks at the Air Force are just as interested in their version and track it very closely as we do ours. I would say that, even though we decoupled that because we did not want to hold back the C and the A models as they deliver. Quite frankly, they're delivering just behind the B model. So we actually got more test points earlier. The Air Force's A model right now has delivered more aircraft and has more aircraft in testing. The Marine Corps has four of those and I think we got our second C model.

So as the testing goes and the test points, we aren't really holding each model variant up.

Senator BROWN. Obviously, with the development of the new aircraft there are support facilities and different types of studies that are being done, the environmental studies, the actual construction of new hangars and whatever else is needed to support that. How is that all going and where are we with that? General Carlisle?

General CARLISLE. Senator, with respect to the Air Force, we're well on the way. The first pilot training base—and it'll be a joint pilot training base—is going to be at Eglin Air Force Base in Florida, and the facilities there are coming to completion and ready for training that was talked about in the previous hearing. The AF–8 delivered to the Air Force should be delivered to Eglin some time in the fall and we'll be ready for training and the facilities are there and ready to go.

Follow-on bases are in the line. Military construction (MILCON) for new missions is established out there as we move into the next bases. But right now at Edwards, testing; Nellis, operational testing; and then Eglin, the MILCON is well on track, sir.

General ROBLING. Sir, we're on the same track as the Air Force. We'll do our joint training down at Eglin initially with the Air Force and with the Navy. Our MILCON, our manpower, and our support assets are all very closely integrated. The MILCON for Yuma is either on contract now or just completing contract for all the hangar facilities we need in Yuma, and the Environmental Im-

pact Statement processes are complete. We'll do the same for Beaufort, SC, and the other bases as we march our way across.

But we have a very tight transition task force that looks at every one of these issues, and right now we're on track.

Senator BROWN. Thank you, sir.

Senator LIEBERMAN. Thanks, Senator Brown.

Let me go to initial operating capability (IOC). Correct me if I'm wrong. I believe the Marine Corps has an IOC of 2012 for the F–35B. Last year the Air Force and the Navy moved their IOCs or backward to 2016. I wanted to ask you, because of the concerns now about additional delay in the JSF, and there's a lot of concern that the numbers may slip again when the Defense Acquisition Board completes its realignment program. General Robling, is the Marine Corps still sticking to the 2012 IOC date?

General ROBLING. No, sir, and thank you for that question. I think we waited to change the 2012 IOC date until we had to, the requirement is coming up in documentation. But certainly, with this period of scrutiny and looking at the aircraft and the reduced ramp, we're going to slide. I think what we've decided to do now is not set an IOC date certain, but set a window out there. Of course, we're looking, with a slide of at least 2 years, probably somewhere in the 2014 or 2015 timeframe. It will be event-driven.

Senator LIEBERMAN. It will be event-driven. Okay, I appreciate your sharing that with us.

Air Force and Navy, still at the same 2016 IOC date?

General CARLISLE. Sir, that is the current date with the slip of the program. We anticipate the same thing as the Marine Corps. We will probably slide to the right. Two years is probably a good estimate. Just like the Marine Corps and the Navy, it'll be event-driven based on the Corps developing, tactics, and the operational testing and evaluation (OT&E) on the airplane.

Senator LIEBERMAN. Right.

Admiral?

Admiral PHILMAN. The same, sir. The 2016 date we feel is no longer valid, so it will slide some to the right. It will be event-driven, where we have a squadron, we have training facilities, we have hangar facilities and all those things, as well as the logistics pipeline to support those aircraft. Then once all those are satisfied, the CNO can declare IOC.

Senator LIEBERMAN. Okay. It's really unfortunate that we've had to do that, but there's nothing you can do about that except react to the reality of the program developments.

I want to ask you a series of questions about how we're coping with those delays. But the first one is whether you've thought about the possibility of deploying variants of the JSF to theater even if they don't have all the capabilities that you want. In other words, I'm asking if there's any consideration, whether combatant commanders ask for or whether they'd actually in some sense allow the deployment to theater of aircraft that don't have all the capabilities. We've followed the Joint Surveillance and Target Attack Radar System program and that's a case where it was deployed to theater before it had all the capabilities, all the testing, because it was needed.

Have you thought about that at all, General Carlisle?

General CARLISLE. Yes, sir, we have. We looked at our schedule and the Air Force's decision to declare IOC when we get Block 3 software and hardware in the airplane. The OT&E is done for that. When we look at our current schedule, we will have a number, and the specific number depends on how things go over the next few years. But we'll have a number probably on the order of 100 airplanes delivered to operational units before we declare IOC, because of the way we're going to bed down the airplane.

Although we may not declare IOC, we will be training, and we'll be doing the tactics, techniques, and procedures (TTP) with the Block 2 Bravo, which will be the airplane that will be initially delivered. We know what capabilities we will train. We'll have the logistics system, we'll have the maintainers. If the combatant commander said we need this capability, then we would clearly provide it. I think that's probably a universal approach.

Senator LIEBERMAN. Yes. That's interesting. Obviously, you wouldn't do it if you had any safety concerns, but you'd do it if you felt it added value, to use a generic term; right?

General CARLISLE. Exactly, sir. I think when you look at the capabilities this airplane is going to bring to the fight, there is a lot of capability even in the Block 2 airplanes that is very impressive. Again, depending on the environment and the combatant commander that was requesting it, then we would, with all the safety considerations, be ready to go.

Senator LIEBERMAN. Right.

General.

General ROBLING. Yes, sir. In fact, I think one of the reasons why the Marine Corps is a little bit earlier than the Air Force and the Navy is that we've decided to IOC with Block 2B. The reason we've decided to do that is because it gives us at least legacy or better capability, really better than legacy, with the very low observable aircraft. So our IOC is a little bit earlier because we're accepting those in 2B. But like General Carlisle, for us it will be in excess of about 50-plus aircraft at that time, that we will be training toward.

Again, that's software- and hardware-dependent. That's the event-driven I was talking about. Once that's certified, we'll IOC. Of course, along with IOC is the capability to deploy.

Senator LIEBERMAN. Admiral?

Admiral PHILMAN. Mr. Chairman, just like the Air Force, we're going to IOC with the Block 3 software and the hardware installed and the training complete. We probably won't have as many numbers of aircraft as the Air Force or the Marine Corps at that point. But once that has been achieved, I don't see any reason why it wouldn't be able to be called to go into theater, assuming all the safety considerations have been taken into account.

Senator LIEBERMAN. There's a certain way in this context in which the term IOC is misleading. It suggests that until you hit the IOC date that the system doesn't work, and that's not really the reality.

General CARLISLE. No, sir, it's not. Mr. Chairman, to be perfectly frank, in a lot of cases if you delay IOC you can maintain pressure on a contractor to deliver the product that you want and to continue to develop it.

Senator LIEBERMAN. Yes.

General CARLISLE. That does give you ability to keep the delivery coming and the pace of the upgrade that you need to get to the capability you want.

Senator LIEBERMAN. Makes sense.

Let me go quickly now to—another way you're dealing with this delay in JSF–SLEP. Last year we directed the Navy to conduct a cost-benefit analysis of the differences between F–18 new procurement and the F–18 SLEP. The report arrived just last night, so I haven't personally had a chance to look at it.

Admiral, could you give us a highlight of what the report concludes?

Admiral PHILMAN. Mr. Chairman, with a great deal of analysis from the folks at Pax River and the people from Boeing, we looked at six different courses of action, from procuring only new F–18 Es and Fs, to a combination of SLEP and procurement, to only SLEP, as many as 280 aircraft. The findings really came down to pretty much what we've offered in the program objective memorandum-2012 submission. If we continue to procure in the numbers that we're looking at those 41 plus 9 aircraft, Es and Fs—and if we have a good population of 150 to SLEP then that is the best balance to bridge us to the fifth-generation fighter.

