

**DEPARTMENT OF DEFENSE AUTHORIZATION FOR
APPROPRIATIONS FOR FISCAL YEAR 2010**

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES

UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

ON

S. 1390

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2010 FOR MILITARY
ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CON-
STRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF
ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL
YEAR, AND FOR OTHER PURPOSES

**PART 4
AIRLAND**

JUNE 9 AND 16, 2009



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**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2010**

TUESDAY, JUNE 9, 2009

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

TACTICAL AVIATION PROGRAMS

The subcommittee met, pursuant to notice, at 2:33 p.m. in room SR-222, Russell Senate Office Building, Senator Joseph Lieberman (chairman of the subcommittee) presiding.

Committee members present: Senators Lieberman, McCaskill, Hagan, Begich, Inhofe, Chambliss, and Thune.

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

Minority staff members present: David M. Morriss, minority counsel; and Christopher J. Paul, professional staff member.

Staff assistants present: Mary C. Holloway and Brian F. Sebold.

Committee members' assistants present: Christopher Griffin, assistant to Senator Lieberman; Roger Pena, assistant to Senator Hagan; David Ramseur, assistant to Senator Begich; Anthony J. Lazarski, assistant to Senator Inhofe; Lenwood Landrum and Sandra Luff, assistants to Senator Sessions; and Jason Van Beek, assistant to Senator Thune.

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

Senator LIEBERMAN. The subcommittee will come to order. I thank everyone for being here. A special thank you and welcome to our witnesses who are here with us today. It is against the backdrop of the continued bravery and exemplary performance of the American Military in Iraq and Afghanistan and in fact throughout the world that we convene this session of the Airland Subcommittee to discuss the President's future of aviation programs, particularly tactical aviation (TACAIR) programs. This has become an annual meeting for the Airland Subcommittee. Every year we're faced with the challenge of balancing a number of competing demands for limited resources including a balance between current operations and future modernizations, all of it to fulfill as best we can our constitutional responsibility to enable the men and women of the American Military to provide for the common defense. Be-

cause of the pressure on our budget and the pressure on our military this is a particularly difficult year in which we try to strike exactly the right balance.

The subcommittee and the full committee hope to markup, to prepare our authorization bill if possible by the end of this month. So what we hear today and what we learn today would be of specific and tangible effect on the deliberations of this subcommittee as we will report and recommend to our colleagues on this program, so they appreciate the extraordinary group of witnesses we have before us. I'm going to abbreviate my statement and just say briefly that among the issues that we want to talk about are, of course, the F-22A, the F/A-18, structure issues about the Joint Strike Fighter (JSF) development progress and the impact of the decision on the F-22 and the President's budget and the increase in the pace of development of the JSF, what impact that will have on that program, and also the question of the alternate engine for the JSF. These are difficult and important questions, but we know that the witnesses before us today can help illuminate our path forward and therefore we thank you for being here.

STATEMENT OF SENATOR JOHN THUNE

Senator THUNE. Thank you, Mr. Chairman. I want to thank our panelist and join you in welcoming our witnesses here today to discuss TACAIR programs contained within the President's budget request for fiscal year 2010. The fiscal year 2010 budget is an integral part of a much longer term process that will help insure defense dollars are spent wisely to address the threats that we face today and will likely face tomorrow. I understand there are additional issues that must be addressed, which will be informed by a number of ongoing reviews including the defense review. The committee looks forward to being briefed on the full range of those issues and how they will affect future budget decisions.

While the President's fiscal year 2010 budget submission represents a snapshot of the Services' overall requirements, it also raises several questions about our military's TACAIR programs. First, the Navy has vastly expanded its estimate of size of the so-called fighter gap, putting the shortfall of fighter planes at 243 aircraft by 2018. Is the Navy taking appropriate action to mitigate that gap and the operational implications of that gap? Can the Navy maintain adequate carrier air wings to satisfy the needs of 11 aircraft carriers?

Second, during hearings on last year's budget request, the Air Force likewise testified that due to new estimates of the legacy fighter force, the current F-22 Raptor and JSF procurement plans would likely leave a gap of up to 800 fighter aircrafts by 2024. Is the Air Force taking appropriate actions to mitigate that gap?

Third, given Secretary Gates' decision to end the F-22 Raptor production at 187 aircraft and provide \$1 billion for modernization of the A-10, F-16 Falcon, and F-15 Eagle strike fighter aircraft, is the Air Force effectively institutionalizing and enhancing our capabilities to fight the wars we're in today and address the scenarios we're most likely to face in the future while hedging against other contingencies?

Fourth, the Secretary's purposed commitment to the JSF also requires us to confront serious questions about high cost and affordability. The F-35 variants for the Navy, Marine Corps, and Air Force all will cost more to procure than to replace the older tactical aircraft. Those costs have increased 47 percent since 2001 from \$65 million to \$105 million per aircraft. Given very limited flight testing and production processes and the degree of technology risks in the F-35 JSF program, is it wise to accelerate buying those aircraft only to have procurement costs increase later?

Fifth, the Combat Air Force Restructure Plan allows the Air Force to bridge to the predominantly fifth general force of the future. Did the Air Force get it right regarding the decision to accelerate the retirement of 250 strike fighters and does the plan properly weigh the benefits of retiring aircraft nearing their expected service life against the near-term risk to our national security?

Finally, the President's proposal to delay the next generation bomber pending the outcome of the nuclear review and in light of arms control negotiations. How is the administration's position on the next generation bomber reconciled with prior statements Secretary Gates has made on the military need to continue that program and its decision to move forward on another program, the *Ohio* Submarine Replacement Program, given that both programs will be informed by those same documents?

I look forward to hearing from our witnesses, Mr. Chairman, on each of these issues and others and thanks again to our witnesses for being here. Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you very much, Senator Thune. Let's go right to the witnesses and if we have the order right, we'll begin with Admiral Architzel and then we'll go to General Shackelford. Thanks for being here Admiral.

STATEMENT OF VADM DAVID ARCHITZEL, USN, PRINCIPAL DEPUTY, OFFICE OF THE ASSISTANT SECRETARY OF THE NAVY (RESEARCH, DEVELOPMENT, AND ACQUISITION)

Admiral ARCHITZEL. Thank you. Mr. Chairman, Senator Thune, and distinguished members of the subcommittee, it's an honor to appear before you today to discuss the Department of the Navy's TACAIR programs. I would like to submit my statement for the record.

Senator LIEBERMAN. Without objection.

Admiral ARCHITZEL. The Department of the Navy's acquisition teams develop, test, and acquire the country's naval aviation weapon systems; balancing performance schedule and cost effectiveness. Therefore, our fiscal year 2010 budget supports the Navy and Marine Corps joint forces capable of meeting the wide spectrum of threats to our Nation both today and in the future. The Department continues the development and low rate initial production (LRIP) of the F-35 Lightning II, the E-2D Advanced Hawkeye, the CH-53K Heavy Lift Replacement aircraft, the P-8A Poseidon, unmanned aviation, and new strike weapons capabilities. We will procure our first full rate production EA-18 Growler this year and continue procurement of the F/A-18 E/F Hornet, the V-22, T-6B Joint Primary Aircraft Training System, UH-1 and AH-1Z helicopters, and MH-60R/S helicopters. In total, Navy and Marine

Corps aviation will procure 98 tactical and fixed-wing aircraft, 100 rotary-wing aircraft, and 5 Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicles (VTUAVs) for a total of 203 aircraft for this fiscal year 2010 funding. The Navy is committed to funding and fielding the JSF as a highly capable fifth-generation multi-mission strike fighter. The JSF is in its 8th year of design, development, and testing. Three system design and development (SDD) aircraft are in ground and flight tests. All F-35 variants are projected to meet their respective key performance parameters (KPPs). The F135 engine has completed some 11,300-plus test hours and on 16 different engines through mid-April 2009.

Systems integration testing continues on plan via flight tests, a flying lab, and over 150,000 hours of ground labs testing. A fully integrated mission systems jet will fly in 2009.

The F/A-18 E/F Super Hornet and the EA-18 Growler alliance continue delivering a superior capability to the warfighter, on cost and on schedule. We have delivered 383 Super Hornets and 11 Growlers to the fleet and procured 529 of those aircraft total through April 2009.

The program continues to make technological advances in concert with the required spiral development plan. Earlier this year, we deployed our first and second F/A-18E/F squadrons with the new APG-79 active electronically scanned array radar aboard CVN-76 and CVN-73 with outstanding results; this concludes a significant realized increase in reliability and performance. I'd like to emphasize the good news acquisition story of the EA-18 Growler, built in an integral fashion with Lot 30 F/A 18Fs. It became a part of the multi-year plan initially with the Hornets and is also in leverage in the fiscal year 2010 single year buy of that Hornet.

With operational tests complete, we have delivered 13 aircraft to Whidbey Island and are on track for initial operating capability (IOC) later this year. In fiscal year 2010 we will procure 22 production aircraft of Growlers. The E-2D Advanced Hawkeye program has completed over 92 percent of the system development and demonstration program and operational assessment and currently has two aircrafts in flight test. This program is absolutely critical to the Navy in maintaining our continued superiority in TACAIR operations against defense threats.

Funding reductions resulted in the loss of two aircraft in fiscal year 2009 and major perturbations in budget appropriations, as was experienced in fiscal year 2009, would not allow the success that is demanded by today's fiscal environment and this committee.

Another good news story is the P-8A Poseidon acquisition program. We are leveraging the efficiencies of the commercial production product, Boeing 737, to realize a technologically advanced product in a shortened acquisition time line. This aircraft will be delivered only 9 years after program initiation and will be both capable and affordable.

In fiscal year 2010 we will procure six LRIP-1 aircraft. The program will commence flight tests later this year and IOC in fiscal year 2013. This weapons system fills a critical need, replacing legacy P-3 maritime patrol aircraft in the fleet of tomorrow.

Lastly, we remain committed to the vision to meld unmanned and manned aircraft systems in the future of naval aviation by ex-

ploring, producing, and delivering shore- and sea-based systems such as short takeoff unmanned aircraft, vertical takeoff unmanned aircraft, and the Broad Area Maritime Surveillance Unmanned Airlift System (BAMS). The VTUAV has completed its shipboard landing tests aboard the USS *McInerney*, FFG-8, and the BAMS demonstrator has deployed and commenced operations within U.S. Central Command (CENTCOM) area of responsibility (AOR).

Our current Navy Unmanned Carrier Aviation System demonstration efforts include maturing technologies for actual aircraft carrier catapult launches and recoveries in the future, as well as operation in carrier-controlled air space.

I'd like to close by emphasizing our commitment to advancing state-of-the-art acquisition excellence. One of the cornerstones of our improvement activities is the Department's six-gate, two-pass governance process. We are seeing improvements in our ability to assess program risk and status and we are making better decisions that will lead to more capable and more affordable weapons systems.

It is an honor to testify before the subcommittee today and I welcome your questions regarding the Department of Navy's aviation programs.

[The joint prepared statement of Admiral Architzel, General Trautman, and Admiral Myers follows:]

JOINT PREPARED STATEMENT BY VADM DAVID ARCHITZEL, USN; LT. GEN. GEORGE J. TRAUTMAN III, USMC; AND RADM ALLEN G. MYERS, USN

Chairman Lieberman, Senator Thune, and distinguished members of the subcommittee, thank you for providing us with this opportunity to appear before you to discuss the Department of the Navy's aviation programs. Your Navy/Marine Corps team remains engaged around the world, and naval aviation is in the fight, every day, in support of our forces in harm's way. For nearly 8 years, we have been at an extraordinarily high operational tempo, and we will stay at that tempo as long as our Nation requires it. Your naval service is serving honorably and well, and we are guided by our tradition and history while we keep an eye on our future. The significant accomplishments of those who serve this great Nation are a direct reflection of the tireless efforts and the consistent support of the military by this subcommittee. Thank you for your dedication, and for your oversight.

NAVAL AVIATION PROGRAMS OVERVIEW

The fiscal year 2010 President's budget implements a recapitalization strategy for new capabilities and initiatives, reduced operating costs, and sustainment of legacy fleet aircraft that are performing magnificently in current operations. We continue to work with industry in seeking ways to reduce costs such as contracting strategies on the F/A-18E/F airframe, the H-1 airframe, the F-35, the MH-60R/S, and the MV-22. As an example of our dedication to stewardship of the public's trust and funding, we are implementing a 'prototype' strategy on the Joint Air-to-Ground Missile (JAGM) to ensure high technology readiness and reduced risk prior to entering system development and demonstration (SDD). The Department continues the development and low rate procurement of the F-35, both the B and C models, and continues the development of the E-2D Advanced Hawkeye, the EA-18G, the CH-53K Heavy Lift Replacement aircraft, unmanned aircraft systems, and new strike weapons capabilities. In total, with our fiscal year 2010 funding, Navy/Marine Corps aviation will procure 98 additional tactical and fixed-wing aircraft, 100 rotary-wing aircraft, and 5 VTUAVs for a total of 203 aircraft.

TACTICAL AIRCRAFT/TACTICAL AIRCRAFT SYSTEMS

F-35 Joint Strike Fighter

The fiscal year 2010 President's budget requests \$1.7 billion in research, development, test, and evaluation (RDT&E) and \$4.7 billion in Aircraft Procurement, Navy (APN) for 20 Joint Strike Fighter (JSF) aircraft (16 F-35B and 4 F-35C) and associ-

ated spares. The commonality designed into the joint F-35 program will minimize acquisition and operating costs of Navy and Marine Corps tactical aircraft, and allow enhanced interoperability with our sister Service, the United States Air Force, and the eight partner nations participating in the development of this aircraft. This aircraft will give combatant commanders greater flexibility across the range of military operations. A true fifth-generation aircraft, the F-35 will enhance precision strike capability through unprecedented stealth, range, sensor fusion, improved radar performance, combat identification and electronic attack capabilities compared to legacy platforms. It will also add sophisticated electronic warfare capabilities, as compared to the legacy platforms it will replace, and will tie together disparate units scattered across the battlefield, in real time. The F-35C carrier variant (CV) complements the F/A-18E/F Block II and EA-18G in providing survivable, long-range strike capability and persistence over the battlefield. The F-35 will give the ESG and CSG commanders a survivable "Day-One" strike capability in a denied access environment that cannot be accomplished by current legacy aircraft. The F-35B short take-off vertical landing (STOVL) variant combines the multi-role versatility and strike fighter capability of the legacy F/A-18 with the basing flexibility of the AV-8B. Having these capabilities in one aircraft will provide the Joint Force Commander and the MAGTF Commander unprecedented strategic and operational agility.

The Marine Corps' tactical aviation (TACAIR) fixed-wing platforms, used for direct support to our ground combat marines in the fight, are the AV-8B Harrier, the F/A-18 A+/C/D Hornet and the EA-6B Prowler. These aircraft are approaching the end of their planned service lives, and the Marine Corps, through careful service life extension programs, has managed these legacy platforms to bridge our aviation force until future airframes come on line. The Marines' F-35B will replace both the AV-8B and F/A-18 A+/C/D, as well as fill a large portion of the EA-6B mission as part of a networked system of systems. The Marine Corps intends to leverage the F-35B's sophisticated sensor suite and very low observable (VLO), fifth-generation strike fighter capabilities, particularly in the area of data collection, to support the Marine Air-Ground Task Force (MAGTF) well beyond the abilities of today's strike and EW assets.

Three SDD jets (AA-1, BF-1, and BF-2) are in flight testing. The remaining SDD jets and ground test articles, plus low rate initial production (LRIP) I and LRIP II aircraft, are in various stages of production. The SDD jets are setting new standards for quality and manufacturing efficiencies that improve with each jet. In flight testing, the initial conventional takeoff and landing (CTOL) aircraft (AA-1) has demonstrated superb performance and reduced program risk, with 81 sorties (111 flight hours) flown through April 20, 2009. BF-1, the first STOVL flight test jet, first flew in June 2008, on the schedule established 2 years prior. BF-1 has flown 14 flights (13 hours), and is currently on the hover pit, undergoing vertical engine operations. BF-2 first flew February 2009 and returned with no flight discrepancies noted. BG-1 static test results are favorable. The F135 engine has completed 11,300+ test hours on 16 engines through mid-April 2009. Software is 74 percent complete, with 13 million lines of code released including Block 0.5 mission systems, per the spiral development plan/schedule and with record-setting code-writing efficiencies. Software demonstrates stability across multiple mission system subsystems.

Systems integration testing continues on plan via flight tests, a flying lab and over 150,000 hours of ground labs testing. A fully integrated mission systems jet will fly later this year. The second production lot contract was signed below the cost model prediction. LRIP III contract negotiations are near complete, and LRIP IV advance procurement funding is on contract. All F-35 variants are projected to meet their respective key performance parameters. The F-35 plan for incremental blocks of capability balances cost, schedule and risk.

F/A-18 E/F Super Hornet

The fiscal year 2010 President's budget requests \$1.1 billion in APN for nine F/A-18 E/F Block II aircraft. The F/A-18E/F continues to transition into the fleet, improving the survivability and strike capability of the carrier air wing. Super Hornets and legacy F/A-18A-D Hornets have conducted more than 80,000 combat missions in support of Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF) since September 11, 2001. While deployed both on the ground and at sea aboard our aircraft carriers, F/A-18s have dropped 4,600 precision ordnance Joint Direct Attack Munitions and more than 19,000 laser-guided munitions, and have shot countless rounds of 20mm ammunition during strafing runs. These aircraft continue to provide vital overwatch and direct support to our troops on the ground in Iraq and Afghanistan.

The Super Hornet provides a 40 percent increase in combat radius, 50 percent increase in endurance, and 25 percent increase in weapons payload over our older, legacy Hornets. Over 449 F/A-18E/Fs will have been procured through fiscal year 2009. The program is on track to complete procurement of the program of record of 506 aircraft by 2012. The Super Hornet has used an incremental development approach to incorporate new technologies, such as the Joint Helmet Mounted Cueing System, Advanced Targeting Forward Looking Infra-Red, with shared real-time video, Shared Reconnaissance Pod System and Multifunctional Information Distribution System data-link. The APG-79 active electronically scanned array (AESA) radar system, in the Block II aircraft, has completed operational testing, achieved full rate production (June 2007) and material support date (December 2008). Four fully operational AESA-equipped F/A-18E/F squadrons have been transitioned and two squadrons have been deployed with full integrated logistics support. The F/A-18E/F fiscal year 2010 budget request also includes \$102.0 million in APN to implement commonality, maintain capabilities and improve reliability and structural safety.

F/A-18 A/B/C/D (Legacy) Hornet

The fiscal year 2010 President's budget request is \$277.7 million in APN for the continuation of the systems upgrade programs for the F/A-18 platform. As the F/A-18 program transitions to the F/A-18E/F and JSF, today's inventory of 624 F/A-18 A/B/C/Ds will continue to comprise half of the Navy's strike fighter inventory until 2013. Included in this request is the continued procurement of recently fielded systems such as the Joint Helmet Mounted Cueing System, Advanced Targeting Forward-Looking Infrared (FLIR), Multi-Function Information Distribution System and a Digital Communications System. The Marine Corps continues to upgrade 56 Lot 7-9 F/A-18A models and 30 Lot 10/11 F/A-18C models to a Lot 21 F/A-18C avionics aircraft capability with digital communications and a tactical data link. The Marine Corps anticipates programmed upgrades to enhance the current capabilities of the F/A-18C/D with digital communications, tactical data link and tactical reconnaissance systems. This upgrade ensures that our F/A-18s remain viable and relevant in support of tactical air integration and expeditionary maneuver warfare.

The Marines are planning for and expect the F/A-18(A+/C/D) to remain in the active inventory until 2023. The Marines are also employing the Litening targeting pod on the F/A-18A+/C/D aircraft in expeditionary operations including OIF and pending employment in OEF. When combined with data link hardware, the Litening pod provides real-time video to ground forces through Remotely Operated Video Enhanced Receiver (ROVER) workstations. Continued analysis of TACAIR inventories will continue throughout 2010, in the QDR and beyond to determine the health of the legacy F/A-18A-D fleet.

Airborne Electronic Attack (AEA)/EA-18G Growler

The fiscal year 2010 President's budget request is \$55.4 million in Research, Development, Test, and Evaluation, Navy (RDT&E,N) for the completion of SDD and \$1.6 billion in APN for 22 full rate production EA-18G Lot 4 aircraft. The EA-18G continues its development as the Navy's replacement for the EA-6B AEA aircraft. The EA-18G will replace carrier-based Navy EA-6B aircraft by 2013. A total quantity of 27 aircraft will be procured in LRIP. The Navy is using the F/A-18E/F single year procurement SYP contract to buy the Lot 4 aircraft in fiscal year 2010. The program began operational evaluation in fall 2008. The Fleet Replacement Squadron (FRS) has achieved ready for training (RFT) and the first deployable EA-18G squadron is on schedule for a August 2009 safe for flight, leading to initial operating capability (IOC) in fiscal year 2009 and full operating capability (FOC) in fiscal year 2012. The EA-18G program of record is 88 aircraft.

Airborne Electronic Attack (AEA)/EA-6B Prowler

The EA-6B is in near-continuous use in Iraq and Afghanistan today in support of our troops on the ground as DOD's only tactical electronic attack aircraft performing communications jamming and information operation missions. The program's key issue is current readiness of the EA-6B. The fiscal year 2010 President's budget request is \$40.0 million in APN for procurement of critical airborne electronic attack (AEA) products and continuing EA-6B readiness improvements, to increase operational availability and reduce operating cost of this low-density/high-demand aircraft. EA-6B upgrades include procuring 32 low-band transmitters to provide a new jamming capability, replacing aging transmitters to be employed on legacy EA-6B and new EA-18G aircraft. The budget request also provides for operational safety and cost-wise readiness improvement initiatives to ensure availability and safety of the aging EA-6B aircraft.

The Navy and Marine Corps remain fully committed to the EA-6B as we continue to enhance our legacy capabilities. The EA-6B continues to maintain an extremely high deployment tempo, supporting operations against growing and diverse irregular warfare threats. The EA-6B, when deployed to Iraq, has the highest utilization rate of any aircraft in our inventory: five times its peacetime utilization. The fiscal year 2010 budget requests \$11 million for EA-6B operational sustainment. Ongoing structural improvements and the planned Improved Capabilities III upgrades have extended the aircraft's service life, and will deliver increased capability through its program of record of 2016.

The fiscal year 2010 President's budget request is \$128 million of RDT&E, Navy (RDT&E,N) for Next Generation Jammer (NGJ) analysis of alternatives and technology maturation. The JSF will leverage this remarkable asset when it comes on line. NGJ will begin competitive technology maturation efforts to mature technology to system level prototypes in preparation for engineering and manufacturing development phase. NGJ will combat evolving electronic attack communication and radar targets, and will adopt an adaptable, modular, and open architecture philosophy to enable future growth.

AV-8B Harrier

The AV-8B continues to be widely deployed in support of OIF and OEF. Each Marine Expeditionary Unit that sails does so with embarked AV-8Bs. The Harrier recently ended a highly successful 6-year rotation in Iraq, and now are in the vanguard of the Marine Expeditionary Brigade deploying into Afghanistan. We intend to make use of its weapons, sensors and basing flexibility in that austere environment.

Fiscal year 2010 budget requests \$20.9 million RDT&E funds to support development of the AV-8 Engine Life Management Plan (ELMP)/Engine Monitoring System, Tactical Moving Map Capability, the Readiness Management Plan (RMP), and Digital Improved Triple Ejector Racks (DITER). The DITER effort will increase the digital weapons carriage capability of the Harrier to better support combat operations. The fiscal year 2010 budget also requests \$35.7 million procurement funding for the Open Systems Core Avionics Requirement, ELMP upgrades, and the RMP, which addresses aircraft obsolescence and deficiency issues associated with sustaining the current AV-8B fleet. The Litening targeting pod also will be upgraded, to better support the Marine Corps' warfighter on the ground. When combined with data link hardware and the Rover ground station, the Litening pod adds a new dimension to precision fires and to intelligence, surveillance, and reconnaissance (ISR). Finally, the AV-8B program is upgrading 1 day attack aircraft to a night attack configuration as part of the attrition recovery effort needed to address significant legacy inventory shortfalls until we transition to the F-35B.

Strike Fighter Trends

Our aviation plan balances aviation capabilities through cost-wise investments in recapitalization, sustainment, and modernization programs. One of the issues we will be dealing with in the Quadrennial Defense Review (QDR) process is the implications of naval inventory trends. We are updating the inputs to the predictive model and will have an updated assessment for evaluation during the QDR.

F/A-18A/B/C/D aircraft are reaching life limits and will require extensions to bridge the gap to JSF. The Service Life Assessment Program (SLAP) assessed the airframe's potential for life extension. The SLAP analytical data necessary to determine extension to 10,000 flight hours was released in May 2008. Estimated cost data to support the extension was released in November 2008. A budget quality rough order of magnitude cost for engineering change proposals is in development to support the Service Life Extension Program.

A combination of addressing variables and mitigating strategies will lead to a solution for this issue. We will continue to optimize and balance our inventory while investing in the future.

FIXED-WING AIRCRAFT

P-8A Poseidon

The future of the Navy's maritime patrol force includes plans for sustainment, modernization, and re-capitalization of the force. The fiscal year 2010 President's budget request is \$1.162 billion for development and \$160.5 million for advanced procurement of the P-3 replacement aircraft, the P-8 Poseidon. Fiscal year 2010 development funding will support the continued development of the P-8A and associated test. Fiscal year 2010 procurement funding will support the procurement of the first six LRIP P-8A aircraft which are scheduled to begin delivery in February 2012 and advanced procurement for subsequent lots of LRIP. The program is on track for

fielding in late fiscal year 2013 when the first squadron will have transitioned and be ready to deploy forward in support of the combatant commander.

The program completed the Interim Program Review in April 2009 and awarded the advanced acquisition contract for low rate initial production advanced procurement. Boeing is currently building the fifth of eight test aircraft. These first five test articles (three flight test aircraft and two ground test articles) are on schedule for delivery in accordance with the revised plan designed to recover from the 2 month machinist strike that interrupted progress last fall. The first flight of the first flight test article occurred on April 25, 2009, in Seattle, WA. The start of flight testing is on-schedule to commence in the fourth quarter of this fiscal year.

P-3C Orion

The P-3 is being sustained to keep the aircraft a viable warfighter until it is replaced by P-8. Results of the P-3 Service Life Assessment Program revealed the need for an aggressive approach to P-3 airframe sustainment. The accumulation of two decades of heavy demand by the combatant commanders, to include OEF and OIF, has resulted in advanced fatigue. In fiscal year 2010, \$485.2 million is requested to sustain the P-3C until transition to the P-8A Multi-Mission Maritime aircraft. More than half of this amount (\$349.6 million) is for Special Structural Inspections-Kits (SSI-K), which will allow for airframe sustainment to support the CNO's P-3 Fleet Response Plan, as well as supporting EP-3E requirements which are executed within the P-3 SSI-K program.

In December 2007, ongoing refinement of the model used to calculate wing stress indicated that the lower wing surface of the P-3 aircraft had fatigue beyond standards for acceptable risk resulting in the grounding of an additional 39 P-3 aircraft; 4 more aircraft have since been grounded, 2 in calendar year 2008 and 2 in March 2009. Key elements of the sustainment approach are strict management of requirements and flight hour use, special structural inspections to keep the aircraft safely flying, and increased use of simulators to satisfy training requirements. In fiscal year 2010, a systems sustainment and modernization budget of \$135.6 million is requested to continue to address a multitude of mission essential efforts to replace obsolete components, integrate open architecture technology, and leverage commonality.

EP-3 Aries Replacement/Sustainment

The Navy plans to recapitalize its aging EP-3E fleet with a land-based, manned, airborne intelligence, surveillance, reconnaissance, and targeting platform, called EP-X, to meet maritime requirements. In fiscal year 2010, the President's budget request is \$12.0 million in RDT&E,N funds for this effort to support studies focused on capabilities, documentation, and technology development. In fiscal year 2010, the President's budget request is \$46.2 million in RDT&E,N and \$92.5 million in APN to address EP-3E SIGINT sensor and communications equipment obsolescence issues that are necessary to keep the EP-3E viable until the replacement platform is fielded, and to develop follow-on capabilities that can be migrated to the EP-X. This funding supports procurement associated with obsolescence upgrades, and engineering development for JCC Spiral 3 and Recapitalization Capabilities Migration (RCM).

E-2D Advanced Hawkeye

The E-2D Advanced Hawkeye (AHE) is a critical enabler of transformational intelligence, surveillance, and reconnaissance capability by providing robust overland and littoral detection and tracking of current and future aircraft and cruise missile-type targets. The E-2D Advanced Hawkeye replaces the current E-2C Hawkeye aircraft. The radar for the Advanced Hawkeye will provide enhanced capability in the overland and the littoral environment, in addition to the open ocean environment, while improving performance against clutter and small targets, adding transformational surveillance and theater air and missile defense capabilities. In fiscal year 2009 Congress appropriated \$385.7 million in APN-1 for two LRIP Lot I aircraft and advanced procurement for fiscal year 2010 LRIP Lot II aircraft. This funds one fewer aircraft than the number requested in the fiscal year 2009 President's budget request and underfunds advanced procurement for fiscal year 2010 LRIP Lot II aircraft. An 'operational assessment' was completed in first quarter fiscal year 2009 to support a Milestone C decision in third quarter 2009. Fiscal year 2010 President's budget requests \$364.557 million in RDT&E,N for continuation of SDD and \$606.169 million in APN-1 for two LRIP Lot II aircraft and advanced procurement for four fiscal year 2011 LRIP Lot III aircraft.

KC-130J Hercules

The Marine Corps' KC-130J Hercules aircraft are invaluable workhorses, deployed continuously in support of OIF and OEF. These aircraft primarily provide multi-mission tactical aerial refueling, but also provide fixed-wing assault support through standard cargo and aerial delivery missions to dispersed units. Soon, these aircraft will increase their warfighting contribution with the incorporation of "Harvest Hawk," which provides support for ground forces through a roll-on/roll-off ISR/weapon system.

The recent combat introduction of the aerial-refuelable MV-22, combined with the retirement of the legacy KC-130F/R fleet last year, requires accelerated procurement of the KC-130J. The Marine Corps is programmed to procure a total of 63 KC-130J aircraft by the end of fiscal year 2015. To date, 34 new aircraft have been delivered and 13 more are either on contract, or in contract negotiations, for a total of 47. This is still four aircraft short of the inventory objective of 51 KC-130Js for the active force. Ultimately, the Marine Corps will seek to replace our 28 Reserve component KC-130T aircraft with KC-130Js, thus necking down our aerial refueling force to a single type/model/series of aircraft.

The Navy intends to replace its aging C-130T aircraft with 25 KC-130J as the most cost effective means for addressing growing obsolescence and supportability issues.

T-6B Joint Primary Air Training System (JPATS)

The T-6 is the primary flight training aircraft for Navy and Marine Corps pilots and naval flight officers, replacing the T-34C. The current requirement is for 315 aircraft, of which 162 aircraft have been procured and 52 aircraft delivered to date. The fiscal year 2010 President's budget request includes \$266.5 million to procure 38 aircraft under an Air Force contract. We are also dedicated to sustainment of the TH-57, the training helicopter for Navy and Marine Corps helicopter pilots, and the T-45, the training jet for our future jet pilots and naval flight officers.

ROTARY-WING AND TILT-ROTOR AIRCRAFT

V-22 Osprey

The MV-22B Osprey is now combat-tested and ready for deployment anywhere throughout the world. As our premier medium lift assault support platform, the Osprey brings unprecedented range, speed, and survivability to the warfighter, in a platform that far exceeds the capabilities of the CH-46E it is replacing. The MV-22B has been supporting our marines in combat continuously since October 2007, with the third successive squadron recently completing a highly successful 7 month rotation in support of OIF just last month. In Iraq, Osprey squadrons have logged over 9,000 flight hours, carried over 40,000 passengers, and lifted over 2 million pounds of cargo while flying every mission profile assigned by the Multi-National Force-West Commander.

As we continue to explore the tremendous capabilities of tilt-rotor aircraft and look forward to employing Osprey both aboard ship and in new theaters of operation, we are learning valuable lessons with respect to reliability and maintainability. Like other types of aircraft in the early operational phase of their lifecycles, the MV-22 has experienced lower-than-desired reliability of some components and therefore higher operations and support costs. With the cooperation and support of our industry partners, we are tackling these issues head on, with aggressive logistics and support plans that will increase the durability and availability of the parts needed to raise reliability and concurrently lower operating costs of this aircraft.

The fiscal year 2010 President's budget request includes \$2.3 billion in APN for procurement of 30 MV-22s and continued development of follow-on block upgrades. Fiscal year 2010 is the third year of the V-22 MYP contract. Our MYP strategy supports a continued cost reduction and affordability trend, provides a stable basis for industry, and best supports the needs of the warfighter. The fiscal year 2010 appropriations will fully fund Lot 14 and procure long-lead items for Lot 15 under the V-22 multi-year contract.

V-22 capability is being increased and fielded over time via a block upgrade acquisition strategy. MV-22B Block A aircraft are now predominantly used in the training squadrons. Block B aircraft are being fielded with our operational squadrons and continue to be delivered via the current MYP. Block C aircraft will provide additional mission enhancements, primarily in the areas of environmental control systems upgrades, weather radar, and mission systems improvements. The targeted delivery for Block C aircraft is Lot 14, fiscal year 2012. The CV-22 variant provides a capability that will augment the MC-130 in the Air Force/Special Operations Command inventory for special operations infiltration, extraction, and resupply mis-

sions. CV-22 Block 0/10 is a CV-unique configuration for Special Operations Capabilities to include multi-mode radar and electronic countermeasures upgrades. CV-22 Block 20 will provide an enhanced CV-unique configuration with planned communications and aircraft system performance upgrades. The CV-22 program has completed IOT&E and a successful trans-Atlantic operational deployment in support of an exercise in Africa.

AH-1Z/UH-1Y

The H-1 Upgrades Program will replace the Marine Corps' AH-1W and UH-1N helicopters with state-of-the-art AH-1Z and UH-1Y models. The legacy fleet of AH-1W and UH-1N aircraft have proven enormously effective over decades of heavy use, and as these aircraft reach the end of their service lives we look forward to expanding utility and attack helicopter capabilities. The new Z and Y model aircraft will begin our process of linking the battlefield into a coherent whole. On the future battlefield, the Strikelink system will tie these airframes, their sensors and their weapons systems together with ground combat forces and fixed-wing aircraft, while weapons systems such as the Advanced Precision Kill Weapon System II (APKWS II) will provide the lethality in support our ground forces need.

The fiscal year 2010 budget requests \$32.8 million in RDT&E,N for continued product improvements and \$780.4 million in APN for 16 UH-1Y and 12 AH-1Z aircraft. The program is a key modernization effort designed to resolve existing safety deficiencies, enhance operational effectiveness, and extend the service life of both aircraft. Additionally, the 84 percent commonality between the AH-1Z and UH-1Y will significantly reduce life-cycle costs and logistical footprint, while increasing the maintainability and deployability of both aircraft. The program will provide the Marine Corps with 226 AH-1Z helicopters and 123 UH-1Y models through a combination of remanufacturing and new production. This represents an increase of 69 aircraft above the previous inventory objective of 280 aircraft. The revised objective is driven by the need to increase our active duty light attack helicopter squadrons (HMLAs) from six to nine over the next several years as part of the Marine Corps' directed increase in force structure and manning.

The UH-1Y aircraft achieved initial operational capability in August 2008 and full rate production in September 2008. The first three lots of low rate production aircraft have been delivered. The final phase of OPEVAL for the UH-1Y was completed and the aircraft was deemed operationally effective and suitable. AH-1Z development is continuing and the final phase of OPEVAL is scheduled to conclude in fiscal year 2010. We are developing the capability to fabricate new some of the AH-1Z aircraft to reduce the number of AH-1W aircraft removed from service for remanufacturing and to support the increased inventory objective which exceeds the quantity of existing AH-1W airframes. Fifty eight AH-1Zs will be built new. This covers 46 additional aircraft for increasing inventory objective and twelve aircraft to cover required routine maintenance inspection cycles along with forecasted airframe lifetime fatigue and attrition rates

MH-60R and MH-60S

The fiscal year 2010 President's budget requests \$943.3 million for 24 MH-60R aircraft and \$82.0 million in RDT&E,N for continued replacement of the Light Airborne Multi-Purpose System MK III SH-60B and carrier-based SH-60F helicopters with the MH-60R. The \$82.0 million is to continue development of the Ku-band data link, automatic radar periscope detection and discrimination program, which is a fleet-driven capability upgrade to the APS-147 Radar, and Mode V interrogation capability in its identification friend-or-foe system. The MH-60R is used in both the anti-submarine warfare (ASW) with its dipping sonar, sonobouys and torpedoes, and the surface warfare (SUW) roles with its electronics surveillance measures system, multimode radar with inverse synthetic aperture radar (ISAR), FLIR system, and Hellfire missiles. It has demonstrated three to seven times the capability in the ASW role and significant increases in its SUW capability over legacy systems. The MH-60R program is post-Milestone III, having received approval for full-rate production in 2006. The first operational squadron, HSM-71, established in 2007, is deploying in Carrier Strike Group Three with the USS *John C Stennis* (CVN-74). The MH-60R program has just finished installing its first pre-planned product improvement set of upgrades to include Link-16 and the multi-spectral targeting system (MTS) FLIR in time to make the first deployment.

The fiscal year 2010 President's budget requests \$493.0 million in APN for 18 MH-60S aircraft and \$49.1 million in RDT&E,N funds for the MH-60S, to continue development of the organic airborne mine countermeasures (Block II) and the armed helicopter (Block III) missions. The MH-60S is the Navy's primary combat support helicopter designed to support carrier and expeditionary strike groups. It will re-

place four legacy platforms with a new H-60 variant. The basic MH-60S reached IOC and full rate production in 2002. Armed helo configuration reached IOC in June 2007 and AMCM is scheduled to reach IOC in fiscal year 2010. The MH-60S armed helicopter configuration is also on its first carrier deployment with the USS *Stennis*. HSC-8 is currently operating eight helicopters, including six aircraft in the armed helo configuration, adding the MTS targeting FLIR, Link-16, self defense equipment, two .50 caliber crew served weapons, and eight Hellfire missiles.

The Army and Navy are executing a joint platform multi-year contract that includes both the MH-60R and MH-60S airframes along with the Army's UH-60M. The Navy is also executing a multi-year contract for integration of mission systems into the MH-60R.

CH-46E Sea Knight

The venerable CH-46E continues to perform well, and is poised to maintain operational relevancy through its projected retirement in 2018. The fiscal year 2010 budget requests \$35.9 million targeted at safety enhancements in dynamic components, avionics, and aircraft survivability equipment. These will sustain the health of the airframe as the Marine Corps progresses through the transition to the MV-22 Osprey. This fleet of helicopters will be over 50 years old when they retire, yet they are still relevant, still engaged in the fight, and still the workhorse of assault support to the Marine rifleman.

CH-53K Heavy Lift Replacement Program

In fiscal year 2010 the President's budget requests \$554.8 million RDT&E,N to continue SDD of the CH-53K, which will replace the Marine Corps' current heavy-lift helicopters, the CH-53E "Super Stallion" and the CH-53D "Sea Stallion." In the past year the CH-53K program conducted its preliminary design review, has begun producing long-lead items in preparation for building test articles under the SDD contract, and is scheduled to conduct critical design review in fiscal year 2010.

The legacy CH-53E was built for sustained shipboard operations, entered service in 1981, and continues to demonstrate its value as an expeditionary heavy-lift platform. This aging but very relevant helicopter is in high demand, making significant contributions to missions in Afghanistan, Iraq, and the Horn of Africa; and disaster relief operations around the world. Expeditionary heavy-lift capabilities will continue to be critical to successful land- and sea-based operations in future anti-access, area-denial environments, enabling sea basing and the joint operating concepts of force application and focused logistics.

As a design evolution of the CH-53E, the new-build CH-53K will fulfill land- and sea-based heavy-lift requirements not resident in any of today's platforms, and contribute directly to the increased agility, lethality, and persistent presence of Joint Task Forces and Marine Air-Ground Task Forces. The CH-53K will transport 27,000 lbs. external cargo out to a range of 110 nautical miles, nearly tripling the CH-53E's lift capability under similar environmental conditions while fitting under the same shipboard footprint. The CH-53K will also provide unparalleled lift capability under high altitude, hot weather conditions similar to those found in Afghanistan, thereby greatly expanding the commander's operational reach. Maintainability and reliability enhancements of the CH-53K will significantly decrease recurring operating costs, and will vastly improve aircraft efficiency and operational effectiveness over the current CH-53E. Additionally, survivability and force protection enhancements will increase protection dramatically, for both aircrew and passengers, thereby broadening the depth and breadth of heavy lift operational support to the JTF Commander. Until fielding begins, we will upgrade and maintain our CH-53D and CH-53E fleet for heavy lift support to our warfighters.

VH-71 Presidential Helicopter Replacement Aircraft

The fiscal year 2010 President's budget recommends that the VH-71 program be cancelled. The Department of the Navy is developing options for a follow-on program. The fiscal year 2010 budget requests \$30.0 million for pre-MS A risk reduction activities, capability based assessments, CONOPS development, trade study analysis, specification development, system concept development and threat analysis leading to a late fiscal year 2010/early fiscal year 2011 material development decision for a VH-71 follow on program. In addition, the fiscal year 2010 President's budget requests \$55.2 million to address fiscal year 2010 VH-71 cancellation costs.

VH-3D/VH-60N Sustainment

The fiscal year 2010 budget requests an investment of \$42 million to continue programs that will ensure the aging legacy Presidential fleet remains viable until its replacement is fielded. These programs include the Lift Improvement for the VH-3D and the Cockpit Upgrade Program and Structural Enhancement Program

for the VH-60N. Increased future investment in both aircraft will be required to ensure continued safe and reliable executive transportation until a replacement aircraft is fielded.

SURVIVABILITY, SUPPORT AND COMMAND AND CONTROL SYSTEMS

Integrated Defensive Electronic Countermeasures

Integrated Defensive Electronic Countermeasures (IDECM) Block 3/ALE-55 completed initial operational test and evaluation in December 2008. Based on the requirement to correct deficiencies identified during test, IDECM Block 3 full-rate production decision is now planned for fiscal year 2010 following verification of correction to deficiencies. Additional LRIP awards were approved for fiscal years 2009 and 2010. The President's budget requests \$25.8 million in Ammunition Procurement for 401 ALE-55 fiber optic towed decoys (FOTDs) in fiscal year 2010. \$40.3 million in aircraft procurement (APN-5) is requested for the procurement of 10 ALQ-214 on-board radio frequency jamming systems (IDECM Block 2), 53 electronic frequency converters and other associated aircraft hardware for FOTD integration. IDECM Block 4 is a modification to the ALQ-214 that will enable its use on F/A-18C/D aircraft, in addition to F/A-18E/F aircraft. IDECM Block 4 will replace the obsolete ALQ-126B on-board jammer, currently installed on F/A-18C/D aircraft. The President's budget requests \$65.5 million in RDT&E in fiscal year 2010 for IDECM Block 4 development and test.

Aircraft Survivability Equipment

To prevent current technology from lagging behind the threat, science and technology are developing next-generation helicopter survivability equipment. For fiscal year 2010, the Department of the Navy has requested \$8.8 million for continued Directed Infrared Countermeasures (DIRCM) hardware procurement and \$64.7 million for Joint Allied Threat Awareness System (JATAS) development to provide a state-of-the-art missile warning detection and cueing system. We will thus pace the threat of advanced anti-aircraft systems proliferation. Funds obligated to date for DIRCM have been used for development and procurement of 64 systems, which began delivery in October 2008. The remaining unfunded portion is for an additional 83 DIRCM systems, which equates to 2 years of production capacity, in 2009 and 2010.

Infrared Countermeasures

The Navy has a multi-faceted approach to providing aircrew protection against current and next generation IR-guided Manportable Air Defenses. The fiscal year 2010 President's budget requests \$63.7 million in RDT&E,N for the execution of the JATAS technology demonstration efforts.

Joint Precision Approach and Landing Systems

Joint Precision Approach and Landing Systems (JPALS) is a Global Positioning System-based precision approach and landing system that will replace aging and obsolete aircraft landing systems with a family of systems that is more affordable and will function in more operational environments, and support all Department of Defense land- and sea-based applications. JPALS will provide this capability by being rapidly deployable, survivable and interoperable among the U.S. Services and with U.S. allies, as well as with civil aircraft and landing facilities. JPALS will eventually support unmanned and highly automated aircraft, and will be able to operate during restricted emission control conditions. Milestone B was achieved third quarter 2008 with a subsequent engineering and manufacturing development (EMD) contract awarded. The fiscal year 2010 President's budget requests \$139.3 million in RDT&E,N in continued support of the EMD phase of the program.

WEAPONS

In an era of continuing global uncertainty and shifting threats, the Department of the Navy is developing and deploying air-to-air and strike weapons to enhance our warfighter's capabilities in an evolving and uncertain security environment. The naval aviation fiscal year 2010 President's budget request for each new weapon or weapon system modification program is directed towards deterring potential aggressors, power-projection, sea-control, or other maritime and expeditionary warfare security objectives. Our budget provides resources for weapon systems that directly support troops deployed in the field—as well as weapon systems that will shape our plans to address potential near-peer competitors.

The Navy/Marine Corps weapons programs take into account the lessons-learned from ongoing combat operations as well as the results of our research, development, and test efforts. The resulting fiscal year 2010 weapons budget provides for a portfolio of affordable weapons programs that is balanced between solutions to address

Overseas Contingency Operations (OCO) threats and development of new military capabilities.

Tactical Tomahawk BLK IV Cruise Missile

The Navy supports the continued procurement of this combat-proven, deep-attack weapon in order to meet ship-fill loadouts and potential combat requirements. The Block IV Tactical Tomahawk missile is in a full-rate production status and in fiscal year 2010 the President's budget requests \$283.1 million for an additional 196 Block IV weapons and associated support.

Direct Attack Moving Target Capability

In response to an urgent requirement identified by the combatant Commander in Iraq and Afghanistan, the Department of the Navy approved a rapid deployment capability (RDC) in fiscal year 2007 to develop the direct attack moving target capability, known as DAMTC. DAMTC improves our ability to attack and strike moving targets by leveraging highly successful, congressionally-supported procurement of dual-mode systems. The fiscal year 2010 President's budget requests \$46.4 million to transition the RDC to a formal acquisition program, support a competitive acquisition strategy, and acquire 2,099 additional weapons from a single source through competition at reduced costs.

