



Tactical Aircraft Modernization: Issues for Congress

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Summary

This report provides an overview discussion on the modernization of U.S. military tactical aircraft, meaning fighter aircraft, strike-fighters, and attack planes. Tactical aircraft are a major component of U.S. military capability, and account for a significant portion of U.S. defense spending. In early 2009, the Air Force, Navy, and Marine collectively had an inventory of about 3,500 tactical aircraft.

Current efforts for modernizing U.S. tactical aircraft center on three aircraft acquisition programs—the F-35 Joint Strike Fighter (JSF) program, the Air Force F-22 fighter program, and the Navy F/A-18E/F strike fighter program. For discussions of issues relating specifically to the F-35 program, the F-22 program, or the F/A-18E/F program, see CRS Reports RL30563, RL31673, and RL30624, respectively.

Air Force officials in 2008 testimony projected an Air Force fighter shortfall of up to 800 aircraft by 2024. Navy officials have projected a Navy-Marine Corps strike fighter shortfall peaking at more than 100 aircraft, and possibly more than 200 aircraft, by about 2018. On May 18, 2009, the Air Force announced a combat air forces restructuring plan that would accelerate the retirement of 249 older Air Force tactical aircraft, including 112 F-15s, 134 F-16s, and three A-10s, so as to generate savings that can be applied to other Air Force program needs.

A key issue for Congress regarding tactical aircraft is the overall affordability of DOD's plans for modernizing the tactical aircraft force. The issue has been a concern in Congress and elsewhere for many years, with some observers predicting that tactical aircraft modernization is heading for an eventual budget "train wreck" as tactical aircraft acquisition plans collide with insufficient amounts of funding available for tactical aircraft acquisition. A May 2009 Congressional Budget Office (CBO) report examines several potential options for modernizing the U.S. tactical aircraft force. A second key issue for Congress regarding tactical aircraft concerns the future of the U.S. industrial base for designing and manufacturing tactical aircraft.

Section 133 of H.R. 2647, the House-passed version of the FY2010 defense authorization bill, would require the Department of Defense (DOD) to submit a report to Congress on the procurement of "4.5"-generation tactical aircraft. Section 1047 would prohibit the Air Force from retiring fighter aircraft in accordance with the combat air forces restructuring plan until 90 days after the Air Force submits to Congress a report on various aspects of the plan. Section 1051 expresses the sense of Congress regarding Navy carrier air wing force structure.

The House and Senate Armed Services Committees, in their reports (H.Rept. 111-166 of June 18, 2009, and S.Rept. 111-35 of July 2, 2009, respectively) on the FY2010 defense authorization bill (H.R. 2647 and S. 1390, respectively), include report language discussing the combat air forces restructuring plan, the projected Air Force fighter shortfall, and the projected Navy-Marine Corps strike fighter shortfall.

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Introduction

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Current efforts for modernizing U.S. tactical aircraft center on three aircraft acquisition programs—the F-35 Joint Strike Fighter (JSF) program, the Air Force F-22 fighter program, and the Navy F/A-18E/F strike fighter program. Program-specific issues for Congress in FY2010 relating to the F-35, F-22, and F/A-18E/F include the following:

- Whether to approve or reject the administration's proposal to terminate program for developing an alternate engine for the F-35.
- Whether to approve the administration's request to end F-22 procurement at the 187 aircraft that have been procured through FY2009, or reject that proposal and provide funding in FY2010 for the procurement of additional F-22s in FY2010 and/or subsequent years.
- Whether to approve, reject, or modify the Navy's FY2010 funding request for procurement of nine F/A-18E/Fs, and whether to approve a multiyear procurement (MYP) arrangement for FY2010-FY2014 for procuring F/A-18E/Fs (and also EA-18Gs, which are electronic attack versions of the F/A-18E/F).

These program-specific issues, as well as FY2010 legislative activity relating specifically to the F-35, F-22, and F/A-18E/F programs, are covered in detail in the following CRS reports:

- CRS Report RL30563 on the F-35 program.¹
- CRS Report RL31673 on the F-22 program.²
- CRS Report RL30624 on the F/A-18E/F program.³

This CRS report discusses and presents FY2010 legislative activity on issues relating to U.S. tactical aircraft in general. For several years now, a central issue relating to tactical aircraft in general has been the overall affordability of the Department of Defense's (DOD's) plans for modernizing the tactical aircraft force. A second key issue concerns the future of the U.S. industrial base for designing and manufacturing tactical aircraft.