So we didn't predetermine the answer, I don't think, but that report is pretty thorough and, given the six different options, the option that was selected as the most attractive is the so-called option 2, which is just as I described, sir.

Senator LIEBERMAN. I'll come back to that in my next round. Thank you.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman.

So the design and development efforts are not proving reliable, is what last June the Pentagon's chief independent weapons tester issued a memo stating. Then DOD issued direction that would measure and improve the reliability and maintainability of the newest weapons systems. If each one of you can independently comment as to how programs within each of your portfolios are complying with that direction, and does additional work called for in this report still need to be done?

General CARLISLE. Senator, from the Air Force standpoint, we are clearly taking that to heart. I think part of the issues are it's early in the program. It was a good time to have that kind of study and review as we move forward. It has put more scrutiny and more emphasis on the completion of those test points. It has added test points. It has added rigor in some cases where there probably wasn't enough rigor in the program to create the positive results since then.

Actually, General Robling and I were just down at Fort Worth. That scorecard of where they're moving on those test points as well as meeting those requirements is moving along at a very good pace and is actually a pretty good news story. There are a few holdups still. The helmet is one that we're continuing to work, and I'm sure you've heard about that. There's a dual path idea with the helmet now.

The Air Force's airplane is probably the one that's moving farthest ahead. The missions systems capability, the flying testbed, and the weapons performance are actually coming along at a very good pace, and the Air Force right now is continuing to keep pressure on it. But we're seeing great progress in that area.

Senator BROWN. Thank you. General Robling.

General ROBLING. Yes, sir. I'm on the same track as the Air Force. Their problems were our problems, obviously. A lot of those are software-driven, some hardware, but software because of the test points; we've increased those. I think before they were testing to these corner points to get to the outer edge of the envelope so we could move it along. I think since that time we've realized that you need to test inside of those corner points, and the more testing we've done, it's added more reliability, and that will increase as we continue to test.

Admiral PHILMAN. Likewise, sir. We are very pleased that we have two C model aircraft down there at Pax River now, so we can expand those envelopes and have those testing points returned from almost every flight. Admiral Venlet has been very diligent about driving in, okay, this is the test plan that is needed for all three variants to meet his satisfaction that we're moving in the right direction. So I'm comfortable with that.

Senator BROWN. Thank you.

I know China, as I mentioned in my opening, has gotten a lot of press for its fighter development. Russia, as we all know, has been exporting fighter aircraft and related technology for a long time now. What do you see as the pacing threat for military aviation? Is there any particular air force that worries us more than yesterday or in the future?

General Carlisle?

General CARLISLE. Sir, that's the rollout of the J–20, which is the PRC's attempt at a stealth fighter. We just recently had the second aircraft of the PAC–FA show up, which is a joint Russian and Indian attempt at a stealth fighter. Those are discouraging in that they rolled out in a time that we thought there was maybe a little bit more time, although we were unsure of that. I think the thing that we think about is the fact that we have had a technological advantage against our adversaries in and, given the world that we're in today and the informational age and the interdependency, over time I believe we'll still maintain an advantage. I think our advantage will be a shorter period of time.

We've had a stealth advantage. The F–117 flew in the late 1970s. So we've had a stealth advantage over our adversaries for a long time. I don't see us maintaining an advantage for as long because I think other nations will continue to try to gain that technology. There will be different avenues for them to do that, and they'll try to replicate it in a lot of ways.

The Russians produce a very good fighter aircraft and the PRC produces a very good fighter aircraft, and they will continue to develop that. You need only look across the Pacific and see what the PRC is doing with respect to not just their air force capability, but their surface-to-air capability, their ballistic missile capability, their anti-ship ballistic missiles, their CSS–3 that has the range to

get to Guam, as well as missiles that can get to Kadena. All of those things are incredibly disturbing to us for the future.

As Terry said, we need not only to be able to defeat those, we have to hold those targets at risk. That's where these fifth-generation aircraft come in.

Senator BROWN. I'm going to submit some questions for the record. I'm not quite there yet. But I'd like to see, based on your observation of those, the Indian-PRC joint effort, what your assessment is of it.

General CARLISLE. Sir, I think for both the J–20 and the PAC–FA, I believe that they'll get there. There's no doubt in my mind that over time the technology will get there. I will say, though, in an effort not to make anybody 10 feet tall or to give them artificially great capability, it's not easy. These things are hard to develop. These airplanes are not easy. We saw it in the B–2, the F–22, and the F–35.

As you look at even the initial rollout of both the J–20 and the PAC–FA, they're certainly getting there, but there are some things that a practiced eye that's been doing this for a long time can look at them and see that they probably don't have it exactly right.

To produce these is not easy. It's going to take some work for them to get there.

Senator BROWN. General, I'm presuming you're similar in terms of your commentary?

General ROBLING. Yes, sir. When that rolled out we had the same assessment. You can look at the aircraft and tell how far they've gone in design and what their capabilities are, and it's advanced. But to get to the crux of your question on the pacing and what's keeping us ahead right now, I think the JSF and its capabilities will do that. If that's in jeopardy, then that pacing is in jeopardy.

Senator BROWN. What keeps you up at night in terms of guiding the committee in our thoughts and thinking through force structure, and in terms of acquisition quantities and the timing of acquiring new systems? Is there anything in particular that keeps you up at night?

Admiral PHILMAN. The China scenario is first and foremost, I believe, because they seem to be more advanced and have the capability out there right now; and their ships at sea and their other anti-access capabilities. Their fighter, as was mentioned, that was just rolled out. The good news for us is there's over 1,000 hours on the F–35 series right now, which we are hard on ourselves, but that's a far leap ahead from the Chinese fighter that's flown three times.

So that's the good news story. But as was mentioned earlier, they will catch up. They understand. They're a smart and learning enemy, and if we don't keep our edge then we will be behind, or at least lose our advantage.

Senator BROWN. They're not our enemy, but you mean the other country in terms of what they're capable of, right?

Admiral PHILMAN. Yes, sir.

Senator LIEBERMAN. Thank you, Senator Brown. We'll do one more round.

General Robling and Admiral Philman, in your prepared testimony you mention that the Navy has taken a number of steps to deal with the situation you face. We talked about that a little more earlier, in terms of the reduction in the estimated shortfall. I know you've taken steps to reduce requirements or essentially reduce the demand for the aircraft. You also reduced the size of some of the deploying squadrons.

What I wanted to ask you about was a concept that I know you've also implemented called productive ratio. Why don't you tell the committee for the record, what is productive ratio? Admiral?

Admiral PHILMAN. Sir, the productive ratio is a method of allowing the squadrons' so-called entitlement of aircraft as they proceed thorough the training process. Between deployments, a squadron will do unit-level training, which goes from basic training, then to integrated and more advanced training before they deploy. So as those squadrons are building up in that training cycle, they don't need 12 aircraft every day to conduct the kind of squadron business they need to do.

So we can take aircraft out, run them through the depot-level maintenance and other things that need to be done to the aircraft, so that particular squadron may only have six or eight aircraft. As you progress along on the training pipeline, you get more and more aircraft until you have your full complement upon deployment.

So it's a term that's a little bit misunderstood, but it's a method of controlling the number of aircraft to be on the flight line and stretching out the life of the whole fleet in order to not only meet our commitments overseas, but to meet our commitments in training as well.

Senator LIEBERMAN. I think it's very creative. Would you say that's reducing demand or increasing supply by better utilizing the aircraft?

Admiral PHILMAN. Almost both, sir. You're reducing the demand early on in the phase. If we're able to get those aircraft into the repair facility faster—as was mentioned earlier by General Robling—then we can also increase the supply at the other end.