Joint Standoff Weapon (JSOW)

The combat proven JSOW family of Joint Navy and United States Air Force air-to-ground weapons continues on cost and schedule to develop a JSOW-C-1 variant. JSOW-C-1 adds a 'moving target capability' to the highly successful baseline JSOW-C variant with the addition of a data link and guidance software improvements. The fiscal year 2010 President's budget requests \$10.0 million for telemetry crypto-key modernization and continued JSOW-C-1 development and \$145.3 million for JSOW-C-1 production totaling 430 all-up-rounds to fill our weapons magazines that remain below approved Non-Nuclear Ordnance Requirements.

Small Diameter Bomb II (SDB II)

The Department of the Navy is partnering with the United States Air Force on the development of the Small Diameter Bomb II (SDB II) program. SDB II provides an adverse weather, day or night standoff capability against mobile, moving, and fixed targets, and also allows for target prosecution while minimizing collateral damage. SDB II is of special interest to the Department as it will be integrated into the 'internal carriage' of both Navy and Marine Corps variants of the JSF. SDB II acquisition consists of a competitive development, risk reduction phase between two industry teams with a down-select at Milestone B estimated in early fiscal year 2010. The fiscal year 2010 President's budget requests \$43.9 million of RDT&E for the continued development of this joint program.

Joint Air-to-Ground Missile

JAGM will become the next-generation, forward firing precision-guided missile capable of being launched from Navy/Marine Corps fixed-wing, rotary-wing, and unmanned platforms. The Department of the Navy, in conjunction with the United States Army as the executive service, received formal approval from USD(AT&L) to proceed with the development of the JAGM in January 2008. The JAGM request for proposal was released in March and proposals were received in May. In September 2008, fixed-price incentive contracts were awarded.

During the 27-month technology development phase, the two competing contractors will carry their design through a system-level preliminary design review (PDR) phase and conduct prototype ground launches of their missiles. The intent behind this competitive prototyping during the technology development phase is to improve the probability of overall program success and reduce program costs. To support this critical development program, the fiscal year 2010 President's budget requests \$81.6 million of RDT&E to implement this acquisition strategy.

Hellfire Weapon System

While the Department of the Navy develops JAGM, we are requesting continued support for legacy Hellfire weapons. Hellfire continues to be a priority weapon, providing our Navy/Marine Corps warfighters the ability to attack targets in the caves of Afghanistan as well as the urban canyons of Baghdad. The fiscal year 2010 President's budget requests \$133.1 million for 1,578 weapons with a mix of thermobaric, blast/fragmentation, and anti-armor warheads to provide the maximum operational flexibility to our warfighters.

Advanced Anti-Radiation Guided Missile (AARGM)

The AARGM development program transforms the legacy High-Speed Anti-Radiation Missile (HARM) into an affordable, lethal, and flexible time-sensitive strike weapon system. AARGM adds multi-spectral targeting capability with supersonic fly-out to destroy sophisticated enemy air defenses and expand upon the traditional anti-radiation missile target set. The program has completed all design reviews, began its formal test program in fiscal year 2007, was approved for low rate initial production (LRIP) in fiscal year 2008, and is scheduled to be deployed on the F/A-18 Hornet in 2010. The fiscal year 2010 President's budget requests \$9.2 million for the development and test program and \$48 million for production.

Advanced Precision Kill Weapon System II (APKWS II)

The Department of the Navy assumed program authority for the APKWS II on September 30, 2008. Congress appropriated funding and approved an above threshold reprogramming request in fiscal year 2008 for the Marine Corps to complete SDD. The fiscal year 2010 President's budget requests \$5.0 million in RDT&E funding to complete development and testing for subsequent fielding in fiscal year 2011. In the past year, we saw successful transfer of the laser-guided 2.75" rocket contract from the Department of the Army to the Department of the Navy. This initiative will provide an unprecedented precision capability to our current unguided (and thus less accurate) rockets fired from attack helicopters. Congressional support in fiscal year 2008, with both a \$6 million addition and approval of a \$13 million reprogramming request, provided the \$19 million in fiscal year 2009 that will complete development of this critical weapon in anticipation of the procurement's beginning in 2010. The program is on schedule and on budget, and will meet the needs of our warfighters in theater right now.

Sidewinder AIM-9X Air-to-Air Missile

The joint Navy/Air Force (Navy led) AIM-9X Sidewinder missile is the newest variant in the Sidewinder family. The Sidewinder missile is the only short-range infrared air-to-air missile integrated on USN/USAF strike fighter aircraft. This fifth generation-9X weapon incorporates high off-boresight acquisition capability and thrust vectoring to achieve superior maneuverability, and provides increased sensitivity through an imaging infrared focal plane array seeker and advanced processing. The fiscal year 2010 President's budget requests \$2.3 million for RDT&E efforts, and \$56.8 million for production of 161 all-up-rounds, captive air training missiles, and associated hardware.

Advanced Medium-Range Air-to-Air Missile (AMRAAM) AIM-120

AMRAAM is a joint Navy/Air Force (Air Force led) advanced, medium range missile that counters existing aircraft and cruise missile threats with advanced electronic attack capabilities operating at high/low altitudes from both beyond visual range and within visual range. AMRAAM provides an air-to-air first look, first shot, first kill capability working within a networked environment in support of the Navy's Sea Power-21 theater air and missile defense mission area. The fiscal year 2010 President's budget requests \$3.6 million for RDT&E efforts and \$145.5 million for production of a combined total of 79 all-up-rounds, captive air training missiles and associated hardware.

UNMANNED AIRCRAFT SYSTEMS

Overseas contingency operations continue to emphasize unmanned aircraft systems (UAS). The fiscal year 2010 budget reflects our commitment to a focused array of UAS that will support targeting and fires as well as enhance intelligence, reconnaissance, and surveillance missions with persistent, distributed, and netted sensors. The naval services have recently adopted the joint categorization of UAS into distinct groups that identify systems by weight, speed, and altitude. In addition to the five programs of record noted below, a number of small, specialized systems in the Group 1 and 2 categories are being supported to meet the urgent needs of the warfighter (i.e. Gasoline Micro Air Vehicle, Raven-B, WASP III Micro-UAS, and Scan-Eagle).

Marine Corps Tactical UAS (MCTUAS)

The Army's RQ-7B Shadow UAS is a Group 3 system procured as an interim replacement for the RQ-2B Pioneer UAS until a suitable Group 4 UAS can be fielded in fiscal year 2015. The fiscal year 2010 President's budget requests \$1 million RDT&E and \$56.8 million APN for continued product improvement and procurement of the RQ-7B. The transition to the RQ-7B Shadow began in fiscal year 2007 with the procurement of two systems and was augmented in fiscal year 2008 with

the procurement of nine Shadow systems (five baseline systems and four global war on terror-funded systems). The Marine Corps will procure 13 systems. The Shadow UAS provides rapid fielding of a capability that meets urgent Marine Corps operational requirements and brings immediate interoperability and commonality between Army and Marine Corps units operating side by side in Iraq and Afghanistan.

UAS/Small Tactical Unmanned Air Systems

The fiscal year 2010 President's budget requests \$37.4 million in RDT&E (\$18.6 million Navy, \$18.8 million Marine Corps, with a \$6.0 million fiscal year 2010 OCO request pending) and \$13.8 million in PMC for the UAS/Small Tactical Unmanned Air Systems (STUAS) program that will address Marine Corps and Navy targeting and ISR capability shortfalls identified in the OCO and currently supported by costly service contracts. The Group-3 UAS will provide persistent, ship- and land-based targeting and ISR support for tactical level maneuver decisions and unit level force defense/force protection. The Milestone B decision to enter engineering and manufacturing development is scheduled for the fourth quarter of fiscal year 2009 with IOC planned in 2012. UAS/STUAS plans to begin source selection fourth quarter fiscal year 2009 for a contract award to coincide with the Milestone B decision. Fiscal year 2010 PMC is planned to procure a STUAS/Tier II system as an early operational capability, which consists of four air vehicles and two ground control stations.

Broad Area Maritime Surveillance UAS

The fiscal year 2010 President's budget requests \$465.8 million RDT&E,N to continue SDD of the Broad Area Maritime Surveillance (BAMS) UAS. The Milestone B decision for the BAMS UAS program occurred on April 18, 2008. The program conducted the first major design review, systems requirements review, in January 2009. The BAMS UAS program will meet the Navy requirement for a persistent ISR capability as well as providing a communication relay capability. The BAMS UAS is a larger Group-5 system which will be a force multiplier for the Fleet Commander, enhancing situational awareness of the battlespace and shortening the sensor-to-shooter kill chain. BAMS UAS will work as an adjunct to the new P-8A Multi-Mission Aircraft (MMA) to provide a more affordable, effective and supportable maritime ISR option than current ISR aircraft provide. The Navy also procured two Air Force Global Hawk UASs in fiscal year 2003 for demonstration purposes and to perform risk reduction activities for the BAMS Program. One of the two Global Hawk UAS, renamed the BAMS-demonstrator (BAMS-D) has been recently deployed to the CENTCOM theater of operations.

Fire Scout UAS

The fiscal year 2010 President's budget requests \$25.6 million RDT&E to continue development of the Fire Scout UAS and \$77.6 million APN for the production of five Fire Scout MQ-8B aircraft and three ship control stations. The Fire Scout is a Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle (VTUAV) designed to operate from all air-capable ships, carry modular mission payloads, and operate using the Tactical Control System and Tactical Common Data Link. The Fire Scout UAS is a medium-to-large sized Group-4 system that will provide day/night real time ISR and targeting as well as communication-relay and battlefield management capabilities to support core Littoral Combat Ship mission areas of ASW, MIW and ASUW for the Naval forces. The fiscal year 2010 RDT&E budget request included funding to integrate a maritime search radar system that will significantly increase surveillance capability of the MQ-8B. Due to delays in the Littoral Combat System (LCS) program, the Department is certifying the MQ-8B system on the FFG-8 USS *McInerney* in order to meet Fleet requirements to deploy this capability, as planned, in fiscal year 2009. An above threshold reprogramming request for \$22.8 million to the fiscal year 2008 RDT&E budget was approved by Congress to support the Fire Scout FFG integration. The Fire Scout Program will continue to support integration and testing as a mission module on LCS. Deploying this capability in fiscal year 2010 on the USS *McInerney* will provide much needed new capability to operating forces and also reduce LCS developmental and operational test risks. Developmental testing of Fire Scout with the USS *McInerney* is in process. The Navy continues to cooperate with the Army on their Class IV UAS and with the Coast Guard for their ship based UAS planning. The Navy and Army have achieved over 90 percent commonality in the Fire Scout air vehicle.

Unmanned Combat Air System

The fiscal year 2010 President's budget requests \$311.2 million of RDT&E budget to continue the Navy Unmanned Combat Aircraft System (Navy UCAS) efforts to develop a large Group-5, carrier-suitable, long range, low observable, penetrating,

persistent, unmanned aircraft system capability to conduct ISR/strike missions in denied access environments. The Navy UCAS efforts consist of continuation of the UCAS carrier suitability demonstration (UCAS-D) along with the initiation of acquisition planning and associated technology development. The UCAS-D effort will mature technologies associated with unmanned carrier-suitability, including launch, recovery, and carrier controlled airspace integration, to the technology readiness levels required for a potential follow-on acquisition program. The demonstration will include catapult launch and arrested landings aboard an aircraft carrier. Additionally, the program will demonstrate autonomous aerial refueling using the same unmanned systems from the carrier suitability demonstration. The demonstrations will be complete in fiscal year 2013 though additional technology maturation will be required before entering a potential follow-on acquisition program. Northrop-Grumman, prime contractor for the UCAS carrier suitability demonstration, is currently on track for an early fiscal year 2010 first flight.

SUMMARY

The fiscal year 2010 President's budget reflects considerable effort in identifying solutions to the challenges faced in the Department's aviation programs through a balance between sustaining fielded capabilities, as they are employed in the OCO and continued forward presence worldwide, and a substantive recapitalization effort that will deliver significantly better capabilities to the war fighter. The naval aviation team continues to work aggressively to identify efficiencies in the development, testing, procurement and sustainment of platforms, components, and weapons systems in order to ensure that investments made result in quality products and services provided to the fleet. Since 2001, the Navy and Marine Corps have been fighting shoulder to shoulder overseas, supporting an extremely high operational tempo in two theaters while growing our force, introducing new aircraft and systems, and looking beyond the current fight to how we will shape the naval aviation structure of the future.

In closing, Mr. Chairman, we thank you for the opportunity to testify before your subcommittee regarding the Department of the Navy's aviation procurement programs. We look forward to your questions.

Senator LIEBERMAN. Thanks, Admiral. I appreciate it. Good beginning.

Now we'll go to Lt. Gen. Mark D. Shackelford, USAF, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition.

STATEMENT OF LT. GEN. MARK D. SHACKELFORD, USAF, MILITARY DEPUTY, OFFICE OF THE ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

General SHACKELFORD. Thank you, sir.

Chairman Lieberman, Ranking Member Thune, 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. Your Air Force is fully engaged in operations across the globe, in overseas contingency operations and providing support to the combatant commanders to enable them to successfully execute their missions.

As we prepare for the upcoming year, we will be assessing how the fiscal year 2010 budget aligns with our standing operational requirements, along with the upcoming needs of the entire Air Force. We frame our decisions and recommendations using the Secretary of the Air Force's and Chief of Staff of the Air Force's top five priorities list to ensure we are aligned with the desires of our senior leadership.

We understand your focus today is on the fourth priority, modernizing our air and space inventories, organizations, and training. We are prepared to discuss how our rapidly aging aircraft fleet

drives our urgent need to find a balance between the acquisition of new inventory and the ongoing sustainment of the current fleet.

The Secretary and Chief of Staff of the Air Force have made recapturing acquisition excellence their fifth priority. Last month they approved the Air Force acquisition improvement plan. This plan focuses our efforts and serves as our strategic framework for the critical work of modernizing and recapitalizing our air, space, and cyber systems. It builds on lessons learned from past shortfalls in our procurement processes. But more importantly, it establishes five initiatives that ensure rigor, reliability, and transparency across the Air Force acquisition enterprise.

Those five initiatives are: revitalizing the Air Force acquisition workforce, improving the requirements generation process, instilling budget and financial discipline, improving Air Force major systems source selections, and establishing clear lines of authority and accountability within acquisition organizations.

Your Air Force stands ready to win today's joint fight and plan for tomorrow's challenges. I thank the subcommittee for allowing me to appear before you today and for your continued support of the Air Force. I request our combined written statement be submitted for the record and I look forward to your questions.

[The joint prepared statement of General Shackelford and Major General Gibson follows:]

JOINT PREPARED STATEMENT BY LT. GEN. MARK D. SHACKELFORD, USAF, AND MAJ. GEN. MARKE GIBSON, USAF

I. INTRODUCTION

Chairman Lieberman, Ranking Member Thune, and distinguished members of the subcommittee, thank you for calling this hearing, and for the opportunity to provide you with an update on the Air Force modernization efforts and other matters that are important to our Air Force and to the Nation. Your Air Force is fully engaged in operations across the globe, engaged in overseas contingency operations (OCO) and providing support to the combatant commanders to enable them to successfully execute their missions. As we prepare for the upcoming year, we will be assessing how the fiscal year 2010 budget aligns with the standing operational requirements along with the upcoming needs of the entire Air Force. We frame our decisions and recommendations using the SECAF/CSAF top five priorities list to ensure we are aligned with the desires of our senior leadership. We understand your focus today is on the fourth priority, which is modernizing our air and space inventories, organizations and training. We are prepared to discuss our rapidly aging aircraft fleet that drives our urgent need to find a balance between the acquisition of new inventory and the ongoing effort of sustainment of our current fleet. We look forward to a discussion on how best to interlace the requirements and the available resources that have been allocated in order to execute the National Military Strategy.

II. WINNING THE FIGHT

When it comes to winning today's fight your Air Force is "All In." When we say "All In," that covers a lot of ground. We, along with our sister Services, partner with the joint and coalition team to bring airpower wherever it is needed. The current operations in Iraq, Afghanistan, and the Horn of Africa highlight over 18 consecutive years of planning, resourcing and executing combat missions. Since OCO began in 2001, your Air Force has flown over 80 percent of the coalition's combat sorties in support of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). These missions provide the joint and coalition team with global airlift; aero-medical evacuation; air-refueling; command and control; close air support (CAS) to ground operations; strike; intelligence, surveillance, and reconnaissance (ISR) and electronic warfare. We have flown over 385,000 mobility sorties dedicated to moving equipment and troops to and from the Central Command (CENTCOM) area of responsibility (AOR).

The total air and space effort takes its toll on our equipment and people as we continue to maintain the high operations tempo over time. We currently have over 208,000 airmen contributing 24/7 to combatant command operations, including 35,800 airmen who are deployed to locations worldwide. When adding in the non-combat operations including humanitarian relief missions both globally and at home, and the air sovereignty alert (ASA) operations, the effects on the Air Force assets are tangible and measurable and are reflected in some of the problems we see in maintaining the current fleet. In direct support of the ASA mission, your Air Force has flown over 54,410 total sorties under Operation Noble Eagle, including 39,390 fighter sorties, 11,290 air refueling sorties, and 1,826 airborne early warning sorties. As a testament to the total force, the Air National Guard has flown more than 70 percent of these sorties and currently operates 16 of 18 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. When approaching critical budget decisions, we face the same challenge of balancing between risk and operational necessity as we do when apportioning sorties. Our Air Force leadership is scrutinizing programs and budgets to find acceptable solutions to meet growing demands that are competing for limited amounts of funding.

III. COMBAT AIR FORCES RESTRUCTURE PLAN

The Air Force intends to retire legacy fighters to fund a smaller and more capable force and redistribute savings for higher priority missions. Under the combat air forces (CAF) restructuring plan, the Air Force will accelerate the retirement of approximately 250 aircraft, which includes 112 F-15s, 134 F-16s, and 3 A-10s, over and above the 5 fighters previously scheduled for retirement in fiscal year 2010. The CAF restructure will result in cost savings of \$355 million in fiscal year 2010 and \$3.5 billion over the next 5 fiscal years. The savings would fund advanced capability modifications to remaining fighters and bombers. Additionally, funds would go toward procuring munitions for joint warfighters, to include the small diameter bomb (SDB), hard-target weapons and the AIM-120D and AIM-9X missiles. Remaining funds would be dedicated to procuring or sustaining critical intelligence capabilities, such as the advanced targeting pod, as well as enabling technologies for tactical air controllers and Special Operations Forces.

The CAF restructuring plan, which will require appropriate environmental analyses, would enable the Air Force to use reassignment and retraining programs to move approximately 4,000 manpower authorizations to emerging and priority missions such as manned and unmanned surveillance operations and nuclear deterrence operations. This realignment would include the expansion of MQ-1 Predator, MQ-9 Reaper and MC-12 aircrews; the addition of a fourth active-duty B-52 squadron; and the expansion of Distributed Common Ground System and information processing, exploitation and dissemination capabilities for continued combatant commander support in Afghanistan and Iraq, among other adjustments.

IV. STATUS OF COMBAT AIRCRAFT ACQUISITION

The following information provides updates on Air Force combat aircraft modernization:

A-10

The A-10 provides the Joint Force Commander lethal, precise, persistent, and responsive firepower for CAS and combat search and rescue (CSAR). It has performed superbly in Operations Desert Storm, Allied Force (OAF), OEF, and OIF. However, the age of the A-10 and high operations tempo have taken a toll on the fleet. In the Fall of 2006, the Air Force Fleet Viability Board (FVB) recommended that the Air Force upgrade 242 thin-skin center wing A-10 aircraft with thick-skinned wing replacements; this program is currently designing the new wing and installs will begin in fiscal year 2011. Last fall, approximately 240 A-10s were grounded due to wing cracks. An inspect and repair program was implemented that has reduced the number still grounded to approximately 60; we anticipate these will all return to flying by the end of June 2009. Additionally, A-10 landing gear failures have resulted in a program for replacing failure-prone parts. The Air Force is currently upgrading 347 A-10s to the "C" configuration through the Precision Engagement (PE) modification and anticipates completion by the end of fiscal year 2011. This modification enables J-Series weapons, such as Joint Direct Attack Munitions (JDAM) and Wind Corrected Munitions Dispenser (WCMD); integrates a digital data link and advanced targeting pods with video downlink; replaces monochrome cockpit displays with color multi-function displays; installs new pilot throttle and stick con-

trols; adds a moving map capability and a mass-memory upgrade; and doubles current DC power. Additionally, we have integrated beyond line of sight radios into the A-10 for faster communication with ground units, forward controllers, and C2 centers.

F-15 A-D

The average age of the F-15 A-D fleet is over 25 years old and the average age of the F-15E fleet is over 16 years old. However, analysis suggests that Air Combat Command can manage the fleet through scheduled field/depot inspections under an individual aircraft tracking program.

The F-15A-D fleet has returned to flying status after engineering analysis confirmed they are safe for flight. Of the 407 aircraft in the inventory, only 9 were grounded due to the longeron crack. The Air Force repaired five, and four were retired due to their proximity to planned retirement. The five aircraft were repaired in 2008 at a cost of approximately \$235,000 each using organic materials and labor at Warner-Robins Air Logistics Center.

Based on the recommendation of Boeing and depot engineers, the Air Force has instituted recurring inspections of F-15 longerons every 400 flight hours to detect cracks before they become catastrophic. Analysis confirms that this interval is very conservative and will avoid a mishap such as the one that occurred on 2 November 2007. Additionally, the Air Force will conduct a full-scale fatigue test, aircraft tear-down, and improved structural monitoring to help establish the maximum F-15 service life and more effectively manage structural health of the fleet. We expect these efforts to successfully enable the 176 F-15C/D long-term "Golden Eagles" to operate safely and effectively through 2025.

F-15E

The F-15E fleet, which was not affected by the longeron crack, continues to provide support for ongoing operations in Afghanistan and Iraq. Like the A-10, the F-15E performed superbly in Operations Desert Storm, Allied Force, OEF, and OIF. The Air Force has been working hard to improve the F-15E's ability to rapidly engage and destroy time sensitive targets by adding secure radios and data links for faster communications with ground units and forward controllers; by integrating the latest precision weapons that not only hit a target accurately but are designed to reduce collateral damage; by adding a helmet mounted cueing system that will reduce the F-15E's time to engage a target by up to 80 percent; and by adding a state-of-the-art, active electronically scanned array (AESA), radar system that not only addresses sustainment issues with the current system but will give the F-15E advanced capabilities to identify and engage targets, share real-time information with other aircraft, and protect itself from enemy threats. The Air Force plans for the F-15E to be an integral part of the Nation's force through at least 2035.

F-16

Our F-16s, the bulk of the fighter fleet, are undergoing a structural upgrade program to replace known life-limited structural components. Due to the use of more stressing mission profiles, this upgrade program is required to maintain the original design airframe life of 8,000 flight hours. Wing pylon rib corrosion, a known problem with the F-16 aircraft, is an issue we monitor closely. This corrosion can prevent the F-16s from carrying pylon-mounted external fuel tanks which limits their effective combat range. We currently inspect F-16 aircraft every 800 hours to monitor for this problem. In partnership with industry, the Air Force has recently developed and certified an effective repair allowing repair of affected aircraft at the unit in a single day instead of requiring a lengthy wing overhaul at the depot.

As of 15 May 2009, maintainers have repaired 41 wings at 4 units worldwide, restoring those aircraft to full mission capability. We will award a long-term support contract within the next 2 months which will further enhance the ability of units to obtain repairs for their aircraft.

In other inspections, maintainers have found bulkhead cracks in approximately 37.5 percent (149 of 397) of our Block 40/42 F-16 aircraft. Eight-four aircraft have been repaired and 5 aircraft have had the bulkheads replaced with 19 more in progress. As of 12 May 2009, three Block 40/42 F-16 aircraft were in non-flying status awaiting bulkhead repair or replacement. An additional 57 aircraft continue to fly with increased inspection requirements to measure crack growth. We will continue to monitor this situation closely. Similarly to the F-15, the Air Force will start conducting a full-scale durability test for the F-16 in fiscal year 2011 to help establish the maximum service life and more effectively manage structural health of the fleet. The Common Configuration Implementation Program (CCIP) is a top F-16 priority and will enable the maintenance of a single operational flight program configuration on the Block 40/42/50/52 F-16s. The Block 50/52 modification is complete and

the Block 40/42 modification will be complete in fiscal year 2010. It combines several modifications including a new mission computer, color displays, air-to-air interrogator (Block 50/52 only), Link-16, and Joint Helmet Mounted Cueing System. The F-16 is expected to be a capable element of the fighter force well into 2024.

Fifth-Generation Fighters

Fifth-generation fighters like the F-22A and the F-35 are key elements of our Nation's defense and ability for deterrence. As long as hostile Nations recognize that U.S. airpower can strike their vital centers with impunity, all other U.S. Government efforts are enhanced, which reduces the need for military confrontation. This is the timeless paradox of deterrence; the best way to avoid war is to demonstrate to your enemies, and potential enemies, that you have the ability, the will, and the resolve to defeat them.

Both the F-22A and the F-35 represent our latest generation of fighter aircraft. We need both aircraft to maintain the margin of superiority we have come to depend upon, the margin that has granted our forces in the air and on the ground freedom to maneuver and to attack. The F-22A and F-35 each possess unique, complementary, and essential capabilities that together provide the synergistic effects required to maintain that margin of superiority across the spectrum of conflict. The Office of the Secretary of Defense-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 and Modifications

The F-22A Raptor is the Air Force's primary air superiority fighter, providing unmatched capabilities for air supremacy, homeland defense and cruise missile defense for the Joint team. The multi-role F-22A's combination of speed, stealth, maneuverability and integrated avionics gives this remarkable aircraft the ability to gain access to, and survive in, 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 the Raptor remains the world's most dominant fighter in the decades to come. The F-22A modernization program consists of two major efforts that, together, will ensure every Raptor maintains its maximum combat capability: the Common Configuration program and a pre-planned product improvement (P3I) program (Increments 2 and 3). We are currently in year 6 of the planned 13-year program.

As of 1 May 2009, the Air Force has accepted 139 F-22A aircraft, out of a programmed delivery of 183. Most of these aircraft include the Increment 2 upgrade, which provides the ability to employ Joint Direct Attack Munitions (JDAM) at supersonic speeds and enhances the intra-flight data-link (IFDL) to provide connectivity with other F-22As. The Air Force will upgrade the F-22A fleet under the JROC-approved Increment 3 upgrade designed to enhance both air-to-air and precision ground attack capability. Raptors from the production line today are wired to accept Increment 3.1, which when equipped, upgrades the APG-77 AESA radar to enable 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 SDBs. The Air Force will begin to field Increment 3.1 in fiscal year 2011. Future F-22As will include the Increment 3.2 upgrade, which features the next generation data-link, improved SDB employment capability, improved targeting using multi-ship geo-location, automatic ground collision avoidance system (Auto GCAS) and the capability to employ our enhanced air-to-air weapons (AIM-120D and AIM-9X). Increment 3.2 should begin to field in fiscal year 2015.

The current F-22A modernization plan will result in 34 Block 20 aircraft used for test and training, 63 combat-coded Block 30s fielded with Increment 3.1, 83 combat-coded Block 35s fielded with Increment 3.2, and 3 Edwards AFB-test coded aircraft. Consideration is also being given to upgrade the 63 Block 30s to the most capable Block 35 configuration.

F-22A Procurement Plans

The F-22A production program has delivered 22 "zero defects" aircraft to date and is currently delivering Lot 7 aircraft ahead of scheduled contract delivery dates at a rate of about two per month. Lot 7 Raptors are the first lot of the 3-year multiyear procurement contract awarded in the summer of 2007. The Air Force completed F-22A deliveries to Elmendorf Air Force Base (AFB), AK, and we are currently underway with deliveries to Holloman AFB, NM, with expected completion in January 2011.

When the plant delivers the last Lot 9 aircraft in December 2011, we will have completed the program of 183 Raptors. The average unit cost for the 60 aircraft in the multiyear procurement was \$142.6 million. Should Congress decide to fund the 4 additional Lot 10 Raptors in the Overseas Contingency Operations supplemental request, the unit flyaway cost without tail-up costs will be approximately \$153.2 million. The unit flyaway cost is estimated to be \$10.6 million higher due to higher material costs for a much smaller lot buy, loss of the multiyear procurement savings in parts and labor, inflation, and in-line incorporation of pre-planned product improvements, including SDB capability, ability to retarget JDAMs, and the ability to map ground targets with the synthetic aperture radar. This average does not include tail-up costs of \$147 million.

F-35

The F-35 program will develop and deploy a family of highly capable, affordable, fifth-generation strike fighter aircraft to meet the operational needs of the Air Force, Navy, Marine Corps, and allies with optimum commonality to minimize life cycle costs. The F-35 was designed from the bottom-up to be our premier surface-to-air missile killer and is uniquely equipped for this mission with cutting edge processing power, synthetic aperture radar integration techniques, and advanced target recognition. The F-35 also provides "leap ahead" capabilities in its resistance to jamming, maintainability, and logistic support. The F-35 is currently in the 8th year of a 13-year engineering and manufacturing development (EMD) phase.

The F-35 is projected to meet all key performance parameters (KPP) and as of 10 May 2009, AA-1 has completed 84 test flights, including a deployment to Eglin AFB. The first system design and development (SDD) short take-off and vertical landing (STOVL) aircraft, BF-1, has completed 14 flights. The second SDD STOVL aircraft, BF-2, had its first flight in February 2009. The Cooperative Avionics Test Bed (CAT-B) continues to provide unprecedented risk reduction at this stage in a major weapon system not seen in any legacy program. In December 2008, the Defense Acquisition Executive (DAE)-approved full funding for seven conventional take-off and landing (CTOL) aircraft and engines, plus sustainment and associated equipment as part of the low rate initial production (LRIP) Lot 3 acquisition decision memorandum. In addition, the DAE approved full funding for seven STOVL aircraft plus sustainment and associated equipment contingent upon successful completion of the F135 Pratt & Whitney lead engine stress test, flight test engine 6 proof test and receipt of full STOVL flight clearance, which occurred on 30 January 2009. The fiscal year 2010 President's budget provided funding for 10 CTOL, 16 STOVL, and 4 CV aircraft for operational test.

Joint Strike Fighter Alternative Engine Program

Presidential budget 10, released earlier this month, did not fund the development and procurement of the alternative engine program for the Joint Strike Fighter. The Air Force and Navy are executing the funding appropriated by Congress in the 2009 budget to continue the F136 program.

The cost to continue F136 engine development is approximately \$1.8 billion through fiscal year 2015. In addition, the Department of Defense will have to fund the production of GE engines to get the suppliers on equal footing in the amount of approximately \$2.8 billion. Continued funding for the F136 engine carries cost penalties to both F135 and F136 engines for reduced production line learning curves and inefficient economic order quantities. The department has concluded that maintaining a single engine supplier provides the best balance of cost and risk. Our belief is 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.

Unmanned Aircraft Systems (UAS)

MQ-9A Reaper

The MQ-9 Reaper is a "hunter-killer" remotely piloted aircraft capable of automatic cueing and prosecuting critical, emerging time-sensitive targets with self-contained hard-kill capability. SDD for the first increment began in fiscal year 2005 and additional SDD efforts are currently ongoing. An interim combat capability aircraft deployed to CENTCOM in September 2007 and, even though not yet at IOC, more have continued to deploy. There are now 12 U.S. and 2 United Kingdom MQ-9s supporting OEF operations. The MQ-9 has military-standard 1760-based stores management capability, an FAA-certified engine and GBU-12/AGM-114 Hellfire weapon capability now, and an anticipated 500-lb. JDAM (GBU-38) capability in July 2009. As part of the fiscal year 2010 President's budget, the Air Force requests funding to procure 24 MQ-9A Reapers.

Missile Programs

Joint Air-to-Surface Stand-off Missile

The Joint Air-to-Surface Stand-off Missile (JASSM) is the Nation's only stealthy, conventional, precision, launch-and-leave, stand-off missile capable of being launched from fighter and bomber aircraft. The JASSM achieved an initial operational capability on B-52, B-1, F-16 and B-2 and puts adversary's center-of-gravity targets at risk even if protected by next-generation air defense systems.

The Air Force postponed the JASSM fiscal year 2009 production contract due to unsatisfactory flight tests of the Lot 5 JASSM production missiles. Of the 10 flight tests, we considered 6 to be complete successes. To address issues discovered during the JASSM test program to date, we are taking a pause in fiscal year 2010 missile production in order to incorporate reliability improvements on Lot 6 missiles, and will conduct a 16-shot flight test in the late summer/early fall 2009 timeframe to verify JASSM is on track to achieve our established reliability goal of 90 percent.

As part of the fiscal year 2010 President's budget, the Air Force is not requesting any funds for procurement of missiles, but rather is requesting procurement funds only to continue reliability and retrofit activities.

Legacy Bomber Fleet

The Air Force bomber fleet exemplifies how we continue to sustain and modernize legacy aircraft as they are passed from one generation of crew force to the next.

B-1

The B-1 provides the Joint Force Commander massive firepower potential coupled with a significant loiter capability perfectly suited for the inconsistent tempo of today's ongoing operations. Added to this is the B-1's unique supersonic dash potential which allows a single aircraft to perform as a roving linebacker over large portions of the overall AOR. Once solely a nuclear deterrent, the Air Force has re-focused the B-1's capabilities through modernizing its current conventional lethality.

A perfect example of the B-1's potential was realized by adding an advanced targeting pod to the platform's sensor suite. In an exceptional display of acquisition effectiveness, in 2007 the Air Force and our corporate partners responded to AFCENT's highest Urgent Operational Need requirement by energizing a fast-track development and procurement timeline. With the help of supplemental funding, by June 2008 the 34th Bomb Squadron out of Ellsworth AFB, SD, was able to deploy a full complement of Sniper-equipped B-1 bombers to support both OEF and OIF operations without a single break in daily combat operations. The program continues in 2009 to outfit the remaining fleet and incorporate laser-guided weapons as well as integrating pod data directly into the avionics system, allowing for direct machine-to-machine transfer of targeting data. As stated by the Combined Force Air Component Commander, "The Sniper pod on the B-1 Bomber is amazing."

This new capability means the B-1 is even more in demand for current operational taskings. The non-stop overseas contingency operations are taking a toll on the overall fleet. Currently in fiscal year 2009, the Air Force is addressing five different issues which would have meant potentially grounding aircraft if they were not addressed. As a baseline to many of these sustainment modifications, the Air Force also embarked on its largest cockpit and communications modernization for the B-1 since its inception. Begun in 2005, the B-1 Fully Integrated Data Link (FIDL) program infuses a tactical Link-16 data link and a Joint Range Extension (JRE) Beyond Line of Sight (BLOS) data link into an entirely overhauled modern cockpit. This system of modifications removes legacy monochrome displays and incorporates a series of color multifunction displays capable of displaying a wide array of fused data at all crew stations. Although the B-1 FIDL program has suffered several setbacks, through the continued persistence of Air Force and congressional support the program is now turning the corner and progressing toward completion. This upgrade will not only help protect the B-1 parts from obsolescence, it will evolve an already capable conventional platform into a networked provider of precision firepower.

B-2

The B-2 Spirit advanced technology bomber provides a lethal combination of stealth, range, payload, and precision engagement. The B-2 remains the world's sole long-range, low observable bomber, and the only platform capable of delivering 80 independently targeted GBU-38s.

B-2 availability has steadily increased over the past 5 years, due in large part to focused efforts to enhance low observable maintenance such as the highly successful Alternate High Frequency Material program. However, it still faces increasing

pressures to upgrade avionics originally designed over 20 years ago. The three-increment Extremely High Frequency Satellite Communications and Computer Upgrade program (EHF SATCOM and Computer Upgrade) seeks first, in Increment 1, to upgrade the Spirit's flight management computers as an enabler for future avionics efforts. Increment 2 integrates the Family of Beyond-line-of-sight Terminals (FAB-T) along with a low observable antenna to provide secure, survivable strategic two-way communications, while Increment 3 will connect the B-2 into the global information grid. Increment 1 of EHF SATCOM and Computer Upgrade is currently in EMD and on track to begin procurement in fiscal year 2011 for fleet installation beginning at the end of fiscal year 2013.

The B-2 is also replacing the original radar antenna and upgrading selected radar avionics as part of the Radar Modernization Program (RMP) to change the radar operating frequency. RMP recently recovered from development challenges and has been approved to enter production. The LRIP contract for the first six production radar kits was signed on 29 December 2008, with the second and final buy for the remaining seven shipsets slated for later this year. Seven radar shipsets were also bought during development and are currently being installed in fleet aircraft to round out the 20 aircraft B-2 fleet; the developmental units will be retrofitted to the final production configuration. Thanks in large part to congressional support, the RMP acquisition strategy was modified to include both life-of-type component buys to avoid diminishing manufacturing issues during the production run, and advance procurement to recover 5 months of the schedule lost while resolving the RMP integration issues during development.

B-52

The B-52 Stratofortress is our Nation's oldest frontline long-range strategic bomber, with the last airframe entering service with the United States Air Force in 1962. Given the expected service life of the aircraft, the B-52 airframes will be the longest operationally employed powered war machine in history, far surpassing the lifespan of any other single model land, sea or air weapon system. For more than 40 years B-52s have been the backbone of the strategic bomber force for the U.S. The B-52 is capable of dropping or launching the widest array of weapons in the U.S. inventory, including gravity bombs, cluster bombs, precision guided missiles and JDAMs. Updated with modern technology, the B-52 will be capable of delivering the full complement of Joint developed weapons and will continue into the 21st century as an important element of our Nation's defenses.

The Air Force has invested in B-52 modernization programs to keep the platform operationally relevant by adding satellite and nuclear survivable and secure wideband high data rate communications; Sniper and Litening advanced targeting pods; aircraft computer and data transfer unit upgrades; and integration of smart weapons to improve conventional warfare capability.

Together with the B-1 and the B-2, the B-52 serves as a key component of the U.S.' long-range bomber force. It has earned respect as a highly capable conventional and nuclear combat platform during the Cold War, the Vietnam War, Operation Desert Storm, OAF, OIF, OEF, and frequently deploys to Guam to provide a continuous bomber presence mission in the Pacific. The B-52 continues to serve the Nation well as it has during its long and distinguished history, and we have provided significant support across the Future Years Defense Program in recognition of its value.

V. CLOSING

Your 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 ensure we are 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. 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.

Without objection, we'll submit all the statements for the record.
General Trautman, do you have a statement?

**STATEMENT OF LT. GEN. GEORGE J. TRAUTMAN III, USMC,
DEPUTY COMMANDANT FOR AVIATION, UNITED STATES MA-
RINE CORPS**

General TRAUTMAN. I do, sir.

Senator LIEBERMAN. Please proceed.

General TRAUTMAN. Mr. Chairman, Senator Thune, distinguished members of the subcommittee, it is a pleasure for me to be here as the leader of marine aviation to discuss the President's 2010 budget submission. The Commandant and I are extremely grateful for the exceptional way this subcommittee and Congress support the men and women who volunteer to serve in our Marine Corps during this time of war.

With marines in the fight every day, my focus is on supporting our deployed forces by striving for operational excellence while managing risk to our air crew and those we support. Our older aircraft have performed well in sustained combat operations and they continue to do so, but we are wearing them out.

While waging the current fight, we in Marine Corps aviation are also embarking on significant transitions to new aircraft and our family of unmanned aerial systems. These aircraft and systems will give us the operational capabilities we need to fulfill our vision of a fast, lethal, expeditionary force that is ready for the uncertainties of future combat operations, yet has the staying power of engagement in the most austere conditions imaginable.

Two of our key transition efforts promise to change the way we project Marine Corps combat power in the future. First, the MV-22 Osprey has recently finished three highly successful combat rotations to Iraq and last month the fourth Osprey squadron sailed toward the fight with the Marine Expeditionary Unit that will be deployed for the next 6 to 7 months.

The Osprey has transformed the way we are fighting in a manner akin to the introduction of the helicopter in the middle of the last century. We can now project combat-loaded marines, soldiers, or special operators from a sea base or any forward site deep into the battle space, at the speed of a KC-130, and we can do it at altitudes above ground level and the threat that resides on the ground that has claimed so many helicopters in Afghanistan, Iraq, and elsewhere. Then we can land that payload anywhere it is needed, just like a helicopter.

With its speed, range, and survivability, the MV-22 is truly a game-changer. Another game-changer will be the F-35B short takeoff and vertical landing variant of the JSF. In the fall of 2012 when the Marine Corps stands up its first operational squadron, this fifth generation stealth aircraft will begin replacing our FA-18s, AV-8s, and EA-6Bs with a single platform that will exceed the operational capabilities of any tactical aircraft being flown today.

The JSF gives us the operational agility we need to support the joint force in the hybrid battles that loom off our Nation's bow. Most importantly, we intend to leverage the unprecedented sensor capability this machine offers for the benefit of the entire marine air-ground task force, allowing us to accelerate the decision cycle and fight smarter than ever before.

Just over 3 short years from now, our operational commanders will be able to combine the effects of these two machines, the MV-22 Osprey and the F-35 Lightning II, from a sea or land base to unleash a tempo, agility, and speed of action that has never been possible in the past. Regardless of the future threats we will face, our unwavering mission remains to be the Marine Corps' aviation force in readiness across the full spectrum of combat operations.

My pride in the accomplishments of our marines past and present and the staying power of our military families is only exceeded by my confidence that we are properly poised to meet our future challenges.

Thank you for this opportunity to speak with you today and I look forward to answering any questions that you may have. Thank you, sir.

Senator LIEBERMAN. Thank you, General.
General Gibson.

STATEMENT OF MAJ. GEN. MARKE F. GIBSON, USAF, DIRECTOR OF OPERATIONS, DEPUTY CHIEF OF STAFF FOR OPERATIONS, PLANS AND REQUIREMENTS, DEPARTMENT OF THE AIR FORCE

General GIBSON. Yes, sir. Thank you. Chairman Lieberman, Ranking Member Thune, and distinguished members of the subcommittee, I would also like to thank you for calling this hearing and for the opportunity to provide you with an update on Air Force operations and other matters that are important to our Air Force and to our Nation.

The current operations in Iraq, Afghanistan, and in the Horn of Africa highlight over 18 consecutive years of planning, resourcing, and executing combat missions. Since 2001 your Air Force has flown over 80 percent of the coalition's combat sorties in support of Operation Iraqi Freedom and Operation Enduring Freedom (OEF). These missions provide the joint coalition team with global airlift; air medical evacuation; air refueling; command and control; close air support; strike; intelligence, surveillance, and reconnaissance (ISR), and electronic warfare.

We have flown over 385,000 mobility sorties dedicated to moving equipment and troops to and from the CENTCOM AOR. Twenty-four/seven, your Air Force is providing a preponderance of the flying assets supporting the combatant commanders, enabling them to successfully execute their missions both in the AOR overseas and in homeland defense.

But this total air, cyber, and space effort takes its toll on our equipment and people, and we continue to maintain high operating tempo over time. We currently have over 208,000 airmen contributing to the combatant commander operations, including nearly 36,000 airmen who are deployed to locations worldwide.

We are fully committed to the joint fight as we continue to transform our Service into a smaller, more flexible and lethal force across the spectrum of operations.

I thank the subcommittee for allowing me to appear before you today and for your continued support to our Air Force. I look forward to answering your questions.

Senator LIEBERMAN. Thanks very much, General.

Finally, Admiral Myers. Thanks for being here.

**STATEMENT OF RADM ALLEN G. MYERS, USN, DIRECTOR,
WARFARE INTEGRATION/SENIOR NATIONAL REPRESENTATIVE,
OFFICE OF THE CHIEF OF NAVAL OPERATIONS**

Admiral MYERS. Thank you. Mr. Chairman, Senator Thune, distinguished members of the subcommittee, thank you for this opportunity to appear before you today to discuss Navy aviation.

I am delighted to share this time with my colleagues from the Navy, Air Force, and the Marine Corps to convey the contributions of Navy aircraft in our Armed Forces. Our aviation community, comprised of aircraft, ships, and weapons systems, has proven to be a stabilizing force with the capacity to span the globe. If we could look back to the days following September 11, just 3 weeks after the attack, two carriers, the *Enterprise* and the *Carl Vinson*, were in theater ready to provide continuous strikes and close air support. In fact, the *Enterprise* reversed course while she was steaming out of theater. No need to refuel and no need of immediate replenishment; that strike group commander, with the best trained crews in the world, ready to respond. The Navy carrier-based F-18s provided the first tactical air strikes in country.

Our response and support of the events of September 11, OEF, continues today. In fact, recently the Chief of Naval Operations (CNO) cited a statistic concerning the contributions of our carrier fleet that I would like to emphasize, that a single Navy aircraft carrier provides 46 percent of the fixed-wing aircraft sorties in Afghanistan. That one carrier provides close air support, airborne reconnaissance, and electronic attack to our troops in contact with the enemy. By the way, the response time for those troops in contact with the enemy is often less than 10 minutes.

Augmenting carrier support to our troops ashore, the Navy also deploys land-based airborne electronic attack via the EA-6B. These aircraft conduct critical missions that support U.S. forces and support offensive operations.

Is it really any wonder that in moments of crisis you hear the phrase, "Where are the carriers?" Often the first to arrive in response to a crisis, the carrier strike group provides the credible capability, assured access, speed, agility, and persistence needed without reliance on infrastructure ashore.

Sea power provides persistent combat power ashore while facilitating partnerships at sea, as we've seen off the Horn of Africa with our combined task forces. Sea power is disrupting insurgents on land as well as disrupting smuggling and piracy at sea. Our fixed- and rotary-wing Navy assets have been engaged in counter-piracy operations around the Horn of Africa. During the Maersk *Alabama* incident, the first U.S. military asset on the scene was a Navy P-3 and our helicopters have been integral in the apprehension of a number of pirates by providing the necessary surveillance to locate, track, and intercept vessels on behalf of the visit, board, search, and seizure teams.

Our carriers and the ships remain on station around the world, providing presence in other places as well: the Caribbean, the Mediterranean, the Pacific, the South China Sea, the Indian Ocean,

and the Red Sea. Our forces provide effects ashore and at sea, strengthening relationships and building regional stability.

The fiscal year 2010 President's budget maintains our ability to meet wartime needs for today and contend with future security challenges. The aircraft that are fighting today's war are being recapitalized or sustained to ensure relevancy against a full spectrum of threats. We're thankful to our predecessors for investing in programs that we are benefiting from today and those that will meet the future security challenges of tomorrow.

Our budget continues the development of the F-35, the E-2D Advanced Hawkeye, the P-8, unmanned aviation, and new strike weapons capabilities. The Department of the Navy will produce 98 additional tactical and fixed-wing aircraft, 100 rotary-wing aircraft, and 5 VTUAVs, for a total of 203 aircraft.

I would like to offer my appreciation to the committee. Without this committee's tireless devotion and significant contributions, the great successes of our force would not be possible. We are truly grateful.