¹ CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program: Background and Issues for Congress*, by Ronald O'Rourke.

² CRS Report RL31673, *Air Force F-22 Fighter Program: Background and Issues for Congress*, by Ronald O'Rourke.

³ CRS Report RL30624, *Navy F/A-18E/F and EA-18G Aircraft Procurement and Strike Fighter Shortfall: Background and Issues for Congress*, by Ronald O'Rourke.

Background

Tactical Aircraft In General

Terminology

In general, the term tactical aircraft refers to shorter-ranged combat aircraft that can conduct missions up to several hundred miles away from their home bases without need for in-flight refueling. Tactical aircraft tend to perform their missions within a single regional theater of operations, which is why they are also sometimes called theater-ranged aircraft or simply theater aircraft. The term strategic aircraft, in contrast, usually refers to larger and longer-ranged Air Force B-52, B-1, and B-2 bombers that are designed to conduct missions involving very long (including intercontinental) flights to their intended areas of operations (though they can also be used for missions that take place within a single theater of operations).⁴

Although the above distinction between tactical and strategic aircraft can suggest that the term tactical aircraft refers to virtually all types of shorter-ranged aircraft, in practice the term is used primarily to refer to fighters, strike fighters, and attack planes. Fighters, which usually have an “F” designation (e.g., F-22), are designed primarily for air-to-air combat, though they can have some air-to-ground combat capability as well. Strike fighters, which can have either an “F” designation (e.g., F-35) or an “F/A” designation (e.g., F/A-18E/F), are dual-role aircraft that are designed to have a substantial capability in both air-to-ground (strike) and air-to-air (fighter) operations.⁵ Attack planes, which usually have an “A” designation (e.g., A-10) are designed primarily for air-to-ground operations.⁶ The term tactical aircraft is often shortened to tac air (also spelled tacair).

Air Force tactical aircraft operate from land bases and are conventional takeoff and landing (CTOL) aircraft. Navy tactical aircraft are CTOL aircraft that have features permitting them to operate from aircraft carriers.⁷ Marine Corps aircraft are operated from both Navy ships and land bases, including expeditionary land bases with short runways. Some Marine Corps tactical aircraft are short takeoff, vertical landing (VSTOL) aircraft.

Missions

Tactical aircraft are used to perform a variety of missions. Fighters engage primarily in air-to-air combat so as to establish and maintain air superiority in a theater of operations. Attack planes focus on air-to-ground combat operations, including close air support (CAS) for friendly ground

⁴ The Air Force in 1992 implemented a reorganization that replaced its Strategic Air Command (SAC) and Tactical Air Command (TAC) with a combined new Air Combat Command (ACC).

⁵ In earlier years, strike fighters were called fighter-bombers.

⁶ Although DOD uses letter designations (e.g., F, F/A, and A) to identify an aircraft’s primary intended mission, the designations can be confusing because they are applied somewhat loosely (e.g., the F-35 is a strike fighter, suggesting that it should have been designated the F/A-35) and because aircraft can be modified over time to perform additional missions.

⁷ Examples of such features include strengthened landing gear, a strengthened airframe, and an arresting hook so as to permit catapult launches and arrested-wire landings, as well as folding wing tips for more compact storage aboard ship.

forces engaged in battle, battlefield air interdiction (BAI) against enemy forces that are behind the front lines, and deep interdiction (also known as “deep strike”) against the enemy’s military, political, and industrial infrastructure. Strike fighters engage in both air-to-air and air-to-ground operations. Tactical aircraft can also be used for other operations, including surveillance and reconnaissance operations.

U.S. Tactical Aircraft

Types

The Air Force currently operates new F-22 fighters and the following older aircraft types: F-15 fighters, F-15E strike fighters (a version of the F-15 with enhanced air-to-ground capabilities), F-16 fighters (which are actually strike-fighters), and A-10 attack aircraft. The Navy currently operates older F/A-18A through D strike fighters and newer and more capable F/A-18E/F strike fighters. The Marine Corps’ operates two older types of aircraft: F/A-18 A, C, and D strike fighters and AV-8B VSTOL attack planes.

Numbers

Table 1, which presents figures from a May 2009 Congressional Budget Office (CBO) report, shows approximate numbers of U.S. tactical aircraft in early 2009. As can be seen in the table, DOD in early 2009 had a total inventory of about 3,500 tactical aircraft, of which about 2,375 were in the Air Force and about 1,125 were in the Navy and Marine Corps.