Senator LIEBERMAN. It sounds like, though we don't like the circumstances we're in with the delays in the production of the aircraft you need to meet your needs and the Nation's need, that this is perhaps, would you say, one of those cases where necessity has been the mother of invention?

Admiral PHILMAN. Absolutely, sir. You would love to have a full complement of aircraft everyday, 24–7. But that's just not the case. So being ingenious or uncanny about it, how do we make sure we have aircraft to do the Nation's business when we deploy? We do it by making all these different techniques, sometimes reducing the number of aircraft and squadrons, and scheduling those aircraft in a way that makes most sense for a particular training mission.

We know more now about how to measure fatigue life expenditure. So in a particular, a young pilot like yourself goes out and there's a certain training mission, so——

Senator LIEBERMAN. I appreciate that very much. Senator Brown snickered, but that will not be in the record. [Laughter.]

Admiral PHILMAN. But for a particular training mission, we can match that pilot and that air crew with a particular number or tail

number that makes the most sense, so to not only get the training done, but also preserve the life of the aircraft.

Senator LIEBERMAN. General Carlisle, is the Air Force taking similar steps to what we've called productive ratio to help reduce the demand for aircraft, if I can use that term?

General CARLISLE. Sir, I wouldn't say we have the exact same concept. I think the concept of operations, the concept of employment, is different, given the way that the Navy spins up and goes aboard a carrier and then deploys. We clearly have a little bit different approach to it. So we are optimizing the use of our aircraft. We are looking hard at how to get the most training out of every single sortie that we fly with, although there's no tanker capability because that's all deployed, but to try to get as much training as possible out of it.

The other part that we're looking hard into is the live, virtual, constructive with respect to the simulation and modeling that we can do in training as well. But the optimum use of the aircraft is clearly something that we're looking at. We haven't really gone to moving tails between different squadrons yet, sir, no.

Senator LIEBERMAN. I hope you will keep us posted on that.

In your testimony, General Carlisle, both written and presented here today, you've described the Air Force's investigation into ways to extend the service life of A–10s, F–15s, and F–16s to help mitigate this gap between requirements and aircraft. I want to focus on one sentence which I read in my opening statement, where you say in your prepared testimony, "Actions to extend and modernize the legacy fleet are a bridge to fifth-generation capabilities and are not considered replacement actions."

So what I wanted to ask you, and it's relevant, and I'll come back to the F/A–18s as well, are you still conceiving of a TACAIR inventory fleet that is totally fifth generation? In other words, if you're investing in these various programs—in this case, service life extension—do we need the full JSF fifth-generation fleet?

General CARLISLE. Sir, in our current analysis, we're moving towards a fifth-generation fleet. But, having said that, I think we will continue to analyze the requirements based on the comprehensive strategic review, the National Security Strategy, and the National Military Strategy as we go forward in the future.

As we transition the F–35s, the intent is to replace our F–16s, A–10s, and eventually the F–15Es. Those other three airplanes, the F–16, the A–10, and the F–15E, will last well into the 2020s and even later. So as we transition, the time to make that decision of whether we even extend those airplanes farther will be something we'll look at over time.

Our intent now is to procure the F–35 at the numbers that we talked about and then to enhance the capability of the legacy fleet so that we can get into the mid to late 2020s, and then we'll assess as we go on. As we've all seen, our ability to predict the future and what the world's going to look like a decade out is not very good. So we have the option to continue to look at those things as time goes on.

Senator LIEBERMAN. Okay. I'm hearing you to say that the goal has been to go to the full fifth-generation fleet with the JSF, but you're extending the lives of some of these other tactical aircraft;

that, obviously, you'll continue to use them so long as they're able to be used reasonably.

General CARLISLE. Most definitely, sir. I will tell you, there are great capabilities in those airplanes. All three of those aircraft—the F–16, the F–15, particularly the E model and the C model, and the A–10—are all great airplanes. The modernization we're doing to those airplanes makes them very viable into the future, especially if you pair those with fifth-generation fighters.

If you pair F–15s with F–22s and F–35s, you now have the ability to open an anti-access area and allow those airplanes to get in and do work and then come back out, with the protection of a fifth-generation fighter. What we've all discovered is, with the F–22 and the F–35 coming on, those airplanes give added capability to the fourth-generation airplanes as well.

Senator LIEBERMAN. That's a very important point and I appreciate your answer, that the fifth-generation aircraft can go in first and essentially clear the field, to the extent that they're able, and make it possible then for the fourth generation to follow on.

General CARLISLE. Yes, sir, most definitely. That is, in fact, how we all operate. We operate that way today.

Senator LIEBERMAN. Right. The same for the Marine Corps and the Navy. In other words, you're buying some new aircraft, you're extending the lives of the existing F–18. Their service life will be how long? We have a lot of years ahead of us.

General ROBLING. The service life for the JSF is an 8,000-hour aircraft, compared to some of the legacy ones that were 6,000 hours, and then trying to get them through SLEP. It took a lot of money to do that. Bringing up legacy aircraft to the increased capabilities that we need, I think for all three of us we fight in a joint environment now and we're all joint enablers. If you don't advance those legacy aircraft, you don't become part of the joint force that's able to fight in that arena. I think that's why we've asked for that additional funding.

Senator LIEBERMAN. Admiral?

Admiral PHILMAN. Mr. Chairman, in the case of the Navy, we have the legacy F–18s that we will extend the life. But we also have the late-model F–18 Es and Fs, with the very capable radars and all the other systems which are resident in the aircraft.

So as we get farther into the future and certainly into the 20s, we have a population on the flight deck of the aircraft carriers of very advanced F–35Cs, we have the F–18 Es and Fs, which are complemented by the jamming version, the G model.

So, no, we're not going to be full-in all fifth-generation fighters. But we have a nice array of capabilities: the first day of the war, F–35s that can fight in the joint environment with our Air Force and Marine Corps brethren; and then the F–18s of various lots that can follow on and do other good business.

Senator LIEBERMAN. So again, the goal—I think there was some contemplation that we were heading as rapidly as we could to all fifth-generation fleets. But for various reasons, including the delay in the JSF program, we're now extending the life of fourth-generation planes and acquiring some, as in the F/A–18 E and Fs. Therefore, for the foreseeable future I take it it's fair to say that we're

going to have a mix and we're going to keep the fourth generation going as long as they can effectively go.

Thank you.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman. This will be my last round. I have some other commitments I need to get to. But I'm going to submit additional questions for the record.

General Carlisle, the numbers that you're providing, are Guard and Reserve aircraft included in that total number?

General CARLISLE. Yes, sir. That's total aircraft inventory.

Senator BROWN. When you go to this next generation, are a lot of those going to trickle down to the Guard and Reserves, the older aircraft?

General CARLISLE. Sir, it'll be both.

Senator BROWN. Integrated with everything?

General CARLISLE. The legacy airplanes that are modernized in SLEP will flow down, as well as new JSFs. So it's going to be a mix, as it is in the Active-Duty Force. We'll have a mix of the fifth and fourth and then the Guard and Reserve will have a mix of fifth and fourth, yes, sir.

Senator BROWN. With regard to the Osprey, has that program proceeded according to plan?

General CARLISLE. Sir, the CV–22, the Air Force Special Operations Command variant for the Air Force, obviously we had some growing pains with that airplane. I will tell you that its deployments to the area of responsibility, its work in Libya and other areas, and it is in Afghanistan today, has been tremendous. The airplane has performed extremely well.

Senator BROWN. It has a very high cost per flying hour, though, right?

General CARLISLE. Given the capability it brings to the fight and what it's used for, sir, I think that we're continuing to try to drive those costs down. They're probably higher than we would have expected. I don't think we in the Air Force consider them outrageous by any stretch of the imagination.