Thank you for the opportunity to appear before you today and thank you for your support for what we do today and what we will do tomorrow. I look forward to your questions. Thank you.

Senator LIEBERMAN. Thanks very much, Admiral.

We really have a good turnout of members of the subcommittee this afternoon, which is the most tangible expression one could ask of the interest in the TACAIR question. So we'll do 7-minute rounds for questioning.

Admiral ARCHITZEL, I want to start with a few overview and future-oriented questions. Last year at the comparable hearing, we were told that there was a potential strike fighter shortfall for the Navy of 125 aircraft in the 2017 timeframe. But last week at the full committee, the CNO said that the Department of the Navy is now projecting the shortfall could be as high as 250 aircraft. I wonder if you could describe what happened to lead to that doubling of that shortfall, and to comment on the shortfall.

Admiral ARCHITZEL. Mr. Chairman, thank you. You're correct that in the Presidential budget 2009 year the strike fighter inventory projections used numbers of 69 for the Navy and 125 for the overall Department of the Navy.

Senator LIEBERMAN. Right.

Admiral ARCHITZEL. Those are based on a model developed at Naval Air Systems Command, which projects based on a number of factors what the aircraft total would be in the out years. Using that model, it peaked, by the way, in 2017 to give you the numbers you just quoted, sir.

In that model at that time there were a number of assumptions made. Some of those assumptions assumed that we would continue to operate with 10 carrier wings, which we fully expect to do. With that comes 40 strike fighter squadrons, and the Navy would have 35 strike fighter squadrons augmented with 5 from the Marine Corps. Marine Corps aviation is essentially 19 strike fighter squadrons and will grow with 2 cadre squadrons to 21.

Some other assumptions in that model were that, while we would have legacy aircraft, we would be able to fly legacy aircraft to

10,000 hours. That would have been a total of 623 legacy Hornets that could reach 10,000 hours.

Senator LIEBERMAN. Right.

Admiral ARCHITZEL. It also assumed that we would have full production of the then-projected E and F line of 506 strike fighters. We also had a projection of what's called the high flying hour inspection, which would occur at 8,000 hours, which would allow us to take it to 8,600 hours for Hornets without having to do major structural, depot-level repairs.

That high flying hour inspection in that model, in that number, was projected to be a 5 percent dropout rate. In other words, of the airplanes you inducted into that inspection, which is a 6-month inspection and requires about \$474,000 to complete, it would be about 5 percent of airplanes that wouldn't pass that inspection. So in other words, the vast majority would.

Also, we assumed in that model at that time the ramp rate would go to 50 aircraft for the Navy per year.

As we went forward in time, we learned more about the legacy airplanes, we learned more about production rates, we learned more about the model, and the model gets adjusted and reworked. The latest information that would be the most timely that I have now would be that that shortfall would still be there. It might be slightly different because we're taking steps to mitigate that shortfall, as you can imagine.

So what has changed? One thing that would be changed is that we believe that the dropout rate to 10,000 hours for the inspection is not 5 percent; it would be much higher, more like 95 percent. In other words, we won't get those airplanes to 10,000 hours just by inspection. We're going to have to do some serious level depot work to get them there.

So that number comes down from 623 to around 295 that we believe we could get to 10,000 hours through the Service Life Extension Program (SLEP). The other 191 aircraft we would take through the high flying hour inspection and expect 8,600 hours on them. Keep in mind, if we don't do a high flying hour inspection the airplanes would basically drop off the line at 8,000 hours.

We do still plan on the full program of record which was established to be 506 E and Fs, and we do expect to be able to press forward with that. So it explains why the numbers change slightly over the year-to-year or model runs, sir, as you go forward with those assumptions that are in there.

But the Navy is committed to manage our strike fighter inventory through four principal ways: to manage the JSF to make sure we get the ramp rate; to make sure absolutely that we get the IOC for the Marine Corps in 2012 for the B variant; and for the Navy in 2015 for the C.

We also want to make sure that we maintain program-related engineering and logistics to make sure we maintain and sustain our airplanes that we have, the legacy Hornets and the E and F as well, to get the most utilization out of them.

We also want to make sure that we go through the Service Life Assessment Program (SLAP)-SLEP. SLAP is the assessment; SLEP is the actual depot-level maintenance. There is a considerable

amount of work to be done, and that is programmed to be done between 2012 and 2018 or 2019 to keep our force levels up.

Finally, as I mentioned, the high flying hour inspection as we get from 8,000 to 8,600 hours.

All this is based on the operation of our Navy and our tactical Air Force. I would point to today, while I can't predict what the future would be, and we will learn more through the Quadrennial Defense Review (QDR) about force structure, et cetera, but today we have seven carriers operating at sea. Four of them are deployed. Two of them are doing workups. *George Herbert Walker Bush* is off the coast doing fleet carrier qualifications (CQ). So you have seven aircraft carriers at sea today, with six air wings embarked, and also replacement air groups operating off the seventh.

In the future, we want to be able to maintain and do everything we can from an acquisition standpoint, from a technical standpoint, in the Naval Air Systems Command to support that fleet in the future.

Senator LIEBERMAN. I think you were ready for that question. That was a very thorough answer.

Let me ask this question. Would you accept the 250 aircraft below requirements number? I want you to help us understand, because in all the discussion about spending on defense I think, particularly on these programs, there's not an appreciation, if one accepts the Department of Defense's (DOD) definition of what's required, that we are on a course that is going to put us way below requirements. So my question really is, are we going to be capable of, in the case of the Navy for instance, maintaining the fleet response plan of being able to surge to 5 or 6 carriers within 30 days of notification, followed by another carrier within 90 days, if the Navy is 250 aircraft below requirements?

Admiral MYERS. Thank you, Mr. Chairman. If you don't mind, I think I can address part of your question.

Senator LIEBERMAN. Good.

Admiral MYERS. A year ago I was in front of this committee and talked about the challenges of the strike fighter shortfall and that we were projecting for the U.S. Navy a 69 aircraft shortfall if we were able to get all of the legacy Hornets through SLEP or up to 10,000 hours. These are 6,000-hour aircraft that have been extended to 8,000 hours. Admiral Architzel just mentioned we have a method to get them from 8,000 to 8,600 hours. It's called the high flying hour inspection. It's heavy on the inspection and meant to be light on the maintenance required. Those aircraft we think can get from 8,600 hours all the way out to 10,000.

So the bracket that I briefed last year was 69 aircraft if we could get all the aircraft we needed to 10,000 hours. That would be our shortfall. If we got none of those aircraft to 10,000 hours, then it would be 243. That's basically the range that we were working in a year ago.

Now, what's changed since last year? Admiral Architzel mentioned that we have aircraft that are going through the high flying hour inspection. We finished our analysis program and we have 38 aircraft that entered the high flying hour inspections and we have the first aircraft just approaching 8,000 hours to try to see how it is we're going to get those to 8,600 hours.

In that inspection, meant to be about 5 or 6 months worth of work in the depot, they looked at 159 focus areas or hot spots. As Admiral Architzel also mentioned, the intent or the expectation was that we would be able to inspect and we'd have about a 5 percent fallout rate, and then we'd return those to the fleet with another 600 hours.

What we found is there is an additional 60 hot spots on those 38 aircraft. Nine of them have completed the inspection, and it's increased the time to get through that depot from 11,000 man-hours to about 24,000 man-hours. So we're already starting to see that it's going to be a lot of work to get these aircraft at least to the 8,600 hour point.

To get beyond 8,600 hours, we're going to have to do an extension for the aircraft, and we're in the process of understanding where we are on the high flying hour inspection and trying to manage what parts we need so that we can start inducting the right aircraft into the service life extension within the next couple years.

We think we're going to be SLEP-ing aircraft through about 2018.

So what has happened in the last year is we have the analysis and a little bit more information and we know that we can get aircraft to 10,000 hours. So our challenge is to make sure that we program enough in Program Objective Memorandum 2012, because that's when we think we're going to need the money, to actually take about half of the legacy Hornets from 8,000 to 8,600 hours to 10,000 hours.

Then we would wind up with a strike fighter shortfall for the U.S. Navy of about 70 aircraft.

Senator LIEBERMAN. By which year?

Admiral MYERS. That peaks in about 2015. It starts in about 2013. So what we're discovering by looking at these aircraft in the high flying hour inspection is that they're not passing as quickly, so we're going to have a shortfall a little earlier.

Senator LIEBERMAN. Okay. My time is up. I'd just say briefly, your explanation is very thorough and I think the point is that we're pushing you hard and you're pushing the aircraft that you have hard to meet the requirements, because we're not replenishing rapidly enough. I think at some point therefore it makes it very difficult for the Navy to meet the response plans that you have to crises that we may confront.

I'll come back to this in my next round. Senator Thune.

Senator THUNE. Thank you, Mr. Chairman.

Let me direct this to all of our witnesses, but I want to get a general reaction or observation with respect to the 2010 defense budget request, in which the President and Secretary Gates have stated that they intend to reshape the priorities of the defense establishment. In so doing, they propose to cut dramatically or cancel various major weapons systems.

In terms of the TACAIR portfolio, are there any aspects of that plan with which you have any difficulty? [No response.]

Don't jump. [Laughter.]

General TRAUTMAN. Well, I'll start, sir, since I'm probably the happiest with it. I think the exact correct thing to do is to accelerate and move forward to the F-35, the JSF. If you look across

the board at how much is being spent on TACAIR in this time of other needs, I think that's exactly the right thing to do.

Admiral ARCHITZEL. I would say that as we go into the challenges of the future, whether it be irregular warfare, hybrid warfare, or conventional warfare, the carrier capability and its embarked air wings can meet the fight and be able to provide the full spectrum availability to meet the challenges that exist that you mentioned in all those areas, and believe exists within the carrier air wings of today and will in the future.

So I would answer the same way as I did before about supporting the next generation strike fighter, but also ensuring that we maintain our legacy Hornets and air wings as well as we go forward.

General SHACKELFORD. Senator, if I might, I believe the strategy in the new budget largely relies on a re-analysis of what the future threat looks like coming from the QDR, which will have whatever effect it has on our future weapons systems procurement. In the mean time, as we look at what the Air Force is capable of bringing to bear in the next 5 to 10 years, we don't see any risk of shortfall there. We do believe, as was stated prior, that ramp-up in production of the F-35 is absolutely critical to recapitalize our Air Force capability.

We have a number of new programs in progress which were unaffected by the new budget, to sustain existing weapons systems. We have no major heartburn.

Senator THUNE. Anybody else care to comment?

General GIBSON. Senator Thune, I'll just piggyback on General Shackelford's comment about the view of the strategic risk in the relatively near term in what's termed the combat air forces redux within the Air Force, taking some of those savings, I think it's \$355 million this year and about \$3.5 billion over the Future Years Defense Program (FYDP), to reinvest that into some of our fourth generation and improve capabilities both in the aircraft and in some of the enhanced weapons that they'll be able to carry in the near term.

So I think it was a conscious decision to start working that gap now.

Senator THUNE. This I guess I would direct to General Shackelford and General Gibson. But what's your view of the proposal to end the production of the F-22 fighter aircraft at 187?

General SHACKELFORD. Sir, you're familiar with the numbers that have been presented by our chief and our secretary. We believe that the end of the production of the F-22, as the Secretary of Defense has stated, is the end of the program of record. The capability that we get out of those 187 F-22s we believe is sufficient for the type of threat that the Secretary of Defense is addressing in the future.

Again, as we look at fifth-generation capability we're going to wind up leveraging the F-35's capabilities as those numbers build in the future. If we had a concern with it, it would lie in the area of sustaining the fleet. The 187 F-22s provide excellent combat capability. To sustain that fleet over a long period of time may become a challenge.

Senator THUNE. How about the proposal to terminate the combat search and rescue replacement helicopter (CSAR-X) program?

General SHACKELFORD. Yes, sir. In the case of CSAR-X, the Secretary of Defense was concerned that we didn't have it right in terms of the requirements for that platform, particularly in context of the approach we were taking to take what are essentially existing helicopters and spend a large amount of money on development to specialize them for the CSAR-X missions.

Now, he did not cancel the CSAR-X mission. He did cancel the program. That gives us an opportunity to work with the Office of the Secretary of Defense (OSD) staff this summer in a study to come back and relook at those requirements and how it might best be addressed, given other rotary-wing capabilities and the larger body of rotary-wing capability across DOD.

Senator THUNE. Finally, your view of the proposed suspension of the Next Generation Bomber?

General SHACKELFORD. Similar to the helicopter, sir, the Secretary had concerns about the requirements for the bomber, particularly in the area of nuclear capability and whether or not it would be unmanned. Likewise, through the QDR we're going to go back and relook at those requirements and make sure we have them right for what he foresees the type of strategic bomber capability he wants DOD to have in the future. Based on the outcome of the QDR, we'll move forward as appropriate with the program.

Senator THUNE. Let me move back to the fighter gap. Without the benefit of the Air Force's having conducted a service life assessment as the Navy has with regard to its strike fighter capability, do you have a sense of what the probable extent of the Air Force's fighter gap is? I think you've sort of answered that question in response to Senator Lieberman's question and in some of your opening statements.

But I guess my question comes back to the extent to which buying more quantities of some of the legacy aircraft, such as F-16s and F-15Es, might help mitigate on a cost-effective basis the shortfall in the Air Force over the intermediate- to long-term.

General GIBSON. Sir, I think one of the earlier testimonies put that gap at nearly 800 at around 2024. With the acceleration proposed with the F-35 buy ramping up to 80 and possibly even higher, we think that that greatly mitigates that risk in the out years. We also have a number of aircraft—the legacy aircraft that we have now—that in that timeframe are extended on or about those dates, that could possibly be extended if required.

The QDR is currently relooking at what those numbers will need to be in future scenarios. So we think at this time it's manageable, and the idea of going back and purchasing more fourth generation systems is not seen as buying us into the future capability that we'll require.

Senator THUNE. I see my time has expired, Mr. Chairman. I'll come back in another round.

Senator LIEBERMAN. Okay, thanks, Senator Thune.

Senator Begich, thanks for being here.

Senator BEGICH. Mr. Chairman, I'm going to yield to Ms. McCaskill. I know she has to catch a train, so I wanted to give her my time for right now.

Senator LIEBERMAN. That's very gracious of you.

Senator MCCASKILL. Isn't he nice?

Senator LIEBERMAN. He is nice.

Senator BEGICH. I'm making a note of this.

Senator MCCASKILL. Believe me, that means I owe you one.

Senator BEGICH. That's right.

Senator LIEBERMAN. You elicited that testimony from me. I was not prepared for it.

Senator MCCASKILL. There you go.

Thank you very much, Senator Begich. I appreciate it.

Let me drill down a little bit on the testimony that I heard as I came in. My understanding is, Admiral, that you're saying that our manhours to take the Hornet to 8,600 hours have increased from 11,000 to 24,000 manhours, or to get them to 10,000 it's increased?

Admiral MYERS. That's for the high flying hour inspection, ma'am.

Senator MCCASKILL. So what you're saying is that the original estimate of when the gap was going to be most acute may have to be moved forward because of the number of hours it's taking to extend?

Admiral MYERS. Yes, ma'am. What's happening is, those aircraft are pulled out of the inventory so that we can do the inspection before they get to 8,600 hours. What we thought was going to take a matter of about 6 to 8 months is now taking upwards of 11 months in order to get those aircraft back to the fleet.

Now, I want to caveat that. There's only 38 aircraft that have gone into the high flying hour inspection and only 9 have come out. So this is our early snapshot, but based on that insight we're taking a look at our models and we project that we're going to have a shortfall. We don't have a shortfall today, but we think that, based on the number of aircraft and the rate that they're flying and when they're going to have to be inspected prior to 8,000 hours, that it'll start to pull them out of the inventory earlier than we anticipated.

Senator MCCASKILL. We know now that the JSF is 55 percent over the 2001 estimate. We know it's at least 2 years behind schedule. We know that all the technologies on it have not yet matured. What I'm trying to get to here is that there seems to be a strong factual basis that we're not going to get to where we want to be on the JSF soon enough or at the price that we had hoped, and that we have—I think I'm quoting the Admiral—"the backbone of our ability to push power ashore, the F-18"—that is on schedule.

We keep talking about the QDR, why there isn't more of an acknowledgment of the cost savings that we would get with the multi-year at this point. I think if you had to guess at this point, based on where we are with the JSF and where we are with the F-18, that the number 70 is wildly optimistic; that in fact it is going to be significantly over 70. If we know that, why wouldn't we want to get the billion dollars in savings and do the multi-year?

Admiral ARCHITZEL. Let me take it from an acquisition standpoint if I could, Senator. Thank you for the question. First off, to understand the strike fighter inventory management, the issue we're talking about is getting the Hornets to fill an area until we can get the JSF in numbers to replace. The Navy stands strongly

behind the JSF program and the capability it brings as a fifth-generation fighter.

It is projected to make all of its KPPs. As you pointed out, the most recent master schedule, whether it's the A, B, or C variant, has some delay. But at the same time, changes to the program are not what we have seen on other legacy programs in development.

We believe it will make the 2012 and 2015 deliveries for the Navy. However, we need to manage not just the JSF; we have to manage the Hornets, which is not just the legacy Hornets; the E and F as well. If we look at the SLEP-SLAP program and we talk about what we're going to do and the time we would need it, it's based on when those airplanes would reach 8,000 hours. That begins in the numbers we're talking about, where it would make a difference to SLEP those aircraft, those are from about 2012 to 2018.

The fly rate we project today could change with the QDR, it could change with a lot of things, it could change with how we manage our force levels. But using what we have today, we would say that we're going to have about 295 aircraft that we would want to SLEP, as I mentioned, and we'll take another 191 aircraft and run them through a high flying hour inspection program that would allow us to maintain the strike fighters we need as projected at that time.

I believe we're managing across the inventory both to preserve the JSF we need in the future as well as to ensure we have the capability of our carrier wings that we'll need as we bring on the JSF. But the Navy stands firmly behind the JSF.

There have been challenges in the program, as you mentioned. This is a critical year for that program. The JSF this year is finishing up the SDD. We're also increasing ramp rates on the airplane, and we're also going forward and starting the test profiles in earnest on the airplane. So it's a very stressing time for the program. But the program is moving forward in all variants and we have confidence that it will meet the numbers and the performance we need out of that aircraft.

Senator MCCASKILL. I certainly understand that the Navy stands behind the JSF and that DOD stands behind the JSF, and that's not really my quarrel. My quarrel is if we know we're going to have a shortfall and we know we need to fill it, why don't we make sure we do it in the most cost effective way for the taxpayer in terms of a multi-year procurement of the FA-18?

Let's fast forward. Let's assume that other Senators are sitting here 15, 20 years from now. Does anybody have any thought as to whether or not it's a good idea to have only one manufacturer manufacturing tactical aircraft in the United States? Isn't the F/A-18 keeping costs down on the JSF?

Admiral ARCHITZEL. We certainly value the industrial base and as we go forward, we do competitively build for the JSF. We have other manufacturers of aircraft as we go forward. Just as we do in the shipbuilding side, we value the industrial base on the aviation side as well.

We also have the programs in place to allow us to manufacture the aircraft components, and it's not just Lockheed Martin, for example, on the JSF or it's not just Boeing on the F/A-18. You have

multiple sub-vendors across the United States. So we certainly would not be sitting here and saying we didn't value it. We know that if we're going to need strike fighters in the future we're going to need industry that can build them. If we're going to need ships in the future, we're going to need a shipbuilding defense industry base that can build them as well.

Senator McCASKILL. My time has expired. Thank you all very much for your service.

Thank you, Mr. Chairman; and especially thank you, Senator Begich, for your consideration.

Senator LIEBERMAN. Thank you, Senator McCaskill.

Senator Chambliss, good afternoon.

Senator CHAMBLISS. Thank you, Mr. Chairman. Good afternoon.

Gentlemen, thank you for your service. This is an extremely difficult issue that we've been talking about for several years. My criticism of the process is not directed at you, but at those folks that were sitting there 15 or 20 years ago making decisions. We've been very concerned about this road wreck on TACAIR force, and it's here. Each of you have just outlined why this is so critical.

Senator McCaskill makes a good point there with respect to this gap on the part of the Navy. Of course, the Navy is proposing to fill that gap in part with F/A-18s. Ramping up the F-35 sounds like it makes sense. That's what the Air Force is doing. But also what the Air Force is doing is taking an airplane that still has years ahead of it from a research and development (R&D) standpoint, and we know there are going to be problems with it. We absolutely know that. Yet the Air Force is making a decision to ramp up purchases of the JSF, which is a great airplane. I fully support it. But we're doing this in a way that we have never done before.

To me, it makes no sense. I'm just afraid that we're headed for even more of a road wreck several years from now.

But there's been conversation here about the strike fighter gap on the part of the Navy. I think Senator McCaskill adequately dealt with that. It looks like we have somewhere around a shortfall of 200. I guess we could argue about that number, but that seems to be somewhere in the generally accepted range.

I also note that the Navy is requesting the purchase of 31 fourth generation F/A-18s in the 2010 budget. Now, General Shackelford, General Gibson, last year General Hoffman and General Darnell appeared before this committee in your place and talked about a fighter gap in the Air Force of approximately 800 fighters; General Gibson, just what you alluded to.

Frankly, when we look at the 200 number and look at the 800 number with the problems both of you alluded to assumptions that we have made over the years with respect to previous situations as well as the current situation, and those assumptions have proven to be false. So we could be looking at higher numbers. Chances are they're going to be higher than they are going to be lower.

But in any event, and in addition to what we're planning in the Air Force for 800, you now come forward and say we're going to retire an additional 250 tactical fighters in fiscal year 2010.

So let me see if I can summarize this. The Air Force has a fighter gap that's five times as big as the Navy's. The Navy's buying fourth generation fighters that can only fly in a permissive threat environ-

ment, and we're going to examine additional F/A-18 procurement, including a possible multi-year, in the QDR.

The F-22 is the only proven fifth-generation fighter. Yet the Air Force is not buying any more F-22s, even though the Air Force leadership, General Schwartz, has said that the military requirement for F-22s is not 187, but it's 243.

The Air Force is being told to rely on the F-35 and it is not allowed to buy F-22s. Yet the Navy is thinking about purchasing over 100 more F/A-18s, which will inevitably result in them purchasing fewer F-35s.

I really have a hard time understanding, gentlemen, how this makes sense. Now, General Shackelford and General Gibson, your chief of staff has stated that the requirement is 243 and he has characterized the risk of only 187 F-22s as medium to high. Do either of you disagree with that assessment by General Schwartz?

General GIBSON. Sir, of course I would agree with the comment of my chief. General Shackelford addressed earlier that the term now is higher risk, especially when one looks at sustainment of the fleet with those lower numbers. But I think his recent terminology was, in the light of today's constrained resources, it was an affordable solution.

Senator CHAMBLISS. That was my point with Secretary Gates, that in spite of what he says with respect to military requirement, this is a budget-driven decision, which means that somebody's going to be at risk. We know who's going to be at risk if we do not have the capability of maintaining air superiority.

Now, General Gibson, you represent the operator. As I understand it, with only 187 F-22s in the fleet, none would be stationed in Europe. What kind of deterrent capability do you think the F-22 provides for countering a potentially hostile country like Iran who may seek to hold the U.S. and our allies at risk, who could have double-digit surface-to-air missiles (SAMs) in the near term?

General GIBSON. Sir, clearly the F-22, as are all of our tactical air assets, is a deployable asset. It can be moved to locations of stress, as it is now in the Pacific forward-deployed, covering assets that are in today's fight in Iraq and Afghanistan. So when one looks at that and its capability, current basing probably is going to be reviewed again in the QDR, but it could be brought forward as required.

Senator CHAMBLISS. So your answer to that is, we're going to look to the QDR and we're going to decide which part of the world we're going to sacrifice first? We're either going to sacrifice Asia or we're going to sacrifice Europe, because we simply don't have enough F-22s in the pipe to cover both of them. Is that a fair statement?

General GIBSON. Sir, I'll have to stand with the previous comment from my Service Chief and the Secretary that 187 is higher risk.

Senator CHAMBLISS. Well, gentlemen, I have raised the issue of SAMs in two previous hearings this year and I fully believe that it is not the threat of enemy aircraft, but the threat of enemy SAMs and their proliferation that represents the true threat to our forces today.

In response to my comment about this at our hearing in May, Secretary Gates said: "The only defense against SAMs is not something that has a pilot in it."

Now, General Shackelford, General Gibson, you mention in your written testimony that the Joint Air-to-Surface Standoff Missile (JASSM) is designed to be a stealthy missile, but you comment that you postponed JASSM production due to unsatisfactory flight tests; and you're not requesting any funds for JASSM procurement in your fiscal year 2010 budget.

In the written statement, the Navy witnesses discuss the Navy's Unmanned Combat Air System (N-UCAS) which is a stealthy unmanned aerial vehicle, and note that the Navy has requested R&D funds for N-UCAS in the fiscal year 2010 budget and that you are planning for a potential follow-on acquisition program.

I would add that at the Navy posture hearing last week Admiral Roughhead noted that he expects N-UCAS to be operational some time after 2020. So I'm not exactly sure what Secretary Gates is talking about. JASSM and N-UCAS may some day have a capability against SAMs, but it certainly will not be any time soon. The only system in the inventory that's capable of countering advanced SAMs now and for the next several years is the F-22, and that's not going to change over the next several years.

My time is up and I'll look forward to the next round, Mr. Chairman.

Senator LIEBERMAN. Thank you very much, Senator Chambliss.

Senator Begich, I want to certify that you're not only a nice guy; you can be very tough when you need to be.

Senator BEGICH. Thank you very much. Patience is a virtue.

I just want to put this on the record, but if you want to respond to it that's great. It's not about tactical aircraft, but related aircraft, and it's the Joint Cargo Aircraft (JCA). In Alaska the plan was to replace our Sherpas with these. Now there are about 78 aircraft. There hasn't been a real laid-out plan how this is going to happen, especially with our Army Guard that was going to be the recipient of these replacements.

If any of you can answer it, great. If not, maybe you can get it to whoever can. I bring it up at every Senate Armed Services Committee hearing as well as subcommittee hearings. I'm looking for the list at some point that will define where the JCAs will go and what they'll be replacing and what the list will look like.

I know the Air Force and DOD have prepared or are in the process of preparing such a list. For Alaska it's critical. The Sherpas are very old and the plan was for replacements. So I don't know if anyone wants to respond to that. If they do that's great. If not, I look forward to a response at some point in writing.

General SHACKELFORD. Sir, if I could comment on that. Of course, the Secretary of Defense moved that program from the Army to the Air Force and at the same time reduced the numbers from 78 to 38, 38 being roughly the same number as Sherpas, though a few less, as you observed.

We're in the process of working the details of how that transfer will occur now as far as development of the C-27J, as well as the testing of it, how it will be managed to make sure that that's a smooth transition.

Most of these aircraft, based on the concept of operations that the Army is after which is time-critical resupply in theater, will wind up being forward-deployed. So very few of them we expect will be present back in stateside locations, at least for the time being. So the actual laydown of home bases is to be determined. If you will, we'll take that for the record and get that back to you as soon as we have something.

[The information referred to follows:]

The Air Force, in close coordination with the National Guard Bureau, is working the C-27J basing plan and will provide this data once it is available.

Senator BEGICH. That would be great. Secretary Gates went in front of the Senate Armed Services Committee and he indicated that decisions had not been formally made or where they'll end up. He did mention the forward theater.

In Alaska it's critical, this type of equipment. So I just want to see what the long-term plan is. So if you can get that. This is, just so you know, I think my third request. So I'll be patient, as patient as I can be. At the next hearing, whoever shows up with a lot of brass is going to get the next conversation. So I look forward to it.

The second thing is on the F136 alternative engines. There's a lot of debate over the 136 or the 135. I know you've gone one direction. I just want some discussion from whoever can do this. I know GE and Rolls-Royce, the producers of the 136, obviously claim their performance is better than the 135. But the Government Accountability Office (GAO) says the same thing.

So just walk me through how you determined that and is there some documentation, cost analysis, that shows why you went with the 135?

Admiral ARCHITZEL. Let me start and then I'll turn it over to General Shackelford. First, the Navy supports the DOD position that in general, while we do support competition, in the case of the alternative engine we view that the cost of continuing two development programs on that is not offset by the savings that we would see in the future of having those two engines and also having to support both engine types.

The Navy remains supportive of that position of just the 135. We have 16 engines that have been in test and a significant number of hours on test with that airplane, which obviously has also been working with the lift fan in terms of Rolls-Royce. So the 135 includes both Pratt and Whitney and the lift fan hookup, if you will.

So that would be where we would stand today in terms of the alternative engine versus the 135.

Senator BEGICH. So to make sure I'm clear, I don't have it with me, but the GAO report indicated that the 136 had better efficiency and opportunity. But you disagree with that and the 135 is the course you're taking?

Admiral ARCHITZEL. I didn't say I disagreed with their comment. What I said was that the Navy's position was that while we generally support competition, we in this case believe the cost of continuing to develop a second engine versus being able to use the procurement dollars for aircraft or the costs also to maintain two engines, and the Navy supports DOD in just having the 135 engine.

Senator BEGICH. Is there a process that you'll have, because you won't have the competition? What's the process you'll do in order

to make sure that the costs of the one producer, one contractor, as time progresses and they get comfortable in the business procurement; as a former mayor, I've seen this before. That's why I'm asking you this.

Admiral ARCHITZEL. Senator, we shifted acquisition lead of the JSF program to the Air Force, and the Air Force in that process is taking steps today, as they come on board both in the airframe as well as in the engine. So I'd rather have General Shackelford address that, because I think he can be forthright with that answer.

Senator BEGICH. Thank you.

General SHACKELFORD. Yes, sir. Similar to Admiral Architzel's comments about favoring competition, the Air Force is one that favors competition in these kinds of cases, too. In this particular case, the analysis that OSD did to look at the costs associated with the second engine yielded a bit of a differing result from what the GAO reported, which basically says the costs associated with development of a second engine would be something we would consider unaffordable in the current timeframe while we would be doing the development, and that the benefit of the comparative costs would be more of a wash than the more optimistic version of what GAO said. So we don't consider that to be an affordable solution.

Senator BEGICH. If you have an alternative it will hold down the cost. I'll echo what Senator McCaskill said. My concern is that you have a lot of engineering and once you get on that production line the contractor has cost creep. They'll have great justification. You'll be in a box. How do you avoid that, and what guarantees can you work into your system, contractual or otherwise, to ensure that that doesn't happen? When you're building this amount of volume, cost creep, they jack it up 2, 3, 4 percent. It doesn't seem like a lot, but in volume it's big money, and it's bottom line.

General SHACKELFORD. Yes, sir. Early on in the program while we have incentive types of contracts, prior to moving over to a fixed price type of environment, which will be a few lots down the road in terms of the engines, that allows us to get the cost and the pricing data from the contractor so that we have a good understanding of what it actually costs them to build that.

Senator BEGICH. To produce that and make it.

General SHACKELFORD. Yes, sir. That's essential to having the proper perspective when we then shift into a fixed price environment a few years from now. So once we move to that fixed price environment, we no longer have that insight into the specifics of the costs, but we have what it was based on to start with. Barring some technical change in the engine that warrants a change in cost, we have a pretty good handle on what those cost at that point in time, and then it becomes a unit cost type of issue based on quantity.

Senator BEGICH. Very good.

Thank you very much. My time is up. Thank you.

Senator LIEBERMAN. Thanks, Senator Begich.

We'll go on to the second round. I want to continue the questions, the topic that Senator Begich has been on. This has been a controversial matter on this committee and before Congress over the last couple of sessions, which is whether we should have an alter-

native engine or alternate engine program for the JSF. I take it, Admiral Architzel, that you agree with the President's recommendation to terminate the alternate engine program in the fiscal year 2010?

Admiral ARCHITZEL. Sir, I agree with the President and Secretary Gates on this issue.

Senator LIEBERMAN. Right.

General Shackelford, I take it from what you've just testified you also agree with that decision?

General SHACKELFORD. Yes, sir, I agree.

Senator LIEBERMAN. Let me ask you, General Shackelford, to go into a little bit more detail on the consequences of the decision. I know both you and the Admiral have said that, obviously, if we build an alternate engine it's going to cost more money to build two than one. What are the estimated costs of the alternate engine program? How much would they add to the buy?

General SHACKELFORD. Sir, between fiscal year 2010 and fiscal year 2015, that second engine is going to cost us \$1.8 billion in development and \$2.8 billion in production.

Senator LIEBERMAN. Right.

General SHACKELFORD. The production figure there is not to make the second engine equal in maturity to the first engine.

Senator LIEBERMAN. Right.

General SHACKELFORD. It's to facilitate the industrial base to bring them up to the point that they can produce in a competitive environment the quantities required, which would be approximately 50 per year out at about Lot 6 or so in terms of the F-35 production lots.

In order to facilitate those dollars, the development piece is \$463 million.

Senator LIEBERMAN. Correct.

General SHACKELFORD. The production piece is \$140 million. Given the remain within-our-means status of the F-35 program, what that would require we estimate is two to four of the aircraft in Lot 10 would be required to make payment for that engine in fiscal year 2010.

Senator LIEBERMAN. In other words, you'd have to cut by two to four the number of JSFs produced?

General SHACKELFORD. Yes, sir.

Senator LIEBERMAN. To pay for the alternate engine.

General SHACKELFORD. Right. The fiscal year 2010 production quantity is 30 aircraft, split between the 3 variants.

Senator LIEBERMAN. Right.

General SHACKELFORD. We would have to reduce that by two to four, depending on which of the variants——

Senator LIEBERMAN. In the 1 year.

General SHACKELFORD. In 1 year, yes, sir. Now, that has a negative effect on the unit cost of the remaining aircraft if you buy fewer. It also ripples into the next year's quantities and costs. Then as we take that fiscal year 2010 increment of dollars and extend that out through the FYDP, there are equal decrements in terms of the numbers of aircraft that we can buy with the remaining dollars.

Senator LIEBERMAN. So it would be what, 10 to 20 less over the 5-year period from 2010 to 2015?

General SHACKELFORD. Over the 5-year period it would be 53.

Senator LIEBERMAN. Fifty-three less? In other words, I'm asking what would be the consequences on the buy that you want to make of the JSF if the alternate engine program was continued through 2015?

General SHACKELFORD. The 513 that would presently be bought between now and through fiscal year 2015 would be decremented by approximately 50 aircraft.

Senator LIEBERMAN. By 50 aircraft. What would be the operational consequences of that?

General SHACKELFORD. As we reduce the number of aircraft, particularly in the near years, those aircraft are destined for either the operational test environment or the integrated training center at Eglin Air Force Base, some of which will eventually move on to one of the operations locations.

So as we start to decrement the number of aircraft early on, we start to push out just from an availability of aircraft to conduct the test work necessary, not developmental tests, but operational tests. That will then have an effect upon the IOC timeline. At the Integrated Training Center it'll reduce the pilot throughput, so the number of pilots that we have, and potentially the number of maintainers who are trained on the aircraft through the same process, will be reduced somewhat.

So in effect it pushes the capability out to the right.

Senator LIEBERMAN. So this has real consequences. In a normal case, of course you'd like to have two programs. But you can't have it all. So if you go for the two engines, we're going to be 53 planes short of what we'd otherwise be within that 5-year period.

General Trautman, I have a recollection at a previous hearing on this particular subject that the Marine representative was very passionate about the impact of going with the alternate engine in terms of reducing the number of the JSF model that would be available to the Marines as quickly as possible.

I take it you support the President's budget to eliminate or terminate the alternative engine program?

General TRAUTMAN. I do, sir, and for the reasons that General Shackelford did a very nice job laying out. Our IOC is desired in 2012. Loss of any airplanes between now and 2012 would put that IOC at considerable risk. So the early loss of airplanes, each and every one causes us to go back to the drawing board and rescript our plan to see if we can make the objective that the Commandant and I have in mind.

Now, we haven't purchased a TACAIR airplane in over 11 years and our legacy fleet of Hornets, AV-8s, and EA-6Bs have been ridden very hard in combat. So we are passionate about keeping the JSF on track, sir.

Senator LIEBERMAN. Admiral Architzel, why don't you just take a moment and talk about the consequences for the Navy of spending that money on the second engine instead of using it to accelerate the purchase of the JSFs?

Admiral ARCHITZEL. Mr. Chairman, I really can't add much from what was said by General Shackelford. The facts that he presented

I agree with, as well as General Trautman. For the Navy, we just have come to the point where this year we get our first four jets delivered on the C variant. While initially it may not affect those four, it certainly will affect it as we go forward into the FYDP in terms of developmental aircraft and then into production. It would have an impact on both on our costs. At the same time, we're talking about ramp rates and managing our strike fighter inventory; this would push the IOC out to the right further and also have an impact on our strike fighter account.

So that's the same argument I think you just heard.

Senator LIEBERMAN. I thank you. I thank you all.

My own personal conclusion from all of this—and I thank you for the case you have made—is that we can't afford the second engine and it will compromise the JSF program. So I hope we stick with the President's recommendation on that one.

Senator Thune.

Senator THUNE. Thank you, Mr. Chairman.

Admiral Architzel and General Trautman, long-range bombers appear to share important attributes with carrier air wings, including not requiring in-theater basing, and thereby offering the potential for prompt strikes in a crisis. But the Department of the Navy's strike fighter gap could be a problem, especially if the JSF slips in becoming IOC.

My question is, to what extent could an increased inventory of long-range bombers in some ways make up for the shortfall in Navy and Marine Corps strike fighters? I'd like to have you speak, if you could, to cost issues and survivability issues.

Admiral ARCHITZEL. Speaking on the acquisition side, this question really is more specifically directed at Admiral Myers. I will say, having been a carrier commanding officer and operated carriers at sea, I know the value of carrier wings and I know the flexibility and adaptability they bring with them. So I see that today, I see that in the future. I don't see that changing.

But the answer probably should come from Admiral Myers in terms of the requirements, sir.

Admiral MYERS. The short answer is it doesn't replace the carrier air wing on the flight deck. Just to give you a sense of how we're trying to manage this, if we did nothing in terms of extending the life of the current aircraft that we have in our legacy fleet, then you would see a 243-aircraft shortfall. It's clear that we're going to be doing all we can to get those aircraft to 10,000 hours, and we only need to get about half of them to 10,000 hours.

We have a fleet of over 600 legacy F-18s and if we can get about 295 of those extended, then we will manage a 70-aircraft shortfall. It's the fleet commander's responsibility and prerogative of where he's going to put that shortfall.

Just to put it in perspective, Senator, at that time when we see these numbers, if we project this correctly, we have about 760 F-18s. We'll be 70 short. So whether the fleet commander takes the shortfall in a training unit or in test is his responsibility. Now, we have levers to try to mitigate that and to make it even less. We have to maintain our JSF wholeness, we have to maintain the legacy fleet. We talked about SLEP and doing everything we can on the legacy aircraft.

Lastly is we need to continue to procure the F-18 Super Hornets. We have a hot line. That line stays hot for 4 more years. We're going to continue to assess this in QDR this summer and we have options.

Senator THUNE. But any comment on how a long-range bomber might fit into that?

General MYERS. The effects that you're talking about from a long-range bomber are limited to kinetic. The effects that our carrier air wings today are delivering in Afghanistan in OEF range from airborne early surveillance to electronic attack to close air support, and then also include kinetic effects. So that would be only one piece of what a strike fighter carrier air wing would deliver in the course of supporting our troops on the ground.

General TRAUTMAN. Senator Thune, I think I understand your premise and it's an apt premise. That is, all the parts of the joint force need to fit together in some kind of a puzzle, a combination of long-range bombers, carriers, with a combination of legacy and F-35Cs or Bs, F-22s, unmanned aerial systems, the short-takeoff and vertical landing variant—the F-35B. These all have to fit together and provide the joint force the capability set that will do what our Nation needs done both now and in the future.

From my perspective, I haven't personally studied the long-range bomber issue, so I'm not qualified to talk about whether the Secretary and the Chief of the Air Force have it right. But I trust their judgment and have to stand by where they are on that decision at this point, sir.

Senator THUNE. General Shackelford and General Gibson, in testimony before the committee, General Schwartz testified regarding the decision to accelerate the retirement of 250 strike fighters that, "The review weighed the benefits of retiring aircraft nearing their expected service life against near-term risks to our national security." When were these aircraft previously planned to be retired?

General SHACKELFORD. The 250 aircraft that are proposed to be retired in fiscal year 2010 were spread between 2010 and 2013. The assessment that the chief brought is one that we believe the risk in that timeframe is minimal, given the world situation and given the depth of fighter capability we have now. The previously addressed shortfall in fighters out in 2024 was based on ramping the F-35 to 48 per year and based on 187 F-22s, with the remainder of the force timing out between now and the mid-20s.

So as we move now to ramping the F-35 up to 80 of the Air Force variants or possibly to a higher number, it mitigates that issue from a total force structure shortfall, if you will. But it brings that capability back up. We dip slightly below where we would really like to be for 4 or 5 years here and then come right back up to it.

Senator THUNE. How many hours are on the aircraft that are going to be retired?

General SHACKELFORD. The service life for the F-15s right now is 8,000 hours, and the F-16s is 8,000 hours. Just a few A-10s in those numbers. The A-10s go out to 16,000 hours.

I don't know off the top of my head the specific tail numbers in terms of the hours that they have.

Senator THUNE. Is it done by tail number? Is that kind of how that was how those decisions were made about which ones are going to be retired?

General SHACKELFORD. I expect we would be very careful in picking and choosing the aircraft that we would be retiring.

Senator THUNE. Did the combatant commanders sign off on the restructuring plan?

General SHACKELFORD. Sir, I don't know.

Senator THUNE. General?

General GIBSON. Senator, it's my understanding they were briefed on it. Obviously, they needed to understand the impact. Some of those discussions are still ongoing. But they were all aware.

Senator THUNE. I know that you sort of explained how the interaction between the retiring planes and the F-35s coming on and the existing F-22s. But was the risk quantified? Was there a formulaic way that you went about quantifying the risk?

General GIBSON. Senator, I'm not certain of the particular study that was done. We can take that for the record and review it. It's our understanding that it was taken in the context of strategic risk in the near-term, as mentioned before, to take that and then reinvest it into both fourth generation fighter capability bomber upgrades as well as weapon upgrades, to use that for investment to bring that legacy capability up.

[The information referred to follows:]

The Air Force conducted analysis of the Combat Air Forces Restructuring Plan using the Office of the Secretary of Defense-approved analytic baseline military objectives, while identifying the need for key enablers and advanced weapons for both the bomber and fighter forces. The resultant force mix presented less warfighting risk in fiscal year 2015 and beyond than any course of action that maintained the status quo in legacy fighter numbers. In any case, reinvestments must be made in modernization, weapons, and other key enablers.

Senator THUNE. Did you look at joint force capability? Did you look at the Navy and Marines in that assessment?

General GIBSON. Sir, in the context of the combatant command?

Senator THUNE. Yes.

General GIBSON. Sir, I can't say for certain.

Senator THUNE. I see my time has expired, Mr. Chairman. Thank you all again very much and thanks for your service.

Senator LIEBERMAN. Thank you, Senator Thune.

Senator Begich.

Senator BEGICH. Thank you very much, Mr. Chairman.

Mine's just kind of a general question and just more of a discussion point. I started this discussion with the Senate Armed Services Committee in the full committee. But can you talk a little bit about the future of the unmanned aircraft and the variety? Where do you see that and what does that mean for our military as you move forward on the next 5 years?

Can you just have a little discussion on that? I'm not asking any specific question in the sense of how many or what cost. I'm more interested in how do you see that fitting in. The second part is: How do you deal with the conflict with the pilots, who probably aren't very excited about this idea because they may be behind just a little stick shift in a room versus in a plane flying around? How

do you see to overcome that, but also how do you see the unmanned aircraft, in a variety of sources?

Admiral ARCHITZEL. Again from an acquisition standpoint, we have a number of unmanned aerial vehicle systems, both ashore and at sea, as I mentioned on the *McInerney*, for example, with Fire Scout, where we are producing systems and testing them. Today it's doing well, both in day and night testing. To be able to deploy that aboard all air-capable ships in the future is a significant step forward in that regard. That's for reconnaissance, surveillance, and maritime domain awareness.

We look to the next generation P-8 as we go forward. That airplane is being built around being able to use it with the BAMS aerial system as well, unmanned. That will allow us to use less aircraft. For example, the P-3 squadrons of today are manned at 12 squadrons. BAMS, the P-8 squadrons of the future, use less numbers of aircraft because some of that role can be taken up with the BAMS aircraft to go forward.

We also have on the land side to support the Marine Corps as well, which is Short Takeoff Unmanned Aerial Systems (STUAS), as well as unmanned aerial systems on the ship. So again, acquisition-wise we're in a lot of development and stages on those programs, but also getting to the point of moving out on them. Then we have the BAMS demonstrator for the Navy as well, which is actually deployed to CENTCOM in support of forces.

So I'd like to turn that requirements and operational piece over to Admiral Myers.

Senator BEGICH. Thank you.

Admiral MYERS. Thank you for the question. Our approach is to leverage the unmanned vehicles at every opportunity for their capacity and for their capability. Admiral Architzel laid out a couple of levels. I'll talk about four levels. The first is on the surface ships we have Scan Eagle, which is going to be replaced with STUAS, and that extends the sensors from the surface ships and they're able to use the electrical-optical and infrared sensors. Eventually we'll be taking that kind of sensor and putting an automated information system on it, so it'll increase the situational awareness and it saves wear and tear on helicopters and things like that.

On the next level is VTUAV. What Admiral Architzel just mentioned is we just finished the development test and evaluation on the *McInerney*, and we're going to the operational test.

The VTUAV is going to be on all of our Littoral Combat Ships.

So what we're doing is we're going to deploy our Littoral Combat Ships with a helicopter and one or more unmanned helicopters, if you will. So it'll augment the manned helicopter. It'll serve as communications relay and we have some other electro-optical/infrared automated information system and some other growth development areas for VTUAV.

The next level is to complement our P-8s, the 737 variant, and to give some persistence in ISR, where we can use the P-8, leverage the capability that the P-8 is going to offer with air-to-surface antisubmarine or close-to-kill kind of capability. We can take advantage of the N-UCAS, BAMS, dwell time, and then use the same maintenance folks that are launching and recovering the P-8s to

launch and recover the BAMS and N-UCAS. So we think that that's about the right blend of capability and capacity.

When it comes to the air wing, we replace about half of our strike fighter air wing about every decade. We have 44 strike fighters in our carrier wing and in 1983 we IOC'ed the F-18 A and B. In 1987, we IOC'ed the C and D variant. Then a little over a decade later we brought on board the Super Hornet. Then in the teens we're going to bring on board the JSF, and then in later 2020s we're going to replace our F-18 Super Hornets with FA-XX.