Table 1. Approximate U.S. Tactical Aircraft Inventory in Early 2009

Service and aircraft type	Number in inventory
Air Force	
F-22 fighter	135
F-15 fighter	470
F-15E strike fighter	220
F-16 strike fighter	1,200
A-10 attack plane	350
Subtotal Air Force	2,375
Navy and Marine Corps	
F/A-18E/F strike fighter (Navy)	380
F/A-18A/B/C/D strike fighter (Navy and Marine Corps)	620
AV-8B VSTOL attack plane (Marine Corps)	125
Subtotal Navy and Marine Corps	1,125
TOTAL all services	3,500

Source: Source: Congressional Budget Office, Alternatives for Modernizing U.S. Fighter Forces, May 2009, Tables I-1 and I-2 on pages 2 and 3, which the CBO report states are based on DOD data. CBO states in a note to the tables that the inventory figures are approximate and may not reflect recent deliveries or retirements.

Current Acquisition Programs

Current efforts for modernizing U.S. tactical aircraft center on three aircraft acquisition programs—the F-35 Joint Strike Fighter (JSF) program, the Air Force F-22 fighter program, and the Navy F/A-18E/F strike fighter program.

F-35 Joint Strike Fighter (JSF)

The F-35 Joint Strike Fighter (JSF), also called the Lighting II, is a new strike fighter being procured in different versions for the Air Force, Marine Corps, and Navy. The F-35 was conceived as a relatively affordable 5th-generation strike fighter⁸ that could be procured in three highly common versions for the three services, so that the services could avoid the higher costs of developing, procuring, and operating and supporting three separate tactical aircraft designs to meet their similar but not identical operational needs. The F-35 program is DOD's largest weapon procurement program in terms of total estimated acquisition cost. Current DOD plans call for acquiring a total of 2,456 JSFs for the three services⁹ at an estimated total acquisition cost (as of December 31, 2007) of about \$246 billion in constant (i.e., inflation-adjusted) FY2009 dollars. Procurement of F-35s began in FY2007.

The Air Force is procuring the F-35A, a conventional takeoff and landing (CTOL) version of the F-35, as the replacement for the service's F-16s and A-10s. The F-35A is intended to be a more affordable complement to the Air Force's new F-22s. The Marine Corps is procuring the F-35B, a short takeoff and vertical landing (STOVL) version of the F-35, as the replacement for the service's F/A-18A, C, and D strike fighters and AV-8B Harrier VSTOL attack planes. The Navy is procuring the F-35C, a carrier-capable CTOL version of the aircraft, and plans to operate carrier air wings in the future featuring a combination of F/A-18E/F and F-35C strike fighters. The administration's proposed FY2010 budget requests funding for the procurement of 30 F-35s, including 10 F-35As for the Air Force, 16 F-35Bs for the Marine Corps, and four F-35Cs for the Navy.

F-22 Fighter

The Air Force F-22 fighter, also known as the Raptor, is the world's most capable air-to-air combat aircraft. The F-22 is a 5th-generation aircraft that incorporates a high degree of stealth, supercruise,¹⁰ thrust-vectoring for high maneuverability,¹¹ and integrated avionics that fuse information from on-board and off-board sensors. Procurement of F-22s began in FY1999, and a

⁸ Fifth-generation aircraft incorporate the most modern technology, and are considered to be generally more capable than earlier-generation (e.g., 4th-generation and below) aircraft. Currently, only the F-22 and the F-35 are considered fifth-generation aircraft. Russia reportedly has a fifth-generation fighter under development.

⁹ As of December 31, 2007, the F-35 program included a planned total of 2,456 aircraft—13 research and development aircraft and a planned total of 2,443 production aircraft. The 2,443 production aircraft include 1,763 F-35As for the Air Force and 680 F-35Bs and Cs for the Marine Corps and Navy, with exact numbers of Bs and Cs to be determined. These planned production totals are subject to review in the Quadrennial Defense Review (QDR) that is to be reported to Congress with the submission of the proposed FY2011 defense budget in February 2010. Hundreds of additional F-35s are to be purchased by several U.S. allies.

¹⁰ Supercruise is the ability to cruise at supersonic speeds without using engine afterburners. The F-22 is expected to have a level speed of about Mach 1.7 using afterburners and a cruise speed of about Mach 1.5 without afterburners.