General ROBLING. In the Marine Corps, the MV–22 is progressing on track and doing very well. It's passed 100,000 hours combined with the Air Force and the Marine Corps version. It is our safest tactical helicopter in the last 10 years as far as safety records. We've gotten the cost per flight hour from $11,000 down through $10,000. We're hoping to get it down in the $9,000 range. But quite frankly, it's the lowest cost per seat per mile of any of our tactical helicopters. What that means if you compare this helicopter to, say, the CH–46 that it replaced, somewhere around a little over $4,000 a flight hour, it doesn't really equate because you would have to use two of those aircraft to get the amount of marines that you needed to a farther distance.

It was an aircraft that started out high. We found efficiencies. We're getting it down to a reasonable range. I think it's the aircraft that the Nation needs for its Marine Corps.

Senator BROWN. With the major design of the JSF at least theoretically done today, we have no new fighters under development in this country. We also have no cargo aircraft under development

and aside from the KC–46, no tankers under development. I don't know the last time that this was true.

The F–22 and C–17 lines are getting ready to close and the F–15 line is at very minimal rates. I'm not sure if this is a natural consequence of the defense industry consolidations over the last decade or if it's a cyclical situation. To what extent does this development concern you, Admiral?

Then, getting back to General Carlisle, does the Air Force have a notion of what minimum capabilities or surge capacities it would like maintained in the industry?

Admiral PHILMAN. Your point is exactly right, sir. Right now, with the JSF there is still work to be done. There is work for good engineers to have on that aircraft and other follow-on aircraft.

The only follow-on aircraft programs that would fit our answer to your question are our unmanned systems. Right now, in the Navy we have the Navy Unmanned Carrier Demonstration, which is going to demonstrate flight, takeoff and recovery aboard an aircraft carrier, as well as some airborne tanking in and around the aircraft carrier.

But then there's another concept called the Unmanned Carrier-Launched Air Strike System, which should be demonstrating around the 2018 timeframe. The mold line isn't defined just yet, whether it's a wing and tail design or if it's tailless, more of a flying chip, much like the B–2. We don't know that yet.

But those kinds of designs and concepts, unmanned systems that will be complementary to our manned fighters, are good work to be done, and I think it's pretty exciting for the future of both naval and Air Force aviation.

General ROBLING. You said it as a matter of consequence, and I don't think that's the case. I think all of us—, and I use the example of the Marine Corps, but this was a well thought out, methodical drawdown to minimum type-model-series, and getting right down to the end of the life of the aircraft that the Nation gave us. In our case, where we necked down to three type-model-series, to the JSF, using the initial JSF costs, we were going to save $1 billion a year in O&S costs by coming down to a single type-model-series for those.

Timing is everything and our timing is bad now, at a time when our Nation's in fiscal austerity. I think we thought through this and now we're faced with this higher cost aircraft than we originally looked at and the cost is significantly higher than we thought it would be.

Senator BROWN. General Carlisle, in terms of the next-generation bomber, what's the Air Force's role in defining the new long-range strike platform? Will this be a joint program, Air Force-led, or some other type of structure?

General CARLISLE. Sir, it's an Air Force program. We're working closely with the Office of the Secretary of Defense, and our goal in this program is affordability, and we're trying to drive that in at the outset. We're going to use existing technologies as we develop that airplane, so we're not going to put ourselves in too high of a technology expectation. Again, we'll continue to work with what currently is out there.

Our intent on that program is again to develop that by the mid-2020s, to have the long-range strike platform that can either be manned or unmanned, will also have the ability to have a standoff weapon that will go with that, to again add more capability, and clearly it'll be a stealthy aircraft for the future.

With respect to the industrial base, I think the next long-range strike is a big part of that. The KC–46 is part of that. The JSF as it continues to mature is part of that as well. But the industrial base is important. We definitely believe that, sir.

Senator BROWN. Thank you, Mr. Chairman, for holding this hearing.

Senator LIEBERMAN. Thanks, Senator Brown.

Thanks, gentlemen. I think we've had a good exchange. I appreciate the directness of your answers and your testimony. Thanks for what you're doing every day. It just says the obvious, that in these resource-constrained times, to speak more in normal language, economic difficulties, and increasing deficit-debt realities for the Federal Government, we're going to really be fighting for every dollar we can get.

I noticed Secretary Gates made a statement yesterday, I think at Notre Dame at their commencement, that we have to be careful not to just come up with numbers out of the air that we use to cut our defense budget, because it's so critical to our constitutional responsibilities. On the other hand, in the position that the three of you are in it means that you are under greater pressure than ever to operate the programs that are in your responsibility areas effectively, and to squeeze out of the system as much waste as you possibly can.

I appreciate some of the things you've done to get to where we are. Of course, then we have to make sure that the contractors produce really extraordinary programs like the JSF more quickly and hopefully at less inflation and expense.

But I really thank you for the testimony. It's going to help us as we go forward to our markup for fiscal year 2012. We'll keep the record of the hearing open for a week for any additional questions or statements. With that and with thanks to Senator Brown, the hearing is adjourned.

[Questions for the record with answers supplied follow:]

## QUESTIONS SUBMITTED BY SENATOR CLAIRE MCCASKILL

### FIGHTER SHORTFALL

1. Senator MCCASKILL. Rear Admiral Philman, the Navy has been all over the map on the numbers that you have estimated for the fighter shortfall on U.S. carriers. Last year, Senator Hagan and I won inclusion of a provision to require the Navy to: (1) present the business case for stretching the Service Life Extension Program (SLEP) from 8,600 to 10,000 total service time for legacy Super Hornets; (2) explain why the Department of Defense (DOD) is reducing the Marine Corps squadron size from 12 to 10; and (3) explain why the Navy plans to take training planes and put them into the full-time force. Please comment on each of these requirements and what the Navy's latest view is on the shortfall and the cost of SLEP.

Admiral PHILMAN. In 2009, the Navy testified to a DON Strike Fighter Shortfall (SFS) of 146 aircraft. When factoring in the changes contained in the fiscal year 2011 President's budget, the SFS was updated to a peak DON Shortfall of 177 aircraft—primarily due to a flattening of the F–35 delivery ramp and the removal of the assumption that F/A–18 A–D aircraft would reach 10,000 flight hours, because funding for this effort was not in place. In early 2010, the Department of the Navy identified a number of management "levers" which, if implemented, would allow the

U.S. Navy and Marine Corps to further mitigate the projected SFS. These actions included: accelerating the transition of five legacy USN F/A–18C squadrons into F/A–18 E/F and transitioning two additional U.S. Navy F/A–18C squadrons into F/A–18 E/F by using the remaining F/A–18 E/F attrition reserve aircraft. Additionally, funding was put in place to extend the life of 150 legacy Hornets out to 10,000 flight hours. With the application of these levers and funding initiative, the projected peak shortfall was reduced to an estimated 100 aircraft with a peak in 2018. A third management lever was identified which would have reduced the Navy Unit Deployment Program and Marine Corps Expeditionary F/A–18 A+/C/D squadrons from 12 to 10 aircraft per squadron, thereby further reducing the overall shortfall. However, this lever has not been implemented, nor is there a current plan to do so.

The DON's procurement objectives presented in the fiscal year 2012 President's budget include the procurement of 41 additional F/A–18 E/F as a result of RMD–703. In fiscal year 2011, subsequent to the addition of the 41 additional aircraft, 9 additional OCO jets were added for a total Program of Record of 565. These 50 additional aircraft will allow the U.S. Navy to transition three more F/A–18C squadrons into F/A–18Es, further reducing the demand for legacy Hornets. Additionally, the DoN modified its transition plan into the F–35 to take advantage of service life remaining in the AV–8B fleet. With the additional Super Hornets, change in squadron transition timing, reduced legacy Hornet utilization rates, and funding to cover the Service Life Extension of 150 F/A–18 A–D aircraft, the U.S. Navy was able to reduce the projected SFS to a peak value of 52 aircraft, occurring in 2018. The DON has indicated that this shortfall is manageable for a limited duration as forecast by our assessment.