Now, one of our technology maturation and risk mitigators is to fly that kind of variant onto a carrier and prove that a tailless, unmanned vehicle can land on a carrier safely and taxi. That's what the N-UCAS demonstration is going to do. We're going to go to a carrier in 2011, and then we're going to test unmanned air-to-air refueling with a probe and drogue in 2013.

That puts us on a course for FA-XX to make the right decision in the 2020s timeframe. But to replace the F-18 E and F Block 2 Super Hornet, we need a lot of capability. So we have time to replace, to do the right kind of technology maturation to take us into the mid to late 2020s so that we can make the right decision.

But each time we replace half the air wing we always have a very capable fighter that can provide the effects for the soldiers and the marines on the ground today and have what it takes for future security challenges. So that's why having a hot line for Boeing right now for the F-18 E and F is important to us as we transition to the JSF, which is the Navy's future for TACAIR on our flight decks.

So we have to have both. Our challenge is to do everything that we can to mitigate the risk as we transition to a JSF and F-18 E and F Block 2 Super Hornet air wing.

Senator BEGICH. Thank you very much.

My time has expired, so I just wanted to quickly summarize. One of the pieces in the next 5 years is a lot of testing and demonstration to see the capabilities and capacity and ensure that it cannot only take off, land, refuel, but give the coverage that is necessary. Is that a fair quick summary?

Admiral MYERS. Essentially, yes. It's the takeoff and landing piece which we know we can do. We've done that with N-UCAS. We've done that with VTUAV. We know we can take off and land and taxi. But it's the carrier piece and to make sure that we can taxi around the carrier, safely launch, and then also to go to the next step with the air-to-air refueling with an unmanned vehicle.

Senator BEGICH. Thank you very much. At another time, I'm sure, when we have our Personnel Subcommittee hearing, I'll talk to them about just trying to get a sense of how they make that transition with pilots; it will be an experience, I'm sure, for them. But I'll leave it at that. I won't leave it for you to discuss, but I'll leave it to the Personnel Subcommittee when we meet.

Thanks.

Senator LIEBERMAN. Thanks, Senator Begich.

Senator Chambliss.

Senator CHAMBLISS. Thanks, Mr. Chairman.

General Shackelford and General Gibson, please know that I understand you guys are the messenger and that your statements re-

flect the policy coming out of the Pentagon. But in your written statement you make a comment regarding the F-35 being the premier SAM killer. You also commented that the F-35 is uniquely equipped for that mission.

Based on the information that I have, that is not correct. Based on the comments before the House Armed Services Committee last month, I don't think General Darnell thinks that statement is correct, either. I'm particularly concerned about this discrepancy since it was one of DOD's justifications for terminating the F-22 program, and that was the need for the additional air-to-ground capability that the F-35 provides and that the F-22 does not provide, according to DOD.

That clearly is just not an accurate characterization. The F-22 has superior speed and altitude and it has the clear advantage, particularly against advanced SAMs, especially when you combine advanced SAMs and enemy air.

So I know we can't get into all the details here, but I would simply offer to you or to the Air Force otherwise that if you want to come in and talk to me about this particular issue and about the assets that both the F-35 and the F-22 bring to the table, I would welcome that.

Gentlemen, you refer in your written statement also to the Joint Air Dominance (JAD) Study and that this study has been mentioned as a justification for DOD's TACAIR procurement plan. Now, I've talked to General Schwartz about this study and I understand that the JAD Study was done by PA&E in 2006 and was based on a single major contingency operation. Now, to my knowledge the JAD Study assumed that F-22s had only air-to-air capability and no air-to-ground capability.

First, as we previously established, the F-22 has always had air-to-ground capability, and the newer blocks of the F-22s will even have more robust air-to-ground capability.

Second, regarding the major contingency operation (MCO) scenario, my staff received a briefing from the Air Force last month when the Air Force explained that the fundamental difference between DOD's assessment and the Air Force's assessment regarding how many F-22s are required relates to whether F-22s are required in more than one MCO. The Air Force believes that F-22s may be required in more than one MCO, which leads the Air Force to the conclusion that a higher number of F-22s are required than the 243 F-22s, and therefore that's how we arrive at the moderate risk analysis.

I agree with that conclusion. I think you're exactly right. SAMs are proliferating right now and, although we can slow them down, we're not going to stop them. I find it perfectly reasonable to believe that a nation aligned against the United States like Iran, North Korea, Syria, or even Venezuela may acquire double-digit SAMs in the near term.

Now, I know in your discussions when you're talking about threats you include—and I find it perfectly reasonable—that one of those countries may look for a time when we are occupied with another country and take advantage of our preoccupation to threaten the United States and our allies. As we've established before, only

the F-22 currently has the ability to take out SAMs for the foreseeable future.

Now, I've said a lot there. I don't have a question to ask you about that. But having said a lot, if you want to make a comment or dispute anything I've said, gentlemen, please.

General SHACKELFORD. Senator, if I may. That area of countering double digit SAMs is one area where both the F-22 and the F-35 complement each other very well. You're correct in observing that the F-22's performance, which is from an altitude and air speed perspective greater than the F-35, gives it some advantages in some scenarios.

The F-35 brings a different sensor set. The F-22 sensor set, the radar, gets upgrades to better air-to-ground capability in the 3.1 increment that comes along fielding in fiscal year 2011. The F-35 has a wider array of sensor capabilities that are more optimized towards air to ground and it has a larger payload capability, with similar stealthiness to an F-22. It's just not as fast in terms of how fast it can get in and get out, but it has similar anti-SAM capabilities to the F-22 in that context.

Senator CHAMBLISS. I don't disagree with that at all. We've had this situation before where the Pentagon has come forward with a major recommendation like this. In fact, in 2006 we had two scenarios. The Air Force first recommended the termination of the B-52. Here we are today flying the B-52 in close air support scenarios, and thank goodness Congress overrode that decision from the Air Force.

Second, the Air Force made the recommendation that we terminate the U-2 program. Again, Congress made the decision that we should not do that, and today I think you gentlemen would have to agree that the right decision was not to retire the B-52 or the U-2 because of the significant services that they are providing. So we'll have to see where this goes, I guess.

I have one more area that I want to cover with General Trautman. Unlike in previous years, your fiscal year 2010 budget request does not include any KC-130Js. It's my understanding that the Marine Corps may have requested those planes and that DOD chose not to support the request. But in any event, they're not in there.

How is this going to affect the Marine Corps's ability to execute your mission and what is the Marine Corps's remaining requirement for KC-130Js?

General TRAUTMAN. Thank you, sir. Our validated requirement is 79 KC-130Js. We currently have 47 KC-130Js either on contract or soon to be on contract. You're right, there were zero in fiscal year 2010. I think that was just a matter of other priorities resulting in that line being reduced to zero. But in the future we hope to get back into the procurement line and continue from 47 up to 79.

The generosity of Congress last year probably had something to do with this in that we were able to add in the supplemental some of the KC-130s that we needed, and that was a very wise measure on the part of Congress because it enabled us to take out of service our 40- or 50-year-old KC-130 Fs and Rs, and we retired that last F and R in Okinawa, Japan, in December 2008. So now our full ac-

tive duty fleet is KC-130Js and we're very, very pleased with the performance of that airplane.

Senator CHAMBLISS. Mr. Chairman, it's another scenario we have there, where all of these decisions are being budget-driven. I don't know what the answer to it is. I don't think any of us know that answer. But I think we have some serious decisions that we're going to have to make with respect to what I treat as basically recommendations coming out of DOD with respect to these weapons systems, and we try to find the money and determine what the priorities should be.

So I thank you.

Senator LIEBERMAN. I agree with you, Senator Chambliss. Thank you.

Senator Thune has one more question.

Senator THUNE. Mr. Chairman, I have a question I'll submit for the record, having to do with close air support. But I do want to just get your reaction very quickly, if I might; earlier this month Defense Secretary Gates told his Japanese counterpart that the United States still has no plans to export the F-22s. He reportedly said this, and he cited a longstanding congressional prohibition on international sales of the F-22.

But keeping the F-22 line hot may make sense while the verdict on whether the first operationally capable F-35 JSF will be delivered on time. So I guess my question for you is, should Congress consider lifting that prohibition and allow foreign military sales of F-22s to countries like Japan and Australia, which have expressed some interest?

General SHACKELFORD. Senator, of course the Obey amendment prohibits foreign military sales of the F-22 and also prohibits us from using any dollars to even go look at that right now. Were that to change, were it to be taken out of statute, that we could look at foreign military sales, we would go into the process dealing within DOD with the policy crowd and the international affairs community, to go look at the potential to put together a foreign military sales version of the F-22, and we would do that during our normal foreign military sales processes to look at it.

What would come out of that would be some kind of a plan that would, given the rules for foreign military sales, have to be funded by the international entity in this case. So there would still be a fairly large question of affordability on their part, given the cost of the F-22, as to whether that was worthwhile for them to pursue or not.

Senator THUNE. Thank you, Mr. Chairman. I would echo Senator Chambliss' comments about budgetary factors driving a lot of our decisionmaking. That's obviously a concern. There are a lot of threats and dangers around the world, and it's frustrating to have budgets driving a lot of decisionmaking with respect to how we respond to some of those threats and where we put our resources.

But I thank you all. It's not directed at you. I know you have a job to do and I thank you very much for your service to our country. Thanks.

Senator LIEBERMAN. Thanks, Senator Thune. I agree. I was thinking when Senator Chambliss said you were messengers that

you should be assured that this is a subcommittee where we do not kill the messengers. So we appreciate your service very much.

Just one follow-up on Senator Thune's question. I understand that what's involved here is the Obey amendment, not the Shackelford amendment or the Architzel amendment. But how would you describe the rationale for prohibiting foreign sales of the F-22, but really encouraging and kind of outreaching on the JSF, because we have a bunch of foreign investors and partners in that program?

General SHACKELFORD. Sir, in the case of the F-22, that aircraft was designed and built in a timeframe where it was not envisioned to be shared in the international community. There are a number of very sensitive technologies in the aircraft that are not protected in the same manner they're protected on the F-35, which has been built from the ground up with an international sales market in mind.

So the F-22 that the United States flies would not be exactly the same F-22 that country X would fly if they had the foreign military sales version.

Senator LIEBERMAN. Got you. Thank you. I'm not sure even Congressman Obey could have answered that as well.

I want to thank the five of you for your presence, you've been very responsive to our questions, and I've been impressed by the extent to which you're right on top of all the information and the programs that you oversee. I thank you for that. You've helped to inform our decisions. We're making tough and important decisions this year.

We on this committee are always mindful that we're a Nation at war, and obviously the budget has to play some role and resources have to play some role. But we also have a role, which I think is a superior role, to do everything we possibly can to support your effort on our behalf and all those who work with you and under you to protect our security.

So this has been a very productive hearing from the subcommittee's point of view, I believe, and will help us as we go forward to our markup at the end of the month.

Do either of my colleagues have any final words? [No response.]

If not, the hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ROLAND BURRIS

STRIKE FIGHTER SHORTFALL

1. Senator BURRIS. Vice Admiral Architzel, a recently released House Appropriations Committee report states that "the Department of Defense (DOD) and Congress must seriously come to grips with the looming shortfall" of fighters, and a multi-year F/A-18 deal is "the most cost-effective approach." Likewise, the Senate Appropriations Committee said a multi-year F/A-18 purchase is needed "to ensure that the Navy has sufficient aircraft for the fleet." I would like to hear your thoughts about this comment and meeting the shortfall.

Admiral ARCHITZEL. Continued procurement of F/A-18E/F is one of four areas that the Department of the Navy will continue to assess through this summer's Quadrennial Defense Review (QDR) and into the following year's budget submission. The option for continued F/A-18E/F procurement could be exercised in fiscal year 2011, without a break in Boeing's production line capability. Other avenues to be considered—each in balance with one another—are: (1) maintaining wholeness of the JSF program; (2) making a roughly \$3.6 billion Program Objective Memorandum (POM)-12 additional investment to extend the service life of approximately

295 F/A-18A-D legacy Hornets from 8,600 to 10,000 flight hour service life; and, (3) continued funding for support of our legacy fleet aircraft.

The challenge that leadership is undertaking during the QDR and upcoming budget year, is to determine the necessary balance of these options in terms of force requirements, as they become evident over this summer's review.

2. Senator BURRIS. Vice Admiral Architzel, the Navy is expected to face strike fighter shortfalls in the coming years as it begins to modernize their fleet. One solution to meeting this shortfall that has been suggested is raising the service life of the F-18 Hornet 10,000 hours—up from 8,000 hours. What are the costs associated with extending the service life of this plane, given that it was only designed to meet 6,000 service hours when it was produced?

Admiral ARCHITZEL.

- To extend the service life of the Hornets from 8,000 to 8,600 hours, the Navy is currently investing an average of \$475,000 per aircraft for high flying hour inspections.
- To extend the service life of 295 Hornets from 8,600 to 10,000 flight hours, the Navy and Marine Corps will incorporate the repairs and modification improvements from the list below. This will provide a 3.5 to 4.5 year return on investment for a 1,400 hour service extension. The most recent Naval Air Systems Command (NAVAIR) cost estimates are:
 - Service Life Extension Program (SLEP) (Depot Level Repair)—\$11.5 million per aircraft
 - Sustainment (engineering, logistics, supply support)—\$7.1 million per aircraft
 - Obsolescence (parts that are no longer available)—\$5.0 million per aircraft
 - Capability Improvements 'Lot 21 baseline' capability—\$2.6 million per aircraft (warfighting improvements to bring A-D Hornets up to Lot 21 E/F like capabilities)
 - Cost Estimate¹—\$26.2 million per aircraft
- The Department currently has \$4.1 billion invested for planned maintenance and nonrecurring engineering that can be leveraged in any service life extension plan for the F/A-18A-D. Given this reality, the Department would need to invest an additional \$3.6 billion in POM-12, for a total of \$7.7 billion, to SLEP the aircraft in time to mitigate the strike fighter shortfall.

SOLE SOURCE ENGINE

3. Senator BURRIS. Lieutenant General Shackelford, from my understanding, the sole source engine for the F-35 was envisioned as a derivative engine of the F-119—the engine which is used to power the F-22 aircraft. How much has the Government spent to date in developing this so-called derivative engine?

General SHACKELFORD. The Government has spent approximately \$7.3 billion developing the Pratt & Whitney F135 propulsion system between fiscal year 1995 and fiscal year 2009.

4. Senator BURRIS. Lieutenant General Shackelford, is the sole source contract a fixed-price contract or is it a cost-plus contract?

General SHACKELFORD. The contract to develop the Pratt & Whitney F135 propulsion system is a cost plus award fee contract.

AIR SOVEREIGNTY ALERT CAPABILITY

5. Senator BURRIS. Lieutenant General Shackelford, the Air Force has two challenges facing its air sovereignty alert (ASA) capabilities over the long-term. When will we see a plan for fully sourcing the crucial ASA mission?

General SHACKELFORD. Homeland defense is DOD's first priority and the Air Force is committed to the ASA mission. Long-term recapitalization of the fighter and tanker fleet requires many years. Within the funding available, the Air Force must maximize the life of the existing aircraft until they can be replaced. All of the options to ensure the ASA mission remains viable are dependent on the life expectancy of these airframes.

¹ Note: Depending on the Service's operational requirements, the need for capabilities requirements and obsolescence will vary for individual aircraft.

The Air Force is currently developing plans to ensure that we, in conjunction with the rest of the DOD, can meet the combatant commander's requirements for the defense of the Nation—whether it is with Air National Guard aircraft or in combination with active duty assigned aircraft. There are many moving pieces as we look at all the different Air National Guard units around the country to determine the best alignment of our limited resources. We are currently waiting for an update from the QDR regarding the national requirement, and subsequently, the Air Force's requirement for this critical mission. From there we can come back in late fall or early winter with an overarching approach that will cascade throughout the Air Force, and that will provide the required guidance to build the Air Force's fiscal year 2012 POM and the President's fiscal year 2012 budget.

6. Senator BURRIS. Lieutenant General Shackelford, how does the Air Force plan to fill the impending gap of tactical fighters if the Joint Strike Fighter (JSF) is not declared initial operational capability (IOC) by 2013, as current trends indicate?

General SHACKELFORD. We have invested heavily in the F-35 program and are closely tracking developments in order to ensure that it stays on track. Chief of Staff of the Air Force General Schwartz has stated on many occasions that the key to the Air Force's fighter recapitalization is the F-35.

Once we get through the QDR and have a better picture of what the national requirement and the Air Force requirement is, we can look at an updated delivery timeline for the F-35. If there is going to be a gap it may be addressed by extending the service life of F-15s and F-16s. We are currently fatigue testing the F-15 and F-16 fleets. Once these structural tests are complete we will have some sense of whether or not we need a SLEP for the legacy fleets and what scope and focus areas will be necessary.

QUESTIONS SUBMITTED BY SENATOR JOHN THUNE

QUADRENNIAL DEFENSE REVIEW

7. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, until the 2009 QDR is completed sometime this summer, the 2006 version of the document (and its associated guidance) is the only framework we have for judging how well the DOD's airpower capabilities meet national requirements. In your view, how should Congress consider President Obama's proposals for the fiscal year 2010 budget and, in particular, those reflecting substantial changes to force structure when the only definitive framework we have is the 2006 QDR?

Admiral ARCHITZEL and Admiral MYERS. The Navy is currently committed to an 11 carrier force structure for the next several decades, and this commitment was supported by Secretary Gates during his April budget announcement. The carrier force structure, along with the entire battle force, is being considered in the QDR. The overall carrier force structure is driven by two primary considerations. First, we must have sufficient carrier strength to carry out the Navy's wartime missions and strategic assignments. Second, and equally important, we must have adequate force structure to meet the presence demands required by the President and combatant commanders. The 2006 QDR defined the need for 11 CVNs. Navy supports the Secretary of Defense's plan to change the aircraft carrier program to a 5-year build cycle. Should the outcome of the 2009 QDR recommend changes in long-term force structure, Navy will work with Congress to address any legislation that may be required.

General TRAUTMAN. DOD's airpower capabilities will always be consistent with national requirements. Similarly, the Marine Corps' airpower capabilities are tailored to meet Marine Corps' requirements within the Marine Air-Ground Task Force (MAGTF) construct.

Once a QDR is complete, our National Defense Strategy and National Military Strategy will be developed to meet the National Security Strategy issued by the President. In this way, requirements drive capabilities, force structure, and employment of forces. Currently, the only approved framework for such an assessment is the 2006 QDR. One possible alternative to the 2006 QDR is to measure our capability relative to our current National Defense Strategy; however, it too will evolve due to influence from the ongoing QDR.

General SHACKELFORD and General GIBSON. In response to the dynamic national security environment, the Secretary of Defense provided a mid-course update to the 2006 QDR report in the form of his 2008 Guidance for the Development of the Force (GDF). This guidance document established strategic priorities for force develop-

ment planning, as well as a basis for development of the fiscal year 2010 POM submissions from the Services as part of the DOD input to the President's budget (PB).

From the Air Force perspective regarding the fiscal year 2010 PB, we used Secretary Gates' GDF as a baseline to analyze our combat air forces (CAF) fighter force structure, and subsequently identified a window of opportunity to take a strategic pause and build a smaller, but more flexible, capable, and lethal force as we bridge to the fifth-generation-enabled force. This analysis determined that the Air Force is faced with aging fighter aircraft during a period in history where we are not directly threatened by a near-peer competitor, ultimately assessing the risk as acceptable. Any remaining risk is mitigated in the short term through a combination of permanently based and rotational forces. The fiscal year 2010 CAF restructuring plan is part of a global resource allocation process to create a more efficient 21st century Air Force for the Joint team.

Admiral MYERS. The Navy is currently committed to an 11 carrier force structure for the next several decades, and this commitment was supported by Secretary Gates during his April budget announcement. The carrier force structure, along with the entire battle force, is being considered in the QDR. The overall carrier force structure is driven by two primary considerations. First, we must have sufficient carrier strength to carry out the Navy's wartime missions and strategic assignments. Second, and equally important, we must have adequate force structure to meet the presence demands required by the President and combatant commanders. The 2006 QDR defined the need for 11 CVNs. Navy supports the Secretary of Defense's plan to change the aircraft carrier program to a 5-year build cycle. Should the outcome of the 2009 QDR recommend changes in long-term force structure, Navy will work with Congress to address any legislation that may be required.

8. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, in your view, what would the effect be on airpower capabilities and force structure if the 2009 QDR eliminates the longstanding requirement to successfully fight two simultaneous major theater wars?

Admiral ARCHITZEL and Admiral MYERS. The overall carrier structure is driven by two primary issues. First, we must have sufficient carrier strength to carry out the Navy's wartime missions and strategic assignments. Second, and equally important, we must have adequate force structure to meet the presence demands required by the President and combatant commanders. It is carrier presence demand that ultimately defines the carrier force structure. While major theater war demands are significant they tend to impact the desired readiness and response time required for surge capability and capacity. As a result, any change in major theater war numbers or sequencing will not necessarily impact the overall carrier requirement. However, it will define the number of carrier strike groups required to be available to respond and the timeliness of response. Should this construct change, an entirely new detailed analysis would be required in order to answer this question.

General TRAUTMAN. General Cartwright has laid out a vision of just such a contraction of force structure. The applicable functions of airpower extend well beyond the strike and anti-air capabilities traditionally associated with major theater wars. Our current and future aviation assets provide a wide array of capabilities that support our Marine forces within the Marine Air-Ground Task Force. Regardless of the types of conflicts we must prepare to conduct simultaneously, Marine aviation will always strive to support operations across the full spectrum.

As part of a forward-deployed naval force and an expeditionary force in readiness, the Marine Corps requires an aviation combat element with multirole capability and multi-mission aircraft. The effect of eliminating the long-standing requirement to fight two simultaneous major theater wars is difficult to determine without identifying what requirements take its place.

General SHACKELFORD and General GIBSON. The 2004 National Defense Strategy directs a force sized to defend the homeland, deter forward in and from four regions, and conduct two, overlapping "swift defeat" campaigns. Even when committed to a limited number of lesser contingencies, the force must be able to "win decisively" in one of the two campaigns. The most recent National Defense Strategy did not specify a requirement to fight two simultaneous major theater wars. The fiscal year 2010 President's budget reflects the airpower capabilities and force structure to accomplish the National Defense Strategy.

Admiral MYERS. The overall carrier structure is driven by two primary issues. First, we must have sufficient carrier strength to carry out the Navy's wartime missions and strategic assignments. Second, and equally important, we must have adequate force structure to meet the presence demands required by the President and combatant commanders. It is carrier presence demand that ultimately defines the

carrier force structure. While major theater war demands are significant they tend to impact the desired readiness and response time required for surge capability and capacity. As a result, any change in major theater war numbers or sequencing will not necessarily impact the overall carrier requirement. However, it will define the number of carrier strike groups required to be available to respond and the timeliness of response. Should this construct change, an entirely new detailed analysis would be required in order to answer this question.

AVIATION STRIKE FIGHTER SHORTFALL

9. Senator THUNE. Admiral Architzel, our Nation's need for the continued presence of U.S. Navy aircraft carriers to protect and defend the interests of America and its allies is self-evident. But the Department of the Navy has identified a naval aviation strike fighter shortfall, which it projects to be more than 240 aircraft by 2018. This shortfall has apparently been caused by delays in the F-35 JSF program and the challenges associated with extending the life of older strike fighters. What is the Department of the Navy's current assessment of its aviation strike fighter shortfall?

Admiral ARCHITZEL. The Department of the Navy's F/A-18A-D strike fighter shortfall is estimated to be 146 aircraft (70 aircraft for the Navy) in 2014. This is based on the following assumptions:

- F-35B IOC of 2012; F-35C IOC of 2015; PB10 delivery ramp and final quantities
- 506 F/A-18E/F program of record through fiscal year 2012
- Current Department of Navy force structure requirements:
 - a. U.S. Navy: 10 CVW of 44 strike fighters each at 90 percent productive ratio aircraft entitlement—35 total Navy strike fighter squadrons (VFA)
 - b. U.S. Marine Corps: 19 Active/1 Reserve strike fighter squadrons; additional stand-up of 2 Active/2 Reserve cadre squadrons with JSF beginning in 2012
- Department of Navy makes a future \$3.6 billion investment for service life extension of F/A 18A-D from 8,600 to 10,000 flight hours service life.
- NAVAIR Inventory Forecasting Tool, version 18.0.

10. Senator THUNE. Admiral Architzel, how concerned are you about that shortfall and its effect on future carrier warfighting capability?

Admiral ARCHITZEL. Carrier aviation and our carrier strike group force structure are vital to executing our Military Strategy in support of the Nation's security and strategic objectives. During this summer's QDR, we will have the opportunity to assess the requirement for the essential capability and capacity that carrier aviation provides to current and potential conflicts, as well as the valued, continuous contribution that our carrier strike groups provide for preventing conflicts, in balance with other DOD requirements and priorities. Based on the outcome of this assessment, there are several factors—providing different opportunities—that will be considered in resourcing the Department of the Navy's strike fighter requirements, including attaining the IOC of the Department's JSFs on time and at planned quantities. Additionally, the Department will continue to assess and make determinations on a \$3.6 billion additional POM-12 investment in the service life extension of up to 295 of our F/A 18A-D legacy Hornets. Finally, through PR-11, the Navy preserves the option—if required—to procure additional F/A-18E/F Super Hornets beyond the current budgeted quantity.

11. Senator THUNE. Admiral Architzel, why isn't it premature for the Navy to assess the significance of its projected strike fighter shortfall (or its operational impact) before the pending QDR is completed?

Admiral ARCHITZEL. During this summer's QDR, we will have the opportunity to assess the requirement for the essential capability and capacity that carrier aviation provides to current and potential conflicts, as well as the valued, continuous contribution that our carrier strike groups provide for preventing conflicts, in balance with other DOD requirements and priorities. Based on the outcome of this assessment, there are several factors—providing different opportunities—that will be considered in resourcing the Department of the Navy's strike fighter requirements, including attaining the IOC of the Department's JSFs on time and at planned quantities. Additionally, the Department will continue to assess and make determinations on an estimated \$3.6 billion additional investment in the service life extension of up to 295 of its F/A-18A-D legacy Hornets. Finally, through PR-11, the Navy preserves the option—if required—to procure additional F/A-18E/F Super Hornets

beyond the current budgeted quantity. Each of these options provides opportunity that runs concurrent with or that can be acted on, after the completion of this summer's QDR.

12. Senator THUNE. Admiral Architzel, the Department of the Navy has apparently exhausted all options to reduce its projected 240-aircraft strike fighter shortfall. There are no viable plans to speed up production of the carrier version of the JSF planned to be fielded on carrier decks around 2015. Some already suggest that this date may slip an additional year or 2. Finally, a Navy plan to extend the life of the older legacy Hornets may be too costly. Is it a viable solution to consider purchasing additional F/A-18 Super Hornets—the only new strike fighter aircraft in production? If not, how will the Navy expect to mitigate the shortfall and the operational risks associated with that shortfall?

Admiral ARCHITZEL. Continued procurement of F/A-18E/F is one of four areas that the Department of the Navy will continue to assess through this summer's QDR and into the following year's budget submission. The option for continued F/A-18E/F procurement could be exercised in fiscal year 2011, without a break in Boeing's production line capability. Other avenues to be considered—each in balance with one another—are: (1) maintaining wholeness of the JSF program; (2) investing roughly \$3.6 billion to extend the service life of approximately 295 F/A-18A-D legacy Hornets from 8,600 to 10,000 flight hour service life; and, (3) continued funding for support of our legacy fleet aircraft.

The challenge that leadership is undertaking during the QDR and upcoming budget year, is to determine the necessary balance of these options in terms of force requirements, as they become evident over this summer's review.

AIR FORCE TACTICAL FIGHTER AIRCRAFT GAP

13. Senator THUNE. General Shackelford and General Gibson, as you of course know, in hearings on the Air Force's fiscal year 2009 budget request, Air Force leaders testified that, due to new estimates of the life of the legacy fighter force, the current F-22 Raptor and JSF procurement plans would likely leave a gap of up to 800 fighter aircraft by 2024. Without the benefit of the Air Force's having conducted a service life assessment, as the Navy has with regard to its strike fighter capability, do you have a sense of what the probable extent of the Air Force's fighter gap is?

General SHACKELFORD and General GIBSON. In April 2008, the Air Force estimated its projected fighter shortfall in the mid-2020s at approximately 800 aircraft, which assumed a maximum F-35A production rate of 48 aircraft a year beginning in 2013. Since that time, several things have changed that influence projected fighter requirements in the coming decade and beyond: the Secretary of Defense published the National Defense Strategy and the attendant force planning construct; the fiscal year 2010 President's budget request included funding to increase the production rate to 80 F-35A aircraft a year beginning in 2015; and the Department has begun assessing fighter force requirements as part of the QDR. Following conclusion of the QDR, the Air Force will reassess fighter force structure through 2030.

14. Senator THUNE. General Shackelford and General Gibson, with declining procurement dollars as far as the eyes can see, to what extent could buying more quantities of legacy aircraft such as F-16s and F-15Es help mitigate—on a cost-effective basis—a major fighter shortfall in the Air Force over the intermediate- to long-term?

General SHACKELFORD and General GIBSON. In a limited defense budget, it is essential we focus our efforts and resources on procuring fifth-generation fighters. The F-35 is the aircraft that will allow the Air Force to perform our missions for the next 20 to 30 years, to be certain, along with a complementary fleet of F-22s. Therefore, we need to put whatever funding is available to ramp up F-35 production rates so that: (1) we can field sufficient numbers of aircraft to effectively manage the aging issues of our fighter fleet; and (2) keep the average unit cost affordable to us, our fellow Services, and our international partners. Buying legacy aircraft would come at the expense of fifth-generation fighters, and would promote a less capable, less survivable fighter force.

15. Senator THUNE. General Trautman and General Gibson, a March 2008 Government Accountability Office (GAO) report on the F-35 program raises serious concerns regarding the development schedule for the F-35. According to the GAO report on the F-35 program, "[T]hree independent defense offices separately concluded that . . . the F-35 program development schedule is likely to slip from 12 months

to 27 months.” What impact will a slip in the development schedule of the F-35 have on the projected strike fighter shortfall?

General TRAUTMAN. The Marine Corps is confident that the current schedule will be met. Meeting this schedule will ensure that it will bridge from its legacy aircraft to the fifth-generation JSF and not contribute to the strike fighter shortfall.

General GIBSON. In light of ongoing assessments such as the QDR plus the emerging National Defense Strategy and its attendant force planning construct, the Air Force is taking a close look at the projected strike fighter force requirements for the coming decade and beyond. The current program of record for the F-35, with its programmed build up through the Future Years Defense Program (FYDP) of production aircraft to reach a plan of 80 aircraft per year by 2015, helps the Air Force mitigate risk in the strike fighter mission. Slips in the development schedule will impact the level of risk.

AIR FORCE STRIKE FIGHTER RESTRUCTURING PLAN

16. Senator THUNE. General Shackelford and General Gibson, in testimony before the committee, General Schwartz testified, regarding the decision to accelerate the retirement of 250 strike fighters, that “[t]he review weighed the benefits of retiring aircraft nearing their expected service life, against near-term risk [to our national security].” When were these aircraft previously planned to be retired?

General SHACKELFORD and General GIBSON. The aircraft under the proposed fiscal year 2010 CAF restructuring plan would retire in a range from approximately 3 years early for certain F-16s, approximately 6 years early for certain F-15Cs, to about 11 years for the A-10s, all based upon force structure plans and service life considerations. The important point to emphasize is in order to comply with OSD’s Guidance for the Development of the Force, the Air Force analyzed its fighter force structure and determined we have a window of opportunity to take a strategic pause and build a smaller, but more flexible, capable, and lethal force as we bridge to the fifth-generation-enabled force.

This analysis determined that the Air Force is faced with aging fighter aircraft during a period in history where we are not directly threatened by a near-peer competitor, ultimately assessing the risk as acceptable. Any remaining risk is mitigated in the short term through a combination of permanently based and rotational forces. The CAF Restructuring plan is part of a global resource allocation process to create a more efficient 21st century Air Force for the Joint Team.

This plan offers your Air Force an opportunity to reinvest significant savings into critical modifications for our enduring combat forces fleet, procure preferred air-to-air and air-to-ground munitions and critical Air Force and Joint enabling technologies, and redistribute manpower to national priority missions.

17. Senator THUNE. General Shackelford and General Gibson, how many hours are on the aircraft you are going to retire?

General SHACKELFORD and General GIBSON. Specific aircraft have not been selected, but once a determination is made to pursue a force structure change that drives aircraft retirements, the lead command weapon system team, in concert with the System Program Office, will review a multitude of data across the fleet. Examples of those are the current operating time (flight hours) on the aircraft and current modifications on the fleet that would lead to targeting aircraft that haven’t been modified in order to reduce installation costs and increase quantities of spare parts for the remainder of the fleet. Depot induction requirements such as SLEP/scheduled structural inspection will be reviewed in order to potentially recoup depot cost by not inputting a retiring aircraft.

18. Senator THUNE. General Shackelford and General Gibson, are you managing aircraft retirements by tail numbers?

General SHACKELFORD and General GIBSON. Yes. Air Combat Command (ACC), the Air Force’s lead command for our combat aircraft, is developing a detailed plan for implementing the proposed fighter aircraft retirements in fiscal year 2010. ACC’s force programmers and weapons systems teams comprehensively manage each type of fighter aircraft as an entire fleet. These teams will select the most appropriate aircraft across the fleet for retirement by tail number, based on a variety of factors such as total airframe hours, remaining service life, airframe fatigue, maintenance history, and completed or required future modifications. The end result is the retirement of aircraft that are generally the oldest and least capable in the fleet of their type. This optimizes unit combat capability by retaining the strongest and most capable performing aircraft for training and operational employment.

19. Senator THUNE. General Shackelford and General Gibson, did the combatant commanders sign off on your restructuring plan?

General SHACKELFORD and General GIBSON. Yes. As we developed the CAF restructuring plan as part of the fiscal year 2010 Air Force POM build, we were successful in balancing planned force reductions across our active duty, Guard, and Reserve components, as well as in the States and overseas locations. We carefully analyzed the missions across our units in all the Air Force components to achieve the force mix that made the most strategic sense. The changes in this plan were closely coordinated with our Air National Guard and Air Force Reserve partners, as well as our Major Commands and affected Combatant Commanders.

The Air Force Director of Programs (a two-star general), representing the Air Force Deputy Chief of Staff for Strategic Plans and Programs, traveled to all Air Force Major Commands and Unified Combatant Commands to personally brief the four-star commanders or their designated representatives on the Air Force fiscal year 2010 POM submission. Concerns about the program were either addressed directly with Air Force leadership, or the combatant commanders could address their concerns with the Secretary of Defense. Ultimately, Secretary Gates approved the restructuring plan as part of the DOD submission to the fiscal year 2010 President's budget, announcing on April 6th, 2009 that "we will retire 250 of the oldest Air Force tactical fighter aircraft in fiscal year 2010."

20. Senator THUNE. General Shackelford and General Gibson, how exactly did you quantify that risk?

General SHACKELFORD and General GIBSON. At the campaign level, the Air Force conducted analysis of the CAF restructuring plan using the OSD-approved analytic baseline military objectives, while identifying the need for key enablers and advanced weapons for both the bomber and fighter forces. The resultant force mix presented less warfighting risk in fiscal year 2015 and beyond than any course of action that maintained the status quo in legacy fighter numbers. In any case, reinvestments must be made in modernization, weapons, and other key enablers.

21. Senator THUNE. General Shackelford and General Gibson, did the risk assessment consider the joint air force capability of all the Services; that is, the Navy and Marine Corps also?

General SHACKELFORD and General GIBSON. Yes. The assessment considered the ability of the force structure to address the Air Force target set which is developed in the context of the Joint Campaign. The unified combatant commands were consulted and their respective combatant commanders concurred with the CAF restructuring plan that was ultimately approved by the Secretary of Defense.

22. Senator THUNE. General Shackelford and General Gibson, did the risk assessment include the increased reliance by combatant commanders on aviation assets in lieu of the relative unavailability of ground combat units due to decreased readiness rates and commitments to overseas contingency operations?

General SHACKELFORD and General GIBSON. The Air Force conducted analysis of the CAF restructuring plan using the OSD approved analytic baseline military objectives, while identifying the need for key enablers and advanced weapons for both the bomber and fighter forces. The resultant force mix presented less warfighting risk in fiscal year 2015 and beyond than any course of action that maintained the status quo in legacy fighter numbers. In any case, reinvestments must be made in modernization, weapons, and other key enablers.

The Air Force itself did not specifically analyze the risk of increased reliance on aviation assets due to unavailability of ground units. However, all of the unified combatant commands were consulted and their respective combatant commanders concurred with the CAF restructuring plan that was ultimately approved by the Secretary of Defense.

23. Senator THUNE. General Shackelford and General Gibson, when do you anticipate that the risk will be mitigated or eliminated?

General SHACKELFORD and General GIBSON. To comply with Secretary Gates' 2008 Guidance for the Development of the Force, the Air Force analyzed its fighter force structure and identified a window of opportunity to take a strategic pause and build a smaller, but more flexible, capable, and lethal force as we bridge to the fifth-generation-enabled force. This analysis determined that the Air Force is faced with aging fighter aircraft during a period in history where we are not directly threatened by a near-peer competitor, ultimately assessing the risk as acceptable. Any remaining risk is mitigated in the short term through a combination of permanently based and rotational forces, and further reduced in the mid-term as we field greater

numbers of fifth-generation fighters. The fiscal year 2010 CAF restructuring plan is part of a global resource allocation process to create a more efficient 21st century Air Force for the joint team.

24. Senator THUNE. General Shackelford and General Gibson, what is the impact on current mission capabilities and to the Air Force's fifth-generation requirements in the out years?

General SHACKELFORD and General GIBSON. In line with the Office of the Secretary of Defense's guidance to eliminate excessive overmatch in force structure, the Air Force assessed the threat environment and analyzed CAF capabilities. Studies show the Air Force has a window of opportunity to: (1) reshape our aging fighter force via accelerated retirements, (2) redistribute funding to modernize and equip a smaller, more flexible, capable and lethal force, and (3) redistribute manpower to support expanding areas of critical national priority missions. Although the fighter fleet will be smaller, the effects provided by the newer modifications, preferred munitions, and critical enablers create a capabilities-based bridge from our current force to a fifth-generation-enabled fighter fleet. These actions will ensure the proper mix of platforms to meet the combatant commanders' mission requirements.

25. Senator THUNE. General Shackelford and General Gibson, in his testimony before the committee, General Schwartz, the Air Force Chief of Staff, testified that the CAF restructure plan would not only fund upgrades to the legacy fighter fleet, but also fund improvements to the bomber fleet. Specifically, he mentioned that all three bombers will receive radar upgrades. How does the CAF restructure plan benefit the B-1 fleet?

General SHACKELFORD and General GIBSON. The fighter force restructure plan reinvests savings from accelerating the inevitable retirement of older legacy aircraft back into the remaining legacy fighters and bombers, munitions, and other key enablers. Specifically, the fiscal year 2010 PB adds funding into the B-1 program for gyro stabilization system replacements, inertial navigation system replacements, central integrated test system upgrades, an advanced radar electronic warfare test system, and nose radome repair capabilities. Fiscal year 2010 PB also continues the Radar Reliability and Maintainability Improvement Program (RMIP), which addresses reliability and maintainability issues that have the potential to ground fleet aircraft as early as fiscal year 2011. Although it does not increase the capability of the current system, it will increase aircraft availability through greater reliability and ease of maintenance. By accelerating the inevitable retirements of our aging fighter force, we are able to reinvest approximately \$1.0 billion across the FYDP to the bomber fleet as a whole and build a smaller, but more capable and lethal force as a bridge to fifth-generation-enabled capabilities.

26. Senator THUNE. General Shackelford and General Gibson, what are the plans to upgrade the B-1 bomber's radar?

General SHACKELFORD and General GIBSON. The fiscal year 2010 PB provides funding for the B-1 Radar RMIP, which addresses reliability and maintainability issues that have the potential to ground fleet aircraft as early as fiscal year 2011. This modification provides for the upgrade of the B-1 radar (AN/APQ-164) to resolve significant diminishing manufacturing resources, reliability problems with the existing dual-string radar, and will allow the B-1 to take advantage of future radar improvements. The hardware modification leverages off the already completed F-16 Foreign Military Sales (FMS) (V) 9 radar program, and specifically provides two modular receiver exciters, two common radar processors, supporting installation cables, and clamps. This line replaceable unit upgrade is a form-fit-function installation. Although it does not increase the capability of the current system it will increase aircraft availability through greater reliability and ease of maintenance.

LONG-RANGE BOMBERS AND THE STRIKE FIGHTER SHORTFALL

27. Senator THUNE. Admiral Architzel and General Trautman, long-range bombers appear to share important attributes with carrier air wings, including not requiring in-theater basing and, thereby, offering the potential for prompt strikes in a crisis. But, the Department of the Navy's strike fighter gap could be a problem; especially if the JSF slips in becoming IOC. To what extent could an increased inventory of long-range bombers, in some ways, make up for the shortfall in Navy and Marine Corp strike fighters? Please speak specifically to cost and survivability.

Admiral ARCHITZEL. Increasing the inventory of long-range bombers doesn't replace the carrier air wing on the flight deck for several reasons—the carrier strike

wings provide airborne early warning and surveillance, electronic attack and close air support along with a kinetic impact (effects that munitions will have on specific targets prosecuted) to the troops on the ground. The long-range bomber in this case is limited to the kinetic. As part of the Joint Force, the long-range bomber and the carrier strike wing work well together both now and in the future.

General TRAUTMAN. The Marine Corps' warfighting structure is based upon the MAGTF. MAGTFs are task organized and can be tailored to a specific threat. While long-range bombers are a strategic asset, the Corps views our MAGTFs as an operational asset with forcible entry capability and the ability to operate without long-range bombers. The Marine Corps maintains confidence in the JSF Program Office's ability to maintain schedule and will fund its legacy fleet of Hornets and Harriers to mitigate any perceived negative inventory trends in its strike fighters. The best option for cost and survivability is to procure the fifth-generation F-35 in all variants, especially the short-takeoff and vertical landing (STOVL) F-35B variant. Fifth generation offers the Nation the best balance of cost, lethality, and survivability.

F-35 JOINT STRIKE FIGHTER PROGRAM

28. Senator THUNE. General Trautman and General Shackelford, the JSF program's size, its international scope, and its competing objectives for performance, cost effectiveness, and commonality make it arguably the most challenging defense acquisition program ever. With shortfalls in strike fighter capability, the Air Force, Navy, and Marine Corps are relying on the program's delivering each of those Service's versions of an IOC aircraft on time.

In connection with this year's budget request, the President proposes to increase the buy of the F-35 JSF from the 14 aircraft bought in fiscal year 2009 to 30 in fiscal year 2010, with corresponding funding increases from \$6.8 billion to \$11.2 billion. According to the proposal, we would plan to buy 513 F-35s over the 5-year defense plan, and, ultimately, plan to buy 2,443. So, this is a good time for an update on the program.

In terms of quantity and investment over the FYDP, please explain how the DOD's plan to procure JSF aircraft is different now, from what was proposed last year.

General TRAUTMAN. DOD's plan to procure JSF will meet the Marine Corps' IOC of 2012. The program will manage risk in production quantities in order to maintain IOC.

General SHACKELFORD. When the fiscal year 2009 President's budget was submitted to Congress, the plan was to procure 485 F-35 aircraft for the Air Force, Navy, and Marine Corps through fiscal year 2015. The current plan is to procure 513 aircraft, an additional 28 aircraft, through fiscal year 2015. The overall quantity of aircraft to be procured for the U.S. is 2,443 aircraft.

General Schwartz, Air Force Chief of Staff, stated that the F-35 is a key capability to ensure U.S. air superiority for the next 20 to 30 years. He has repeatedly emphasized the importance of high production rates as a way to manage our aging aircraft inventory and keep the average price of the F-35 competitive for not only the USAF and DOD, but our allies as well. The fiscal year 2010 budget renews our commitment to the F-35 as the backbone of U.S. and allied fighter force structure in the years to come.

29. Senator THUNE. General Trautman and General Shackelford, with regard to each variant, please explain where the program is on developmental testing, where it is going, and when it is going to get there.

General TRAUTMAN. The Test and Evaluation Master Plan (TEMP) fully identifies those sorties necessary to verify all mission systems and life science flights required to fully test the air system. The Marine Corps has confidence that the TEMP, as currently written, will meet its objective.

General SHACKELFORD. AA-1, the first conventional takeoff and landing (CTOL) variant, has flown 87 times. It is currently in flyable storage at Lockheed Martin Fort Worth and is scheduled to fly to China Lake later this year to begin live fire testing. BF-1, the first STOVL variant, has flown 14 times. BF-1 is scheduled to ferry to Patuxent River in August 2009 and conduct its first vertical landing in September 2009. BF-2 has flown once.

AF-1, the first weight-optimized CTOL variant, is scheduled to begin flight tests in September 2009 and ferry to Edwards Air Force Base (AFB) in February 2010. CF-1, the first carrier variant, is scheduled to fly in January 2010 and ferry to Patuxent River in June 2010.

30. Senator THUNE. General Trautman and General Shackelford, at this point, is the program having any difficulty meeting its key performance parameters?

General TRAUTMAN. JSF program is meeting all key performance parameters.

General SHACKELFORD. All F-35 variants are projected to meet their respective key performance parameters.

31. Senator THUNE. General Trautman and General Shackelford, please explain, in objective terms, not relative to legacy programs at comparable points, how successful the program is likely to be in terms of retiring risk and design maturity before we get much more into production.

General TRAUTMAN. The JSF program is following a path of concurrency. The Marine Corps is still developing the program and will enter production. The program believes that sufficient simulation and laboratory assets are available to mitigate the risk of concurrency.

General SHACKELFORD. The Department is very pleased with the program's progress in retiring risk and demonstrating design and processes maturity. Extensive use of ground test laboratories, modeling and simulation techniques and flying test beds continue to mature designs and burn-down development risk far in advance of flight testing. The first system development and demonstration (SDD) aircraft, AA-1, has been a superb aircraft and valuable pathfinder, incorporating 80 percent of flight software and aircraft systems that will also be used in the STOVL variant. AA-1, BF-1, and BF-2 are all in flight testing, and validating design, manufacturing and test processes, aero performance, vehicle systems performance, control systems and our autonomic logistics global sustainment concepts. These three initial SDD jets have returned from sorties as "Code 1," i.e., ready to fly again, 80 percent of the time. Actual flight-test data correlation to modeling is outstanding, showing the maturity of design tools. AA-1 also greatly contributed to validation of design and production processes by demonstrating actual weight within 0.1 percent of predicted, no fuel leaks during ground tests (unprecedented), high level of quality in manufacturing and assembly, and a high frequency of flights. "Digital Thread" technology is a key enabler of the exceptional manufacturing quality we've seen on AA-1, manifested in dramatically lower defects and scrap rates compared to legacy programs, which in turn results in cost avoidance.