¹¹ The F-22's two Pratt & Whitney F-119 turbofan engines are equipped with thrust-vectoring nozzles.

total of 187 have been procured through FY2009, including 24 in FY2009. The administration wants to end F-22 procurement at 187 aircraft, and the administration's proposed FY2010 budget does not request funding for the procurement of additional F-22s in FY2010. Supporters of the F-22 want to continue procuring the aircraft in FY2010 and/or subsequent years, toward an eventual goal of 243 to 250 (or more).

F/A-18E/F Strike Fighter

The F/A-18E/F, also known as the Super Hornet, is a Navy strike fighter. It is larger, more modern, and more capable than the earlier F/A-18A/B/C/Ds, which are known as Hornets. The F/A-18E/F is generally considered a fourth-generation aircraft. (Some F/A-18E/F supporters argue that it is a “fourth-plus” or “4.5” generation aircraft because it incorporates some fifth-generation technology, particularly in its sensors.) Hornets and Super Hornets currently form the core of the Navy's aircraft carrier air wings—of the 70 or so aircraft in each carrier air wing, more than 40 typically are Hornets and Super Hornets. The Navy has been procuring F/A-18E/F Super Hornets since FY1997, and has procured a total of 449 through FY2009. The administration's proposed FY2010 budget requests funding for the procurement of nine F/A-18E/Fs.

Projected Tactical Aircraft Shortfalls

Air Force officials in 2008 testimony projected an Air Force fighter shortfall of up to 800 aircraft by 2024.¹² Navy officials have projected a Navy-Marine Corps strike fighter shortfall peaking at more than 100 aircraft, and possibly more than 200 aircraft, by about 2018.¹³ Some observers have questioned the Air Force's projection of an 800-aircraft shortfall, arguing that such projections are strongly influenced by assumptions concerning military threats posed by other countries and on whether the United States will fight alone or part of a coalition, and that Air Force demands for more fighter aircraft are driven partly by organizational constraints rather than warfighting needs.¹⁴

Combat Air Forces Restructuring Plan

On May 18, 2009—11 days after the submission to Congress of the proposed FY2010 defense budget—the Air Force announced a combat air forces restructuring plan that would accelerate the retirement of 249 older Air Force tactical aircraft, including 112 F-15s, 134 F-16s, and three A-10s, so as to generate savings that can be applied to other Air Force program needs. The proposal plan does not include the retirements of five fighters proposed as part of the FY2010 Air Force budget submission. An Air Force News Service story on the restructuring plan stated:

¹² See, for example, the testimony of Lieutenant General Daniel Darnell, Deputy Chief of Staff Air, Space and Information Operations, Plans and Requirements, at an April 9, 2008, hearing before the Airland subcommittee of the Senate Armed Services Committee Subcommittee on the FY2009 Budget for Air Force and Navy aviation programs. (Source: Transcript of hearing.)

¹³ For additional discussion of the projected Navy-Marine Corps strike fighter shortfall, see CRS Report RL30624, *Navy F/A-18E/F and EA-18G Aircraft Procurement and Strike Fighter Shortfall: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁴ William Matthews, “Coming up short; Is the Air Force's ‘Fighter-gap’ truth or spin?” *Armed Forces Journal International*, July 2008, p.26.

Following the May 7 roll-out of the fiscal year 2010 budget proposal for the Department of Defense, Air Force officials announced plans to retire legacy fighters to fund a smaller and more capable force and redistribute people for higher priority missions.

The Combat Air Forces restructuring plan would accelerate the retirement of approximately 250 aircraft, which includes 112 F-15 Eagles, 134 F-16 fighting Falcons and three A-10 Thunderbolt IIs. This does not include the five fighters previously scheduled for retirement in FY10.

“We have a strategic window of opportunity to do some important things with fighter aircraft restructuring,” said Secretary of the Air Force Michael Donley. “By accepting some short-term risk, we can convert our inventory of legacy fighters and F-22 (Raptors) into a smaller, more flexible and lethal bridge to fifth-generation fighters like the F-35 (Lightning II Joint Strike Fighter). We’ll also add manpower to capabilities needed now for operations across the spectrum of conflict.”

Under the plan, cost savings of \$355 million in FY10 and \$3.5 billion over the next five fiscal years would be used to reduce current capability gaps. Air Force officials would invest most of the funds in advanced capability modifications to remaining fighters and bombers. Some would go toward procuring munitions for joint warfighters, including the small diameter bomb, hard-target weapons and the AIM-120D and AIM-9X missiles. The remainder would be dedicated to the procurement or sustainment of critical intelligence capabilities such as the advanced targeting pod as well as enabling technologies for tactical air controllers and special operations forces.