Section 114 of the National Defense Authorization Act for Fiscal Year 2011 directs the Secretary of the Navy to conduct a cost benefit analysis (CBA) and submit a report on that analysis to Congress. The Naval Air Systems Command (NAVAIR) has completed the CBA, comparing the service life extension of the F/A–18 A–D Legacy Hornet aircraft with procuring new F/A–18 E/F aircraft to mitigate the SFS. Subsequently, ASN(RDA) prepared the Report to Congress based on the CBA for signature by the Secretary of the Navy. The report was delivered to Congress on May 23, 2011. The purpose of the CBA was to identify the most cost effective solution for reducing the peak and duration of the SFS. The CBA indicates that the DON's plan to procure a total of 565 F/A–18 E/Fs and SLEP 150 F/A–18 A–D aircraft, as presented in the fiscal year 2012 President's budget request, mitigates the shortfall to a manageable level and that the plan's ability to balance the strike fighter inventory requirement, within limited financial resources, is optimal.

The Navy does not have a dedicated plan to remove "training planes and put them into the full time force". Commander, Naval Air Forces (CNAF) maintains control of Tactical Aircraft Inventory and manages aircraft assignments throughout U.S. Navy and Marine Corps fleet squadrons, including training and test aircraft. F/A–18s currently assigned to training squadrons are fleet representative aircraft, meaning most of the training aircraft have the same combat capability as those in the fleet. CNAF manages this inventory to meet current operational commitments and to optimize how aircraft service life is expended. Consequently, F/A–18 aircraft are routinely moved to support operational and training requirements based on current demand and to optimize fatigue life usage. The movement of aircraft does not compromise fleet capability nor does it result in any loss of training capacity at the Fleet Replacement Squadrons. Our ability to do this provides greater flexibility for aircraft inventory management.

### FISCAL COMMISSION RECOMMENDATIONS ON F/A–18S

2. Senator MCCASKILL. Rear Admiral Philman, the President's Fiscal Commission proposed to basically substitute F/A–18s and F–16s for about half of the Air Force's and Navy's planned buys of the F–35. They say this change could save about $9.5 billion. I have often noted we can get 80 percent of the F–35's capability for a fraction of the cost by buying the most advanced F/A–18 aircraft; something the Navy has largely acknowledged. Have you considered adopting the Fiscal Commission's option, and if not, why not?

Admiral PHILMAN. The Navy is recapitalizing the fleet with the JSF F–35C, delivering a true 5th generation strike aircraft combining stealth and enhanced sensors to provide lethal, survivable, and supportable tactical jet aviation strike fighters. The F–35C will complement the F/A–18 E/F, providing the most flexibility and striking capability while pacing the threat. The F–35 will provide a survivable "Day One" strike capability in a denied access environment that cannot be accomplished by legacy aircraft.

It can be misleading to compare current-year procurement costs of aircraft with very different capabilities, different quantity assumptions, and at different phases of the acquisition cycle (e.g. F/A–18 E/F is nearing the end of production and F–35 is early in the production phase). The F–35 is designed to structurally meet an 8,000 hour service life versus a 6,000 hour service life for the F/A–18 E/F, which will affect a life cycle cost comparison prorated for flying hours. Maintainability and obsolescence issues inevitably emerge as aircraft age, making it imperative we recapitalize our legacy fleet with a new generation of aircraft incorporating upfront factors such as commonality, maintainability and the benefits of interoperability.

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## QUESTIONS SUBMITTED BY SENATOR SCOTT P. BROWN

### STRIKE-FIGHTER SHORTFALL

3. Senator BROWN. Lieutenant General Carlisle and Rear Admiral Philman, in testimony before the committee last week on the Joint Strike Fighter (JSF) program, the Pentagon's chief independent cost estimator said that, having concluded an in-depth review of the strike-fighter shortfalls projected by the Navy and the Air Force, the most recent shortfall projects are manageable. But, I would like your perspective. What is your current assessment of the strike-fighter shortfalls projected by your Service and of your Service's ability to manage that shortfall over the intermediate- and long-run?

General CARLISLE. A 2010 comprehensive review of Air Force current and projected force structure revealed a shortfall of approximately 3–5 percent of total aircraft through the Future Years Defense Program (FYDP). This shortfall is manageable, and will be mitigated through aggressive management of F–35 production and legacy fleet sustainment, along with selected SLEP and modernization programs outside the FYDP.

In order to mitigate mid- and long-term force structure risk, the fiscal year 2012 President's budget funds research, development, test, and evaluation (RDT&E) for capability modifications and SLEP for the F–16 Block 40/42/50/52 fleet. Selected legacy SLEP of the most suitable F–16 Block 40s and 50s would add approximately 6–8 years to their anticipated service life and provides the most cost effective alternative to transition to a 5th generation capability. The Air Force also intends to accelerate the procurement of the F–15E AESA radar modernization program and continue the A–10C wing replacement program. The Air Force will continue to monitor and assess the fighter force structure and will remain flexible to pursue appropriate courses of action necessary to mitigate risk should the situation change.

Admiral PHILMAN. The DoN's procurement objectives presented in the fiscal year 2012 President's budget include the procurement of 41 additional F/A–18E/F. In fiscal year 2011, subsequent to the addition of the 41 additional aircraft, 9 additional OCO jets were added for a total Program of Record of 565. These 50 additional aircraft will allow the U.S. Navy to transition 3 more F/A–18C squadrons into F/A–18Es, further reducing the demand for legacy Hornets. Additionally, the DoN modified its transition plan into the F–35 to take advantage of service life remaining in the AV–8B fleet. With the additional Super Hornets, change in squadron transition timing, reduced legacy Hornet utilization rates, and funding toward the Service Life Extension of 150 F/A–18 A–D aircraft, the U.S. Navy was able to reduce the projected SFS to a peak of 52 aircraft occurring in 2018. The DoN has indicated that this shortfall is manageable for a limited duration as forecast by our assessment.

The DoN continues to meticulously manage the flight hours and fatigue life of our tactical aircraft. Since 2004, we have provided fleet users guidance to optimize aircraft utilization rates while maximizing training and operational opportunities. The F/A–18 A–D SLEP initial request is included in PB 2012. The program will extend the airframe life of approximately 150 aircraft from 8,600 to 10,000 flight hours. Current SFS estimates are based on 150 F/A–18 A–D aircraft being extended to 10,000 flight hours and without these service life extensions, the shortfall projections will increase in both magnitude and duration. Engineering analysis continues and as experience and knowledge is gained and more aircraft are inspected, the DoN will adjust the program schedule and cost estimates as required.

### JOINT STRIKE FIGHTER FUTURE

4. Senator BROWN. General Robling, with regard to the Marine Corps' short-take off, vertical landing (STOVL) JSF, how confident are you that the current design, plus modifications we know about now, plus discovery to come, produce enough

vertical lift to overcome the weight of the aircraft (plus weapons and fuel) to operate as planned?

General ROBLING. Both the Commandant and I are very confident in the shared process to manage thrust-to-weight margin on the F–35B. We frequently engage on this topic with leadership at the Joint Program Office, Lockheed Martin and Pratt & Whitney-closely monitoring the progress of airframe and power plant maturity. Design and development maturation typically results in weight growth. Given the criticality of weight growth for the F–35, we have aggressively pursued the optimization of thrust, refinement of our concepts of flight operation, and are closely tracking component changes in order to ensure there is sufficient thrust margin for vertical lift capabilities of our F–35B. As it stands through June, we've seen vertical thrust-to-weight margins improve from a positive 115 pounds to 281 pounds over the past 5 months. I am highly confident that our integrated leadership team can continue to manage weight related opportunities and risks, thereby preserving our thrust-to-weight margin needed to ensure operational success from both expeditionary airfields and amphibious big-deck ships.