Extensive use of digital design and development tools, ground test laboratories, modeling and simulation techniques and flying test beds continue to mature designs and burn-down development risk far in advance of flight testing. The remaining SDD jets and ground test articles, plus low rate initial production (LRIP) I and LRIP II aircraft, are in various stages of production. The SDD jets are taking longer to build than planned but setting new standards for quality and manufacturing efficiencies that improve with each jet. Software is 74 percent complete, with 13 million lines of code, per the spiral development plan/schedule and with record-setting code-writing efficiencies. Software demonstrates stability (i.e., tens to hundreds of hours error-free run times) across multiple mission system subsystems. Challenges remain, but development is on track, and DOD closely monitors program progress on technical issues and risk mitigation.

32. Senator THUNE. General Trautman and General Shackelford, I understand that development is expected to slip from 2 to 9 months. Exactly what caused that slip in development, and why won't this affect the production schedule adversely?

General TRAUTMAN. Pratt & Whitney experienced some problems during developmental testing. The cause of these problems was quickly identified and mitigation plans were put into place. The overall development of the air system has not been jeopardized. The Marine Corps expects to meet its steadfast IOC of 2012.

General SHACKELFORD. The current program status reflects average delays of approximately 3 months, driven by late bit/piece parts which have been driven by late configuration changes to accommodate "make-it-work" changes. A variety of mitigation actions are in work to maintain the current status and/or recover schedule. These include expediting teams at all critical part suppliers, increased staffing in key Lockheed Martin planning and assembly areas, and optimized/integrated work plans by ship by work station for each behind schedule aircraft.

33. Senator THUNE. General Trautman and General Shackelford, please explain how the program intends to mitigate the slip to maintain or recover its schedule.

General TRAUTMAN. Pratt & Whitney experienced some problems during developmental testing. The cause of these problems was quickly identified and mitigation plans were put into place. The overall development of the air system has not been jeopardized. The Marine Corps expects to meet its steadfast IOC of 2012.

General SHACKELFORD. The current program status reflects average delays of approximately 3 months, driven by late bit/piece parts which have been driven by late configuration changes to accommodate “make-it-work” changes. A variety of mitigation actions are in work to maintain the current status and/or recover schedule. These include expediting teams at all critical part suppliers, increased staffing in key Lockheed Martin planning and assembly areas, and optimized/integrated work plans by ship by work station for each behind schedule aircraft.

34. Senator THUNE. General Trautman and General Shackelford, please explain where the program is in terms of its systems integration plan and why the plan, and the program’s performance under that plan, will effectively mete out integration risk.

General TRAUTMAN. The JSF Program Office is actively monitoring all aspects of integration to include systems integration. The program as currently structured is balancing cost, schedule, and performance and the Marine Corps has confidence in the Program Executive Officer’s way forward to meet our IOC date of 2012 while delivering a Block II air system.

General SHACKELFORD. As of May 2009, systems integration testing continues on plan via flight tests, a flying lab and over 150,000 hours of ground labs testing. A fully integrated mission systems jet will fly later this year. All F-35 variants are projected to meet their respective key performance parameters. The F-35 plan for incremental blocks of capability balances cost, schedule, and risk.

Extensive use of ground test laboratories, modeling and simulation techniques, and flying test beds continue to mature designs and burn-down development risk far in advance of flight testing. Deliveries of SDD aircraft are approximately 3 months on average behind plan, but mitigation plans are in place to maintain or recover schedule. Challenges remain, but development is on track, and DOD closely monitors program progress on technical issues and risk mitigation.

The cooperative avionics test bed (CATB), a modified Boeing 737 designed to validate the JSF’s avionics suite, has flown 65 flights and 165 total hours, including 54 hours of mission systems testing. The nose of this aircraft has been modified to replicate the F-35, and a 13-foot canard has been added to emulate the wing. External structures on the aircraft’s top and bottom hold F-35 avionics equipment and about 1,500 wiring harnesses to connect and link the various mission system sensors. This aircraft will integrate and validate the performance of all F-35 sensor systems before they are flown on F-35 aircraft. CATB recently successfully deployed with Block 0.5 software, which will be the operational load in the first LRIP I jet deployed to Eglin next year.

Three SDD jets (AA-1, BF-1 and BF-2) are in flight testing. The remaining SDD jets and ground test articles, plus LRIP I and LRIP II aircraft, are in various stages of production. The SDD jets are taking longer to build than planned, but setting new standards for quality, and manufacturing efficiencies that improve with each jet. Software is 74 percent complete, with 13 million lines of code, per the spiral development plan/schedule and with record-setting code-writing efficiencies. Software demonstrates stability (i.e., tens to hundreds of hours error-free run times) across multiple mission system subsystems.

35. Senator THUNE. General Trautman and General Shackelford, I understand that the F135 engine has seen considerable cost growth. Please explain how much costs have grown in the engine program and what measures will be employed to control costs in there.

General TRAUTMAN. The Marine Corps does not manage specific aspects of the program to include costs. The Program Office, as the executive agent of the government to industry, is actively managing all aspects of the program with regard to cost, schedule, and performance. The Program Executive Officer has taken direct measures to manage cost growth in the propulsion system.

General SHACKELFORD. The F135 SDD contract estimate has increased from \$4.8 billion at contract award in 2001 to \$6.7 billion now. Primary drivers of the \$1.9 billion increase were approximately \$1 billion for the 2004 F-35 replan to address weight-driven aircraft performance issues and \$0.8 billion for implementation of over target baseline due to cost overruns.

Cost estimates for production engines have also increased. Much of the final engine cost is associated with Pratt and Whitney suppliers. Pratt is visiting its major suppliers to help them improve efficiencies and reduce cost in key areas. Pratt also has a robust affordability initiatives process in place that identifies new manufacturing processes and design changes that reduce manufacturing time and costs. A board reviews proposed initiatives and implements them if the business case is posi-

tive. In addition, the program office has implemented a cost control objective award fee area to incentivize Pratt and Whitney to focus on cost control.

36. Senator THUNE. General Trautman and General Shackelford, at this point, where do you see the most significant risk in the program?

General TRAUTMAN. Interrupting the stable funding profile as submitted in PB10 would introduce risk to the program.

General SHACKELFORD. Extensive use of ground test laboratories, modeling and simulation techniques and flying test beds continue to mature designs and burn-down development risk far in advance of flight testing. All F-35 variants are projected to meet their respective key performance parameters. Deliveries of SDD aircraft are approximately 3 months on average behind plan, but mitigation plans are in place to maintain or recover schedule. Challenges remain, but development is on track, and DOD closely monitors program progress on technical issues and risk mitigation. A key management focus area now is SDD cost and schedule pressures. The key drivers for these challenges are supply chain growing pains, design change traffic and, as with all development aircraft programs, flight test progress.

37. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, GAO's March 2009 report, "JSF—Accelerating Procurement before Completing Development Increases the Government's Financial Risk," notes that "two recent [DOD] estimates indicate that JSF development will cost more and take longer to complete than reported to Congress in April 2008, primarily because of contract cost overruns and extended time to complete flight testing." According to GAO, DOD projects that JSF developmental costs could increase between \$2.4 and \$7.4 billion, with the program experiencing schedule delays of up to 3 years. Only last year, DOD's JSF program-of-record indicated completing development would require \$7.4 billion and a DOD Joint Estimating Team (JET) estimated the cost at more than \$15 billion. The JSF Program Office concluded that completion of aircraft development would require \$9.8 billion. Of course, these varying estimates stand in stark contrast to DOD's April 2008 Selected Acquisition Report (SAR) which seemingly concluded that JSF costs were actually decreasing. Needless to say, with an approaching strike fighter gap in the Navy and fighter gap in the Air Force, these discrepancies are troubling.

However, under the current budget proposal and despite increasing development costs and schedule slips DOD is apparently intending to accelerate JSF procurement. According to GAO, such acceleration could require up to an additional \$33.4 billion over the next 6 years and would expose the Government to additional risk of cost growth. GAO estimates that an accelerated plan could have DOD procuring 360 JSF aircraft costing approximately \$57 billion before development flight testing is completed.

Based on your experience over many years, both in and out of government, is it your sense that DOD has a good handle on JSF program cost, performance, and schedule? If so, why the significant variations in DOD's own cost/schedule estimates? If not, what steps should DOD and Congress take to get arms around program cost, performance, and schedule?

Admiral ARCHITZEL and Admiral MYERS. As clarification, the Pentagon JET projected a potential \$3.6 billion development cost increase (excluding F136 engine continuance), not an additional \$15 billion development cost increase.

The Department constantly monitors the JSF Program's development through an unmatched oversight structure, befitting the largest single acquisition program in the Department. The program recently awarded the third LRIP lot for 14 United States aircraft with the costs at the Department's budgeted figure. The costs for the engine have increased over the last year and the program is taking steps to work with the engine contractor to reduce those costs. In 2008, the Department chartered a JET to provide an independent assessment of program cost and schedule. The JET identified F-35 development and production risks. Through rigorous reviews, DOD and our international partner leaders are tracking those risks and making recommendations on how to appropriately address those risks. In the fiscal year 2010 budget request, additional development funding was added as a result of these reviews. The development schedule remains on track with some risk to completing the test schedule on time. The additional funding budgeted in fiscal year 2010 will help address those risks, and the Department will review the progress again in preparation for the fiscal year 2011 budget submission. The performance is tracking to projections and meeting all requirements. The test aircraft are exhibiting unmatched reliability for this stage of testing. Static and durability testing of ground test aircraft are providing excellent results and the engine performance is providing more

thrust than required. By the end of fiscal year 2010, we expect to have all of the development and LRIP Lot 1 aircraft delivered.

General TRAUTMAN. The Marine Corps has confidence in current leadership of the JSF program to manage cost, schedule, and performance. PEO JSF has submitted updated cost schedules to OSD and the Marine Corps has confidence that these schedules will be met.

General SHACKELFORD and General GIBSON. Yes, DOD has a good handle on the cost, schedule, and performance of the JSF Program. The Services have spent considerable time reviewing the program and bringing in independent cost experts to develop a joint cost estimate. This joint estimate assessed the overall ability to execute the development program and identified technical and executing constraints. It developed cost and schedule estimates reflecting F-35 performance to date and performance of other DOD programs and suggested improvements that address cost and schedule issues. Internal JSF Program Office estimates are more optimistic based on early, upfront investments made in the program. There are significant program milestones that will take place this year and in fiscal year 2010 which will determine how well the program is doing against the current joint estimate.

38. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, in light of the size, scope, cost, and importance of the JSF program, should DOD release copies of the JSF Program Office and DOD JET estimates/reports identified by GAO?

Admiral ARCHITZEL and Admiral MYERS. The JET assessment was a DOD predecisional, for official use only effort to support the Department's development of the fiscal year 2010 President's budget and outyear planning. The Department provided briefings last fall to the Government Accountability Office (GAO) on the JET's conclusions and assumptions and the Program Office's perspectives on the same.

General TRAUTMAN. The JSF Program Office is managing all cost estimates and reports and is treating these documents as FOUO information. The Marine Corps has confidence in the JSF program leadership.

General SHACKELFORD and General GIBSON. No, the JET assessment was a DOD predecisional, for official use only effort to support the Department's development of the fiscal year 2010 President's budget and outyear planning. The Department provided briefings last fall to GAO on the JET's conclusions and assumptions and the Program Office's perspectives on the same.

39. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, does there need to be a more open and insightful dialogue or debate on the significant challenges confronting the JSF program?

Admiral ARCHITZEL and Admiral MYERS. Various leadership from DOD, Navy, Air Force, Marines, and F-35 International Partners routinely convene to review program status, address issues, discuss planning, and provide strategic oversight. Standing forums include the following: Joint Executive Steering Board (i.e., Configuration Steering Board); Senior Warfighter Group; Autonomic Logistics Advisory Council; CEO Conference; Training Advisory Council; and Interoperability Advisory Council. The annual periodic Defense Acquisition Board (DAB) provides a forum for Department leadership to scrutinize all aspects of the F-35 program. The Services have frequent interaction with the joint program office and prime contractors from the working group to senior executive level. In these engagements, the challenges of the program are worked with all stakeholders present in a collaborative manner. The current level of dialogue and debate both within and external to the Department is both open and effective.

General TRAUTMAN. The Marine Corps is confronting all challenges and looks forward to developing CONOPS for this fifth-generation aircraft. The Marine Corps welcome dialogue from both Government and Industry as it bridges forward toward the JSF.

General SHACKELFORD and General GIBSON. The Department has briefed the GAO on the JET's estimates and the JET briefing has been significantly referenced in the GAO report released in March 2009. The challenges facing the JSF program are manageable and are overseen by the DOD and the Services on a continuing basis.

40. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, some have speculated that the additional funding for JSF announced earlier this month

by Secretary Gates may reflect in part the restoral of funds that were removed at one time from the program in order to manage cost growth. With cost increases and schedule slips of this magnitude, do you see any way that this program can or will avoid breaching one or more Nunn-McCurdy thresholds?

Admiral ARCHITZEL and Admiral MYERS. Funding announced for the JSF program in June was intended to address ramp-rate inefficiencies for the United States and international partners, not to restore funds previously removed. The JSF Program has declared two breaches since Milestone B in October 2001. The first breach was reported to Congress in March 2004, and primarily resulted from cost and schedule increases to weight-driven performance issues. The second breach was reported to Congress in spring 2006 as a result of new Nunn-McCurdy provisions in the National Defense Authorization Act for Fiscal Year 2006 requiring unit cost increases to be compared to the current baseline and the original Milestone B baseline. The 2006 breach primarily reflected the historical cost increases reported in 2004. Department leadership is closely monitoring program cost and schedule challenges and mitigations, but is not prepared to speculate on the likelihood of future Nunn-McCurdy threshold breaches.

General TRAUTMAN. The Marine Corps believes that JSF program leadership is managing cost and schedule to avoid breaching a Nunn-McCurdy threshold.

General SHACKELFORD and General GIBSON. Funding announced for the JSF program in June was intended to address ramp rate inefficiencies for the U.S. and international partners, not to restore funds previously removed. The JSF program has declared two breaches since Milestone B in October 2001. The first breach was reported to Congress in March 2004, and primarily resulted from cost and schedule increases to weight-driven performance issues. The second breach was reported to Congress in spring 2006 as a result of new Nunn-McCurdy provisions in the National Defense Authorization Act for Fiscal Year 2006 requiring unit cost increases to be compared to the current baseline and the original Milestone B baseline. The 2006 breach primarily reflected the historical cost increases reported in 2004. Department leadership is closely monitoring program cost and schedule challenges and mitigations, but is not prepared to speculate on the likelihood of future Nunn-McCurdy threshold breaches.

41. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, in your opinion does it make sense to increase concurrency between development and procurement?

Admiral ARCHITZEL and Admiral MYERS. The Department has not increased program concurrency. By design, the F-35 Program has substantial concurrency of development, test and production built into the schedule, a fact that the Department acknowledges and has approved. That concurrency is designed to provide the warfighters with a fifth-generation strike fighter to replace aging legacy aircraft as quickly as possible, as efficiently as possible, and as affordably as possible. The Department acknowledges the risks and benefits of the concurrency required to acquire and deliver this critical capability. The Department believes the program is well managed, with the proper amount of oversight, and well positioned to deliver on its promise. In summary, the F-35 acquisition strategy of developing and delivering incremental blocks of increasing capability to the warfighter provides the best balance of cost, schedule and risk.

General TRAUTMAN. The Marine Corps believes that the proper balance between procurement and development is being managed at this time.

General SHACKELFORD and General GIBSON. The Department has not increased program concurrency. By design, the F-35 program has substantial concurrency of development, test and production built into the schedule, a fact that the Department acknowledges and has approved. That concurrency is designed to provide the warfighters with a fifth-generation strike fighter to replace aging legacy aircraft as quickly as possible, as efficiently as possible, and as affordably as possible. The Department acknowledges the risks and benefits, of the concurrency required to acquire and deliver this critical capability. The Department believes the program is well managed, with the proper amount of oversight, and well positioned to deliver on its promise. In summary, the F-35 acquisition strategy of developing and delivering incremental blocks of increasing capability to the warfighter provides the best balance of cost, schedule and risk.

42. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, do you share GAO's concerns over the increasing cost risks this program poses for the government?

Admiral ARCHITZEL and Admiral MYERS. The Department is concerned about cost and schedule challenges for all acquisition programs and the JSF Program is no exception. In 2008 the Department did charter a Joint Estimate Team to provide an independent assessment of the program cost and schedule. The JET identified F-35 development and production risks. Through rigorous reviews, DOD leaders (along with our international partners) are tracking those risks and crafting mitigation strategies. In the fiscal year 2010 budget request, additional development funding was added as a result of these reviews. The development schedule remains on track, with some risk to completing the test schedule on time. The additional funding budgeted in fiscal year 2010 will help address those risks, and the Department will review the progress again in preparation for the fiscal year 2011 budget submission. The performance is tracking to projections and meeting all requirements. The test aircraft are exhibiting unmatched reliability for this stage of testing. Static and durability testing of ground test aircraft are providing excellent results and the engine performance is providing thrust required to safely conduct flight test. By the end of fiscal year 2010, we expect to have all of the development and LRIP Lot 1 aircraft delivered. The Department believes the program is well managed, with the proper amount of oversight, and well positioned to deliver on its promise.

General TRAUTMAN. The Marine Corps is always concerned with finding the right balance between cost, schedule and performance and believes that the right balance is being struck between these three variables.

General SHACKELFORD and General GIBSON. The Department is concerned about cost challenges for all acquisition programs and the JSF program is no exception. In 2008 the Department chartered a Joint Estimate Team (JET) to provide an independent assessment of the program cost and schedule. The JET identified F-35 development and production risks. Through rigorous reviews, DOD leaders are tracking those risks and making recommendations on how to appropriately address those risks. In the fiscal year 2010 budget request, additional development funding was added as a result of these reviews. The development schedule remains on track with some risk to completing the test schedule on time. The additional funding budgeted in fiscal year 2010 will help address those risks, and the Department will review the progress again in preparation for the fiscal year 2011 budget submission.

43. Senator THUNE. Vice Admiral Architzel, Lieutenant General Trautman, Lieutenant General Shackelford, Rear Admiral Myers, and Major General Gibson, any thoughts/recommendations on how to better manage this risk?

Admiral ARCHITZEL and Admiral MYERS. The Department constantly monitors the JSF Program's development through an unmatched oversight structure, befitting the largest single acquisition program in the Department. Through independent estimates and rigorous reviews, the Department and our international partners manage risk and make recommendations on how to mitigate it. DOD leadership continues to believe that the F-35 acquisition strategy of developing and delivering incremental blocks of increasing capability to the warfighter provides the best balance of cost, schedule and risk. The program is well managed, with the proper amount of oversight, and well positioned to mitigate risk.

General TRAUTMAN. The Marine Corps has confidence in JSF program leadership to manage risk.

General SHACKELFORD and General GIBSON. The Department constantly monitors the JSF program's development through an unmatched oversight structure, befitting the largest single acquisition program in the Department. Through independent estimates and rigorous reviews, the Department and our international partners manage risk and make recommendations on how to mitigate it. DOD leadership continues to believe that the F-35 acquisition strategy of developing and delivering incremental blocks of increasing capability to the warfighter provides the best balance of cost, schedule and risk. The program is well managed, with the proper amount of oversight, and well positioned to mitigate risk.

44. Senator THUNE. Admiral Architzel, the Services are planning on purchasing approximately 2,450 F-35 JSFs at a cost of over \$300 billion, a sum that reflects a cost growth of nearly 47 percent beyond original 2002 estimates. The Department of the Navy is obviously relying on the JSF to close the gap that it sees in strike fighter capability over the intermediate term.

But, GAO recently issued a report on the JSF program that was critical of its past cost overruns and schedule slips, and predicted that development will cost more and take longer than what has been reported to Congress. In November 2008, a Pentagon JET reportedly said the JSF program would require an additional 2 years of testing and would need another \$15 billion to cover new development costs.

If the JSF program costs continue to significantly increase and development does not go as well as promised, draining resources from other priority programs that are needed by the Department of the Navy, what alternatives may be available to the Navy to remedy its projected strike fighter shortfall and preserve its limited procurement base?

Admiral ARCHITZEL. The Department has four primary avenues for addressing its strike fighter inventory requirements within current force structure and force scheduling requirements. These include:

- Maintaining wholeness of the JSF program: 2012 F-35B initial operating capability (IOC), 2015 F-35C IOC with targeted procurement ramp to 50 aircraft per year;
- Making an estimated \$3.6B additional investment in POM-12 for the service life extension of approximately 295 F/A-18A-D Hornets from 8,600 flight hours to 10,000 flight hours service life;
- Continued sustainment of legacy aircraft; and
- Further procurement of F/A-18E/F Super Hornet.

Each of these management “levers” must be considered in balance of the others. With regard to further F/A-18E/F procurement, the Navy preserves the option through PR-11—if required—to procure additional Super Hornets beyond the current budgeted quantity without any break to Boeing’s production.

The challenge that Navy leadership is undertaking during the QDR and upcoming budget year, is to determine the necessary balance of these options in terms of force requirements, as they become evident over this summer’s review.

45. Senator THUNE. Admiral Architzel and General Trautman, if the JSF costs increase further and its schedule continues to slip, is it sound to hedge against further delays in fielding this strike fighter by continuing the manufacturing lines of legacy aircraft, such as F/A-18s, for example?

Admiral ARCHITZEL. Continued procurement of F/A-18E/F is one of four areas that the Navy will continue to assess through this summer’s QDR and into the following year’s budget submission. One hedge against further delays in the JSF already exists. The option for continued F/A-18E/F procurement could be exercised in fiscal year 2011, without a break in Boeing’s production line capability. Other avenues to all be considered—each in balance with one another—are: (1) maintaining wholeness of the JSF program; (2) making a roughly \$3.6 billion POM-12 additional investment to extend the service life of approximately 295 F/A-18A-D legacy Hornets from 8,600 to 10,000 flight hour service life; and, (3) continued funding for support of our legacy fleet aircraft.

General TRAUTMAN. The Marine Corps has made the decision to bridge to fifth-generation JSF. It will manage its legacy fleet of Hornets and Harriers in such a way to ensure that no gaps in capabilities exist before JSF is fielded.

46. Senator THUNE. Admiral Architzel, what is your view of the proposal to commit to the JSF program in light of the development and technology risk still associated with that program? In other words, what are your views regarding the current risk to the JSF program schedule during its SDD phase?

Admiral ARCHITZEL. The Department’s commitment to the JSF program is steadfast. The development schedule remains on track with some risk to completing the test schedule on time. The additional funding budgeted in fiscal year 2010 will help address those risks, and the Department will review the progress again in preparation for the fiscal year 2011 budget submission. The performance is tracking to projections and meeting all requirements. The test aircraft are exhibiting unmatched reliability for this stage of testing. Static and durability testing of ground test aircraft are providing excellent results and the engine performance is providing thrust required to safely conduct flight test. The test aircraft are exhibiting unmatched reliability for this stage of testing. By the end of fiscal year 2010, we expect to have all of the development and LRIP Lot 1 aircraft delivered. The Department believes the program is well managed, with the proper amount of oversight, and well positioned to deliver on its promise.

47. Senator THUNE. General Trautman, the Marine Corps plans to take initial deliveries of the B Model, Marine Corps, STOVL variant of the JSF beginning in September 2010 at Eglin AFB to support initial joint training for pilots and crews on the aircraft. Recently, the Air Force has run into potential problems due to environmental litigation in establishing the Initial Joint Training Site at Eglin as required by the 2005 round of Base Realignment and Closing (BRAC). If the Air Force basing

action supporting joint training on the JSF at Eglin is delayed, does the Marine Corps have a contingency plan?

General TRAUTMAN. The Marine Corps continues to invest in the Integrated Training Center at Eglin, AFB. We believe those problems encountered to realize the potential of JSF training at Eglin will be resolved in time to meet our training requirements. Until then the operations allowed and the associated under the Environmental Impact study Record of Decision meets our initial training requirements while we standup our activities over the next few years. We are looking at various options in conjunction with the Air Force and Navy if Eglin proves to be unworkable but we are not prepared at this early date to give up on our commitment to training both pilots and enlisted maintainers at Eglin, AFB.

48. Senator THUNE. General Trautman, are you aware of any potential production problems with the B Model of the JSF that could delay the schedule for standing-up the training squadron by September 2010 and the IOC for the first Marine Corps operational squadron scheduled for December 2012?

General TRAUTMAN. At this time we are not aware of any significant problems that would delay production. The JSF Program Office, in concert with Lockheed Martin, is managing the suppliers as well as the other partners of Northrup Grumman, BAE, and Pratt & Whitney. It is critical that funding remain as programmed to maintain the stable production rate that will ensure we receive our training jets in 2010 and meet our 2012 IOC.

49. Senator THUNE. General Trautman, if the B Model is delayed and the December 2012 IOC for the first Marine Corps operational squadron is delayed, what would be the impact on the Marine Corps component of the fighter gap?

General TRAUTMAN. The Marine Corps will continue to manage legacy fleets of Harriers and Hornets until introduction of STOVL JSF.

50. Senator THUNE. General Trautman, how much life is left in the legacy Marine Corps Hornet fleet composed of A+, C, and D models and what will it take to extend those aircraft until the F-35B is delivered to the Marine Corps?

General TRAUTMAN. The Marine Corps has an aggressive program of managing the operation life of all of its Harriers and Hornet models while waiting to introduce JSF into the operating forces.

51. Senator THUNE. General Trautman, regarding the acquisition of 420 F-35Bs, the Commandant of the Marine Corps recently testified to the committee that the Marine Corps "will reach IOC in 2012 with a standing squadron ready to deploy."

I am concerned that the Department of the Navy and the prime contractor have not yet completed testing for the STOVL variant, which is intended for the Marine Corps, and yet the F-35B has the most urgent demand for first deliveries.

On June 4, 2009, the Commandant of the Marine Corps testified that he understood that there will be a 7- to 9-month delay on the B-variant testing. Against that backdrop, I am highly skeptical that the Marine Corps will be able to field a deployable squadron in 2012. Please describe fully this slip in schedule. What is causing it? What possible assurances do you have that this slip will not extend longer than 9 months?

General TRAUTMAN. While there have been problems encountered with the F135 engine, these problems have been rectified and all indications show that these engineering changes have been effective. These problems concerned the propulsion system and not the air vehicle. The Marine Corps has confidence that program leadership will meet 2012 IOC.

52. Senator THUNE. General Trautman, with this slip, why are you not highly skeptical that the Marine Corps will be able to field a deployable squadron in 2012?

General TRAUTMAN. The Marine Corps understands the challenges facing the JSF program and knows that effective leadership is the key to success.

53. Senator THUNE. General Trautman, is anything being done to expedite responsible completion of operational testing on the B variant?

General TRAUTMAN. The Test & Evaluation Master Plan (TEMP) has been verified and Marine Aviation has confidence that this plan will deliver a fully operational F-35B.

54. Senator THUNE. General Trautman, when will final data on the unique noise and flight characteristics of the STOVL variant be available for incorporation into environmental studies and basing plans?

General TRAUTMAN. The noise and environmental studies are ongoing and results will be published once complete.

55. Senator THUNE. General Trautman, will there be a need to construct dedicated facilities to maintain the low-observable surfaces of the B variant?

General TRAUTMAN. No. All maintenance performed will be conducted at the organizational or depot level and will not require dedicated facilities.

56. Senator THUNE. General Trautman, in addition to the slip in testing schedule, what other challenges do you face in meeting the Commandant's requirement for an operational squadron in 2012?

General TRAUTMAN. Maintaining a steady funding profile as put forth in PB10 will be essential to meeting 2012 IOC.

57. Senator THUNE. General Trautman, will new range targets, threat emitters, and F-35 flight and weapons delivery profiles require updates to the environmental impact statements (EISs) supporting Air Force, Navy, and Marine Corps use of established range complexes? If so, when will those requirements be developed to support the EISs or environmental analyses needed to upgrade the range complexes to support pilot training, pre-deployment training, and weaponry for the F-35?

General TRAUTMAN. The Marine Corps will utilize its existing ranges for the STOVL variant. In addition we plan to leverage the advancements in full mission simulators. With these simulators and our existing ranges we believe we will be prepared to train to the full capabilities of the JSF.

It is possible that future Barry M. Goldwater Range (BMGR) upgrades will be necessary and the Marine Corps basing EIS will contain programmatic language to address any future evolving training needs as the platform matures and requirements are refined. For example, the U.S. Marine Corps and U.S. Air Force operate threat emitters on BMGR that may need to be upgraded to support F-35 training. Any upgrade required would be functionally independent of F-35A/B basing and would be required regardless of any F-35A/B basing decision. However, no requirement to upgrade BMGR threat emitters has been identified at this time.

U.S. Marine Corps and U.S. Air Force have prepared numerous EIS documents over the years in support of aviation operations on BMGR. Most of the contentious environmental issues involve impacts to endangered species, in particular the Sonoran pronghorn. U.S. Marine Corps and U.S. Air Force have received Biological Opinions for their operations from Federal Wildlife Service (FWS) and are fully compliant with all environmental regulations.

58. Senator THUNE. General Trautman, will any of the range complexes be used for additional flight training, such as an outlying landing field (OLF) or auxiliary field (Aux Field), requiring an update to account for the distinct flight characteristics of the F-35 as compared to legacy aircraft?

General TRAUTMAN. No. JSF will operate at existing OLFs and Auxiliary fields.

59. Senator THUNE. General Trautman, at this point, will Marine Corps ranges be ready to support initial operational training in 2012?

General TRAUTMAN. The Marine Corps will utilize our existing ranges for the STOVL variant. In addition we plan to leverage the advancements in full mission simulators. With these simulators and our existing ranges we believe we will be prepared to train to the full capabilities of the JSF.

It is possible that future Barry M. Goldwater Range (BMGR) upgrades will be necessary and the Marine Corps basing EIS will contain programmatic language to address any future evolving training needs as the platform matures and requirements are refined. For example, the U.S. Marine Corps and U.S. Air Force operate threat emitters on BMGR that may need to be upgraded to support F-35 training. Any upgrade required would be functionally independent of F-35A/B basing and would be required regardless of any F-35A/B basing decision. However, no requirement to upgrade BMGR threat emitters has been identified at this time.

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60. Senator THUNE. General Trautman, what is the current program of record for the number of F-35s to be stationed at your first operational location?

General TRAUTMAN. We will stand up our first operational squadrons at MCAS Yuma, AZ. We are in the process of conducting our environmental impact studies, dependent upon the study findings our preferred option is to base up to 86 STOVL aircraft.

61. Senator THUNE. General Trautman, are you on track with all environmental actions and construction activities to be able to meet your deadline?

General TRAUTMAN. Yes, all environmental impact studies are being conducted and funding is in place for military construction.

62. Senator THUNE. General Trautman, will you have aviation training ranges ready to support the full spectrum of F-35 operations? If not, what is the plan for the Marine Corps to get ranges ready?

General TRAUTMAN. The Marine Corps will utilize our existing ranges for the STOVL variant. In addition we plan to leverage the advancements in full mission simulators. With these simulators and our existing ranges we believe we will be prepared to train to the full capabilities of the JSF.

It is possible that future BMGR upgrades will be necessary and the Marine Corps basing EIS will contain programmatic language to address any future evolving training needs as the platform matures and requirements are refined. For example, the U.S. Marine Corps and U.S. Air Force operate threat emitters on BMGR that may need to be upgraded to support F-35 training. Any upgrade required would be functionally independent of F-35A/B basing and would be required regardless of any F-35A/B basing decision. However, no requirement to upgrade BMGR threat emitters has been identified at this time.

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63. Senator THUNE. General Trautman, are you concerned that the establishment of a joint pilot training base for the F-35 at Eglin AFB, which is currently delayed due to litigation over the EIS, will affect Marine Corps pilot production by 2012? If so, what actions are you taking to mitigate the risk? Are these actions fully supported and funded in the budget request for fiscal year 2010?

General TRAUTMAN. The initial standup of training capabilities at Eglin is on track. Currently we are experiencing no delays in the necessary construction of facilities required to commence training activities. We are firmly committed to training aircrew and enlisted maintainers at the Integrated Training Center at Eglin, AFB. We believe there are synergies to be gained by training aircrew and maintainers at the same location with our sister services as well as the current U.S. Marine Corps pooling agreement with the United Kingdom.

64. Senator THUNE. General Trautman, could Marine Corps Air Station (MCAS) Yuma serve as a permanent location for the training of Marine Corps Lightning pilots in case Eglin AFB cannot fully support the Marine Corps requirement?

General TRAUTMAN. MCAS Yuma will serve as our first operational base as we transition our legacy fleet to the STOVL JSF. We are firmly committed to training our aircrew and enlisted maintainers at the Integrated Training Center at Eglin, AFB. We are looking at options to conduct training elsewhere, if Eglin becomes unavailable, but are awaiting the findings of our West Coast EIS to inform any decision.

65. Senator THUNE. General Trautman, what efficiencies can the Marine Corps gain by combining training and operational squadrons at one location?

General TRAUTMAN. Any efficiency to combine operational and training squadrons will have to be studied extensively before any decisions could be made. Right now the Marine Corps is committed to standing up the first Integrated Training Center at Eglin, AFB, followed by our stand-up of operational squadrons at MCAS Yuma starting in 2012.

66. Senator THUNE. General Shackelford and General Gibson, a few days ago, Air Force Chief of Staff Norton Schwartz signaled that the Air Force's requirement for 1,763 F-35 JSFs is being examined during the comprehensive QDR now under way. General Schwartz moreover said that the Air Force's plan to field a total of 2,250 fighters, both old and new, is also under review. He said, "it could end up being

less,” adding, “if that’s the case, we will still have a predominately F-35 [force].” Still, General Schwartz said he expects to have well over 1,500 F-35s. Subject to the completion of the QDR, what is your assessment of the Air Force’s overall requirement for JSF?

General SHACKELFORD and General GIBSON. Since one of the primary outputs of the QDR will be a new force sizing construct, it is premature to speculate on the total JSF requirement. Based on current joint campaign analysis, General Schwartz’s estimate appears to be about right. While the total requirement is being evaluated, the Air Force is currently focused on ensuring that the F-35 procurement and capabilities are on track to recapitalize our aging fighter force. Optimized for global precision attack against ever-evolving and more advanced enemy threat capabilities, the F-35A remains a crucial element of the Air Force’s future fighter force structure, and as a decisive addition to the Air Force’s fifth-generation fighter fleet, the F-35A will complement the air dominance capabilities of the F-22.

67. Senator THUNE. General Trautman and General Gibson, a key tenant of Secretary Gates’ tactical aviation (TACAIR) plan is the F-35 JSF. If the F-35 schedule slips or the rate of production is less than assumed, for example, 35 aircraft per year versus 50 per year, alternatives for managing the strike fighter shortfall seem limited. Can the Air Force continue to extend the service life of its legacy strike fighter aircraft, such as A-10 Warthogs, F-16 Falcons, and F-15 Eagles as a bridge to fielding the JSF?

General TRAUTMAN. While the Marine Corps can not comment on the Air Forces plans to the extend service life of their fighter aircraft fleet, Marine Aviation is taking direct and critical measures to manage our legacy fleets of Hornets and Harriers. The Marine Corps will manage our legacy fleet through positive steps of CONOPS and funding in order to bridge the gap to our fifth-generation STOVL JSF. The Marine Corps is confident we can extend the service lives of legacy while bridging to a true fifth-generation weapon system.

General GIBSON. Yes, it is possible to extend the service life of the legacy strike fighter aircraft. The Air Force Fleet Viability Board (FVB) has assessed the long-term viability of the A-10 and F-15C/D fleet and determined these fleets can be sustained beyond the original planned service life with additional investments. In addition, modernization upgrades will be required to provide our legacy aircraft improved capability to operate in controlled airspace and against the emerging air and ground threats. While the FVB has not yet assessed the F-16 or F-15E fleet, we expect similar conclusions for these aircraft.

68. Senator THUNE. General Trautman and General Gibson, what other potential alternatives do you see for maintaining sufficient strike assets in the face of additional slips in the F-35’s IOC?

General TRAUTMAN. The Marine Corps has confidence and will manage our legacy fleets of Hornets and Harriers with funding and CONOPS as we bridge to the fifth-generation JSF air system.

General GIBSON. Chief of Staff of the Air Force General Schwartz has stated on many occasions that the key to the Air Force’s fighter recapitalization is the F-35. We have invested heavily in the F-35 program and are closely tracking developments in order to ensure that it stays on track. General Schwartz believes it is imperative to direct as much funding as possible toward development of the F-35, the aircraft designated to replace the F-16 and A-10 for the Air Force. Any delay in procurement could increase the cost and further delay the F-35 for the Air Force, Navy, and Marine Corps. Until procurement of the F-35 is at full rate, the AF is taking steps to further evaluate the sustainability and viability of its legacy fleet, a process which may take several years to complete.

69. Senator THUNE. General Trautman and General Gibson, earlier this month, Secretary Gates told his Japanese counterpart that the United States still has no plans to export the F-22 Raptor. Secretary Gates reportedly cited a longstanding congressional prohibition on international sales of the F-22. But keeping the F-22 line hot may make sense while the verdict on whether the first operationally capable JSF will be delivered on time. Should Congress consider lifting that prohibition and allow FMS of F-22s, for instance to Japan and Australia, which have expressed some interest?

General TRAUTMAN. The Marine Corps has no comment on the question of Congress lifting the ban on sales of the F-22 to FMS customers. The Marine Corps is committed to the fifth-generation JSF program and we look forward to bridging the gap from our legacy fleet of Hornets and Harriers to the STOVL JSF.

General GIBSON. Because U.S. law (the Obey Amendment) specifically forbids export of the F-22, the Air Force is prohibited from spending funds on any activity related to export of the aircraft. If the law did allow export, the Air Force would work with the Office of the Secretary of Defense, the Interagency, and the Congress to determine if export is appropriate and to which countries. Exportability issues, such as configuration and technology transfer/foreign disclosure, and related political-military matters would need to be addressed before considering F-22 sales to Japan, Australia, or any other partner nation.

F/A-18 SUPER HORNET PROCUREMENT AND INDUSTRIAL BASE

70. Senator THUNE. Admiral Architzel and Admiral Myers, in an October 2008 Center for Strategic and Budgetary Assessment (CSBA) report on the U.S. Defense industrial base, CSBA concluded the following:

In stark contrast to the obvious and proactive steps being taken by DOD in an effort to preserve a competitive domestic shipbuilding industrial base, DOD appears to be taking a very laissez-faire approach to the Nation's tactical fighter aircraft industrial base; an approach that could, if not addressed, quickly result in the loss of a competitive domestic tactical fighter industrial base.

The Department of the Navy has recognized a tactical fighter shortfall of more than 200 aircraft in the years ahead due primarily to delays in the JSF program and the rapid aging of older F/A-18 aircraft. However, DOD has not indicated its long-term intentions when it comes to the future of the F/A-18E/F program, which is in the last year of its second multi-year contract.

There can be no doubt that the F/A-18E/F is both an operational and an acquisition success story and has been cited by DOD as one of its few model programs. Yet, if the Navy does not procure additional F/A-18s, its tactical fighter shortfall will persist and the supplier base and production line will shut down. At that point, the Nation will be left with only one tactical fighter manufacturer. Please comment on the apparent inconsistencies in DOD's management of the shipbuilding and tactical fighter industrial base issues.

Admiral ARCHITZEL and Admiral MYERS. Continued procurement of F/A-18E/F alone will not eliminate the strike fighter shortfall. It is however, an avenue that continues to be assessed within current force structure and force scheduling requirements. The Navy's option for continued F/A-18E/F procurement could be exercised in fiscal year 2011, without a break in Boeing's production line capability. The point to be recognized is that the Department of the Navy has opportunity through PR-11 to continue to assess F-35B and F-35C testing, delivery and transition into the fleet, before critical decisions regarding further Super Hornet procurement must be made. This time allows leadership the opportunity to consider the assessments and recommendations of this summer's QDR in order to determine the necessary balance between Department of Navy JSF programatics, F/A-18A-D service life extension, continued support to legacy aircraft, and possible additional F/A-18E/F procurement. All four avenues the Department of Navy is pursuing to manage its predicted strike fighter trend support multiple sectors of the Nation's fighter production and supply base.

71. Senator THUNE. Admiral Architzel and Admiral Myers, referring back to the CSBA report, do you see DOD's approach to the tactical fighter industrial base as being consistent, thoughtful, long-term, and effective?

Admiral ARCHITZEL and Admiral MYERS. The Department of Navy's current strike fighter inventory trend is due to a combination of factors, including utilization of F/A-18A-D Hornets beyond their originally designed 6,000 and extended 8,000 flight hour service life, as well as past programmatic IOC slips to JSF. Department of Navy has made adjustments to these realities and currently preserves the option through PR-11—if required—to procure additional F/A-18E/F Super Hornets beyond the current program of record quantity of 506. This has the benefit of mitigating the risk of a potential slide to JSF IOC, but also gives the Department of the Navy additional time to thoroughly consider and assess the ramifications of completing production of Super Hornets as currently planned, or opting to procure more should that be decided upon by Navy leadership during the QDR this summer.

72. Senator THUNE. Admiral Architzel and Admiral Myers, should DOD and Congress be concerned with the loss of both design, development, and manufacturing skill sets and domestic competition if production of F/A-18s is terminated?

Admiral ARCHITZEL and Admiral MYERS. The Department of the Navy does view with concern the Nation's aviation industrial base as we neck down our hot fighter

line production to one manufacturer. We are, however, starting the analysis process for the next air dominance platform. The Navy will need to replace Super Hornets in the 2025 timeframe. What that platform will be remains to be seen, but industry will be gearing up to compete for that platform, which we hope will help to sustain the industrial base and those critical skill sets you have described.

73. Senator THUNE. Admiral Architzel and Admiral Myers, in light of both an operational/inventory requirement (i.e., shortfall) and industrial base concerns, do you believe it makes sense for DOD to procure additional F/A-18E/Fs over the course of the next 3 to 5 years, if not longer?

Admiral ARCHITZEL and Admiral MYERS. Based on this summer's QDR, which will look at essential capability and required capacity that carrier aviation must provide in balance with other DOD requirements and priorities, different opportunities will be considered in resourcing the Navy's strike fighter requirements. While the Navy preserves the option through PR-11—if required—to procure additional F/A-18E/F Super Hornets beyond the current budgeted quantity, three other complementary avenues are being assessed in resourcing the Department of Navy's strike fighter requirements. These avenues include attaining the IOC of the Department's JSFs on time (2012 F-35B and 2015 F-35C) and at planned quantities. The Department of Navy also continues to assess and make determinations on investing in the service life extension of up to 295 of its F/A-18A-D legacy Hornets. Finally, the Department will continue to invest in the sustainment of legacy aircraft to keep them viable throughout their increased service life.

None of the four avenues alone solve the Department of Navy's strike fighter requirements and each carries a unique level of financial commitment over different returns on investment that need to be considered with qualities of combat capability. All of the opportunities for resourcing Navy strike fighter requirements are interdependent and Department leadership is considering each opportunity carefully to achieve the necessary balance of capability and capacity as force requirements become evident over this summer's review.

74. Senator THUNE. Admiral Architzel and Admiral Myers, based on low pricing and projected cost savings, should DOD procure additional F/A-18s under a third multi-year procurement contract?

Admiral ARCHITZEL and Admiral MYERS. Based on this summer's QDR, which will look at essential capability and required capacity that carrier aviation must provide in balance with other DOD requirements and priorities, different opportunities will be considered in resourcing the Navy's strike fighter requirements. The Navy preserves the option through PR-11, if required, to procure additional F/A-18E/F Super Hornets beyond the current program of record of 506. Three other complementary avenues are being assessed in resourcing the Department of Navy's strike fighter requirements. Attaining the IOC of the Department's JSFs on time (2012 F-35B and 2015 F-35C) and at planned quantities is essential. The Department of Navy continues to assess investing in the service life extension of up to 295 F/A-18A-D legacy Hornets. Finally, the Department will continue to invest in the sustainment of legacy aircraft to keep them viable throughout their increased service life.

None of the four avenues alone solve the Department of Navy's strike fighter requirements and each carries a unique level of financial commitment over different returns on investment that need to be considered with qualities of combat capability. All of the opportunities for resourcing Navy strike fighter requirements are interdependent and Department leadership is considering each opportunity carefully to achieve the necessary balance of capability and capacity as force requirements become evident over this summer's review.

Historically the F/A-18 multi-year programs have been the most effective means of procuring aircraft because they met the criteria of a multi-year (3–5 years) timeframe and provided the required 'substantial' savings. Should the decision to procure additional F/A-18s be made by Navy leadership during this summer's QDR which meet these criteria, then we will look at all appropriate acquisition strategies including a potential third multi-year procurement contract.

PROPOSED PLANS FOR F-22 RAPTOR

75. Senator THUNE. General Shackelford and General Gibson, how troubled should we be about the President's proposal to end the production of the F-22 fighter aircraft at 187, representing 183 planes currently in the fleet plus 4 sought in the fiscal year 2009 Supplemental?

General SHACKELFORD and General GIBSON. The U.S. Air Force continuously reviews the appropriate capabilities and force mix necessary to support the National Defense Strategy across the full spectrum of conflict. This activity has increased attention now in the context of the QDR. Because we're assuming a greater level of risk with a reduced F-22 fleet, it will be critical that the U.S. Air Force makes appropriate investments to ensure the remaining F-22 airframes are upgraded with increments 3.2 and 3.3 to maximize air-to-air and air-to-ground effectiveness, increase interoperability, and ensure F-22 aircraft flexibility in employment/deployment. The U.S. Air Force can also mitigate risk in the near term by investing in upgraded F-15C radar and weapons capabilities (e.g., infrared search and track system and APG-63(v)3 active electronically scanned array radar) to aid in achieving air superiority. Outside the FYDP, ensuring that an appropriate number of F-35s are procured to fulfill both homeland defense and expeditionary operations, as a complement to a reduced F-22 fleet, will also be critical.

76. Senator THUNE. General Shackelford and General Gibson, former Air Force leaders have conveyed to the Airland Subcommittee that they believe that the number of F-22s required to conduct operations in two major regional contingencies against adversaries capable of contesting our control of the air is 381, not even 243, as has been proposed by some incumbent members of Air Force leadership. Are you concerned that the proposed cut to this program may result in insufficient capability needed to support two major regional contingencies?