“We’ve taken this major step only after a careful assessment of the current threat environment and our current capabilities,” said Air Force Chief of Staff Gen. Norton Schwartz. “Make no mistake, we can’t stand still on modernizing our fighter force. The Air Force’s advantage over potential adversaries is eroding, and this endangers both air and ground forces alike unless there is a very significant investment in bridge capabilities and fifth-generation aircraft. CAF restructuring gets us there.”

The CAF restructuring plan, which will require appropriate environmental analyses, would enable Air Force officials 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 Liberty aircrews; the addition of a fourth active-duty B-52 Stratofortress 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.

Secretary Donley and General Schwartz have committed the Air Force to initiatives that will reinvigorate its nuclear enterprise and field 50 unmanned combat air patrols for ongoing operations by FY11.

“What we’re looking for is a force mix that meets the current mission requirements of combatant commanders while providing a capable force to meet tomorrow’s challenges,” Secretary Donley said.¹⁵

¹⁵ “AF Officials Announce Combat Air Forces Restructure Plan,” *Air Force News Service*, May 20, 2009, available online at: <http://www.af.mil/news/story.asp?id=123150197>.

Issues for Congress

Affordability of Tactical Aircraft Modernization Plans

A Longstanding Concern

A key issue for Congress regarding tactical aircraft in general is the overall affordability of DOD's plans for modernizing the tactical aircraft force. The issue has been a concern in Congress and elsewhere for many years, with some observers predicting that tactical aircraft modernization is heading for an eventual budget "train wreck" as tactical aircraft acquisition plans collide with insufficient amounts of funding available for tactical aircraft acquisition.

In earlier years, the issue of tactical aircraft modernization affordability was characterized in terms of the collective affordability of the F-35, F-22, and F/A-18E/F programs. In coming years, as production of the F-22 and F/A-18E/F winds down, the issue may increasingly be characterized in terms of the affordability of the F-35 program as DOD seeks to ramp F-35 procurement up to higher annual rates. DOD plans have envisaged increasing F-35 procurement to 130 aircraft per year by 2014-2015, including 80 F-35As per year for the Air Force by 2015 and 50 F-35Bs and Cs for the Marine Corps and Navy by 2014.

Since the early 1990s, DOD has substantially lowered the potential cost of its tactical aircraft modernization plans by significantly reducing the planned number of new aircraft to be acquired. Much of the reduction in the planned number of new aircraft to be acquired resulted from post-Cold War reductions in planned numbers of Air Force and Navy air wings. Additional reductions in the planned number of new aircraft to be acquired were accomplished through the Navy-Marine Corps Tactical Air Integration Plan, which more closely integrated the Navy and Marine Corps strike fighter inventories, permitting a reduction in planned procurements of Navy and Marine Corps strike fighters.¹⁶ Another major DOD initiative for limiting tactical aircraft modernization costs is the F-35 program, which seeks to reduce costs for developing, procuring, and operating U.S. tactical aircraft through the acquisition of a strike fighter that can be procured in three highly common versions for the three services.

Even with initiatives such as these, however, it is not clear whether DOD's tactical aircraft modernization plan will be affordable, particularly in the context of future defense budgets that might feature little or no real (i.e., inflation-adjusted) growth over current levels, or possibly some amount of real decline. The projected Air Force fighter shortfall and the projected Navy-Marine Corps strike fighter shortfall (see "Projected Tactical Aircraft Shortfalls" above) might be viewed as indications of a continuing challenge regarding the affordability of tactical aircraft modernization.

¹⁶ The Department of the Navy (DON), which includes the Navy and Marine Corps, stated that the integration plan would permit DON to reduce procurement of F/A-18E/Fs to 460 from 548 (a reduction of 88 aircraft, or about 16%) and procurement of JSFs to 680 from 1,089 (a reduction of 409 aircraft, or about 38%). The combined F/A-18E/F and JSF buy would thus be reduced to 1,140 aircraft from 1,637, a reduction of 497 aircraft, or about 30%. See CRS Report RS21488, *Navy-Marine Corps Tactical Air Integration Plan: Background and Issues for Congress*, by Christopher Bolkcom and Ronald O'Rourke.