5. Senator BROWN. Lieutenant General Carlisle, last year NAVAIR effectively determined that the Marine Corps' and the Navy's versions of the JSF may end up being too expensive to operate. Specifically, it found that, with each flight-hour possibly costing about $31,000 in 2029, compared with about $19,000 per flight hour for current F/A–18 Hornets and AV–8B Harriers, the operating cost associated with the Navy's versions of the JSF may be considerably higher than the costs to operate the legacy aircraft they are intended to replace. Has the Air Force reviewed and independently validated NAVAIR's analysis; and if so, do you agree with its findings on the expected operating costs of the JSF?

General CARLISLE. The Air Force has reviewed NAVAIR's analysis and determined that the operating costs for all three of the JSF variants are higher than originally estimated. Office of the Secretary of Defense (OSD) Cost Assessment and Program Evaluation also conducted an O&S cost estimate for JSF, and their estimate is consistent with the previous Air Force and Navy cost estimates. These estimates also demonstrated that the operating costs of the Air Force's F–35A conventional take-off and land variant will be less than the STOVL and Carrier Variant JSF variants. The Air Force is currently working with the other Services, the JSF Program Office, and the Prime Contractor Lockheed Martin, in an aggressive effort to review the JSF sustainment strategy in order to assess means to reduce total life cycle costs. By the end of the year this should result in recommendations to reduce costs.

While the Air Force expects the operation costs for the F–35A fleet to be higher than the F–16 fleet it is intended to replace, the fifth generation capabilities of the JSF will allow our warfighters to operate and succeed in Anti-Access/Area Denied environments. The U.S.'s legacy fleet will not be able to successfully operate in these environments against tomorrow's advanced threats.

6. Senator BROWN. Lieutenant General Carlisle, what does that mean for the viability of the Air Force's JSF program and what kind of mix we can expect in terms of the Air Force's future strike-fighter force?

General CARLISLE. The Air Force remains firmly committed to the JSF program. The fifth generation capabilities of the F–35A will allow our warfighters to operate and succeed in Anti-Access/Area Denied environments. The U.S.'s legacy fleet will not be able to successfully operate in these environments against tomorrow's advanced threats. The F–35A, complemented by the F–22, will provide the Air Force a fleet of fifth generation fighters that will ensure the Air Force is able to achieve and maintain air dominance for the foreseeable future.

### SERVICE LIFE EXTENSION PROGRAM

7. Senator BROWN. Lieutenant General Carlisle, last year, the Air Force undertook a tail-by-tail survey of the F–16 fleet to determine how much work might be needed to establish a SLEP to tide the F–16 fleet over until the F–35 becomes available. Some reports say the results showed the F–16s were in better-than-expected condition. Last week, the Air Force's acquisitions chief, Mr. Van Buren, indicated that a SLEP was nonetheless a prospect. What did the Air Force find?

General CARLISLE. The Air Force regularly reviews force structure, utilizing information from sources such as the latest engineering data, fleet viability boards and ongoing and scheduled full-scale fatigue/durability tests. Thus far, the Air Force has

determined that it can sustain the F–16 Block 25–32 fleet to its certified service life utilizing existing operations and maintenance funds.

However, the F–16 Block 40–52 fleet is a candidate for SLEP and modernization. In April of this year the Air Force contracted a full scale durability test for an F–16 Block 50 aircraft, the results of which will inform the SLEP. Additionally, the Air Force funded $15 million for RDT&E activities for SLEP and modernization in fiscal year 2012. The initial SLEP budgeting and decision was based on 300 aircraft; however, the decision on SLEP quantity isn't required until calendar year 2014 and can be adjusted to respond to the latest fighter shortfall data. Finally, we expect to continually refine F–16 SLEP details, informed by force structure analyses and F–35A program performance.

8. Senator BROWN. Lieutenant General Carlisle, how big of a SLEP do you believe is required?

General CARLISLE. The initial SLEP budgeting and decision was based on 300 aircraft; however, the decision on SLEP quantity isn't required until calendar year 2014 and can be adjusted to respond to the latest fighter shortfall data. The Air Force performs regular comprehensive fighter force structure reviews that incorporate information from fleet viability boards, ongoing and scheduled full-scale durability tests and the latest actual aircraft engineering data; all of which will be utilized to refine the final SLEP quantity required.

AIRCRAFT INDUSTRY

9. Senator BROWN. Lieutenant General Carlisle, with major design of the F–35 JSF done, today we have no new fighters under development in this country. We also have no cargo aircraft under development and, aside from the KC–46, no tankers under development. I don't know the last time that was true. The F–22 and C–17 lines are getting ready to close, and the F–15 line is at very minimal rates. Maybe this is the natural consequence of the defense industry consolidations of the last decade. And maybe it's just cyclical. To what extent does this development concern you?

General CARLISLE. The Air Force is very concerned about the current and projected state of the domestic industrial base, particularly with respect to its capabilities to support emerging Air Force requirements across all three Air Force domains—air, space, and cyber. Our pursuit of the new bomber program will alleviate some of those concerns. We recognize the current and projected fiscal environment will drive some very difficult budget choices. In that regard, it becomes even more critical for the Air Force to make data-driven investment decisions whether on research, engineering design and development, sustainment, or weapon systems upgrades. An example is the new bomber program where the Air Force is going to make informed, tough capability tradeoffs to hold costs down so the Air Force can procure a sufficient and sustainable inventory over the long term.

The Air Force is working with OSD as it leads a sector-by sector, tier-by-tier review of the current network of the Department's suppliers. We expect this initial review, and subsequent updates, to provide all of the DOD with a shared view of how the industrial base segments interface to support each of our capabilities. With this knowledge of the industrial base, the Air Force will be better informed so that our investment decisions can preserve the critical domestic industrial base capabilities needed for the range of Air Force missions.

10. Senator BROWN. Lieutenant General Carlisle, does the Air Force have a notion of what minimum capabilities or surge capacity it would like maintained in industry?

General CARLISLE. In terms of minimum capabilities, some sectors of the industrial base quickly come to mind, such as aerospace engineering and design capabilities, while the impact of other areas on Air Force capabilities may be more subtle. As reported in the Quadrennial Defense Review (QDR), DOD recognizes that a hands-off approach to the industrial base is no longer viable. However, we do not yet have the knowledge base needed to inform a more active approach to shaping the industrial base. Following the QDR, the Air Force initiated several industrial base studies, specifically to evaluate the aircraft and munitions industrial bases. We expect the results of those studies to be complete later this year. The Air Force is also working with OSD to develop this knowledge through a sector-by-sector, tier-by-tier review of the industrial base. To fly, fight, and win in air, space, and cyberspace, the Air Force draws on the industrial base for a broad array of products and services that enable the Air Force to perform its Core Functions. Looking ahead to

future investments, such as the Common Vertical Lift Support Program, the KC–46A, and the new bomber, the Air Force expects some of these to be provided solely through domestic industrial sources, some to be provided with the support of our allies, while the global commercial market will provide the balance. The Air Force expects the OSD-led review to help inform Air Force choices in this regard.