General SHACKELFORD and General GIBSON. With fewer F-22s, we have acknowledged that the U.S. Air Force will accept higher levels of risk in support of the current National Defense Strategy, especially when viewed in the context of time to achieve military objectives. We can mitigate those risks with better intelligence and a more flexible force. We can also ensure that our legacy platforms are upgraded appropriately to ensure maximum lethality and survivability, and that our pilots are given the tools (flight hours, training, and munitions) to retain the critical skills necessary to enable our battle plans. Lastly, some contingencies will require the unique capabilities of fifth-generation fighters—we will continue to examine the correct mix of our upcoming multi-role F-35 fleet to the reduced air-to-air F-22 fleet.

77. Senator THUNE. General Shackelford and General Gibson, why is the current F-22 program-of-record, and other available tactical fighter assets that could be brought to the fight, not sufficient to achieve air superiority in two major regional contingencies waged by relevant adversaries? What data or analysis supports your position?

General SHACKELFORD and General GIBSON. The Air Force fighter force structure has been studied extensively by Major Commands and the Air Staff using campaign modeling tools. This body of analysis indicates that, combined with the appropriate legacy aircraft modernization in the near term and a successful F-35 procurement program for the mid- to long-term, the 187 aircraft F-22 program-of-record is sufficient to achieve air superiority at higher risk in the current National Defense Strategy of two major combat operations against relevant adversaries.

78. Senator THUNE. General Shackelford and General Gibson, are you aware of any data or analysis that supports ending the production of F-22s after 187? If so, please explain.

General SHACKELFORD and General GIBSON. Extensive Air Force analysis at the Air Force and Joint campaign level shows that within the current force planning constructs, 243 F-22s represent a moderate level of risk. A smaller fleet size increases warfighting, training, and fleet sustainment risks. Any risk assumes adequate weapons availability, no change to programmed upgrades, and F-35 production remains on track.

79. Senator THUNE. General Shackelford and General Gibson, why shouldn't we conclude that this proposal is only budget driven?

General SHACKELFORD and General GIBSON. All weapons system procurements are driven by budget considerations and the F-22 is no exception. As Secretary Donley and General Schwartz said in a April 13, 2009 Washington Post Op Ed: "We assessed the issue (number of F-22s) from many angles, taking into account competing strategic priorities and complementary programs and alternatives—all balanced within the context of available resources."

80. Senator THUNE. General Shackelford and General Gibson, do you believe that the decision on the F-22 program has been subject to sufficient full and open de-

bate, as one would expect of any other proposed major change to a force-sizing construct?

General SHACKELFORD and General GIBSON. As Secretary Donley and General Schwartz said in a April 13, 2009 Washington Post Op Ed: “We assessed the issue (number of F-22s) from many angles, taking into account competing strategic priorities and complementary programs and alternatives—all balanced within the context of available resources. These assessments have concluded that, over time, a progressively more sophisticated mix of aircraft, weapons and networking capabilities will enable us to produce needed combat power with fewer platforms.”

81. Senator THUNE. General Shackelford, Secretary Gates has testified to this committee that the Air Force does not need any more F-22 Raptors and that he proposes to end the line at 187, the stated requirement. However, Air Force Chief of Staff General Schwartz has reportedly maintained that the Air Force needs 243 F-22 Raptors to maintain air superiority. According to one report, he testified that: “243 [F-22s] is the right number and 187 is the affordable force.” What is the right number? Why do you believe that’s the right number?

General SHACKELFORD. The 243 F-22s would provide the Joint Force with moderate risk in accordance with Defense Planning Guidance. 187 F-22s will generate higher risk but is the affordable number of F-22s. These numbers are consistent with AF/A9 Force Structure Analysis.

82. Senator THUNE. General Shackelford, when the Air Force talks about a strike fighter gap are you talking about an Air Force-only strike fighter gap or does your analysis capture total joint capability required for air superiority?

General SHACKELFORD. When analyzing the capabilities required to gain and maintain air superiority in support of combatant commanders, total joint capability is considered, however, the Air Force-specific requirements are extracted from postulated joint campaign requirements.

In light of ongoing assessments such as the QDR and its related studies, we are taking a close look at the projected fighter force requirements of the coming decade and beyond. The emerging National Defense Strategy and its attendant force planning construct will have a direct bearing on establishing the requirement for Air Force fighter capabilities.

AIR FORCE CLOSE-AIR SUPPORT FOR MARINE CORPS IN THEATER

83. Senator THUNE. General Shackelford, recently, the Marine Corps requested approval to reprogram funds to develop and field a modified KC-130J tanker that will provide it with, among other things, enhanced close-air support in theater. In connection with that request, the Marine Corps cited an urgent need for that platform, asserting that “Marine Corps ground forces have needed, but have not benefitted from, capabilities of aircraft such as the very high demand, low density AC-130.” I interpret this to mean that the Marine Corps is saying that it has asked for, but not received, close-air support from the Air Force in theater. Do you agree with that assertion?

General SHACKELFORD. No. The Air Force hasn’t turned down any “Request for Forces” (RFFs) to support Marines on the ground in theater. At the tactical level, CAS requests are prioritized and filled daily and there are no requirements we are aware of that haven’t been filled. Finally, Allied Forces Central Europe (NATO) (AFCENT) has not received any negative feedback from Marine Forces Central Command (MARCENT) about the lack of Air Force CAS support. The Marines, as well as other components, have a liaison officer (LNO) in the Combined Air Operation Center (CAOC) to coordinate requests or requirements, and maintain a current and relevant picture of the other component operations. LNOs work for their respective component commanders and works with the Joint Force Air Component Commander (JFACC) and staff. The component liaisons serve as conduits for direct coordination between the JFACC and their respective component commanders. The liaisons have the responsibility of presenting component perspectives and considerations regarding planning and executing joint air operations.

84. Senator THUNE. General Shackelford, has the Air Force been turning down requests for forces to support marines on the ground in theater? If so, why?

General SHACKELFORD. No. The Air Force hasn’t turned down any RFFs to support marines on the ground in theater. At the tactical level, CAS requests are prioritized and filled daily and there are no requirements we are aware of that haven’t been filled. Finally, AFCENT has not received any negative feedback from

MARCENT about the lack of Air Force CAS support. The Marines, as well as other components, have a LNO in the CAOC to coordinate requests or requirements, and maintain a current and relevant picture of the other component operations. LNOs work for their respective component commanders and works with the JFACC and staff. The component liaisons serve as conduits for direct coordination between the JFACC and their respective component commanders. The liaisons have the responsibility of presenting component perspectives and considerations regarding planning and executing joint air operations.

85. Senator THUNE. General Shackelford, does the Air Force have its own close-air support capability gap? If so, how does your budget request address that gap?

General SHACKELFORD. No, the Air Force is working extremely closely with senior Army and Marine Corps leadership, and we are confident we can provide today's Ground Force Component Commander (GCC) with unmatched responsiveness and mission success. The needs of the GCC will be the centerpiece of the direct support concept of employment.

From a force application perspective, the Air Force has doubled the service life of 233 A-10s from 8,000 hours to 16,000 hours by procuring new thick-skin wings to replace their aging thin-skin wings. This has extended the service life of these aircraft beyond 2030 when the F-35 can begin to replace them. The Air Force has also increased the number of joint terminal attack controllers to match the growth of the new modular Army to 73 Brigade Combat Teams. The Air Force has also added five Air Support Operation Centers, aligned them with the Army divisions, and merged them with the airspace control elements to provide a Joint Air-Ground Integration Cell. Finally, the Air Force has added additional liaisons at the Army corps and division level to bolster the expertise of the many new key enablers that have become critical to today's close air support fight.

In light of ongoing assessments such as the QDR and its related studies, we are taking a close look at the projected fighter force requirements of the coming decade and beyond. The emerging National Defense Strategy and its attendant force planning construct will have a direct bearing on establishing the requirement for Air Force fighter and attack capabilities.

MV-22 RELIABILITY AND SUSTAINABILITY

86. Senator THUNE. General Trautman, the MV-22 program had a troubled procurement history marked by delays and cost overruns, efforts by DOD to cancel the program, and early crashes that took the lives of good marines. The MV-22 is now operational and full-rate procurement is underway with 90 aircraft delivered on the way to a procurement goal of 360. The capabilities of the aircraft in comparison to the CH-46 helicopter which it replaces are a quantum-level improvement. Operational squadrons have deployed to Iraq and conditions in Afghanistan with its higher elevations and more dispersed units would seem to present precisely the sort of conditions for which the MV-22 was designed and created. What have we learned about the operational capabilities and reliability and sustainability of the MV-22 during its operational deployments to Iraq?

General TRAUTMAN. We have learned that the MV-22 is a tremendously capable platform. Its unprecedented speed and range are re-writing the book on assault support operations. In Iraq, our MV-22 squadrons flew almost 10,000 flight hours, carried 45,000 troops and over 2.2 million pounds of cargo, without incident or loss. This aircraft is a game changer, and we look forward to getting it in the hands of our marines in the protracted landscape of Afghanistan, where its operational characteristics are precisely what we need.

As to reliability and maintainability, one factor is the manner in which this aircraft has been introduced. The V-22 community has flown 85 percent of its total flight hours since 2004, with 50 percent of its total program flight hours in the past 2 years alone. These numbers are high in themselves; they are even more dramatic when one realizes that these hours have been flown in some of the world's harshest environments, in a combat zone, and in response to urgent operational warfighting requirements. Most new aircraft—especially innovative technological advances like the Osprey—fly their first years at a slow and controlled rate of increasing hours, in a peacetime environment, and under highly controlled operational conditions. Like other aircraft in the early operational phase of their lifecycles, the MV-22B has experienced lower-than-desired reliability of some components and therefore higher operations and support costs, but this aircraft has experienced them in an acute fashion due to its early employment overseas. In effect, the operations and maintenance costs and reliability issues which we are addressing are compressed

and seem more intense because they are happening in a shorter time, to fewer airplanes, and in a harsher environment than is normal with new technology.

With the cooperation and support of our industry partners, we are tackling these issues head on with aggressive logistics and support plans that will increase the durability and availability of the parts needed to raise reliability and concurrently lower operating costs.

87. Senator THUNE. General Trautman, do you plan to deploy MV-22 squadrons to Afghanistan?

General TRAUTMAN. Yes. We will deploy the MV-22B to Afghanistan this fall.

88. Senator THUNE. General Trautman, how has engine life and maintainability in the field compared with expectations?

General TRAUTMAN. As with any aircraft operating in harsh desert climates, the MV-22B's engines have experienced lower time-on-wing than we experience when operating from our home bases. However, while operating in the desert, MV-22B engine time on wing is comparable to our legacy rotorcraft. We are working diligently with our industry partner Rolls Royce to make improvements to these engines that will raise time on wing. As to maintainability, this engines performance is exemplary. With the "performance-based logistics" contract with Rolls Royce, the MV-22B fleet has yet to experience a "bare firewall". When its time to replace an engine, we don't have to wait; a new one is ready and waiting.

89. Senator THUNE. General Trautman, MV-22 squadrons in Iraq have had maintenance provided by a "power-by-the-hour" contract in which the contractor is paid to perform maintenance. Will this contractor-performed maintenance continue and will adjustments be made to the contract to deal with reliability issues?

General TRAUTMAN. The contractor is paid to provide new engines and technical assistance where necessary. The Marines in the squadron perform all organizational-level maintenance. We are currently working with Rolls Royce to develop a follow on, mid-term contract beginning in calendar year 2010 that will carry us through the next 5 years in a similarly based performance-based logistics contract, under which the vendor will perform all maintenance above the organizational level. With respect to engine availability, this construct has served us very well and we expect this will continue. However, we do want to see improvements that keep the engines on wing longer and ensure our costs are fair and reasonable. These improvements will continue to be made based on lessons learned in both deployed and continental United States-based operations. During execution of this mid-term contract, we will continue to gather the data required to determine what the long-term propulsion system solution for this aircraft will be.

TACAIR BASING

90. Senator THUNE. General Shackelford and General Gibson, how long has it taken the Air Force to conduct an EIS in connection with the decision to possibly base F-35 JSFs, gives rise to concern. So, as you might imagine, the Air Force's recent decision to reassess the criteria it will use to select where the JSF will be based, and how much additional time that will require, is also disconcerting. How much additional time will this reassessment add to the selection process?

General SHACKELFORD and General GIBSON. The enterprise-wide look (EWL) will not add additional time to the final decisions for F-35 basing. The EWL is being developed on a timeline to support near-term F-35 aircraft deliveries and will be used to facilitate the scoping of alternatives for the next two, anticipated EISs.

91. Senator THUNE. General Shackelford and General Gibson, why did the Air Force decide that the criteria guiding the selection of bases up to the fall of 2008 was insufficient and needed to be reevaluated?

General SHACKELFORD and General GIBSON. Formal criteria involving a corporate Air Force review were not used in developing the previous "roadmap." To ensure the Air Force did not miss potential basing opportunities, the Secretary directed the current EWL.

Prior to fall 2008, the basing process was de-centrally executed by our Major Commands. Bringing the basing decision to the Air Force level improves the decision making process in two ways. First, Air Force corporate requirements can be included in the process. Second, for new weapon system basing decisions, the Air Force will be able to incorporate new data as the weapon system matures.

92. Senator THUNE. General Shackelford and General Gibson, what changes do you expect to make to the criteria?

General SHACKELFORD and General GIBSON. F-35 basing criteria are new, and consequently we do not expect to change them once they are completed. The Air Force Senior Basing Executive Steering Group (SB-ESG) oversees the EWL to ensure an unbiased review of a full range of F-35 basing options for both operational and pilot training units, across all Air Force installations. The SB-ESG is working with both Air Combat Command and Air Education and Training Command to finish the content and framework for application of the criteria so the development of the criteria is open and transparent. The criteria will include consideration for, but is not limited to, range and airspace, weather conditions, facility capacity, noise, air conformity, encroachment and cost factors.

93. Senator THUNE. General Shackelford and General Gibson, will the criteria for the selection of bases for the F-35 be different for training versus operational basing?

General SHACKELFORD and General GIBSON. Yes. The criteria will be different for selecting operational and training bases. Within the next few weeks, the Air Force will brief interested congressional members on the Secretary of the Air Force-approved F-35 basing criteria.

94. Senator THUNE. General Shackelford and General Gibson, this decision to review the criteria has caused a delay in the study of the environmental impact of a stationing decision. The Air Force is already struggling to meet the statutory BRAC deadline at Eglin AFB for the first F-35 JSF stationing due to a challenge to the EIS over noise concern. At the same time, the budget request for the Air Force for 2010 includes funds to accelerate the purchase of F-35s. Is there a risk that the aircraft will arrive into the Air Force inventory before basing decisions are finalized and facilities are constructed? If so, how will you mitigate this risk?

General SHACKELFORD and General GIBSON. The Air Force Record of Decision for Implementing BRAC 2005 decisions for the JSF initial joint training site at Eglin AFB was signed on 5 February 2009. This resulted in the decision to beddown 59 F-35 aircraft at Eglin AFB and conduct a Supplemental EIS to analyze the potential beddown of a total of 107 F-35 aircraft. The first F-35 is scheduled to arrive at Eglin AFB in summer 2010 and we expect the facilities to be ready at that time.

95. Senator THUNE. General Shackelford and General Gibson, regarding the decision to establish a joint training base for the F-35 at Eglin AFB, will the Air Force meet the statutory deadline to complete the decisions of the 2005 BRAC round by September 15, 2011? For how many F-35s?

General SHACKELFORD and General GIBSON. The Air Force will meet the statutory BRAC 2005, September 15, 2011 deadline to establish a 59-aircraft F-35 JSF initial training site at Eglin AFB.

96. Senator THUNE. General Shackelford and General Gibson, will this number be enough to meet the total initial training requirement for the Air Force, Navy, and Marine Corps? If not, what alternatives are being considered?

General SHACKELFORD and General GIBSON. In accordance with the 2005 Base Realignment and Closure Commission report, Eglin AFB is designated as the initial Integrated Training Center used by the Air Force, Navy, and Marine Corps, as well as our JSF partner nations, to conduct F-35 pilot training. Even if Eglin is equipped with the previously planned complement of 107 F-35 aircraft, all the Services must pursue additional pilot training center (PTC) locations in order to accommodate pilot training requirements for the total Department of Defense buy of 2,443 F-35s as announced by Secretary Gates. If Eglin is limited to 59 F-35s, the Services will likely have to accelerate their bed down plans for additional PTC locations.

The Air Force is conducting an EWL at F-35 basing options, to include potential locations for additional PTCs. Once the site survey and supplemental Environmental Impact Assessment are completed regarding the basing of additional F-35s at Eglin, decisions will be made by Air Force leadership on the requirements and timing of additional Air Force PTC locations.

97. Senator THUNE. General Shackelford and General Gibson, the budget request for 2010 includes \$33 million for the first military construction project to comply with a 2005 directive from the previous Secretary of Defense to posture Anderson Air Base in Guam as a power hub for intelligence, surveillance, and reconnaissance; strike; and aerial refueling assets. The total cost for all facilities is estimated to exceed \$1 billion. It is my understanding that no aircraft are currently planned to be

permanently stationed in these new facilities. With all the other budget constraints facing the Air Force and the availability of excess facilities resulting from the accelerated retirement of 250 fighter aircraft in 2010, is this plan for Guam viable and currently supported in the FYDP being developed as part of the 2010 budget request?

General SHACKELFORD and General GIBSON. Yes. Although the Air Force does not permanently base aircraft at Andersen AFB, Guam, as part of the continuing force posture adjustments to address worldwide requirements, the United States deploys forces to Guam as part of the Pacific's theater security package. Our budget supports continued Air Force operations at Andersen AFB, posturing the Department to accomplish the National Defense Strategy.

98. Senator THUNE. General Shackelford and General Gibson, will you be reviewing this plan as part of the upcoming QDR?

General SHACKELFORD and General GIBSON. Yes. Global posturing of U.S. forces is part of the charter for the QDR. The Air Force has provided inputs to the QDR team that continues to emphasize the strategic value of Guam in support of the U.S. National Defense Strategy and the Commander, U.S. Pacific Command's goals and objectives.

99. Senator THUNE. General Shackelford and General Trautman, the Marine Corps has also included in the budget request for 2010 funds to carry out the first phase of similar military construction work on the north side of the runway at Anderson AFB to support the stationing of aviation assets. It seems to me that the Air Force may be investing in infrastructure projects at Anderson AFB that are duplicative to the efforts of the Marine Corps. Does the possibility exist for the Air Force and the Marine Corps to share hangars and support facilities?

General SHACKELFORD. Planned facilities are tailored to meet the maintenance and operational throughput for the individual aircraft mission sets of each Service, and we do not believe there is any excess capacity in either program. The Air Force's projects are for fixed-wing aircraft and the Marine Corps projects support predominantly rotary-wing aircraft. The Air Force projects planned for Andersen AFB provide the minimum facility and infrastructure requirements to provide necessary maintenance and operation capabilities to support the current and ongoing tanker task force, continuous bomber presence, and theater security package missions. The current and planned Air Force facilities support large airframe aircraft operations and maintenance already in the south side of the south runway footprint.

Facilities identified for the Marine Air Combat Element (ACE) build-up on the north side of the north runway are programmed to support predominantly rotary-wing aircraft. The north side of the north runway cannot support the Air Force's large airframe bomber and tankers. In addition, as currently configured, the airfield is not large enough to support the facilities and aircraft of both the Air Force and Marine Corps missions should they be collocated together on the north or south side of either runway.

General TRAUTMAN. While there may be some potential to share some common administrative facilities, the operational facilities being developed at the north ramp of Anderson AFB (Rotary-Wing/Tilt-Rotor squadron hangars and aviation support facilities) are not the types of facilities that can be shared. The hangars and aviation support facilities for the proposed permanently assigned tilt-rotor squadron will completely fill the hangar currently in design. The near continuous presence of transient rotary-wing and tilt-rotor assets will also require hangar space for maintenance and support. The aviation logistics squadron hangar requested provides core maintenance and supply support to the rotary-wing and tilt-rotor assets. Transient U.S. Marine Corps fixed-wing aircraft may be able to use Air Force hangars being built on the South Ramp if the Air Force does not have a permanent presence in those facilities.

Existing Air Force hangers are primarily fixed wing and are not compatible with MV-22 requirements. The Navy has one rotary-wing hanger, but it is not large enough to accommodate the MV-22 aircraft.

Lastly, the Marine Corps requirements add capacity to the airfield that cannot be accommodated with existing facilities. More aircraft assigned to the installation drives the need for more parking apron and hangars.

100. Senator THUNE. General Shackelford and General Trautman, has the Air Force assessed the plans of the Marine Corps to determine whether taxpayer funds can be saved by consolidating requirements and efforts?

General SHACKELFORD. Air Force infrastructure projects were programmed in advance of the decision to base Marine Corps aviation assets on Andersen AFB, are

sized to support the Air Force facility requirements, and will not have capacity or proximity required to support the Marine aviation requirement. Subsequently, in the Naval Facilities Engineering Command's development of the Guam Joint Military Master Plan, all existing and planned Air Force and Marine infrastructure were assessed in terms of their ability to support the proposed Marine beddown on Guam and to take into account any shared use opportunities. With the exception of a combined air embarkation/debarkation operation planned for the south ramp of the south runway at Andersen AFB, the plan did not identify any other opportunities for shared use of facilities to support both Marine and Air Force aviation missions. However, we will continue to work through the joint Guam master planning construct to look for joint use capabilities and efficiencies. For instance, our planned low observable maintenance capabilities could be used by the Marine Corps if in the future they look to develop capabilities within their ACE complex to support the F-35 when fielded in the Pacific.

General TRAUTMAN. As the Marine Corps refines plans for relocating to Guam, we are working closely with Air Force facilities planners and the Joint Region to determine what savings can be made through consolidation and reutilization. Joint Basing guidance will be fundamental in positioning the Marine Corps on Guam in such a way as to maximize use of existing facilities and services.

101. Senator THUNE. General Shackelford and General Trautman, once this is done, can you provide a review of that assessment and the reasons for the duplicative request for military construction funds?

General SHACKELFORD. We do not believe the fiscal year 2010 budget requests are duplicative as the programmed projects provide the necessary infrastructure and efficient operational construct to support the very different operational mission set requirements for the Air Force and the Marine Corps.

General TRAUTMAN. We continue to look at ways to reduce costs on AAFB. However, at this time, we do not foresee any duplicative military construction being programmed.

[Whereupon, at 4:21 p.m., the subcommittee adjourned.]

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2010**

TUESDAY, JUNE 16, 2009

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

**ARMY MODERNIZATION AND MANAGEMENT OF THE
FUTURE COMBAT SYSTEMS PROGRAM**

The subcommittee met, pursuant to notice, at 2:34 p.m. in room SR-222, Russell Senate Office Building, Senator Joseph I. Lieberman (chairman of the subcommittee) presiding.

Committee members present: Senators Lieberman, Inhofe, and Thune.

Majority staff members present: Michael J. Kuiken, professional staff member; and William K. Sutey, professional staff member.

Minority staff member present: Paul C. Hutton IV, professional staff member.

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

Committee members' assistants present: Christopher Griffin, assistant to Senator Lieberman; Gerald Thomas, assistant to Senator Burris; Lenwood Landrum, assistant to Senator Sessions; and Jason Van Beek, assistant to Senator Thune.

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

Senator LIEBERMAN. The subcommittee will come to order. Good afternoon. We particularly welcome General Chiarelli and General Thompson. We meet this afternoon for what is our final hearing prior to the markup by the Senate Armed Services Committee next week of the National Defense Authorization Act for Fiscal Year 2010.

Today's topic, which is Army modernization, merits particular concern because of the many changes that are underway to reorient and restructure our national defenses. There are three particular challenges we face today as this subcommittee attempts to carry out our responsibility to conduct oversight.

First, Secretary Gates has announced and the fiscal year 2010 Army budget implements major program changes that restructure the Future Combat Systems (FCS), limit the Army's structural growth to 45 instead of 48 combat brigades, start a new ground

combat vehicle (GCV) program, and direct the integration of mine-resistant ambush-protected (MRAP) vehicles into the Army's force structure.

These changes are reflected in the fiscal year 2010 budget request, but in a manner that I would say is incomplete. The implementation of these decisions will require detailed analysis and planning, prioritization, and resource alignment, none of which has been done yet. That's why I hope our witnesses can help us understand the risks that are faced by the Army's modernization program in the absence of such analysis.

Second, the fiscal year 2010 Army budget request does not include long-range investment plans ordinarily provided in the Future Years Defense Program (FYDP). This is not unusual, of course, in the first year of a new administration, but it does make our subcommittee's work in Army modernization oversight that much more difficult.

Finally, Secretary Gates has stated that additional major decisions for the fiscal year 2011 budget request are contingent upon the conclusions of the Quadrennial Defense Review (QDR). The QDR is not required until February 2010. However, we understand that initial insights will be available to Army budget planners as early as the end of July, with final budget guidance by the end of September.

Even as they await this guidance, we hope that our witnesses this afternoon will discuss to the extent that they're able long-range modernization plans for the Army, especially for those programs that may be at risk of reduction or restructuring.

We have two excellent panels of witnesses: the first, General Peter Chiarelli, Vice Chief of Staff of the Army; and Lieutenant General Ross Thompson, the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Director of Acquisition Career Management.

He has a much longer title than you do, General Chiarelli, but I know you're Vice Chief.

The second panel, immediately following, will include witnesses from the Government Accountability Office (GAO) and the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. That panel we will ask to examine the management history of the FCS program and the lessons that we may learn from it as we go forward with the Army to future modernization. I look forward to the hearing.

Senator Thune.

STATEMENT OF SENATOR JOHN THUNE

Senator THUNE. Thank you, Mr. Chairman. I want to join you in welcoming General Chiarelli and Lieutenant General Thompson back to the committee and thank them for their long and distinguished service to our Nation. Modernizing the Army is necessary to preserve our technological edge over potential adversaries, deliver better protection for our soldiers, and provide our men and women in uniform with improved capabilities to accomplish their mission.

The success or failure of our efforts to modernize and transform the force of the future rests on decisions proposed, discussed, and

implemented today. There is concern among members of the committee, which you will hear, regarding the recent history of Army modernization efforts. The challenge of delivering capability amidst unrelenting technological change and shifting requirements is indeed a difficult one. We are eager to understand the Army's vision for the future and the strategy to achieve it.

Last month Secretary Geren and General Casey testified that, while the Army remains the best led, trained, and equipped army in the world, it is out of balance. General Casey outlined for us his plan to bring the Army into balance and he emphasized four imperatives: sustain, prepare, reset, and transform.

The committee has heard testimony from inside and outside the Army this year on each of General Casey's imperatives, and today we hope to explore more closely the Army's plan for transformation and modernization. An area of special interest is the uncertain future of the Army's recently restructured FCS. This multi-year, multi-billion dollar program was at the core of the Army's weapons modernization efforts and its successor programs will comprise a significant portion of the Army's research, development, and acquisition program.

The witnesses will be asked about the way forward in light of restructuring, the implications to current and future planning, and continuing technical challenges associated with a networked battlefield.

Also, the witnesses will be asked how the modernization program will meet Army Reserve and National Guard requirements, about progress toward resetting all components of the Army, how Army transformation plans will impact future requirements for strategic and tactical mobility, about the Army's aviation requirement, the proper mix of vehicles in the tactical wheeled fleet, including MRAP vehicles, and what type of future vehicle and weapons programs will meet the Army's needs to conduct full spectrum operations in hybrid warfare.

In closing, I'd like to emphasize that, while the focus of this hearing may be the weapons systems and processes that support the soldier, the center of gravity has and always will be the soldiers themselves. Our thanks and gratitude extends to all service-members at home and overseas and the families that support them.

Mr. Chairman, thank you for convening the hearing. I look forward to hearing from our witnesses.

Senator LIEBERMAN. Thanks very much, Senator Thune.

Without further ado, General Chiarelli, thank you for being here. Thank you for your extraordinary service to our country, and we would welcome your testimony now.

STATEMENT OF GEN PETER W. CHIARELLI, USA, VICE CHIEF OF STAFF OF THE ARMY

General CHIARELLI. Mr. Chairman, Ranking Member Thune, distinguished members of the subcommittee: I thank you for the opportunity to appear here today to discuss Army modernization and the management of the FCS program in view of the fiscal year 2010 budget request. This is my first occasion to appear before this esteemed subcommittee and I pledge to always provide you with an honest and forthright assessment and my best military advice as

requested. I have submitted a statement for the record and I look forward to answering your questions at the conclusion of opening remarks.

As all of you know, it's been a busy time for our Nation's military. We are at war, and we have been at war for the past 7-plus years. Since the very beginning, this conflict has been in many ways different and more complex than past wars. We are dealing with less clearly defined and highly savvy adversaries in two theaters. In fact, the only thing we can know for certain in this new strategic environment is that the enemy will purposely go where we are not.

Therefore, in order to stay ahead of the threat and to ensure there are forces prepared and capable to respond to any contingency, we have consistently made improvements and adjustments to our capabilities based upon lessons learned. In every aspect of the Army's modernization strategy, our purpose is to improve soldier survivability and ensure they're able to maintain a decisive advantage over whatever enemy they face. We are adamant, and I know the members of this esteemed subcommittee are equally adamant, that we never want to send our soldiers into a fair fight.

The Army is currently transitioning to a brigade combat team (BCT) modernization strategy focused on building a versatile mix of networked BCTs and enablers so we can leverage mobility, protection, information, intelligence, and precision fires in order to more effectively operate across the full spectrum of conflict.

As you all are aware, on April 6, 2009, Secretary Gates recommended the cancellation of the Manned Ground Vehicle (MGV) portion of FCS. The Army now is moving forward to analyze operational requirements and lessons learned from 7-plus years of war to develop the GCV as a critical capability for the BCT modernization.

Understandably, this platform has received much of the attention and focus in recent days following the Secretary's recommendation and the release of the President's fiscal year 2010 defense budget. Some are of the belief that a majority of the money previously allocated for FCS now should be reallocated elsewhere pending the cancellation of the MGV. With all due respect, I must strongly disagree with this position. While the platform was a key piece of FCS modernization strategy, I believe the most critical component of the new BCT modernization strategy is the network, and I am concerned that cancellation of the MGV has been misunderstood by some to mean cancellation of all things FCS, to include the network.

Today the situation on the battlefield is increasingly complex. Information is collected and shared by various systems across the battle space, including platforms, sensors, computers, radios, transmitters, and satellites. In the Army's new BCT modernization strategy, the network will serve as the hub for all these separate nodes, connecting leaders and soldiers at all levels and at every echelon of command in every formation—Infantry BCTs, Heavy BCTs, Stryker BCTs, and ultimately even across the interagency—with the right information quickly and seamlessly.

Simply put, the network is the centerpiece of the Army's modernization efforts and any shortfall in funding will put that effort

at risk. I assure the members of this subcommittee that the Army's senior leaders are focused on the Army's total modernization efforts and the management of the FCS program, and we will continue to coordinate with senior Department of Defense (DOD) officials and Congress to identify the best possible solutions in order to ensure we never send our soldiers into a fair fight.

In conclusion, on behalf of over 1.1 million soldiers serving in the Army today, I respectfully request your support of DOD's fiscal year 2010 budget, a budget that in its entirety reflects the resources required to grow the network, field early spinout technologies to BCTs on the ground in Iraq and Afghanistan, and restart our development of the next GCV.

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 United States Army and their families. I look forward to your questions.

Senator LIEBERMAN. Thank you, General Chiarelli.

General Thompson.

STATEMENT OF LTG N. ROSS THOMPSON III, USA, MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY FOR ACQUISITION, LOGISTICS, AND TECHNOLOGY, AND DIRECTOR, ACQUISITION CAREER MANAGEMENT

General THOMPSON. Chairman Lieberman, Senator Thune, and distinguished members of the Airland Subcommittee: I want to thank you for this opportunity to discuss Army modernization and management of the FCS program in view of the fiscal year 2010 annual budget.

With all of our programs and our funding requests, the Army's highest priority remains the protection of our warfighters in an operational environment that is increasingly ambiguous, unpredictable, and dangerous. Force protection has taken on an even greater importance as we shift major operations from Iraq to Afghanistan. We are grateful to the members of this subcommittee for your guidance and your steadfast support. We continue to meet the equipping demands of our soldiers in ongoing overseas contingency operations and in other operations worldwide because of the resources and guidance provided by this subcommittee and Congress. We constantly strive to be good stewards of those resources.

The Army's comprehensive modernization program is the key to ensuring that our soldiers maintain a decisive advantage over a diverse array of potential adversaries while continuously improving their survivability. In every aspect of our Army modernization programs we leverage lessons learned from soldiers in the current fight, speed fielding of enhanced capabilities to the force, and concurrently develop capabilities soldiers will need both today and tomorrow.

As General Chiarelli stated, our modernization strategy is focused on building a versatile mix of networked BCTs. The most critical component of the new BCT modernization strategy is the network. By growing the network in regular increments, we will provide our soldiers and their leaders with a continually enhanced common operating picture of the battle space, which is a significant advantage in combat.

The Army and DOD remain committed to the requirement for a manned armed scout helicopter capability and in the need to deliver this capability to our soldiers in a responsible and timely manner.

We are also committed to extending spinouts of our critical war-proven enablers to all of our BCTs and working with the Office of the Secretary of Defense (OSD) and Congress to field the new combat vehicle as expeditiously as possible, a capability that is long overdue.

In all areas of future commitments, we are planning for continued development of systems and technologies to ensure that our soldiers maintain a decisive advantage over potential adversaries.

Mr. Chairman and members of the subcommittee, your deep and abiding commitment to our men and women in uniform is widely recognized throughout our ranks. We thank you for your continued support of the outstanding men and women of the United States Army and their families, as well as your support of the fiscal year 2010 budget.

This concludes my opening remarks, Mr. Chairman. I look forward to your questions.

[The joint prepared statement of General Chiarelli and Lieutenant General Thompson follows:]

JOINT PREPARED STATEMENT BY GEN PETER W. CHIARELLI, USA, AND LTG N. ROSS THOMPSON III, USA

Chairman Lieberman, Ranking Member Thune, distinguished members of the Airland Subcommittee. We thank you for the opportunity to discuss Army Modernization and management of the Future Combat Systems (FCS) program in view of the fiscal year 2010 annual budget and Overseas Contingency Operations supplemental requests. On behalf of Army Secretary, the Honorable Pete Geren and our Army Chief of Staff, General George Casey, we would also like to take this opportunity to thank you for your continued, strong support and demonstrated commitment to our soldiers, Army civilians, and family members.

As all of you know, it has been a busy time for our Nation's military. We are at war; we have been at war for the past 7-plus years, and that has undeniably put a strain on our people and equipment. We have had our share of good and bad experiences; and, we are continually making adjustments and improvements to our tactics, training, and equipment based upon the lessons learned.

Since the very beginning, this war has been in many ways different and more complex than past wars. We are dealing with less clearly defined and highly savvy adversaries in two theaters. In this new strategic environment, the only thing we can know for certain is that the enemy will purposely go where we are not.

Therefore, we must ensure that our Force is prepared and capable to respond to any contingency. As Secretary Gates has said, "In all, we have to be prepared for the wars we are most likely to fight, not just the wars we've traditionally been best suited to fight or threats we conjure up from potential adversaries who also have limited resources."

In recent years, in order to remain dominant we have had to simultaneously and swiftly adapt our doctrine and organizational structure to effectively span the breadth of operational environments. It's all part of a changing strategy we refer to in the Army as Full Spectrum Operations (FSO).

The centerpiece of our efforts has been a shift to a modular construct focused at the brigade level that has greatly enhanced our ability to respond to any situation, quickly and effectively. We've also made corresponding changes to our Table of Organization and Equipment (TO&E); and, we've expanded our capability by adding Civil Affairs, MPs, Special Forces, and other enablers.

MODERNIZATION

The adage that "we never want to send our soldiers into a fair fight" is at the core of the Army Modernization Strategy. Modernization is the key to ensuring our soldiers maintain a decisive advantage over whatever enemy they face, while im-

proving their survivability. We are pursuing a strategy that rapidly fields equipment to the current force; upgrades equipment for soldiers going into combat and modernizes select systems; spins-out technologies; and modernizes Brigade Combat Teams (BCTs). In every aspect of modernization, we leverage lessons learned from soldiers in the current fight to speed fielding of enhanced capabilities to the force, and concurrently develop capabilities soldiers need today.

We are transitioning immediately from a FCS BCT Strategy to a BCT Modernization Strategy. With respect to the FCS program, the fiscal year 2010 President's budget calls for us to: (1) accelerate fielding of spin-outs to all 73 BCTs starting in fiscal year 2011; (2) halt the development and procurement of FCS manned ground vehicles; and (3) halt the development and procurement of the Non-Line-of-Sight-Cannon.

We will move from a modernization strategy focused on fielding 15 FCS BCTs and spin-outs of FCS systems, as mentioned earlier, to a BCT modernization strategy focused on building a versatile mix of networked BCTs and enablers that can leverage mobility, protection, information, precision intelligence and fires to conduct effective FSO across the spectrum of conflict. Such an approach will enable soldiers to receive key "high-payoff" systems that are quickly integrated into BCTs.

This BCT modernization strategy will continue to integrate valuable technological and network advances developed over the course of this war (e.g., Ground Soldier Ensemble, WIN-T, remote sensors), including those drawn from R&D for the FCS program into our modular formations to enhance their full spectrum capabilities.

To assist us in this regard, the Army recently conducted an after action review of the FCS program's development and acquisition strategy. The valuable information gathered will assist us in our work to develop a ground combat vehicle concept that incorporates the lessons of the past 7 years at war and the technological advances from the FCS program.

An Office of the Secretary of Defense Acquisition Decision Memorandum (ADM) is forthcoming that will provide the detailed guidance for the program going forward. The Army plans to halt the current FCS program after the ADM is signed and capture the results from the May 2009 System of Systems Preliminary Design Review. We plan to field a new ground combat vehicle in 5 to 7 years.

With regard to existing vehicle upgrades, the Army's combat platform modernization program is focused on standardizing our Heavy Brigade Combat Team (HBCT) sets with two variants of the Abrams tank and the Bradley Fighting Vehicle System, two of the Army's highest priority combat vehicle recapitalization programs, along with the supporting fire support modernization with the Paladin (PIM). This program will modernize all HBCTs (both Active and Army National Guard), the 3rd ACR, Army Prepositioned Stocks, and the Institutional Training Base.

At present, the Army has nearly completed fielding modularized HBCTs, which gives every brigade a common structure. The short-term modernization goal is to populate these brigades with only two variants of the Abrams and the Bradley—the Abrams M1A2SEPV2 (System Enhancement Package) is being paired with its partner the Bradley M2A3 and the Abrams M1A1AIM SA (Abrams Integrated Management Situational Awareness) is being teamed with the Bradley M2A2ODS SA (Operation Desert Storm Situational Awareness). This modernization plan aligns compatible combat platforms with common modular formations.

Stryker has planned procurement of 3,616 vehicles with 2,765 having been accepted to date. The Stryker program received a Full Rate Production decision on 8 of 10 configuration variants, including the Infantry Carrier Vehicle, Reconnaissance Vehicle, Commander Vehicle, Mortar Carrier Vehicle, Fire Support Vehicle, Anti-tank Guided Missile Vehicle, Engineer Squad Vehicle, and Medical Evacuation Vehicle. The remaining variants—the Nuclear, Biological and Chemical Reconnaissance Vehicle and the Mobile Gun System—are in Limited Rate Production.

The Secretary of Defense authorized, and the Army has funded, the procurement and fielding of seven Stryker BCTs to fulfill national security requirements. This will equip seven brigade-size units including maintenance floats, a strategic pool of ready-to-fight systems, Institutional Training Base, Test Articles, a Depot Repair Cycle Float Pool managed by the U.S. Army Materiel Command, other operational requirements, Nuclear Biological and Chemical Reconnaissance Vehicles to fill non-Stryker BCT armored Chemical, Biological, Radiological and Nuclear requirements, and vehicles to support theater operations in Afghanistan.

The M113 Family of Vehicles (FOV) program was terminated in June 2007. At present, we have approximately 6,000 vehicles in our inventory that fill several mission roles including fire support, command and control, medical, chemical, mobility/counter mobility, and others. The Army Ground Vehicle Modernization Strategy, coupled with force structure and force mix analysis will determine the long term replacement strategy for the M113 FOVs.

With regard to tactical radio procurement, the Joint Tactical Radio System (JTRS) is a Department of Defense (DOD) initiative to develop a family of software-programmable tactical radios that provide mobile, interoperable, and networked voice, data and video communications at the tactical edge of the battlefield. For the Army, JTRS will initially provide a tactical radio communications network for Spin Outs as well as Infantry, Heavy, and Stryker BCTs by providing the tactical networking transport capability through scalable and modular networked communications. It will also provide the current force a mobile, ad hoc networking capability using, new advanced waveforms—Soldier Radio Waveform and Wideband Networking Waveform.

The majority of the radios in the Ground Mobile Radio (GMR) Program and the Handheld, Manpack and Small Form Fit Program (HMS) will be procured for the Army. GMR will provide the Army a multi-channel (up to four channels) operation, allowing full functionality of each legacy radio it replaces. In addition, GMR will include an integrated global positioning system (GPS) capability based on the Selective Availability Anti-Spoofing Module-based GPS receiver with a Precise Time and Time Interval output.

HMS will provide a Scalable and modular Software Communications Architecture compliant networked radio frequency communication capability to meet Army Handheld, Manpack (Mounted & Dismounted) and Embedded Radio requirements. The program will deliver a Handheld (2 Channel) radio, a Manpack (2 Channel) radio, and various Small Form Fit radios for various ground sensors/unattended vehicles/unmanned air vehicles.

Warfighter Information Network—Tactical (WIN-T) is the transformational command and control communications system that provides the backbone wide area tactical network at echelons from theater through company in support of full spectrum operations. Following the program's restructure in 2007, the Army plans to field the latest networking capability to our soldiers in four increments, as advanced technologies for enhanced communications becomes available. At present, the Army has already fielded Increment 1 to more than 50 percent of the total force giving our soldiers a communications network that is largely satellite based, allowing for beyond line-of-sight communications and commercial Internet networking technology.

Increment 2 brings initial networking on-the-move capabilities embedded in various platforms to allow a fully operational and connected communications networking capability for our soldiers (from brigade down to the company level). Increment 2 features include commercial routers, radios, and antennas that are technologically mature, with waveform technology optimized for high-capacity broadband networking and support that enables high throughput while the unit is on-the-move. Increment 2 is expected to achieve a low rate initial production decision this August, with fielding expected to begin in 2011. Increment 2 is expected to achieve a low-rate initial production decision this October, with fielding expected to begin in 2012.

Increment 3 capabilities bring the full on-the-move capabilities that feature a single radio combining the line-of-sight and the satellite waveforms from Increment 2 in a military chassis which includes Global Broadcast Service receive capability. Airtier development work planned under this increment brings even more robust communications, providing three tiers of communications that result in less reliance on satellite communications. Network Operations will continue to develop in both Increments 2 and 3 to achieve a fully integrated capability for planning, initializing, operating, and managing the entire on-the-move network.

WIN-T Increment 4 represents the last of the developmental program elements and will provide technology insertions to enable enhanced satellite communications protection.

With regard to Army Aviation, it has been 5 years since the Army, with the support of Congress and the Office of the Secretary of Defense, terminated the Comanche helicopter program to allow modernization of the entire Army Aviation fleet. In just those few years, we have seen steady and substantial progress. Today, 9 of the 13 systems identified for funding at Comanche termination are in production. By fiscal year 2011, we will have started fielding all the aircraft programs, except the Armed Reconnaissance Helicopter. That means 69 percent of all these programs are in some form of production today—low, initial, or full rate production, with 54 percent in full rate production.

These programs will contribute directly to overseas contingency operations by priority fielding to units preparing to deploy to combat operations or currently deployed in support of combat operations. We want to emphasize that every one of these programs will be fielded to units next in rotation to the warfight or units now supporting the warfight. Currently operating in combat operations are the CH-47F and UH-60M helicopters, the Sky Warrior Alpha, Sky Warrior Block . . . , and Raven Unmanned Aircraft Systems and a pre-production variant of the Micro Air Vehicle

spun out of the FCS program. The Light Utility Helicopter has enabled the return of UH-60s to the warfighting fleet and has allowed retirement of UH-1 and OH-58s in both the active and Reserve Components.

The UH-60 Black Hawk is the work horse of Army Aviation. The current UH-60 fleet is comprised of 1,748 aircraft, including 951 UH-60As (produced between 1978 and 1989), 689 UH-60Ls (produced since 1989) and 108 new UH-60Ms. The Black Hawk helicopter is in its 32nd year of production. To date, the Army has employed seven multi-year, multiservice production contracts. The current contract extends from fiscal year 2007 to fiscal year 2011 and includes Navy H-60 aircraft, as well as Foreign Military Sales aircraft.

The ongoing UH-60A to UH-60L recapitalization program extends the service life of the Black Hawk program while providing the improved capability and safety margin of the UH-60L. The Army plans to induct 38 aircraft in fiscal year 2009 and 228 aircraft between fiscal year 2010 and fiscal year 2015.

The UH-60M program incorporates a digitized cockpit for improved combat situational awareness, lift, range, and handling characteristics for enhanced maneuverability and safety. These improvements also extend the service life of the aircraft. Additionally, the Army has a Common Engine Program shared by the UH-60 Blackhawk and AH-64 Apache fleets.

The Army and DOD remain committed to the requirement for a manned Armed Scout Helicopter (ASH) capability and the need to deliver this capability to our Soldiers in a responsible and timely manner.

As a capability bridging strategy, the Secretary of the Army approved a strategy to maintain the Armed Reconnaissance Helicopter (ARH) funds within Army aviation and redistribute them into three primary efforts: (1) sustaining and improving the OH-58D Kiowa Warrior; (2) modernizing the Army National Guard (ARNG) AH-64A Apache fleet; and (3) conducting a competition for and procuring the capabilities associated with the future ASH. The Vice Chief of Staff of the Army and the Army Acquisition Executive jointly signed a Memorandum for the Record codifying this strategy.

To support the potential procurement effort, the Army is conducting a bottom-up review of the armed reconnaissance capability requirement to include a thorough assessment of the specific requirements identified for the initial ARH program, as well as initiating a formal "Analysis of Alternatives." The analysis will cover the entire spectrum of options—from the potential use of UAVs to the use of a manned/unmanned aircraft mix to the procurement of a new manned platform.

Due to the time required to complete these assessments, the Army is currently evaluating what additional enhancements and life extension work, if any, will be required to continue to safely sustain the Kiowa Warrior fleet until a replacement is procured.

The U.S. Army Audit Agency completed an official after action review to identify lessons learned from the termination of the ARH program. The results are being evaluated for assimilation into Army acquisition programs and for use in developing an acquisition strategy to meet the manned ARH requirement.