Potential Tradeoffs

If DOD's tactical aircraft modernization plans cannot be fully funded without reducing funding for other DOD programs, policymakers may face one or more of the following series of potential funding tradeoffs:

- **Funding for tactical aircraft acquisition programs vs. funding for non-aircraft systems that might be able to perform certain missions performed by tactical aircraft.** Examples of such non-aircraft systems include Army and Navy surface-to-air missile systems, Army and Marine Corps surface-to-surface missiles, rockets, and artillery, and Navy ship-based guns and land-attack cruise missiles.
- **Funding for tactical aircraft acquisition programs vs. funding for other aircraft, such as long-range bombers or helicopters, that can perform certain air-to-ground missions performed by tactical aircraft.** Some observers argue that in light of recent and projected improvements in the regional anti-access capabilities of China and other countries,¹⁷ DOD should place less funding emphasis on tactical aircraft and more funding emphasis on long-range aircraft that can operate effectively outside the range of anti-access systems.
- **Funding for tactical aircraft acquisition programs against funding for aircraft intended to perform different missions,** such as airlift aircraft, aerial refueling tankers, electronic attack (aka electronic warfare) aircraft, airborne warning and control aircraft, and surveillance aircraft. For some observers, the affordability of DOD's tactical aircraft modernization plans is a subset of a larger issue concerning the affordability of DOD's plans for procuring new aircraft of all types.
- **Funding for tactical aircraft acquisition programs against funding for unmanned aerial vehicles (UAVs) and unmanned combat aerial vehicles (UCAVs),** which are armed UAVs. UAVs have played an increasing role in recent years in surveillance and reconnaissance operations, and UCAVs are now playing a substantial role in ground-attack operations, particularly for purposes such as conducting precision attacks on terrorist targets. DOD intends to place an increased emphasis on UAVs and UCAVs in coming years, particularly as a means of improving U.S. capabilities for conducting irregular warfare operations (such as counterinsurgency operations).
- **Funding for land-based Air Force tactical aircraft acquisition programs (i.e., F-22 and F-35A) vs. funding for sea-based Navy and Marine Corps sea-based tactical aircraft acquisition programs (i.e., F/A-18E/F and F-35 Bs and Cs).** The relative capabilities and costs of land- and sea-based aircraft for performing missions under various circumstances have been long discussed and debated.
- **Funding for one land-based tactical aircraft (the F-22) against funding for another (the F-35A), or funding for one sea-based tactical aircraft (the F/A-**

¹⁷ Anti-access systems are military systems that are designed to keep opposing military forces outside a certain defensive perimeter. For a discussion of emerging Chinese maritime anti-access systems, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.

18E/F) against funding for another (the F-35B/C). The administration's proposal to end F-22 procurement at 187 aircraft (rather than continuing F-22 procurement until a total of 243 to 250 is reached) and to concentrate future Air Force tactical aircraft procurement on the F-35A might be viewed as an example of DOD proposing such a tradeoff.

- **Funding for procurement of F-35s, F-22s, and F/A-18E/Fs vs. funding for service life extensions of existing tactical aircraft or for procuring new and perhaps upgraded models of older-design tactical aircraft.** Potential examples of the latter might include upgraded F-15s in lieu of additional F-22s, upgraded F-16s in lieu of some currently planned F-35As, and additional F/A-18E/Fs in lieu of some currently planned F-35Cs and Bs.

Assessing Potential Tradeoffs

Each of the above potential tradeoffs poses complex questions of comparative costs, capabilities, and (for service life extensions of older aircraft) technical feasibility. These questions have been studied and debated in depth for years by various parties in the context of U.S. military goals and objectives. U.S. military goals and objectives are currently being reviewed in the Quadrennial Defense Review (QDR), the final report on which is to be submitted to Congress with the proposed FY2011 budget in early-February 2010. One key issue in the QDR is how much emphasis to place on preparing for irregular warfare operations (such as counterinsurgency operations) vs. preparing for conventional interstate conflict, and how various force elements (such as tactical aircraft) relate to those two potential areas of planning emphasis.