11. Senator BROWN. Lieutenant General Carlisle, do you have a plan for how to maintain that capacity?

General CARLISLE. The Air Force does not yet have the knowledge base needed to inform a more active approach to shaping or maintaining the industrial base. Each of the three Air Force domains—air, space, and cyber—has a discrete set of requirements which can be expressed in terms of industrial capacity. However, there are some common needs that cut across all three domains, such as the need for assured integrated circuits. As the Air Force works with OSD to develop a knowledge-based approach to our industrial base network of suppliers and better understands how that network matches up to current and planned capabilities, we will improve our ability to make definitive plans for shaping industrial capacity. The Air Force intent is to take that developing knowledge of industrial base suppliers, view it through the lens of Air Force requirements, and develop focused efforts to maintain, in sufficient capacity, those domestic industrial capabilities essential for the range of Air Force missions and future investments, such as the Common Vertical Lift Support Program, the KC–46A, and the new bomber.

LONG-RANGE STRIKE PLATFORM

12. Senator BROWN. Lieutenant General Carlisle, what is the Air Force's role in defining the new long-range strike platform?

General CARLISLE. Secretary of Defense Gates arrived at a decision to move forward with the Long-Range Strike Bomber (LRS–B) based upon an extensive, department-wide review of an overall family of systems approach to long-range strike. He directed the Air Force to initiate the LRS–B program beginning in fiscal year 2012. As such, the Air Force is responsible for the LRS–B program.

13. Senator BROWN. Lieutenant General Carlisle, will this new long-range strike platform be a joint program, Air Force-led, or some other structure?

General CARLISLE. Secretary of Defense Gates arrived at a decision to move forward with the LRS–B based upon an extensive, department-wide review of an overall family of systems approach to long-range strike. He directed the Air Force to initiate the LRS–B program beginning in fiscal year 2012. As such, the Air Force is solely responsible for the LRS–B program.

COMMON VERTICAL LIFT SUPPORT PROGRAM

14. Senator BROWN. Lieutenant General Carlisle, in this budget, the Air Force begins acquisition of a new support helicopter, the Common Vertical Lift Support Program (CVLSP), to replace its UH–1 Hueys, principally at the missile fields. The Air Force has just recently announced that it will buy these replacement helicopters competitively and has asked for money this year to acquire the first two helicopters. Since there is no money for development or testing, but money for procurement, is it safe to say you intend to buy a helicopter the military already operates?

General CARLISLE. The Air Force intends to purchase a Non-Developmental Item/Off-The-Shelf (NDI/OTS) aircraft to accelerate fielding to the warfighter. Minimal RDT&E funding is required for operational test and evaluation to validate aircraft performance against key performance parameters. To clarify, there is RDT&E funding for CVLSP in the fiscal year 2012 President's budget FYDP, specifically $4.0 million in fiscal year 2011, $5.365 million in fiscal year 2012, $7.44 million in fiscal year 2013, and $8.934 million in fiscal year 2014.

15. Senator BROWN. Lieutenant General Carlisle, since we just took 10 years to buy a tanker, do you believe you can develop a requirement, run a competition, select a winner, and buy the first helicopters all in 1 year?

General CARLISLE. Yes. Since, we intend to purchase a NDI/OTS aircraft; we are confident that we can conduct a source selection and award a contract on schedule.

16. Senator BROWN. Lieutenant General Carlisle, won't buying off-the-shelf, as reflected by the absence of development or testing money sought for this program, limit the possible competitors?

General CARLISLE. Yes. The need to field a platform that meets the warfighter's requirements and target Initial Operational Capability of fiscal year 2015 will limit the potential CVLSP competitors to those that have already developed a helicopter that can meet the user's needs with little or no modifications, i.e. a non-developmental, off-the-shelf solution. But market research and industry responses to requests for information indicate there are several potential competitors.

17. Senator BROWN. Lieutenant General Carlisle, how will you know you're getting the right aircraft?

General CARLISLE. We will conduct a full and open competition that will evaluate the capabilities of each offeror's platform based on the warfighters' requirements.

18. Senator BROWN. Lieutenant General Carlisle, earlier this year, Secretary of the Air Force Donley testified that the Air Force is looking to address the CVLSP requirement and the longstanding need to replace our combat search-and-rescue helicopters with a common aircraft. But the requirements for range, speed, and payload would seem to be rather different between moving a squad around a domestic missile field and penetrating enemy territory. How do you reconcile those missions into a single airframe, especially given the timeline this budget establishes for procurement?

General CARLISLE. The Air Force continued to examine many options in the process of deciding on the acquisition strategy for the HH–60 Recapitalization and CVLSP programs, including the potential merits of combining the program requirements and/or source selections. After reviewing these options, we have recently decided to keep the acquisition programs separate.

CORROSION

19. Senator BROWN. Lieutenant General Carlisle, a recent report on corrosion specific to the F–22 Raptor and F–35 JSF programs calls for focus in the areas of corrosion and material degradation early in the lifecycle of major weapons programs as a way to keep the costs of operating and maintaining those weapons systems attributable to corrosion down. Corrosion has been found to be a major problem with the F–22. What lessons has the Air Force learned from the corrosion report and its specific experience with the F–22?

General CARLISLE. The lessons learned from the corrosion report and its specific experience with the F–22 led the Air Force to initiate a comprehensive revitalization of systems engineering processes and systems engineering tools that consider corrosion prevention early in the life cycle of a weapon system. Focusing on the areas of corrosion and material degradation early in the life cycle of major weapon systems also includes reliance on the legacy corrosion prevention practices, environmental testing, and aircraft basing. Aircraft are being closely monitored in the aggressive corrosion environments until mitigation solutions can be validated. The Air Force continues to improve test and evaluation plans to ensure they address corrosion, environmental severity and duration throughout testing.

Additionally, the Air Force activated the Air Force Corrosion Control and Prevention Executive (AFCCPE) to oversee, coordinate, and implement efforts to address corrosion control and prevention efforts. The AFCCPE will ensure corrosion and prevention efforts are contained in the Air Force's policy, advocate for resources, evaluate program effectiveness supporting the DOD-level efforts.

Our goal is to ensure a comprehensive Air Force level corrosion control and prevention program exists throughout the entire life cycle of the weapon system.

20. Senator BROWN. Lieutenant General Carlisle, will the Air Force develop test and evaluation plans that adequately address corrosion, environmental severity, and duration?

General CARLISLE. Yes, the Air Force continues to improve test and evaluation plans to ensure they adequately address corrosion, environmental severity, and duration and we are actively incorporating lessons learned from the F–22/F–35 Corrosion Evaluation Report.

For example, the F–35 is undergoing rigorous corrosion testing. We have been testing coupon samples of F–35 materials in a variety of harsh climates including maritime exposure for several years now. Additionally, we have been flight testing corrosion properties of F–35 materials on Navy F–18 aircraft. The F–35 will be tested in the Eglin Air Force Base Climatic Lab under conditions ranging from tropical rain and humidity to harsh winter cold. Finally, the F–35 will be built with corro-

sion sensors to monitor the effectiveness of the F–35's preventive corrosion control maintenance and inspection requirements.

Programmatically, the F–35 program has taken actions to improve F–35 corrosion control life cycle management. The F–22/F–35 report identified several areas of concern with systems engineering and life cycle costs. The AFCCPE will oversee, coordinate, and implement efforts to address all of these areas through the Air Force Corrosion Prevention Advisory Board and the Integrated Life Cycle Management Executive Forum governance structure, Air Force's top level life cycle management authority. Our goal is to ensure that comprehensive Air Force-level corrosion-related policy and guidance is integrated and enforced throughout the entire life cycle of a weapon system.

Corrosion control collaboration and integration efforts across the Air Force are at an all time high and continue to gain momentum. We will continue to emphasize and develop strategies and processes for preventing and controlling corrosion.

21. Senator BROWN. Lieutenant General Carlisle, how has the Air Force integrated these lessons learned into its newer acquisition programs, in particular, the F–35 JSF?