MODERNIZATION OF OUR RESERVE COMPONENT

Similarly, the ARNG has seen an increase in capabilities through modernization. For instance, the UH-1 Huey has long been a work horse of the ARNG. Now, with the increased numbers of Black Hawk and fielding of the new Light Utility Helicopter, the last Huey is expected to leave the ARNG by the end of fiscal year 2009. Another example is the famous "deuce and a half," or 2½ ton truck, which has been used for decades by the ARNG for a variety of cargo missions. In 2001, the ARNG had 16,504, or 62 percent, of these vehicles in the Army. We anticipate that the last 2½ ton truck will leave the ARNG by fiscal year 2011.

ACHIEVING TRANSPARENCY

In addition, the Army is diligently working towards transparency. Transparency is the process that provides accountability and traceability of a specific piece of equipment, from budget submission through funding authorization and on to procurement and delivery to Army users. One would think that this would be a fairly straightforward task; it is not. Today, we have individual financial and acquisition systems built to control and track funding and contracted amounts. Further, we have property accountability systems designed to keep track of property, but are not linked to the funding source. The gaps between these disparate systems are wide and difficult to link. However, we are on a deliberate path to obtain full transparency. Right now, the Army is collecting data manually and through selected systems to gather the needed information. Our first full set of data is expected to be

prepared by July 2009. For the long-term, we will adjust automation systems and adapt processes to support transparency reporting. The Army is fully committed to mastering the challenge of achieving full transparency in the equipping process.

CLOSING

The Army's Modernization program is providing our soldiers with leading-edge technologies and advanced capabilities to fight the wars we are engaged in today, while simultaneously preparing them for future threats. The BCT modernization strategy we are moving to will incorporate valuable technological and network advances, developed using lessons learned from the experiences of the past 7-plus years of war, into our modular formations. This strategy will significantly enhance the full spectrum capability of our Force.

As we continue this process, we will coordinate with senior DOD officials and Congress to identify both short- and long-term solutions. Your input will continue to be very valuable to us. We know that all of you are equally committed to ensuring that "we never send our soldiers into a fair fight."

Mr. Chairman, members of the committee, we thank you again for your continued and generous support of the outstanding men and women of the United States Army and their families. We look forward to your questions.

Senator LIEBERMAN. Thanks, General Thompson.

We'll have 7-minute rounds of questions.

Let me say to both of you, who have graciously thanked the subcommittee for our support of the men and women in uniform, in the Army in this case particularly, I'm sure I speak for my colleagues here in saying that really it's our honor, let alone our responsibility, to give whatever support we can to the men and women in our armed services, in this case particularly the Army. To say that the service of the personnel of the Army has been extraordinary, whatever the phrase is, it seems to me that this is the next greatest generation in service of our country, who have been drawn into a battle that in many ways its details were hard to foresee. With extraordinary leadership, such as represented at the table before us, the Army has transformed itself by personal skill, courage, and characteristically American goodwill and compassion, and has succeeded in Iraq and is on the road to success. Now I think I'm confident we'll turn things around in Afghanistan in a way that's really historic and very consequential for our country.

So you evoked that by saying thank you. We don't deserve any thanks when I think about what you all are doing.

Speaking about the service of our troops, General Chiarelli, this is about the Army modernization program, but you've really given great leadership in a host of areas, including as an advocate for Army personnel, which ultimately is what the Army is all about. There are a lot of us on this committee who are concerned that the end strength of the Army now, the statutory end strength, is inadequate to the moment.

While we talk about a lot of different programs for reducing stress on our Army personnel, perhaps the best thing we can do is to make sure there are more of them, so that the dwell time they have between tours of deployed duty increases instead of decreases. I wanted you to know that there will be a serious effort in this subcommittee, I've been working with Senator Thune on this and others—as there has been, I noticed, in the House this week, to increase the authorized end strength of the Army by 30,000.

Do you have a reaction to that?

General CHIARELLI. First of all, Mr. Chairman, I'm in complete agreement with your analysis. As the ranking member said also,

soldiers are at the heart of our formation. We have this constant balancing act between things like modernization and soldiers, because soldiers cost money. At the same time, I'm concerned with dwell time and I know that individual dwell is less than unit dwell. We have finally been able to model that and show that, and it has tremendous significance.

As I have worked with the Secretary of the Army on suicide prevention and realized this is more about the wellness of the entire force and its families, I have come to the point to believe the Army is stressed and there may be a requirement for us to have a temporary authorization of additional soldiers to fill some of the holes we have in our formations and to take the stress off the force in what is going to be a critical 12- to 18-month period.

Senator LIEBERMAN. Thank you for that statement. That's exactly the terms in which we're seeing it, which is as a temporary increase, because, as General Casey said to us when he testified before the full committee, this dwell time and stress is really a matter of supply and demand. How many troops do we have to supply and what's the demand? We know for a fact that we're going to be increasing our presence in Afghanistan and not drawing down our presence in Iraq immediately. So that will mean in the short term there will actually be more people deployed, a higher demand.

To help you increase the dwell time and reduce the stress on individual soldiers—as you said, very important distinction—we're going to work to increase the authorization by 30,000 and hope that together we can find the money for the chief and you to do that as circumstances require.

Let me go on to ask you an overall general question on our Army modernization. As you look back over the last decade or so, there have been a lot of changes in plans and investment priorities and even titles, names. We've gone from Digitization to Force XXI to Army After Next to Interim Force to Objective Force to FCS and Modularity.

I understand that part of this is obviously a reflection of changes in the battle. I remember General Shinseki said at one point that his aim was to see us get to a stable modernization strategy in which there was irreversible momentum in favor of that strategy.

I wanted to ask you if you'd comment on, as you look back over the last 10 years, whether there were too many changes in modernization strategy of the Army and where you see this focus going in the chapter ahead of us.

General CHIARELLI. A majority of the last 10 years for me have been spent in the operational Army, deployed with combat forces. I watched us over a 3-year period in Iraq move from soft-skinned Humvees up to Humvees with frag kit 5 and now today to the MRAP vehicle, and thought, thank goodness, we were able to go ahead and make those kinds of modernization leaps forward to protect our soldiers.

I'd just like to remind everyone that the MGV was a portion of the FCS program. FCS is spinouts, and we have now spinouts for 73 brigades. That's what we're looking at over time. It is that network, and that network is the key and critical piece that's going to pull this whole thing together and provide that soldier in combat the information he needs when he needs it to survive in the fight.

We are very pleased with the Secretary of Defense's commitment to an Army modernization plan and to a GCV. The chief and the Secretary of the Army have charged us with moving ahead rapidly and fielding something to our forces, fielding that vehicle within the next 5 to 7 years. We are well into the planning to do that right now.

We held a very successful blue ribbon symposium yesterday at National Defense University, where we brought in people from OSD, from the building, from the think tanks, to get their ideas on where we should go. But we are committed to this in a 5- to 7-year period.

Senator LIEBERMAN. I appreciate your answer. I take from that you support the changes in the FCS program as recommended by Secretary Gates and ultimately the President. I take it that, based on your opening statement, you feel that the most important part of FCS, which is the networking capability, is being preserved.

General CHIARELLI. We must preserve the network, and we must preserve what we need to move ourselves to a GCV in a 5- to 7-year timeframe.

Senator LIEBERMAN. So we obviously need a new GCV, whether we call it MGCV or GCV. I know that there's been a pledge that the funding will be preserved to transition to the new GCV. Are you worried about the fact that the pots of money that are left unspent in short order tend to be very attractive to Members of Congress?

General CHIARELLI. I support the President's budget. The President's budget will get us to where we need to be, and we are hoping that we will not see that money taken away. That money is made available to move ahead. We think that's absolutely critical.

Senator LIEBERMAN. Let me ask one final question on this topic about ground vehicles. We've invested a lot of money, appropriately so, and bought a lot of MRAP vehicles to deal with the situation our troops were facing in Iraq and now in Afghanistan. What's the role of that particular ground vehicle over the next 5 or 10 years or beyond?

General CHIARELLI. The Army is committed to integrating the MRAP vehicles into our formation. General Dempsey is working that right now. The MRAP vehicle has saved arms, legs, and lives, and I hope one day to be able to show exactly how many it has. It's an absolutely amazing vehicle.

But it cannot be integrated everywhere in our formation. I know you know that there are 16,000 MRAP vehicles, but 200,000 vehicles in the Army inventory. So MRAP vehicles today represent 8 percent of the total vehicles in the United States Army. They will be integrated into our formations, but in places where that vehicle is in fact most suited.

One of the things that came out of our blue ribbon symposium yesterday was noncommissioned officers who told us that carrying infantry around in an MRAP vehicle is fine and it protects them, but they have to wait 9 seconds from the time somebody pushes the button to the ramp coming down. They feel very vulnerable in that vehicle as that ramp slowly comes down. So it's those kinds of things that make the MRAP vehicles better suited for certain places in our formation, and I know General Dempsey and U.S.

Army Training and Doctrine Command (TRADOC) are working to determine that now with our force and vehicle mix.

Senator LIEBERMAN. Of course, the MRAP vehicles play a very different role or have a different function than either the MGCV or the oncoming GCV, correct?

General CHIARELLI. That's correct.

Senator LIEBERMAN. Thank you.

Senator THUNE.

Senator THUNE. Thank you, Mr. Chairman.

I want to come back to the chairman's last question there. DOD I understand is currently selecting a scaled-down MRAP vehicle which by way of greater off-road mobility would be suited for use in Afghanistan. I understand that at least 4,500 of these MRAP all terrain vehicles (ATVs) would be required for use in theater, mostly belonging to the Army.

The Army has not outlined whether or not or how they plan to institutionalize the capability of the thousands of already fielded MRAP vehicles. So General Chiarelli, I guess my question would be, what does the Army intend to do with the MRAP vehicles that are ill-suited for Afghanistan as troops are redeployed from Iraq?

General CHIARELLI. Senator, we brought some home. We're using them in the training base. As I indicated before, we will, in fact, integrate those into our formations in the place they're best suited. We are very, very happy with the MRAP ATV. We think that is a great step forward. We're also very happy that many of the MRAP vehicles, the old MRAP vehicles that don't have the independent off-road suspension, can be retrofitted for that off-road suspension. We expect to do some of that in theater, both the U.S. Army and the Marine Corps.

I think, Ross, you have some information on that.

General THOMPSON. Yes, sir. One of the things that we're doing with one of the variants of MRAP vehicles that already exist today before we go forward with the source selection decision, which is within the next several weeks, on the MRAP ATV is to take the suspension system that goes with the medium truck for the Marine Corps and retrofit some of the existing MRAP vehicles so we get that off-road capability to be able to use in Afghanistan and incorporate those vehicles, as well as the MRAP ATVs once we start to produce those by the end of the summer and begin fielding them in the fall, is the current plan.

Senator THUNE. Is the Army experiencing other shortfalls in other areas when it comes to equipment and trying to meet some of the changing dynamics of operations in Afghanistan relative to what we've been dealing with in Iraq? The MRAP vehicle is a good example of how you have to adapt that vehicle, either through retrofitting it or coming up with a new model. Is the Army facing any other of those types of issues with regard to the conditions in Afghanistan?

General CHIARELLI. In fact, one of our main efforts is lightening the load for the soldier. We have a brigade out of the 4th Infantry Division coming out of Fort Carson that'll be going into country I believe this month, that's going to be going with a set of gear that, depending on the position you hold within that unit, is 14 to 23 pounds lighter than what soldiers in country have today.

So this lighten-the-load effort, particularly up in ?????? Commons-East in Afghanistan at the high altitudes, is absolutely critical. It's something that the field has asked us for, and we are constantly working to figure out ways that we can lighten-the-load for the individual soldiers. I think that is a real need.

Senator THUNE. Coming back to the Future Combat Vehicle, the Army has begun working groups to help define the concept for the next ground vehicle, which would likely be tracked and armored. The Army, as I think you mentioned already, has asserted the requirements and forward planning for that will be done by September.

Has the Army been given any further guidance by OSD pertaining to the cancellation of the FCS MGV?

General THOMPSON. Sir, I'll take that question. One of the things that we've been working with OSD since the fiscal year 2010 budget was submitted is the acquisition decision memorandum, which is the formal guidance from the Defense Acquisition Executive on that program. We are in the final stages of the wording on that to make sure it's exactly right, it captures the decisions of the Secretary of Defense, and it gives us the flexibility to be able to move forward to restructure the program, to cancel the FCS program as we know it today, to terminate the MGV portion of that existing FCS program, but to keep the other parts of that program that we want to move forward with, in particular the network and the spinouts to the Infantry BCTs, the modernization efforts beyond the first spinouts to the Infantry BCTs, and then to do the concept work with TRADOC through the summer, and then begin a new acquisition program for a replacement GCV.

Senator THUNE. Is there an operational urgency to develop a new ground system, General Chiarelli?

General CHIARELLI. We feel it's critical that we work to get something that we can begin fielding into our forces, understanding the amount of time that it's going to take to do this within 5 to 7 years. We've taken on the Secretary's challenge to look at how we can do that. I think you should take great solace in the fact that we are working very hard to pull all those things we learned in the FCS MGV program, all those technologies that we brought from TR level 2, some to 6 and 7 right now. That is not money that has been wasted. Those are all things that we will use and look at for integration into the GCV.

Senator THUNE. In the 2010 budget request, there were requests for hundreds of millions of dollars for FCS termination costs. General Thompson, can the Army say with certainty what those termination costs are going to be? Can you quantify that?

General THOMPSON. Sir, I can't say with certainty. I can give you a range, because the actual termination costs that go with this program are to be negotiated with the contractor, who is Boeing, and then the subcontractors, and there are 25 tier 2 contractors and around 600 contractors below the tier 2 contractors.

So that will be a negotiated settlement, because we are at the government's convenience restructuring this contract in a major way. So there are termination liabilities that are called out for in that contract, the guidance from the Federal Acquisition Regulation and the defense supplement to that. I don't know what that

exact number is, but it's fair to say it's in the hundreds of millions of dollars.

The money that is in the fiscal year 2010 budget we think is needed to pay those termination liabilities. If that money is not there to pay those termination liabilities, then some piece of the work necessary to do the spinouts to the infantry brigades or to do the network development will have to be used to pay those termination liabilities, because they are mandatory. That's work that won't get done and capability that won't be provided to the soldiers.

Senator THUNE. Are there lessons, General Thompson, that you've learned from the FCS experience and the acquisition process that can be applied to future developmental programs?

General THOMPSON. Yes, sir, there are many lessons to be learned. In addition to the blue ribbon panel that we had yesterday at the National Defense University, we conducted a full after-action review to look not just at the acquisition portion of the FCS program over time, but also to look at the requirements process and the modeling and all the work that we've done.

One of the lessons that I take away—and this is a challenge not just for the Army, but for DOD—a systems-of-systems acquisition program and dealing with the challenge to look at an integrated acquisition approach is hard to do. I don't think either the Army or DOD is well-positioned to be able to deal with complicated systems-of-systems acquisition approaches, which FCS is.

FCS was groundbreaking in that approach. To the program's credit, we just finished in May a systems-of-systems preliminary design review, which is one step on the way to begin to do the final integration and the testing and the prototypes. That systems-of-systems preliminary design review was built on 57 preliminary design reviews of all of the other pieces of the program leading up to that, and it shows fairly conclusively that we are where we need to be at this point in the program, we have the technologies at the right point in the technology level to be able to integrate those and to produce the capability.

It's not just MGVs. It's not just network. It's making all parts of the material systems work together to give the soldier an integrated capability and doing that up front, instead of after the fact.

General CHIARELLI. Just one lesson I have learned from this entire experience of 2 years in Iraq. The deployability and ease of deployability, the expeditionary capability, is always more attractive on this side of the next war. But once you get into the next war and on the other side of that war, survivability and crew protection are key and critical elements. We've seen that happen in Iraq, and I think we always have to keep that in mind when we're sitting here in Washington, DC, as opposed to downrange.

Senator THUNE. Thank you very much.

Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you, Senator Thune.

Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman.

Let me start by saying happy birthday, from one Army soldier to two others, and the rest of you back there.

General CHIARELLI. Happy birthday, sir.

Senator INHOFE. I never looked that good, though. [Laughter.]

General CHIARELLI. Don't look a day over 233, sir. [Laughter.]

Senator INHOFE. First of all, let me say, General Chiarelli, that during the years that you were the ground commander in Iraq, I have said publicly that there has never been anyone as capable as you are and the great job that you've done. I think on the other side, you probably would say that you saw more of me over there in Iraq during the time than you did any other Member. So I'm very much concerned about some things, and I think you know one of my concerns.

Most of what I was going to ask has been covered by the chairman and the ranking member, except for the cannon. It just really bothers me that since 1995, Mr. Chairman, we've been trying to replace the Paladin with something that works. Let's go back 15 years ago. Even then, four other countries had a better cannon than we had: Germany; Russia; South Africa, of all places; and the United Kingdom.

Now, 15 years later, those four countries still have a better cannon than we do. We can talk about the Abrams, 1970s technology. We can talk about the Bradley Fighting Vehicle, 1970s technology. But the Paladin is 1950s technology.

We've talked about it since 1995. We came up with the Crusader. We were going to do something with the Crusader. Then Bush cancelled that program in 2002. I have to say that he did it rather abruptly. We were actually, if you'll remember, Mr. Chairman, in our markup at the time they did that. I don't think anyone on the committee had any warning.

After that took place, we started recognizing again that we're going to have to do something about the Paladin. That's when General Shinseki talked about FCS, that we need to have the first major transformation of ground capability in maybe 30 years.

So we thought the lead vehicle was going to be that which we felt we needed the most, and that is the most antiquated platform that we have for ground capability, I believe you would agree, is the Paladin.

So here we are, and now we're saying that, even though we've written it into the law—I believe the law says we're supposed to have that fielded and out there by 2010? That's still in the law, and that still has been the request and what we've done in the House and the Senate.

So I guess I'd just ask, why is it that we don't want to send our kids out to battle with the better cannon than prospective enemies?

General CHIARELLI. Senator, I know that you know we are totally committed to the Paladin Integrated Management (PIM) program. We plan to correct many of the deficiencies we have in the Paladin with that program, spending \$181 million from fiscal years 2008 to 2011, and when the program's completed in 2021, we will have converted over 600 Paladins.

I am a believer in indirect fire systems and I am pleased that the Army is committed in the way that it is to this program, which I think is absolutely critical, particularly given the loss of the MGCV program and the criticality of having that upgraded system in our heavy BCTs.

Senator INHOFE. Haven't we gone through about four incarnations now of the Paladin, PIM programs, upgrades?

General THOMPSON. Sir, I can answer that question. Currently the Paladin system that's out there is version 6. So it has six major upgrades.

Senator INHOFE. Six major upgrades. So now we're going to do another one. It was my understanding that we have 900 of these vehicles. We were going to do the PIM program on 600 and then on the other 300 we were going to jump ahead in terms of rate of fire, in all the things that Paladin would still be deficient in, so that we're going to have better equipment than prospective enemies.

Wasn't that it, that 600 of the 900 would be upgraded, but the other 300 would be the new system?

General THOMPSON. Senator, that was the plan with the MGCV portion and the non-line-of-sight cannon system as a subset of the MGCV portion. So you'd have the new system of 300 and then the other 600. Eventually, when you have a new modern system like we've done with a lot of our other systems, you begin to replace the older ones.

So I don't know exactly what we would have done in 2025, but I suspect we probably would have made a decision to begin to replace the Paladins with the new system if it was a non-line-of-sight cannon.

Senator INHOFE. What do you propose to do if the law is not changed?

General THOMPSON. Sir, one of the things that OSD has to do is work with Congress to determine what do we need to do because of the law and adjust the law, because it is in statute right now. My professional opinion, though, is if we're going to terminate the MGCV, the non-line-of-sight cannon program is highly leveraged and intertwined with the MGCV program, and it is very, very difficult from an acquisition and contracting perspective for us to produce the non-line-of-sight cannon system that doesn't have the MGCV program wrapped around it. It would be prohibitively expensive for us to be able to do that.

Senator INHOFE. That's when you look at it from what we're talking about doing now; I would agree with that. But when we went through this change that started when they stopped the Crusader, at that time it was all planned out in the future.

I know I'm a little bit prejudiced, in that Fort Sill is in my State of Oklahoma and that's where they do this stuff. I don't have a parochial interest in this other than wanting to have the best, because we would be doing the PIM work there anyway. In fact, we're the only place where you can have these capabilities right next to a live range, so it's a logical place to do it.

But I am concerned about not going forward with a modernization program that would put us in a position where we are—you talk about the fair fight. I was coming back from the Air Show and I was reading your statement, and I agree with that. The adage that we never want to send our soldiers into a fair fight is at the core of the Army modernization strategy.

It seems to me that if we send our soldiers out with equipment that is not as good as the prospective enemy, then that's not a fair fight. What am I overlooking?

General CHIARELLI. You're not overlooking anything, Senator. We are working very, very hard to work the GCV, and that may be an individual vehicle, but it could be a series of vehicles. General Dempsey and the team are working, and I would not be surprised if we didn't see a family of vehicles that may include a vehicle that has an indirect fire capability.

Senator INHOFE. I would hope that's the case. Thank you very much.

Thank you, Mr. Chairman.

Senator LIEBERMAN. Thanks very much, Senator Inhofe.

We'll do a second round, up to 5 minutes, and then we'll go on to the second panel.

That was an interesting answer, General Chiarelli, about the follow-on to the MGV, that the GCV might be more than one vehicle.

Senator INHOFE. Mr. Chairman, would you do me a favor, because I can't be here for the second panel?

Senator LIEBERMAN. Yes.

Senator INHOFE. Would you mind asking a similar question to the DOD witness that's on the second panel? I've been pursuing this cannon thing. Just so we can get on the record some kind of an answer.

Senator LIEBERMAN. Of course, okay.

Senator INHOFE. Thank you so much.

Senator LIEBERMAN. Tell us a little more about that. We may have more than one vehicle coming out of that program?

General CHIARELLI. It's entirely possible, sir. I don't want to take away any of the options that General Dempsey and TRADOC are looking at right now. I haven't been able to have a readout of exactly what the blue ribbon symposium told us yesterday, but that's entirely a possibility, that it could make a recommendation of this vehicle morphing into more than one vehicle.

Senator LIEBERMAN. We'll watch that and follow it with a lot of interest.

I know that the fielding target for the GCV is in the 2015 to 2017 range. I know it's early, but are you confident that we can do that, we can get it ready by then?

General CHIARELLI. I think we have to.

Senator LIEBERMAN. Yes.

General CHIARELLI. I just absolutely believe we have to.

Senator LIEBERMAN. The need is there.

General CHIARELLI. The need is there. But also, I just think that the technology is moving so quickly that we have to find a way, like we have done with the MRAP ATV, to be quicker in our fielding of these systems, creating systems that over time may be modified, but provide that key base upon which we will build over time. I really believe that's where we have to go with this particular program.

Senator LIEBERMAN. I couldn't agree with you more that the timeframes for the development of some of the weapons systems are so long. It's part of I think why the costs escalate just over time. But obviously the relevance is diminished, as you said, because of advances in technology and even because of changes in the threat environment by the time they get ready.

I know it's a different kind of vehicle, maybe some would say a simpler challenge. But we did show with the MRAP vehicle that, under conditions of urgent necessity, the Pentagon, working with defense contractors, can turn out an awful lot of a particular piece of equipment that is critically necessary to protect our troops.

Obviously, we'll stay on top of that as we go along.

Let me ask you about the Stryker program, either one of you really. What can you tell us about the Army's thinking now with respect to the Stryker system and the potential growth in the number of combat brigades and plans to modernize and improve the capabilities of the current fleet?

General THOMPSON. Yes, sir. The Stryker program has been a very successful program for the United States Army. About 3,600 Stryker vehicles are the requirement. Over 2,700 of them have been fielded and are in the inventory to date, 7 Stryker brigades. One of the things that the Army is looking at from a force structure perspective is do we need more Stryker brigades to provide a balanced force with different capabilities across the spectrum of conflict.

Senator LIEBERMAN. What are the factors that you will consider in making that decision?

General THOMPSON. Part of that decision, sir, is going to be made as part of the QDR.

Senator LIEBERMAN. Right.

General THOMPSON. It's looking at the force mix of Stryker brigades, heavy brigades, infantry brigades, the enabler brigades, and the many other types of the BCTs in the Army; what is the right force mix? As we look at a balanced force to handle things across the spectrum of conflict, it is a possibility that we would want to build more of the Stryker brigades than the seven that we have today.

Senator LIEBERMAN. What kind of reaction do you get from our troops to the Stryker system as compared to other systems that they're using? In other words, are the troops happy with the Stryker?

General CHIARELLI. They're very happy with them. If you run into a Stryker crewman, he's going to brag on his vehicle like any Army soldier brags on their vehicle. But they love the Stryker.

We have some concerns with the current Strykers right now in power and in some power and weight issues that we have to work our way through. But the Stryker has proven to be an amazing addition and the Stryker BCT an amazing addition to the United States Army. We're on our ninth deployment. We have Strykers in Afghanistan today and we'll have a brigade up and operational in Afghanistan this summer.

So we are looking hard at the Stryker, as General Dempsey again wraps his arms around this entire Army modernization piece as a force mix issue to determine whether or not we may need additional Stryker BCTs.

Senator LIEBERMAN. So here, as well as in some other key decision areas, you're really waiting for the QDR to give some guidance about where we go from here? Is that correct?

General CHIARELLI. The QDR is a critical element, Mr. Chairman. But in addition to that, it's stepping back and relooking at

this after cancellation of the MGV and looking at where we're going to go. We are working day-in and day-out now, between now and Labor Day, and we hope to come out with that plan soon after Labor Day that lays out where we're headed.

General THOMPSON. Chairman Lieberman, if I could just offer some context from my perspective as the senior military acquisition officer. But I was also the Army's programmer for a number of years, looking at the balanced investments across all the capabilities. There's roughly 16,000 combat vehicles in the Army's inventory. Abrams, Bradleys, 113s, and Strykers dominate those numbers.

There is a need over time in a portfolio of capabilities to have a modernization program. I've been associated with armored systems modernization in the late 1980s and early 1990s. Then we had the Future Scout Cavalry System. We had the Armored Gun System. We had the Crusader, and now we have the MGV. Five programs, and every one of those programs got to the point where they were pretty far along in the development, getting ready to go into testing and production of prototypes, and for various reasons all of those programs have been terminated or significantly restructured.

At some point in time, the existing vehicles, even the Strykers, as good as they are, will reach their design limits. The 113s we are not using at all today in theater because they're not survivable and they don't have the capabilities. But Bradleys, Strykers, tanks, and the Abrams today, as capable as they are, eventually will reach their design limits. They reach their design limits in two key areas. One of them is survivability because, like the vice chief said, on the other side of the deployment you want your soldiers and systems that are as survivable as possible.

We need enough power margin and we need enough electrical energy to be able to put the networked systems on the combat platforms we put our soldiers in. So eventually we're going to need to modernize and replace some of those existing systems. The Army needs a stable set of funding across a number of years to be able to keep that portfolio of GCVs as capable as possible, so that our soldiers are as capable as possible and never in a fair fight.

We are not there today. It's been over 20 years since we started the armored systems modernization program and we're now going to start our sixth iteration of trying to modernize the GCV capability in the Army. That bothers me greatly.

Senator LIEBERMAN. Me too. Thank you.

Senator THUNE, do you have other questions?

Senator THUNE. Let me just ask, if I might, Mr. Chairman. As you all know, the President signaled his intention to move away from the use of supplemental spending bills to deal with overseas operations and instead to incorporate these costs into the regular budgeting process.

My question, General Chiarelli, is what challenges does that change create for the Army?

General CHIARELLI. I believe we've been consistent in testimony, not only I have, the chief has, but those that went before us, indicating that reset is a critical piece that is going to continue in the Army. I believe we have \$11 billion in this particular Overseas

Contingency Operations budget for reset. It will continue as long as we're fighting, and it will continue 2 years after we complete fighting.

So it's our hope that everybody will remember that and the need to reset this equipment that is going at operating tempo rates that are much higher than they would if they were back here in the United States.

General THOMPSON. Senator, if I could just add to that again, what I said earlier about having some responsibility for the Army's programming for a number of years. If supplementals decrease or go away, the requirements that are covered by the supplemental funding in most cases don't. So if the supplemental goes away and you don't increase the base program, there are things that won't get done. There are probably fewer soldiers. The modernization programs are the first things that people look at to be able to cut.

So if we just say there's no more supplementals and you don't increase the base program, then something has to change. My analogy would be it's like a two-income family and one of the income earners no longer is employed. Your lifestyle's going to change significantly because you just can't do the same things that you were doing with one income instead of two. Not that the supplementals and the base program are equal, but there's a lot of requirements that are covered with supplemental funding, and you just can't say they go away and just do it with the base program without increasing the base program.

General CHIARELLI. So many of those are Army bills.

Senator THUNE. Let me ask, the Army is in a financial hole. You estimated over \$2 billion in its personnel accounts. Is there a plan for closing that gap right now?

General CHIARELLI. We have a plan. We're hoping to get all the help we possibly can, but we have a plan over the next couple of years to go ahead and do that. We will have to do that. As I indicated and you indicated, Senator, people are absolutely critical, and thank goodness we have those people. We were able to make 547,400 and a little bit more right now as we're rolling that number back, because it's critical when I have almost 9,000 soldiers in Warrior Transition Units, another 10,000 to 11,000 that are currently nondeployable, and then individual augmentees. That adds up to a pretty sizable bill that I'm not able to put into my formations as they deploy on a dwell that's at 1.5 at unit dwell, less on individual dwell today.

Senator THUNE. Can we keep up with all those personnel costs and still ensure good recruiting and retention?

General CHIARELLI. We are blessed right now, Senator. Recruiting and retention are as good as I've ever seen in the time that I've been in the Army. We have to be concerned, though, and we all pray that the economy turns around, but for recruiters that'll make life difficult again, I'm sure. But we will have to continue to recruit the best for our Nation's Army and we are totally focused on doing that.

Senator THUNE. Thank you. Thank you, gentlemen, for your great service to our country, and be sure that you convey that same appreciation to your families, too, for the sacrifices that they make and for your service. Thanks.

Thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you, Senator Thune.

Regarding that last exchange with Senator Thune, we're in a most unusual moment, which is, as you said, recruitment is going very well, there is a high level of recruits coming in. We understand part of it may be the economy, but there's a lot of other factors. Reenlistments are very high. So part of what originally drew our attention to trying to increase the Army end strength is not only the effect on dwell time, but this, as I understand it, most unusual and unacceptable phenomenon where you may actually have to, because you don't have adequate statutory authorized end strength, slow down on recruiting and reenlistment, in fact to let some people go, as it were, hoping that attrition brings you down. When the demand is so high for personnel in active deployment, we ought to protect you from that kind of pressure.

But anyway, we're going to pursue that as we go to our markup next week.

I thank you very much for your testimony. You've been extremely responsive. You're two impressive people that our country and the Army are very fortunate to have in positions of leadership, and I'd really put you up against any group of people in any field or corporation or anything else. You represent the best of our country. Thank you very much.

General CHIARELLI. Thank you, Senator.

General THOMPSON. Thank you, Senator.

Senator LIEBERMAN. We'll call the second panel: Mr. Ahern and Mr. Francis.

As I indicated, David Ahern is the Director of Portfolio Systems Acquisition in the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. Paul Francis is the Managing Director, Acquisition and Sourcing Management, at the GAO.

We thank both of you for being here. Mr. Ahern, I would now welcome your testimony.

STATEMENT OF DAVID G. AHERN, DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS

Mr. AHERN. Good afternoon, Chairman Lieberman, Senator Thune, distinguished members of the subcommittee. Thank you for the opportunity to appear before you to discuss Army modernization and the management of the FCS program as you review the fiscal year 2010 budget. I'll be brief in order to move quickly to the panel's questions.

Senator LIEBERMAN. Good.

Mr. AHERN. In fiscal year 2010, FCS will remain the Army's largest research and development investment. However, we plan to transition from the FCS BCT acquisition program to establish at least four acquisition programs that will leverage the FCS investment to date and deliver realistically defined, cost effective, and timely capability to modernize the Army's ground forces. These new integrated Army modernization programs will include as a minimum: planned early infantry BCT acquisition, follow-on BCT modernization, GCV modernization, and incremental ground tactical network capability.

The importance of meeting the Army's modernization needs and the magnitude of the investment dictate that we get these acquisitions right. We must do it expeditiously. By way of background, we established the FCS BCT in 2003. The Army contracted Boeing and SAIC to develop a system-of-systems design. While the system-of-systems umbrella for the FCS BCT acquisition provided a unique opportunity to optimize capabilities, the complexity involved in applying the system-of-systems approach offered many challenges for the acquisition community.

The FCS investment did, however, provide us with a far better understanding of the potential for integrated capability, with insights for early application of this integrated capability across the combat brigades. In addition, the technology coming from the FCS investment is a game-changer for the Army modernization effort in platforms such as unmanned ground and air systems, in sensors such as active protection and unattended ground sensors, in vehicles with hybrid electric power trains, and lightweight armor, and in the network, with integrated battle command, sensor fusion, and enhanced situational awareness.

All these will transition the Army modernization acquisition as we move forward. A key transition relative to knowledge-based acquisition was a decision in 2006 to capitalize on early increments of FCS capability for delivery to the current force. We term those spinouts.

We will continue this incremental acquisition philosophy as we transition to multiple Army modernization acquisitions in 2010.

Relative to our reporting requirements on FCS, while the Army recently completed the FCS system-of-systems preliminary design review, decisions leading up to the fiscal year 2010 President's budget have already addressed the issues identified for the Defense Acquisition Board milestone review. However, in satisfaction of the National Defense Authorization Act for Fiscal Years 2007 and 2009 provisions, we will provide a report that reflects DOD's FCS decision to the congressional defense committees.

Regarding the committee's interest in future contracting relationships, in the short term the FCS contract will be restructured to continue the integration and development efforts in network, spinouts, and BCT modernization until the new acquisitions are established. Changes in the FCS contract will address our concerns regarding fee structure to give the government leverage to promote cost efficiency. As acquisition plans for the future programs mature, we'll use contracting strategies that include competition, fee structures to incentivize performance, and fixed price contracts when appropriate, all leading to better control of contract costs.

We have learned much from the FCS acquisition program. Our acquisition and program management lessons learned are consistent with those learned from other DOD acquisition programs. As we move forward with the new modernization program, we will seek to match requirements to mature technologies, to estimate program costs more realistically, to seek budget stability for the programs we initiate, staff government acquisition teams adequately, and provide disciplined and effective oversight.

In closing, DOD's fiscal year 2010 budget will facilitate a timely, in-stride transition from the previous plan to acquire 15 FCS BCTs

to multiple major modernization programs to deliver much-needed sensor, networking, and vehicle capability to the Army. We will leverage the FCS development efforts to date and deliver that capability.

We are grateful for the continued support of Congress, which has been critical to ensuring our soldiers are the best trained and best equipped in the world. Thank you for this opportunity to testify on DOD's plans to continue to equip them for today's wars and tomorrow's challenges. I look forward to answering any questions you may have.

[The prepared statement of Mr. Ahern follows:]

PREPARED STATEMENT BY DAVID G. AHERN

Good morning Mr. Chairman, Senator Thune, and members of the committee. Thank you for the opportunity to appear before you today to discuss Army modernization and the management of the Future Combat Systems (FCS) program as you review the fiscal year 2010 budget requests.

The FCS program decisions reflected in the President's fiscal year 2010 defense budget address two priorities of the Secretary of Defense:

- Rebalancing the Department's programs in order to institutionalize and enhance our capabilities to fight the wars we are in today and the scenarios we are most likely to face in the years ahead, while at the same time providing a hedge against other risks and contingencies.
- Reforming how and what the Department buys, a fundamental overhaul of our approach to procurement, acquisition, and contracting.

In fiscal year 2010, the FCS budget line will remain the Army's largest research and development investment at three billion dollars as we rebalance the Army modernization priorities. We will accelerate the fielding of early increments of specific FCS capabilities that have demonstrated success, such as unmanned ground and air vehicles and unattended sensors, to enhance our ability to address counterinsurgency and close quarter combat, such as what we are seeing in operations today. We will cancel the FCS manned ground vehicle effort as we fully assess the Department's ground combat vehicle capability needs for full spectrum operations, informed by operations today and analysis on the appropriate mix of vehicles.

In 2010, we will transition the single FCS acquisition program (a Major Defense Acquisition Program (MDAP)) into multiple acquisitions established on solid capability definition, technology maturity, realistic cost estimates, and sound contracting strategies. The Department will implement our full complement of acquisition reform initiatives as the foundation for establishing these new programs. The importance of meeting the Army modernization needs and the magnitude of the investment dictate that we get these acquisitions right—and we must do it expeditiously.

The Secretary of Defense has directed that these new modernization efforts be fully funded in the outyears as we accelerate FCS spin-off capabilities, across the Army's combat brigades. To properly address the questions you asked in your letter of invitation, I would like to briefly review the history of the FCS program, describe the FCS investment as presented in the fiscal year 2010 budget, briefly discuss how we plan to implement those changes, and finally address significant lessons learned from the FCS program.

2003–2009 FCS BRIGADE COMBAT TEAM ACQUISITION

In 2003, the Department approved Milestone B for the FCS Brigade Combat Team (BCT) acquisition. This decision approved a baseline for development and procurement of 15 BCTs. The Army contracted with Boeing/SAIC to develop a “system-of-systems” design for the FCS BCT. The current contract relationship with Boeing is as a prime contractor for the Systems Design and Development phase of the FCS program, whereby Boeing, in some cases, is required to perform lead systems integrator-type functions as defined by the terms and conditions of the contract. Although the FCS contract uses the term “lead system integrator,” Boeing does not meet the statutory definition of a Lead System Integrator as defined by section 805 of the National Defense Authorization Act for Fiscal Year 2006, (Pub. L. 109–163). Boeing performs a substantial portion of the development work for the program by providing the System Common Operating Environment software and Warrior-Machine Interface.

The FCS contract is a Cost Plus Fixed Fee/Award/Incentive-type contract to develop manned and unmanned ground vehicles, unmanned air systems, unattended ground sensors and to integrate these, and a number of complementary systems—such as Joint Tactical Radio System and Warfighter Information Network-Tactical—into a BCT that delivers the capability defined by the FCS Operational Requirements Document.

Over the 6 years of development to date the program has been modified to accommodate changes in the brigade structure (for instance reducing the types of unmanned air systems and removing capability that was not technologically mature like the unmanned armed reconnaissance vehicle) and to “spin-out” early increments of FCS capabilities to the current force brigades.

The FCS Spin-Out is illustrative of how we have utilized a knowledge based process to inform our acquisition decisions. In 2006 the Department approved the Army’s approach to initiate actions to field FCS capabilities such as the unattended ground sensors, Non-Line-of-Sight Launch System, and an early instantiation of the FCS network to other combat brigades. The Spin-Out approach was updated in 2008, adding unmanned air and ground systems to capabilities ready for consideration for production. The decision was then made to provide the initial increments of capability to the Infantry Brigades. A Capabilities Production Document has been approved defining the expected performance for this initial increment of capability. The systems engineering work, to include Preliminary and Critical Design Reviews, testing of prototypes to demonstrate capability, and cost and technology assessments are all underway to inform a Milestone C decision for this Spin-Out Early Infantry BCT this fall.

While the system-of-systems umbrella for the FCS BCT acquisition provided a unique opportunity to optimize capabilities across the brigade, the complexity involved in applying the system-of-systems approach offered many challenges for acquisition management and oversight.

The FCS contract, initially capitalizing on the early efforts undertaken by DARPA, has undergone major changes yearly. It has transitioned from an Other Transactions Authority agreement to a Federal Acquisition Regulation-based contract, modified to support changes in the brigade structure, and also modified to accommodate the “spin-out” of capability to the current force brigades. The means to effectively deliver integrated capabilities, particularly in the areas of network and battle command, is an area of continued attention for the Service and the Department, to include identifying the correct balance between contractor and government responsibilities.

The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) has reviewed the program at least yearly, providing acquisition direction to keep the program on track to deliver an FCS Brigade capability. Our direction for the FCS BCT focused on continued attention to the capability definition, technology maturity, and current cost estimates. Additionally, we have provided our expectations for spin-out development, exit criteria, and specified actions to address concerns regarding the FCS contract fee structure.

Section 214 of the John Warner National Defense Authorization Act for Fiscal Year 2007, as amended by section 211 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, required a Defense Acquisition Board (DAB) milestone review of the FCS program and a report on that review. As a result of the FCS decisions leading up to the fiscal year 2010 President’s budget we have determined a DAB milestone review is no longer applicable. Nonetheless, in satisfaction of the Fiscal Year 2007 and 2009 Authorization Act provisions, we will provide to the congressional defense committees a report that reflects the Department’s FCS decision.

2010 INVESTMENT FOR ARMY MODERNIZATION

In fiscal year 2010, FCS will remain the Army’s largest research and development investment; however, we plan to transition from the FCS BCT acquisition program to instead establish at least four acquisition programs that will leverage the FCS investment to-date and deliver realistically defined, cost effective and timely capability to modernize the Army’s ground forces. These new integrated Army Modernization programs will include, as a minimum, the following:

- The planned Early-Infantry BCT acquisition
- Follow-on BCT modernization
- Ground combat vehicle modernization
- Incremental ground tactical network capability

IMPLEMENTATION PLANS

We will continue efforts to-date to further develop, produce, and field FCS developed capabilities in the form of early spin-outs to seven Infantry BCTs. This MDAP will start with a Milestone C decision scheduled in the first quarter of fiscal year 2010 following a Limited User Test this summer. Input for this decision will be in accordance with Department of Defense Instruction 5000.02, to include an approved Acquisition Strategy, a Capability Production Document, a Technology Readiness Assessment, and an Independent Cost Estimate. Robust systems engineering work ongoing will support the critical design review and production readiness review we need to support a low-rate production decision. Testing will inform us of both the maturity of the individual systems (the small unmanned ground vehicle, the class I unmanned air vehicle, the unattended ground sensors, and the Non-Line-of-Sight Launch System) as well as network components used to integrate these capabilities into the brigade.

Follow-on BCT modernization acquisition program(s) will follow to expand delivery of these capabilities to the remaining Army combat brigades by 2025. The Army will develop an acquisition plan to support acquiring these capabilities and present that plan for USD(AT&L) review in the fall of 2009.

The acquisition for ground combat vehicles will proceed subsequent to a capability assessment by the Army, working with the Marine Corps. The assessment will include an evaluation of ground combat vehicle missions across the spectrum of operations, a review of the capabilities of the current combat vehicle fleet, identification of joint capability gaps, and incorporation of any lessons learned from ongoing operations. This ground combat vehicle capability assessment will support the development of requirements for a new Ground Combat Vehicle program, and we are planning for a Materiel Development Decision in 2010.

Incremental delivery of ground tactical network capability is another critical element for Army modernization. Initial planning for the continued development and delivery of integrated networking and battle command capability is ongoing.

As we move from a single FCS acquisition to these targeted modernization acquisitions we will focus on buying the right thing, buying it the right way, and managing it effectively.

Buy the right thing:

A clear understanding of our capability needs will be a focus area as we move forward. We will stop development of the current FCS manned ground vehicles as we reevaluate the requirements, technology, and acquisition approach. We will conduct a thorough capability assessment for ground combat vehicles, informed by current operations, full spectrum operational needs, existing available capability, and force structure changes. Additionally, the Army will identify the sensor and unmanned capabilities needed for all combat brigades and will define requirements for the incremental delivery of battle command network and software. We in the acquisition community will work closely with the Joint Staff to expeditiously establish a solid requirements baseline for achievable delivery of capability.

Buy it the right way:

In the short term, the FCS contract will be restructured to address concerns with the current fee structure and to continue the integration and development efforts in the network until the new acquisitions are established. The fundamental issue with the FCS contract structure is that there is an insufficient amount of fee associated with objective contract performance. Changes in the FCS contract will address the Department's concerns regarding a fee structure that gives the government little leverage to promote cost efficiency. We will make changes to the contract structure to more closely tie fee to performance.

As acquisition plans for the future programs mature, we will employ contracting strategies that consider competition, competitive prototyping, and fixed-price development. As the Army expands its contracting and management workforce, government personnel in the program management office will take on an expanded role, particularly in contract management and oversight, systems engineering, and integration. All these efforts will contribute to protecting the Government's interests through the effective use of taxpayer funds to deliver to our soldiers the equipment they need.

Details on plans to modify the contract will be developed over the next few months as we prepare to implement the decisions reflected in the fiscal year 2010 budget. The near-term contracting approach for acquiring the early spin-out systems will also include competition, fee structures to incentivize performance, and fixed price contracts when appropriate.

Manage it effectively:

This fall we will conduct a Defense Acquisition Executive-level review of the FCS program restructure to address the implementation of the fiscal year 2010 budget decisions and transition to multiple acquisitions. This will ensure we are appropriately leveraging the FCS investment to date. Each new acquisition will be established with a solid capability definition, appropriate technology maturity, realistic cost estimates, and sound contracting strategies. We will utilize Configuration Steering Boards, Independent Cost Estimates, Technology Readiness Assessments, and other management tools to ensure capability is delivered on time and within budget. We must continuously challenge our processes to get to timely, supportable decisions that deliver needed capability in a timely, cost effective manner.

LESSONS LEARNED

There are numerous lessons learned from the FCS BCT acquisition—spanning the areas of capability definition, system-of-systems integration, acquisition and program management, costing, and contracting.

Capability definition:

We must be more disciplined in our desire for more and better capability. Successfully defining achievable expectations for emerging capability requires our continued, focused attention. Capability definition in battle command and control, networking, communications, and sensor integration were not of sufficient fidelity when the FCS program started. The FCS network development effort has helped frame what capabilities are important in a tactical ground network. To “buy the right thing” requires clear understanding on the part of the capability developers of what is realistically possible at what cost. As we move forward we in the acquisition community must work closer with the capability developers for a shared understanding of requirements in these areas. We will use evolutionary acquisition strategies to translate these requirements to grow capability incrementally for the ground tactical network, sensor systems, and vehicles.

System-of-Systems Integration:

The investment in the FCS acquisition has provided us with significant advances in understanding both the boundaries and potential for integrated capability. The recently completed System-of-Systems Preliminary Design Review highlighted two significant force multipliers: (1) a reliable, working tactical ground network over broad areas of operation; and (2) sensors and systems providing timely and reliable information to that network. These findings are consistent with lessons learned in operations in Iraq and Afghanistan. These key enablers are the targets of opportunity we will emphasize as we transition to multiple Army Modernization acquisitions. Clearly the significant research and development investments by the FCS program set the stage for fielding a robust integrated capability, beginning with early Infantry BCT units.