In the post-Cold War era, some observers have questioned the need to procure and operate large quantities of high-capability tactical aircraft, arguing among other things that such aircraft are not the most cost-effective forms of airpower for conducting the kinds of counterinsurgency and anti-terrorism operations that have occupied U.S. military forces in recent years. These observers would reduce planned procurement of high-capability tactical aircraft in favor of increased investments in UAVs and UCAVs, special operations helicopters, medical evacuation aircraft, and training and equipping forward air controllers.¹⁸

Other observers argue that large numbers of high-capability tactical aircraft are still necessary because Russian aircraft and surface-to-air missiles (SAMs) are available to potential adversaries, and because some European and Asian companies may soon be able to market advanced aircraft and SAMs to potential adversaries. In this view, the end of the Cold War did not mean the end of potential high-threat areas requiring advanced aircraft. Recent acquisitions of advanced fighter aircraft and surface-to-air missiles by China, and to a lesser degree India, have added to some observers' concerns that these countries may effectively challenge U.S. airpower in the future.

¹⁸ Most observers who question DOD's tactical aircraft modernization plan acknowledge that proliferation of advanced aircraft and air-defense equipment to potential adversaries will require the United States to field some new-generation high-capability aircraft. They argue, however, that the 1991 Gulf War against Iraq showed that the United States has a formidable advantage in air-to-air combat. They argue that the stealthy F-117 attack planes used in the Gulf War constituted a tiny percentage of all tactical aircraft employed against Iraq, and that only a few non-stealthy planes were shot down, even in the early days of the war. They also argue that cruise missiles and stealthy B-2 bombers and non-stealthy B-1s equipped with adequate standoff munitions can be used against heavily defended targets, and that successful development of longer-range and more-accurate and lethal standoff munitions would significantly increase the combat effectiveness of earlier-generation tactical aircraft.

Having large numbers of such advanced aircraft, it is argued, will help ensure operational success in future conflicts with well-armed adversaries.

April 2007 GAO Report

At the request of Representative Neil Abercrombie, the chairman of the Air and Land Forces subcommittee of the House Armed Services Committee, the Government Accountability Office (GAO) examined “DOD’s investment planning for recapitalizing and modernizing its tactical fighter and attack aircraft force portfolio.” GAO’s report, issued in April 2007, stated:

During the next 7 years, the military services plan to spend about \$109.3 billion to acquire about 570 new tactical aircraft and to modernize hundreds of operational aircraft. Substantial cost increases, schedule delays, and changes in requirements have significantly reduced procurement quantities of new aircraft. For example, since its start, the development period for the F-22A doubled, threat conditions changed, new ground attack and intelligence-gathering requirements were added, and its unit costs more than doubled, resulting in a steady decline in the number of aircraft the Air Force can now procure. Similar conditions and risk of poor outcomes seem to be emerging for the Joint Strike Fighter (JSF). The JSF is the linchpin for future modernization efforts because of its sheer size and plans to replace hundreds of operational systems in all three services. However, its development costs have increased by \$31.6 billion since 2004, and procurement and delivery schedules are slipping.

Funding needs and plans for new and legacy aircraft are by nature interdependent. Legacy systems must be sustained and kept operationally relevant until new systems complete development and are ready to replace them. If quantities of new aircraft are reduced and/or deliveries slip further into future years, significantly more as yet unplanned money will be required to sustain, modernize, and extend the life of legacy systems to ensure that the total force is both capable and sufficient in numbers. Uncertainty about new systems costs and deliveries makes it challenging to effectively plan and efficiently implement modernization efforts and legacy retirement schedules. Over the next seven years, the services are investing an average of about \$1.7 billion per year on legacy modifications, but there are large pent up demands—billions more—for unfunded requirements and potential life extension programs identified by program officials. Officials said the time is approaching when hard decisions on retiring or extending the life of legacy aircraft must be made.

Looking forward, DOD does not have a single, comprehensive, and integrated investment plan for recapitalizing and modernizing fighter and attack aircraft. Lacking an integrated DOD-wide view of requirements, it is difficult to determine the extent of capability gaps and shortfalls, or, alternatively, duplication of capability. Rather, each military service operates largely within its own stovepipe to plan and acquire the resources needed to fill its individual force structure construct. In the Air Force’s case, it is the forces deemed necessary to fill its air and space expeditionary wings; for the Navy, its carrier strike forces; and for the Marines, its expeditionary forces. Collectively, the services have underperformed to date in terms of delivering aircraft within desired costs and quantities, and future plans are likely unaffordable within projected funding levels. Individual service plans are largely dependent on favorable assumptions about the cost, quantity, and delivery schedules for new acquisitions and the ability to increase and sustain future funding levels substantially above current levels. These favorable assumptions are not realistic when juxtaposed with projected decline in future federal discretionary spending (including defense investment accounts), continued operational support requirements for the global war on terror, and looming start-ups of other big-ticket defense items, such as a strategic tanker aircraft and next generation long-range strike systems, competing for the same funds. Recent efforts to examine joint requirements on an integrated, DOD-wide basis have not significantly affected service plans and investments.