General CARLISLE. The F–35 adopted the corrosion lessons learned from the F–22 in the areas of conductive gap filler and paint by launching several mitigation actions to deal with the risk, such as: (1) using a gap filler that is less galvanically dissimilar from aluminum; (2) developing an alternative to the conductive paint; (3) employing fewer seams that require gap filler; and (4) conducting additional and more representative verification and qualification tests. Organizational changes include integration of the signature and corrosion materials and processes functional areas to help ensure program success.

The F–35 drainage design is significantly improved over that of the F–22. Drain holes are more adequately sized and complete drain paths were analyzed to account for and prevent fluid entrapment.

The F–35 program adopted more rigorous corrosion testing and pushed for a more maintainable design even before corrosion problems surfaced on previous programs such as the F–22. In addition, the F–35 and F–22 programs established mechanisms to share information, keeping the F–35 program appraised of potential problems. As a result, the overall awareness of corrosion issues on the F–35 program is higher than that of the F–22 program at the same point in development.

The F–35 has several technical performance metrics that are driving a more supportable and maintainable design for corrosion control. One of these, sortie generation rate, is a key performance parameter for the program. Furthermore, the joint DOD requirements drove a more resilient corrosion design for the F–35. That design stemmed largely from the Navy's corrosion qualification tests, which are more severe than those used by the Air Force and driven by a more aggressive operating environment.

22. Senator BROWN. Lieutenant General Carlisle, has the F–35 Corrosion Prevention and Control Plan been updated with lessons learned from corrosion prevention and control for the F–22 Raptor aircraft?

General CARLISLE. Yes, the F–35 program has incorporated corrosion control lessons learned from the F–22 program into the F–35 Corrosion Prevention and Control Plan. Although F–35 structural and low observable coatings are greatly different from those used on the F–22, the F–35 materials are receiving extensive corrosion testing. F–35 materials are being coupon tested in a variety of environments to include the most severe maritime climates. Additionally, F–35 materials are being flown on surrogate aircraft to test material durability. Finally, F–35 will include a series of sensors to help predict and manage F–35 corrosion control inspections and preventative maintenance.

### F–22 RAPTOR GLITCH

23. Senator BROWN. Lieutenant General Carlisle, a few weeks ago, the Air Force stopped flying all of its F–22 Raptor aircraft indefinitely over concerns about a possible glitch in the onboard oxygen generation system. I understand that this standdown is still in effect. What is the current status of the Air Force's investigation into the root causes of this problem and its attempts to remedy it?

General CARLISLE. On 7 Jan 2011, Gen. William M. Fraser III, Commander, Air Combat Command (COMACC), convened a Class E Safety Investigation Board (SIB) to explore on-board oxygen generation systems (OBOGS) in the A–10, F–15E, F–16, F–22, F–35 and T–6 aircraft. The SIB was initiated after concerns were raised about

the F–22 OBOGS as a potential factor in the crash of an F–22 from Elmendorf Air Force Base on 16 Nov 10, which killed the pilot.

On 3 May 11, Gen. Fraser directed a fleet-wide stand-down of the F–22 as a prudent safety measure due to recent reports of potential oxygen system malfunctions in that aircraft. At this time, there is no intent to direct a stand-down of any other Air Force aircraft.

On 16 May 11, Secretary of the Air Force Michael Donley directed the Chief of Staff of the Air Force to convene a Broad Area Review (BAR) to investigate ongoing safety issues involving aircraft oxygen generation systems. Subsequently, the SecAF redirected this effort on 7 Jun 11 to convene under the auspices of the Air Force Scientific Advisory Board (SAB). Specifically, Secretary Donley directed the SAB Chair to conduct a "quick-look" study building on and expanding the efforts of the Hypoxia Deep Dive Integrated Product Team and 7 Jan 11 COMACC-convened Class E SIB exploring OBOGS.

The SAB quick-look study is authorized and encouraged to consult with appropriate Air Force and DOD subject matter experts, other government agencies, and civilian aerospace industry partners to identify suspected deficient areas in the fleet of OBOGS-equipped aircraft and associated aircrew flight equipment. The SAB will focus its efforts on the F–22 aircraft, but is authorized to expand and include F–16, A–10, F–15E, B–1, B–2, CV–22, T–6, F–35, and other aircraft as appropriate.

In late June 2011, the COMACC Convened Class E SIB stood down after briefing the SAB quick-look study. At the same time, a AF/SE Convened Class E SIB stood up to continue the efforts of the previous SIB. Presently, there are two primary investigative efforts in progress, the SAB and the SIB. The AF/SE SIB is charged with finding the root cause(s) of the F–22 incidents and developing a return to fly regimen for an eventual resumption of flying operations.

24. Senator BROWN. Lieutenant General Carlisle, do you have a sense of how much longer the stand-down will remain in effect?

General CARLISLE. The timeline for the current stand-down is undetermined. The safety of our aircrews is paramount, so the current stand-down and Air Force SAB "quick look" study are prudent steps to ensure all potential technical, causal, and contributory factors have been fully considered and that all appropriate steps are being taken to enhance flight safety.

The current stand-down only affects the daily training operations of the F–22 fleet. The F–22 is ready to accomplish any directed missions in support of national security. Furthermore, F–22 crews will maintain proficiency through simulator and ground training events.

A releasable report will be provided to the Secretary of the Air Force when the "quick look" study is completed and vetted through the full membership of the SAB.

25. Senator BROWN. Lieutenant General Carlisle, I understand that the F–35 JSF had a similar glitch, resulting in a pilot complaining of light-headedness. What is being done, if anything, to ensure that the same problem doesn't become more widespread on the JSF?

General CARLISLE. As reported in a congressional inquiry from May of this year, the AF replied that a F–35 did experience a physiological event at Pax River in mid-April that is still under investigation. This incident is thought to be from carbon monoxide, as the OBOGS does not scrub carbon monoxide off well at very low inlet pressures. We established some ground exhaust limitations, until the investigation is completed and solutions are approved.

The F–35 incident happened during the ground handling of the aircraft as opposed to the F–22 event that was a flight related incident that prompted the stand-down of the fleet. At this time, the F–35 program office does not see any commonality in the potential causal factors that the F–22 program has investigated. The F–35 program office will carefully track the progress of ongoing Air Force investigations and studies, and will apply any applicable findings and recommendations to the F–35 systems.

In addition to a detailed safety investigation, the Air Force has also tasked its SAB to conduct a quick-look study. The SAB is authorized and encouraged to consult with appropriate Air Force and DOD subject matter experts, other government agencies, and civilian aerospace industry partners to identify suspected deficient areas in the fleet of on-board oxygen generation systems-equipped aircraft and associated aircrew flight equipment. The SAB will focus its efforts on the F–22 aircraft, but is authorized to expand and include F–16, A–10, F–15E, B–1, B–2, CV–22, T–6, F–35, and other aircraft as appropriate.

The results of the Air Force SAB's investigation will be forwarded to F–35 program office to determine if any of the investigation results apply to systems in the F–35.

F–22 RAPTOR SUSTAINMENT STRATEGY

26. Senator BROWN. Lieutenant General Carlisle, what is the sustainment strategy for the F–22 program going forward and, in particular, to what extent will that strategy use competition, or the option of competition, to drive down costs?

General CARLISLE. The sustainment strategy going forward is to transition to a joint contractor/government support integration team. This transition will occur as the program implements the plan based on the findings of the 2009 F–22 Sustainment Business Case Analysis. The plan was approved by the Secretary of the Air Force in 2010 and is currently being implemented. The projected net savings is more than $1 billion over the life of the F–22. Additionally, the F–22 program office has ongoing efforts to assess opportunities to compete elements of F–22 sustainment work. FASTeR is a 10-year (2008 through 2017) Performance Based Logistics business arrangement with LMA. Annual FASTeR contract awards will implement the transition to a joint contractor/government support integration team.

[Whereupon, at 3:52 p.m., the subcommittee adjourned.]