Acquisition and Program Management:

The acquisition and program management lessons learned in FCS are consistent with those learned from other Department acquisition programs. These include ensuring our investments are affordable and consistent with warfighter priorities; realizing predictable cost and schedule outcomes by accepting and approving requirements based on mature, demonstrated technologies; and establishing programs with realistic cost and schedule estimates. An Acquisition Program Baseline based on achievable performance criteria, an Independent Cost Estimate, and a realistic execution schedule are critical to acquisition success. During development, the use of rapid prototyping and demonstrations provide early and valuable insights to drive effective decision making to keep programs on track. Configuration Steering Boards are needed to effectively communicate what capability the acquisition program can achieve, limit changes in requirements that drive adverse cost and schedule impacts, and to provide the basis for effective tradeoff decisions. Additionally, as part of the Secretary's initiative to revitalize the acquisition workforce, the Department will increase the overall size of the government acquisition workforce by 20,000 through fiscal year 2015, significantly improving the capability and capacity of the Defense acquisition workforce to oversee and execute these important defense programs. The objective is straight forward: ensure the Department has the right acquisition capability to produce best value for the American taxpayer and for the soldiers, sailors, airmen, and marines who depend on the weapons, products and services we buy.

Costing:

The independent cost estimates done for the FCS acquisition were invaluable for informing decisions. Executable acquisition approaches must be developed to address the cost risks identified in the cost estimate. Significant attention to “descoping” options is needed for properly informed cost-performance trade-off decisions. The ability of the requirements community to take into account the cost of capability is also an area that needs attention—particularly in the network and sensor arenas.

Contracting:

Contracting for the development of System-of-Systems capability proved to be complex and challenging. In the contracting arena, we will ensure competition and appropriately incentivize our contractors to control costs. A thorough, risk-based analysis of multiple contracting approaches for delivery of capability will be undertaken prior to approving future contracting strategies.

With these insights gained from the FCS BCT acquisition, in conjunction with the Department’s acquisition reform efforts, we will ensure the Department effectively and efficiently acquires the vehicles, unmanned systems, sensors, and networks needed for Army combat brigade modernization.

CONCLUSION

The FCS element of the fiscal year 2010 budget reflects the Secretary’s priorities. His decisions were based on a combination of the currency of requirements given ongoing operations, the maturity of the development efforts within the FCS acquisition program, modernization priorities, and affordability. The Department’s fiscal year 2010 FCS development budget will facilitate a timely, in stride, transition from the previous plan to acquire 15 FCS BCTs to multiple major modernization programs. These new modernization acquisitions will deliver much needed sensor, networking, and vehicle capability to the Army, and we are intent on expeditiously leveraging the FCS development efforts to date to deliver that capability.

We are grateful for the continued support of Congress which has been critical to ensuring our soldiers are the best trained and best equipped in the world. Thank you for this opportunity to testify on the Department’s plans to continue to equip them for today’s wars and tomorrow’s challenges. I look forward to answering any questions you may have.

Senator LIEBERMAN. Thanks, Mr. Ahern. We look forward to the questions.

Mr. Francis.

STATEMENT OF PAUL L. FRANCIS, MANAGING DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Mr. FRANCIS. Thank you, Mr. Chairman, Mr. Thune. I appreciate your inviting me to participate in this discussion of the Army’s modernization in a post-FCS context. I’ll say a few words about what I think are the positive aspects of FCS that are worth emulating as we go forward, and then talk about some of the difficulties with the program that I think we can learn from.

So, starting with the positive aspects, I think the Army really did break with tradition in thinking through FCS and came up with a holistic view of what it thought the future force ought to look like. It was able to translate that into a context and an architecture for a family of systems that it would field as an integrated force. I think this is a much better approach than developing individual systems and trying to integrate them after the fact.

I also think the Army was innovative in its managerial approach. It wanted to break down its stovepiped organizations and cut across organizational lines to field an integrated force. I think it was very candid about what its abilities were to manage that and contracted with a lead system integrator to try to fill in some of

its own shortfalls. So I think that was a courageous approach on the Army's part.

We do have some concerns with the lead system integrator, but I do think the approach the Army used in that approach did give it unprecedented insight into subcontractor selection and gave it more competition at the subcontractor level. I think that was a good idea.

We heard testimony from the first panel about the network. I think it was discerning on the Army's part to observe that it needed to deliberately develop an information network rather than wait for after the fact and try to cobble it together with systems that had already been developed.

A final thing I would say from a positive standpoint on FCS is the decision to spin out or harvest technologies and give them to the current forces was a really good idea. I think it was even better when the Army developed the evaluation task force to vet these technologies before they went into the field. So again, a good idea worth continuing as we go forward.

In terms of some problematic aspects with FCS, I think the first thing I would say is I believe that the program—and we've reported on this—was not really executable within realistic resource bounds. The technology, the software, the network, the requirements, and the costs were all on a grand scale and we knew very little about them when we got started.

For example, the MGVs were being developed and their performance and their survivability depended on the network, at the same time we were inventing the network. So that concurrent development was I think a bit too much for a single program.

FCS I think was moving too fast. Originally it was going to be a 5½-year program. It eventually stretched out to 10 years, but it was still faster than any single revolutionary program had proceeded before, and on FCS we were looking at 14 to 18 programs in one. I think if the program did continue on its existing path it would have put you in a difficult position, because I think at least 3 years of production funds would have been requested before we had a really meaningful demonstration of FCS capabilities. So it was on a really fast pace.

I think the take-away from that is these risks were knowable and I think understood at the beginning, but accepted. So I think going forward we have to be very careful about accepting those kinds of risks. These were not unexpected discoveries that occurred along the way, and I would make that distinction.

I think from an oversight standpoint the challenges were too great. The scope of the program was such that the visibility over cost changes and schedule changes were not visible. They were very hard to discern. I think the scope of the program was such that it overwhelmed some of our key oversight mechanisms. Selected acquisition reports, the earned value management system, and even our budget requests weren't a good fit for a program of the size of FCS.

The Army's close relationship with the lead system integrator, while it had some advantages, we saw some long-term oversight concerns with that, in that we thought there was a risk that over time the Army would find it difficult to distance itself from the lead

system integrator and in fact the program itself. We looked to OSD to provide that oversight.

In the early years, OSD didn't provide that oversight and basically allowed the Army to proceed with the program as planned. So it proceeded through the start point with significant immature technologies, significantly far afield of OSD's own policies. OSD had independent cost estimates that were much higher than the Army's. Yet they let the Army's estimate prevail. I think even though costs and schedules doubled over these years, there were no Nunn-McCurdy breaches reported on the program.

Now, we've seen an improvement in OSD's oversight in the last 2 years and maybe Dave Ahern here has a large part in that. So we've seen that occur, but again OSD oversight early, was really an important factor.

So, going forward, I think we'll see the Army with at least three efforts: spinouts in some form, a network program, and MGVs. I think each of these will require some different types of management approaches, but they need to share some common principles. That is, they need to be anchored in knowledge and they must adhere to DOD's current acquisition policy. We have to have realistic cost estimates that are informed by independent estimates and we need to budget to the most realistic cost. I think that we have to have programs that are transparent and accountable for oversight.

I think we have to realize that a unique contractual arrangement or a bold managerial approach are not a substitute for knowledge or sound systems engineering.

So I would say in conclusion, I think there's no question that the Army needs to be well-equipped. I don't think there's any debate about that. I think the Army needs to be innovative about its approach, but needs to be pragmatic and knowledge-based when it comes to individual systems.

I would ask a broader question. If we accept the Army's vision of the future and how it wants to equip, I think we can all point out things that could be done differently than FCS. But I think a real challenging question is: how would we do that differently today? I think the burden there is a lot more what would have to be done prior to the acquisition phase. The question becomes, do we have the people, the organizations, the facilities, the transition mechanisms, and so forth in place to do that kind of work up front? I don't know that there's a good answer for that.

So I'll conclude with that and be available for any questions.

[The prepared statement of Mr. Francis follows:]

PREPARED STATEMENT BY PAUL L. FRANCIS

Mr. Chairman and members of the subcommittee: I am pleased to be here today to discuss the Department of the Army's modernization efforts to transform into a lighter, more agile, and more capable combat force using a new concept of operations, technologies, and information network. For the past 6 years, the Future Combat System (FCS), a revolutionary and expansive program, formed the core of Army modernization. Earlier this year, the Secretary of Defense recommended restructuring the FCS program to lower risk and to address more near term needs. His recommendation came a few months before the FCS program was scheduled to undergo a congressionally-mandated go/no-go review to determine the program's future. Although the Army has not yet officially implemented the Secretary's recommendation, the Department of Defense (DOD) and the Army have begun to make conforming programmatic and budgetary adjustments to FCS.

My statement today is based on the work we conducted over the last several years in response to the National Defense Authorization Act for Fiscal Year 2006, which requires the Government Accountability Office (GAO) to report annually on the FCS program.¹ As Congress will be asked to make significant funding commitments for Army ground force modernization over the next several years, this statement will review: (1) aspects of FCS that should be preserved in future efforts, (2) aspects of FCS that were problematic and need re-examination, and (3) considerations for shaping future Army ground force modernization.

BACKGROUND

With FCS, the Army embraced a new warfighting concept designed to replace most of its existing combat systems with a family of manned and unmanned vehicles and systems linked by an advanced information network. According to the Army, FCS represented the greatest technology and integration challenge it had ever undertaken—an FCS-equipped force was to be as lethal and survivable as today's force, but significantly lighter and thus easier to both move and sustain. The Army determined it could not meet the challenges of the FCS scope and schedule with its workforce alone and with traditional management approaches. In 2003, the Army contracted with the Boeing Company as the lead systems integrator (LSI) to assist in defining, developing, and integrating FCS systems. Boeing subcontracted with Science Applications International Corporation (SAIC) to assist in performing the LSI functions. Over the past several years, Congress, GAO, and other organizations have expressed numerous concerns about the management and acquisition strategy for the FCS program, including significant knowledge gaps, questionable costs and affordability, the relationship between the Army and the LSI, and the lack of oversight by the Office of the Secretary of Defense (OSD).

This committee has been influential in overseeing the FCS program and protecting the government's interests therein. In particular, the committee advocated changes to the original contract structure and type to incorporate more Federal Acquisition Regulation provisions, including those related to the Truth-in-Negotiations Act and the Procurement Integrity Act.

This statement is based on work we conducted over the last several years in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

ASPECTS OF FCS THAT SHOULD BE CONSIDERED FOR INCLUSION IN FUTURE EFFORTS

There is no question the Army needs to ensure its forces are well-equipped. The Army has vigorously pursued FCS as the solution, a concept and an approach that is unconventional, yet with many good features that should be considered in future efforts. These features include a holistic, system-of-systems architectural vision, government insight into subcontractor selection and management, a focus on leveraging capabilities through an information network, and establishing organizations to train with and evaluate FCS-related spin-out technologies being provided to current forces.

FCS resulted from Army leadership's vision of how land forces should be organized, equipped, and trained to fight in the future. The decisions to pursue FCS, along with modular combat units, became the centerpiece for realizing this vision. To the Army's credit, these decisions were harder than just replacing current combat systems, like the Abrams tank and Bradley fighting vehicle, with new versions. Rather, Army leadership saw FCS as breaking with tradition. It was to be a system of systems—an overall architecture through which the collective capabilities of individual systems, both manned and unmanned, would be multiplied because of the synergistic effect of being linked by an advanced information network.

Individual systems were to be designed to work within the architecture and the network—an improvement over a traditional, system-centric design approach that would integrate the systems after the fact. Army leadership also chose to cross its own stovepiped combat lines, such as infantry, armor, and fire support. The resultant scope of the FCS program was overly broad for a single acquisition program. Nonetheless, such a holistic view, anchored in a vision of how the land force of the future needs to fight, should continue to guide the modernization investments the Army makes. A context, it should be noted, does not necessarily equate to a program or programs.

¹ Pub. L. No. 109-163, § 211.

While we have reported a number of risks associated with the LSI arrangement on FCS (which are discussed later), the insights the Army gained into subcontractors was beneficial. Army leadership set up the FCS program and LSI contract in such a way that it would create more competition and have more influence over the selection of subcontractors below the LSI. Traditionally, once the Army contracted with a prime contractor, that contractor would bring its own supplier chains, and the Army was not very involved in the choice of the subcontractors. In FCS, the Army called for the LSI to hold a competition for the next tier of contractors. The Army had veto power over these selections. The Army also directed that the LSI contract with integrators at lower levels in the program, and the Army was involved with these selections. These integrators held competitions to select suppliers for those systems. This strategy kept the first tier of subcontractors from bringing their own supplier chains, and the approach promoted competition and pushed Army visibility down lower into the supplier chain. It was also a means for the Army to ensure commonality of key subsystems across FCS platforms. Enhanced visibility into the selection and design decisions of subcontractors appears to have benefited the FCS program and warrants consideration in future efforts.

The Army envisioned an unprecedented information network as the backbone of FCS. Inventing such a network while concurrently designing vehicles and other systems dependent on it was too grand an approach. However, the recognition that an integrated combat network should be deliberately designed versus derived or cobbled together from other systems was discerning. Since FCS began, the Army has achieved an understanding of what the information network needs to be, what may be technically feasible, how to build it, and how to demonstrate it. It has also consciously endeavored to develop the FCS network and software over time in a series of pre-planned blocks. Although work on such a network needs to be properly situated within the acquisition process and guided by requirements that are technically realistic, the deliberate development of an integrated network seems a sound approach.

The Army initiated spin-out development in 2004, when it embarked on an effort to bring selected FCS capabilities, such as the unattended ground sensors and the non-line-of-sight launch system, to current forces while core FCS development continued. In 2006, the Army established the Army Evaluation Task Force to use, evaluate, and train with the spin-out capabilities, and the Task Force began its testing of the first FCS equipment in early 2008. As noted by both Army and DOD officials, the Task Force has proven quite useful in identifying system issues and suggesting design changes. Accordingly, the Army should continue utilizing the Task Force to better understand and improve its systems, spin out and otherwise.

ASPECTS OF FCS THAT WERE PROBLEMATIC AND NEED RE-EXAMINATION

In our work, we found the greatest obstacle to the Army's realizing its vision for FCS to be that the program was not executable within reasonable bounds of technical, engineering, time, or financial resources. The program was very immature when it began, never measuring up to DOD's own standards for technology and design. Over time, adjustments were made such as adding development time and trading off requirements, but nonetheless, vehicle weights and software code grew substantially, key network systems were delayed, and technologies took longer to mature than planned. By 2009, whether FCS would work as planned remained undemonstrated. As we have reported, these difficulties do not necessarily represent problems that could have been avoided; rather, they reflect the actual immaturity of the program. Yet, to a large extent, these difficulties are foreseeable at the start of programs that do not apply the standards embodied in DOD's own acquisition policies.

Oversight of FCS was extremely challenging given the program's vast scope and the innovative, but close, partner-like relationship between the Army and the LSI. OSD did not play an active oversight role, such as stringently applying its own acquisition policies, until about the past 2 years of the program. Congress intervened by mandating a go/no-go milestone decision to occur in late 2009. Oversight was further challenged by the pace of the program; the schedule for making decisions outpaced demonstrated knowledge to the extent that major production commitments were to be made before basic designs were to be demonstrated. Lessons from this experience should be applied to put future modernization efforts on the soundest footing possible for execution.

Strategy to Acquire FCS Was Not Executable Within Projected Resources

Originally, the Army intended to define thousands of requirements; mature critical technologies; and develop the network, manned and unmanned vehicles, and other systems within about 5½ years from development start—much faster than a

single system typically takes. When FCS entered development in 2003, the Army had not yet established firm requirements that were matched with mature technologies and preliminary designs. Although the Army lengthened the development schedule to 10 years, it did not plan to demonstrate the level of knowledge needed at development start until 2009.

In 2003, only 40 percent of the FCS critical technologies were nearing maturity, although DOD's acquisition policy called for all critical technologies to be mature at development start. Originally, the Army officials believed it could mature the remaining technologies in just 3 years. While the Army has made significant progress, today it is still conducting evaluations to demonstrate minimum maturity levels for several critical technologies. Also, the Army needed capabilities being developed by programs outside of FCS to meet network and other requirements. However, these programs were immature as well, and synchronizing them with FCS proved elusive. In particular, the Joint Tactical Radio System and Warfighter Information Network-Tactical programs, the primary enablers of the network, experienced developmental delays that adversely affected the FCS schedule. As technologies, designs, and requirements evolved, key tradeoffs became necessary. For example, the weight of the manned ground vehicles grew from 19 tons to 29 tons, and the use of the C-130 as the main transport aircraft had to be abandoned.

The Army set forth an ambitious schedule for software development and the program as a whole. Originally, the Army anticipated 33 million lines of software code for FCS—which at the time made the program the largest software-intensive acquisition program in DOD history. That estimate has now grown to over 114 million lines of software code. The Army approach to managing the software effort has employed disciplined management practices, but these have been impaired by late and changing requirements. With such a schedule in mind, the Army allowed the program to proceed through developmental and test events without sufficient knowledge. Similarly, the Army was poised to begin early production without having adequately tested production-representative articles.

In light of these and other risks, the John Warner National Defense Authorization Act for Fiscal Year 2007 mandated that the Secretary of Defense carry out a Defense Acquisition Board milestone review of FCS not later than 120 days after the system-of-systems preliminary design review, which occurred in May 2009.² According to the law, the milestone review should include an assessment of:

1. whether the warfighter's needs are valid and can be best met with the concept of the program;
2. whether the concept of the program can be developed and produced within existing resources; and
3. whether the program should
 - a. continue as currently structured;
 - b. continue in restructured form; or
 - c. be terminated.

In our March 2009 report on FCS, we concluded that the Army would be challenged to convincingly demonstrate the level of knowledge needed to warrant an unqualified commitment to the FCS program at the milestone review.³ We identified a number of knowledge gaps that have persisted throughout the development program. Specifically, the FCS program has yet to show that critical technologies are mature, design issues have been resolved, requirements and resources are matched, performance has been demonstrated versus simulated, and costs are affordable. Also, network performance is largely unproven. In summary, we determined that the FCS program was not executable within Army cost and schedule projections.

The pace of the program called for key commitments in advance of needed information. For example, the Army had scheduled only 2 years between the critical design review and the production decision in 2013, leaving little time to gain knowledge between the two events. As a result, FCS was planning to rely on immature prototypes for making the decision to proceed into production. Also, by 2009, the Army had already spent about 60 percent of its planned development funds and schedule but had only proceeded to the preliminary design stage. That would have left only 40 percent of its financial and schedule resources left to complete what is typically the most challenging and expensive development work ahead.

The timing of planned commitments to production funding put decision makers in the difficult position of making production commitments without knowing if FCS would work as intended. Facilitization costs were planned to begin in fiscal year

²Pub. L. No. 109-364, §214 (2006).

³GAO, Defense Acquisitions: Decisions Needed to Shape Army's Combat Systems for the Future, GAO-09-288 (Washington, DC: Mar. 12, 2009).

2011, the budget for which would have been presented to Congress in February 2010, several months prior to the planned FCS critical design review. Further, in February 2011, when Congress would have been asked to approve funding for initial low-rate production of core FCS systems, the Army would not yet have proven that the FCS network and the program concept worked.

Oversight Challenges Were Too Great

The relationship between the Army and the LSI was shaped by the ambitious scope of the FCS program and limitations in the Army's ability to manage it. The relationship is complex; on one hand, the LSI has played the traditional contractor role of developing a product for the Army. On the other hand, the LSI has also acted like a partner to the Army, ensuring the design, development, and prototype implementation of the FCS network and systems. The Army believed this relationship would offer more real-time, better informed decisions; reduce rework; and provide increased flexibility to adjust to new demands. While a close partner-like relationship offers benefits, such as the government and the contractor working together on a continual basis to decide what work is to be done, the partner-like relationship between the Army and the LSI broke new ground. As such, it posed oversight risks such as the government becoming increasingly vested in the results of shared decisions and being less able to provide oversight, especially when the government is disadvantaged in terms of workforce and skills. The Institute for Defense Analysis has also reported on the risks of the Army and LSI relationship, noting that the government cannot expect contractors to act in the best interest of the government as that could potentially conflict with their corporate financial interests. The Institute recommended that the Army take steps to ensure that it has, and continually uses, a competent internal capability to develop a corporate Army position on key FCS issues such as measuring program status and trends as well as independent operational testing.

Part of the Army's original rationale for using an LSI was to keep the contractor's efforts focused on development, rather than on production. Early on in the FCS program, steps were taken to reinforce this focus, such as strengthening organizational conflict of interest provisions. While the original Other Transactions Agreement for FCS development and demonstration contained an organizational conflict of interest clause that required certain safeguards be put into place if and when Boeing and SAIC competed for FCS subcontracts, the 2006 Federal Acquisition Regulation-based contract precluded the Boeing/SAIC team from competing for any FCS subcontract awards. By this time, Boeing already had prime responsibility for two critical software efforts. As the program evolved however, the LSI's role in production grew. In 2007, the Army decided that the LSI should be the prime contractor for the first spin outs as well as low-rate production of FCS core systems. This was a significant change from the early steps taken to keep the LSI's focus on development.

The Army structured the FCS contract consistent with its desire to incentivize development efforts and make it financially rewarding for the LSI to make such efforts. In general, contracts are limited in that they cannot guarantee a successful outcome. As with many cost-reimbursable research and development contracts, the LSI was responsible to put forth its best effort on the development of the FCS capability. If, given that effort, the FCS capability falls short of needs, the LSI would not be responsible, would still be entitled to have its costs reimbursed, and may earn its full fee. Specific aspects of the contract could make it even more difficult to tie the LSI's performance to the actual outcomes of the development effort. Under the terms of the FCS contract, the LSI could earn over 80 percent of its \$2.3 billion fee by the time the program's critical design review is completed in 2011, and the Army would have paid out roughly 80 percent of contract costs by that point. Yet the actual demonstration of individual FCS prototypes and the system-of-systems would have taken place after the design review. Our work on past weapon system programs shows that most cost growth—symptomatic of problems—occurs after the critical design review. The Army shared responsibility with the LSI for making some key FCS decisions and to some extent the Army's performance could thus affect the performance of the LSI.

OSD's oversight did not compensate for these risks early in the program. OSD has largely accepted the program and its changes as defined by the Army, even though it is at wide variance from the best practices embodied in OSD's own acquisition policies. Until recently, OSD had passed on opportunities to hold the FCS program accountable to more knowledge-based acquisition principles. Despite the fact that the program did not meet the requisite criteria for starting an acquisition program, OSD approved the program's entrance into system development and demonstration in 2003. OSD later reevaluated the decision and decided to hold a follow-on review

with a list of action items the program had to complete in order to continue. However, this review never occurred and the FCS program continued as originally planned. Furthermore, OSD did not plan to conduct another review and decision point until the 2013 production decision, when it would be too late to have a material effect on the course of the program. In addition, OSD has allowed the Army to use its own cost estimates rather than independent—and often higher—cost estimates when submitting annual budget requests.

Over the last couple years, the Under Secretary of Defense for Acquisition, Technology, and Logistics has taken steps to improve oversight on the FCS program. For instance, in 2007, the Under Secretary deemed the non-line-of-sight cannon program as being in need of special attention, so he designated the program as special interest and declared that his office would be the decision authority on production. Also, in 2008, the Under Secretary issued a directive to pursue alternate arrangements for any future FCS contracts. The Under Secretary found that the fixed fee was too high and the fee structure allows industry to receive most of the incentive fee dollars prior to demonstrating integrated FCS system-of-systems capability. The Under Secretary also directed that the Army conduct a risk-based assessment to examine contracting alternatives for FCS capability. This assessment is to evaluate opportunities for procurement breakout of the individual platforms and systems that comprise FCS and how the government's interests are served by contracting with the LSI as compared to contracting directly with the manufacturers of the items.

CONSIDERATIONS FOR SHAPING FUTURE ARMY GROUND FORCE MODERNIZATION EFFORTS

In April, the Secretary of Defense announced plans to cancel the FCS manned ground vehicle and non-line-of-sight cannon development and initiate a new ground combat vehicle program that leverages successful outcomes from FCS investments and incorporates lessons learned from current combat operations. Explaining the rationale for his decision, the Secretary noted that FCS vehicle designs did not reflect lessons learned from combat in Iraq and Afghanistan and that the contract fee structure provided little leverage to promote cost efficiency.

As the Army proceeds to modernize and ensure its ground forces are well equipped for current and future operations, there are several important factors to consider, and some questions to answer. While the Army and DOD are in the early stages of deciding how to proceed with modernization, it appears likely that rather than a single program like FCS going forward, several programs with more targeted objectives will emerge. For example, the spin-out program may continue in an accelerated form and a program to develop a new family of manned ground vehicles will likely be pursued per the Secretary of Defense's direction. It is also conceivable that a program focused on developing an information network would also be considered.

Regardless of how the Army's ground force modernization program is structured or managed, some key principles will have to be embodied. These include:

- Knowledge-based acquisition: any emergent modernization programs should be put on the soundest footing possible for success, by following DOD's latest acquisition policy that spans the initial decision to pursue a material solution, analysis of alternatives, concept formulation, technology maturation, requirements definition, incremental system design and development, production, and fielding. Sound systems engineering practices should be the guide throughout these phases.
- Sound cost estimating: Any emergent program following a knowledge-based approach should be well understood and defined sufficiently to facilitate realistic cost estimates with reasonable levels of confidence. In order to ensure the accuracy, completeness, and reliability of these estimates, independent cost estimates should be completed and assessed before approval into the product development phases.
- Transparency and accountability for oversight: The emerging programs need to include sufficiently detailed and transparent reporting approaches to facilitate oversight. Those should include an acquisition strategy that features demonstrations of knowledge before planned commitments to future phases and additional funding; a contracting strategy that features as much competition as possible and protections for the government's interests; complete justification materials to support budget requests; and a clear and understandable framework for selected acquisition and earned value management reporting.

Beyond these principles, the Army will have to tailor its approaches to the needs of the individual programs that emerge, allowing for the different challenges they represent. For example, the current spin-out program is in the late stages of devel-

opment, approaching production. The Army now plans to field at least some FCS equipment and some portion of the FCS network to its current 73 Brigade Combat Teams. We have reported that the pace of the spin-out program has been hurried, not allowing enough time to test and evaluate production-representative prototypes before beginning production. Specifically, it is unclear whether the Army will be testing with the specific equipment it plans to produce and use. To date, that has not been the case. Testing thus far has employed spin-out systems that are surrogate and non-production representative, and are thus not in the form that will be fielded. Using such systems is problematic because it does not conclusively show how well the actual systems perform. Additionally, we do not know how the Army plans to determine the content and schedule of future FCS spin-out phases.

Notional plans for the new ground combat vehicle program include a goal of fielding the new vehicles within 5–7 years, with concept development efforts underway. This program will likely revert back to a pre-acquisition phase. This effort will involve different organizations, such as those involved with science and technology, different strategies, and different contracting approaches than the spin-out program. The risks for the ground combat vehicle program will be different and will have to be addressed differently. For example, under FCS, vehicles were being designed as network-dependent, a risky approach as the network has not yet been developed. In addition to the Secretary of Defense's direction that the new program incorporate lessons learned from current operations, the Army may have to consider whether the vehicle designs should be network-enhanced versus network-dependent. An incremental approach would allow the vehicle designs to incorporate increasing network capabilities as they became available.

While we do not know at this point how the Army plans to approach the development of an information network, its acquisition approach may also have to retrench to a pre-acquisition phase to reconsider how best to proceed to manage risks in line with DOD acquisition policy and to meet the direction of the Secretary of Defense. While some elements of the network may be further advanced than some of the vehicle work, the concept itself and how to test and evaluate its performance in large scale may present greater challenges than the vehicle program. Again, the network may need a different acquisition and contracting approach, as well as involvement from different organizations, than either the spin out or manned ground vehicle program.

In proceeding forward with a different modernization approach, there are several questions or issues that will have to be addressed. These include:

- Closing out or restructuring current contractual arrangements: Depending on what the Army decides to do with the new ground vehicle program, it will have to restructure or possibly terminate the existing FCS contract. To help in that process, it would be useful for the Army to have a more detailed understanding about the factors that influenced the Secretary of Defense's recommendation to cancel the current FCS vehicle development effort. Whereas the Secretary's decision could be interpreted as a determination that the FCS concept would not meet current needs, it is not clear at this point what is required to satisfy current military needs.
- Transferring knowledge from current FCS efforts to emergent programs: The Army should carry forward knowledge already gained from the significant investments in FCS systems development. While the Army plans to capture and use what has been learned, doing so depends in large part on whether that knowledge can be transferred to a follow-on program. For example, the Army and LSI have been jointly managing the development of FCS software centrally. That effort included software for the information network, manned ground vehicles, and other individual FCS systems. As the Army proceeds to structure the multiple programs, it will need to coordinate what may be multiple separate software development and demonstration efforts.
- Transition of FCS information network to current Army forces: Depending on how the Army proceeds with an information network, there are questions as to how it can be transferred to the current forces. None of the existing equipment in the current forces has been developed with such a network in mind. As part of the spin-out evaluation process, the Army encountered difficulties last year in trying to integrate even a small portion of the FCS network. Furthermore, the Abrams and Bradley vehicles have space, weight, and power constraints that may limit their ability to be integrated with an FCS-like network. Additionally, it is not clear whether the Army will be developing and fielding vehicles like the proposed FCS command and control vehicle and reconnaissance and surveillance vehicle, which were to be key components of the FCS network.

- Early emphasis on key development and design considerations: Previously, we have commended the Army's efforts to break from traditional thinking with its early emphasis on key development and design considerations. Specifically, the Army defined the larger context within which it wanted its new assets and capabilities to work, emphasizing open system designs and interoperability early in development, rather than as an afterthought. Further, we have noted the productive nature of the Army's early consideration and focus on challenging issues like sustainability. As the Army ground force modernization effort goes forward, the Army will need to find ways to retain this broader focus across multiple programs.
- Moving from a single program structure to multiple programs: The Army's preliminary plans for the FCS restructuring call for several separate programs, including those for the new ground combat vehicles, the information network, and the FCS spin-out effort. As it shaped the original FCS program, the Army made a concerted effort to reduce the influence of the various "stovepipes" within its user organization and set up a unitary management structure. Separate programs may differ greatly from the centralized structure of the FCS program to date and would have consequences that need to be considered. On the one hand, separate structures might lend themselves more readily to better oversight within each area. On the other hand, multiple programs may require more staffing and might introduce various and competing objectives rather than maintain singular focus on interoperability and other key objectives.
- Balancing investments between future capabilities and keeping fielded systems as capable as possible: The Army will have to strike a balance between near-term and long-term needs, realistic funding expectations, and a sound execution plan as it moves on the new FCS path forward. The Army's FCS budget material for fiscal year 2010, which includes the new ground combat vehicle program, provides little detail and no long-term perspective. DOD, Army, and Congress will eventually have to agree on the magnitude of funds that can be devoted to ground force modernization and how that money should be allocated among near-, mid-, and long-term needs.

CONCLUDING REMARKS

The Army's experience with FCS has been productive. Its vision, holistic context, recognition of network potential, and penchant for innovative managerial and experimentation techniques, are worthy of emulation. On the other hand, the difficulties in executing and overseeing the program were apparent at the outset of the program—they were not unexpected discoveries made along the way. The key in going forward is to take the best from both kinds of lessons and applying them, in a tailored way, to the different modernization efforts that will succeed FCS. The Army and DOD should continue to be innovative as to concepts and approaches, but anchored in knowledge-based strategies when it comes to proposing a specific system development effort. Differences in the task at hand should warrant different approaches. At one end of the spectrum, spin outs are in late development, where the focus should be on testing and production preparations. At the other end of the spectrum are efforts to develop a new family of manned ground vehicles and an information network. These would be in early stages of development, in which informed decisions on technologies and requirements will be key. Even within these two developmental efforts, different technical and managerial approaches may be necessary, for more is known about developing and projecting the performance of vehicles than is known about a network.

Mr. Chairman, that concludes my prepared statement. I will be happy to answer any of your questions.

CONTACTS AND STAFF ACKNOWLEDGEMENTS

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Senator LIEBERMAN. Thanks, Mr. Francis. That was very interesting testimony.

We're at a point where significant changes are being made in the FCS program. One explanation of that is that it is totally the result of budgetary constraints. But I would take it that neither of you

would agree with that. Am I right? It's not totally because of budget pressure?

Mr. AHERN. No, sir, I would not agree with that. No, sir, I don't think that that was the issue at all.

Senator LIEBERMAN. Mr. Francis?

Mr. FRANCIS. Yes, Mr. Chairman. Congress had mandated that go/no-go decision in 2009, and I don't think FCS was going to measure up to that.

Senator LIEBERMAN. Yes. So this leads us to the conclusion that if it wasn't just the shortage of money that something was wrong with the program, at least as it was going forward. Now the Secretary has come in, and the President, with a restructuring of it.

Mr. Francis gave us some negatives. It's an interesting question—I made notes on your positives and negatives from the FCS experience—whether the negatives were inherent and unavoidable in the positives or whether they were avoidable. In other words, if you have, on the positive side, a holistic program that's a breakthrough, where you have an innovative managerial approach, were the shortcomings that you then see about the program not being executable within resources available, oversight challenges too great, et cetera, were those inevitable or was it possible to achieve the positives here without incurring the negatives?

Mr. FRANCIS. I think it was, Mr. Chairman. If we look at where the program is now, after I think an extraordinary effort to develop the requirements, the software, the technologies, and so forth, the program's at the point where the Army could now start a MGVS program based on a solid basis of technology where it knows what it can and can't do.

I think I agree we have to be thinking in terms of systems-of-systems, but there are different sizes and perhaps that was a bit too large to manage. But I think if you took that managerial approach and took a system-of-systems perspective and pushed very hard in the pre-acquisition phases, then I think when you came up for a decision on whether to start an acquisition program you would then allow the requirements to be tempered by what you can do technically, be technically realistic.

So I think the start point was really the problem.

Senator LIEBERMAN. Mr. Ahern, let me ask you to respond to some of Mr. Francis's comments, just in terms of lessons learned and where we go from here. You made an interesting, I thought significant, statement that at different times OSD actually had higher cost estimates for the FCS system than the Army did, but essentially let the Army go ahead. I think I've heard it correctly.

How do you respond to that?

Mr. AHERN. Yes, sir, that's what Mr. Francis said. I was not aware of that. There are always program office estimates and OSD or Cost Analysis Improvement Group estimates. Typically, we try to reconcile the differences between them to get the right cost estimate going forward. I would have to go back in history and ask a question about that specifically. I don't have that.

Senator LIEBERMAN. Okay, good enough. Why did that happen, do you think? Why did OSD yield to the Army?

Mr. AHERN. Mr. Chairman, I don't think there's a requirement that the OSD estimate be adhered to. But I think the big difference

was over software and the OSD estimate forecast a much larger software effort than the Army had programmed. I'm not sure why they deferred to the Army, but I do know that was the main difference between the two estimates.

Senator LIEBERMAN. How about, Mr. Ahern, the conclusion that Mr. Francis presented that the Army had in some senses or cases too close a relationship with the lead systems integrator?

Mr. AHERN. Yes, sir. The relationship between Boeing, SAIC, and the Army. The Army depended upon Boeing to a greater degree going forward. I'm not sure of the characterization as too close a relationship with them. It is a government-contracted, Federal Acquisition Regulation-contracted relationship with them, with the standard clauses and structure to it. So I'm not sure where he's referring to.

I do understand, initially anyway, there was a perception that Boeing was undertaking some of what had been government jobs or normal government positions. But of late, at least to my knowledge, it's a standard government and prime relationship between Boeing and the government.

Senator LIEBERMAN. Do you want to flesh out that conclusion just a bit, about why did you conclude that in some cases the Army was too close to the lead systems integrator? In other words, what was the basis of that conclusion?

Mr. FRANCIS. A few things, Mr. Chairman. One was the immaturity of the program when it started. So requirements were very soft, technologies weren't well-defined. So the lead system integrator was involved in decisions both on what was required as well as what the solution was.

I think a second thing is the level. In this case, the lead system integrator, rather than in a traditional prime arrangement, where you have, say, a contractor who's developing a platform and integrating subsystems, in this case you had a contractor developing a system-of-systems where the subcontractors had major platforms.

The third thing was, the lead system integrator was to act as the Army's agent in a lot of these decisions. Initially when the contract was set up, the Army was careful and this subcommittee in particular made it emphatic that the lead system integrator was to focus on development. There was a pretty high fee on development and there was an attempt to keep the lead system integrator financially disinterested in production, so it could focus on the Army's interests.

Over time that focus was lost and in 2007 the Army decided it would allow the lead system integrator to be the prime for the spinout production and low rate initial production of FCS core systems. So it did develop a financial interest in production. Given the size of the FCS program and it being almost synonymous with the future Army, we could see that developing naturally. I'm not saying it was necessarily improper, but you did then need another layer of oversight to make good decisions about the program, which is where we are looking to OSD.

Senator LIEBERMAN. That was not there?

Mr. FRANCIS. That was not there, yes.

Senator LIEBERMAN. You listed the innovation in the managerial approach, which is to say the lead system integrator, as one of the

positive take-aways as well. So am I correct in putting these two together and saying that you would go with something like that again with the lead system integrator, but provide the greater oversight that was not there this time?

Mr. FRANCIS. I wouldn't rule it out.

Senator LIEBERMAN. But you apparently don't favor it, really, on balance?

Mr. FRANCIS. There are a number of risks with it, and it hasn't worked out in other programs. The Coast Guard has tried it with the Deep Water Project. There was an attempt in missile defense, and I think there are some problems with it on the Secure Border Initiatives. So it's unproven. If we're going to try it, maybe it needs to be tried on a smaller scale.

Senator LIEBERMAN. Thank you very much.

Senator THUNE.

Senator THUNE. Thank you, Mr. Chairman.

FCS as a system of systems was enormously complicated to develop and acquire. What steps has the Army taken to increase the capacity of its acquisition workforce to develop and buy these complicated systems?

Mr. AHERN. The Secretary of Defense has articulated his intent to grow the acquisition community over the next couple of years, the next FYDP period of, I believe, 20,000 individuals, of which 5,400 are intended to go to the Army. There's a split in that. I believe 10,000 are actually growth in strength and the other 10,000 in round numbers are transition from contractor to government individuals. Again, the Army will be growing 5,400 of those.

Senator THUNE. In recent years the Army has had difficulty both in developing a holistic modernization strategy and in executing particular modernization programs. The Comanche, Crusader, Armed Reconnaissance Helicopter (ARH), and of course FCS probably come to mind as the most notable examples of programs that were cancelled or restructured after large investments of time and money.

You've touched on this, Mr. Francis, in your testimony and in response to questions from the chairman. But just if you could again lay out what, in your view, are the key principles to improving the force modernization programs.

Mr. FRANCIS. I think as you look back on those you can identify flaws in what we would call the business case at the start. I think in the case of the Comanche, I worked on that program back in 1983 when it was called the Light Helicopter Experimental, the original concept was for it to be like the Humvee, just a universal airframe that you could equip to perform different missions.

When it exited the requirements process, it became the Next Generation Reconnaissance Helicopter Tank Killer. It was actually more capable in many ways than the Apache. At that point then, the requirements outstripped the technology. So we had to go through a significant technology development effort to meet the requirements.

By the time the program really got on a sound footing, the threat had changed, and I think that's the reason the helicopter was cancelled. So again, I'd look at the business case there.

I think on the ARH, it was a little bit different scenario in that most of the technologies were mature. So the idea was to take different technologies off the shelf and bundle them together in a single airframe. But in that case the Army didn't allow enough time for the integration and presented a program that was going to move really fast. For those of us who were around when the OH-58D was equipped with a mast-mounted sight, we knew how long that integration effort took. So again, I think the business case for the ARH wasn't a technology issue, but a schedule issue.

I think in FCS, we've seen both. On the one hand why you can be a bit frustrated with that, I think these are all take-aways. I think really tightening down on what we need to know about requirements and technology and costs and schedule when we launch a new system is somewhere where the Army can get real payoff here and some real help from OSD.

Senator THUNE. Mr. Ahern, OSD is charged with overseeing major defense acquisition programs, including FCS. Yet with all that oversight, the recommendation to restructure FCS came very abruptly. My question is, should the challenges that were noted by Secretary Gates in his recommendation have been addressed sooner by OSD?

Mr. AHERN. As I noted in my statement, sir, we were beginning to move toward the spinouts and focusing on the early spinouts as early as 2007 and 2008, and breaking them out with an entire set of documentation, the capability production document, an acquisition strategy, and a test and evaluation master plan. So I think we were moving in that direction.

In regards to the networking and the additional BCT modernization the Secretary called for, I think we were on top of that and working in that direction. The Secretary's work on the MGV, his concern that it did not address some of the lessons learned and that perhaps it needed to, as Mr. Francis indicated a couple of minutes ago, were other areas that he looked at, I think is the way for me to say it.

It wasn't a question of the need, and the Secretary's been very clear about that. It was whether the Army program was the right program at the time going forward, recognizing lessons learned out of Iraq and the incorporation of some of the other vehicles, as the MRAP vehicle, that had been put into the field.

Senator THUNE. Mr. Francis, how would you characterize OSD's oversight of FCS?

Mr. FRANCIS. I think that early on OSD was rather passive about FCS and the program proceeded in 2003 even though it was by any measure of DOD's acquisition policy not ready for a start. Yet it did go ahead. There have been a number of occasions, I think, where OSD could have stepped in and taken some action.

For example, after that initial decision in 2003, OSD said in 18 months it was going to have a second milestone decision to clean up the issues that it hadn't covered in the first one, and then never held that milestone decision. So I think early on OSD could have done a lot more. We talked about cost estimates before. I was thinking about the question that you just asked, about the Secretary of Defense's intervention. I know this committee had a leadership in the acquisition reform legislation that just went through.

I think it's a question that a taxpayer would ask or anyone here, which is, with all the processes that were in place at the time and all the policies, why did it take an extraordinary action on the part of the Secretary of Defense to right-size the modernization? Why didn't all the standards work?

I think going forward we have to think in terms of acquisition reform, if we don't stay true to those standards and those reforms and allow programs to go through that don't abide, then we're actually rewarding programs with money that fly in the face of all the hard work on policy. So I think it's a really good question to ask and something that will provide some instruction for going forward.

Senator THUNE. Mr. Ahern, would you agree that the requirements that FCS was developing toward were unrealistic?

Mr. AHERN. No, sir. Holistically, the requirements they're working for, no, sir. I think in terms of the system-of-systems, of the networking of the sensors that they intend to have, of the vehicles that they're going to be utilizing, the incorporation of those is valid, and I think that the recently completed preliminary design review indicates that the requirements are stable for the individual capabilities and that as a system-of-systems that they've taken it under configuration management and that it is a valid set of requirements going forward.

Senator THUNE. Mr. Francis, do you agree?

Mr. FRANCIS. I don't think we know if they're realistic yet. I think the requirements were set before we knew what was technically feasible. So I think there's been a lot of work to rationalize or reconcile the requirements and technologies. I would agree on the MGVS a lot is understood now, but, for example with the network, the network is quite a revolutionary network. There's nothing like it today. It's mobile. It's ad hoc. It'll handle a huge volume. There are requirements for it that we don't know whether it will meet yet.

So I think a lot of the feasibility of the requirements is to be determined yet.

Senator THUNE. Thank you. Thank you, gentlemen, very much for your testimony.

Mr. Chairman, thank you.

Senator LIEBERMAN. Thanks, Senator Thune.

Just one more wrap-up question and then one on behalf of Senator Inhofe. Bottom line, can we say that the taxpayers have gotten or will get their money's worth out of what we've invested in the FCS?

Mr. AHERN. Yes, sir. I think that the payoff, what we've learned, the technologies that have been developed, matured, in the 5-year period of time that the program has been under way, that will be implemented initially in the spinouts and then in the generation to follow of the vehicles, there isn't any question in my mind that, with the right discipline in the acquisition system—and that's what I think we've been talking about for the last few minutes, the discipline that's needed as we go forward with the four or five separate programs, whether it's the network or the vehicles or the sensors—yes, sir, I am sure that we will achieve that capability.

We're going to be working to modernize the Army for a number of years holistically across it. Yes, sir, I think it was the right ap-

proach, the discipline. We will realize the investment that's been made in FCS, as evidenced by the preliminary design review, which I take it was quite successful.

Senator LIEBERMAN. Mr. Francis, how would you answer that?

Mr. FRANCIS. Mr. Chairman, I'd say the FCS program has been very productive. I think what has been accomplished has been phenomenal in terms of understanding the software, the requirements, moving all the technologies, developing the concepts for employment, and so forth.

But the question of value is a very good one, and I don't know quite how to answer that, because I would hypothesize that had we attempted to do this, say, in a pre-acquisition phase with a smaller workforce, perhaps focusing first on the network to see what we could do there and then allow that work to inform what we could do on the vehicles, it's possible we could have been nearly as productive for a smaller investment. I'm hypothesizing there, but I think that's the question.

Senator LIEBERMAN. I hope we've all learned. I agree with you, we're going to get a lot out of it, we've already gotten a lot out of it, some of it quite amazing really in technological advances. Hopefully, we've learned a lot about how to better manage a program like this. Your word, Mr. Ahern, is a good one: discipline.

Let me finally, on Senator Inhofe's behalf, ask you the question. I think you were here, but I gather that he wanted me to follow on that he has asked Secretary Gates for his comments on DOD's plan or recommendation for accommodating existing law on the non-line-of-sight cannon, but has not yet received a reply. What is your reply? What is DOD's plan there?

Mr. AHERN. Yes, sir. As General Thompson said, we're working through the language, the precision to ensure that we get it right, to represent the direction that we have as well as the statutory requirements. We will be communicating with Congress—I am confident of that—in order to get it right, straight across the board.

Senator LIEBERMAN. One thing I'm confident of is that Senator Inhofe will stay on this until he gets that answer.

Mr. AHERN. Yes, sir.

Senator LIEBERMAN. So the sooner the better.

Mr. AHERN. Yes, sir.

Senator LIEBERMAN. I thank you both. It's been a very constructive panel and it helps to guide us as we go forward to our markup next week, but really more to the point, to guide you and us, DOD and Congress, about how better to oversee the expenditure of large sums of taxpayer money to achieve the result that we want for our soldiers.

Thank you very much. The record of the hearing will stay open until Thursday at 5 p.m. for additional statements or questions, and if you get additional questions we hope that you'll answer them as soon as possible.

Senator Thune, do you want to add anything?

Senator THUNE. No, thank you, Mr. Chairman.

Senator LIEBERMAN. Thank you both for your service.

The hearing is adjourned.

[Whereupon, at 4:06 p.m., the subcommittee adjourned.]