In order to recapitalize and sustain capable and sufficient tactical air forces that reflect what is needed and affordable from a joint service perspective and that has high confidence of being executed as planned, GAO is recommending that DOD (1) take decisive actions to shorten cycle times in developing and delivering new tactical aircraft and (2) develop an integrated enterprise-level investment strategy for tactical air forces.¹⁹

May 2009 CBO Report

At the direction of the Senate Armed Services Committee,²⁰ the Congressional Budget Office (CBO) conducted “a study examining the capabilities and costs of the fighter [i.e., tactical aircraft] force that would be fielded under the Department of Defense’s fiscal year 2009 plans and the potential implications for DoD’s long-term budget and inventory levels if planned purchases of new aircraft are insufficient to maintain fighter inventories at levels called for by current service requirements.” CBO stated that the study “also compares the advantages, disadvantages, and costs of seven alternative approaches that DoD might adopt to modernize its fighter forces—three that satisfy today’s inventory requirements, two that maintain aggregate weapons capacity with fewer aircraft, and two that replace portions of the fighter force with longer-range aircraft.”²¹ The report, which was issued in May 2009 and uses the term “fighter force” to refer to the tactical aircraft force, states:

If realized, the services’ *goals* for modernizing their fighter forces over the next several decades would result in a significant increase in capability over that offered by today’s

¹⁹ Government Accountability Office, *Tactical Aircraft[:] DOD Needs a Joint and Integrated Investment Strategy*, GAO-07-415, April 2007, pp. 2-3.

²⁰ The committee’s report (S.Rept. 110-77 of June 5, 2007) on the FY2009 defense authorization bill (S. 1547) stated:

The committee is concerned that the Department of Defense (DOD) has not adequately studied the potential risks associated with shortages in U.S. strike fighter aircraft over the next decade. Last year, Navy witnesses testified before the committee about a potential gap in strike fighters that might develop toward the end of the next decade, and could reach as high as 50 aircraft. While the uncertainties of the service life of the current F-18s and the production schedules for the future F-35 were mentioned then, the potential gap now under discussion could be as high as 220 Navy aircraft by the middle of the next decade. The Government Accountability Office (GAO) recently released a study entitled “Tactical Aircraft: DOD Needs a Joint Integrated Investment Strategy,” that reached several interesting conclusions. The report concluded that DOD does not have a single, integrated investment plan for recapitalizing and modernizing its tactical air forces, and without a joint, integrated investment strategy, it is difficult to evaluate the efficacy and severity of capability gaps or, alternatively, areas of redundancy. The GAO report additionally asserts, “[l]ooking forward over the next 20 years, the Department’s collective tactical aircraft recapitalization plans are likely not affordable as currently planned.”

Under the Department’s current plans, the DOD would spend, on average, about \$13 billion annually through 2020 developing and purchasing tactical combat aircraft. Over the long-term, that demand for funding will coincide with increases needed to execute other major Air Force and Navy acquisitions, including space systems, cargo aircraft, and surface combatants. In the near-term, it will coincide with the funding needed to “reset” and replace equipment worn out and lost during operations conducted in Iraq and Afghanistan.

To better understand the challenges DOD faces as it modernizes its fleets of tactical combat aircraft, the committee directs the Congressional Budget Office (CBO) to conduct a study of alternative approaches to structuring and investing in our Nation’s tactical air forces. The CBO analysis should include alternatives that address shortfalls in the size and composition of tactical aircraft forces relative to the services’ current and past stated requirements. CBO should also develop other alternatives that, while not necessarily satisfying all current requirements, could require less funding to execute than the Department’s current plans. Such options should include, but not be limited to, the potential for unmanned air systems to bridge part of the looming gap in strike fighter capability. CBO should provide the committee with a briefing describing interim results by April 2008, and a final report no later than October 2008. (Pages 135-136)

²¹ Congressional Budget Office, *Alternatives for Modernizing U.S. Fighter Forces*, May 2009, preface page.

forces. Inventories would remain about the same, but the modernized fleets would be equipped with state-of-the-art aircraft that offer substantial technological advances over today's fighters, including increased payload capacity and greater stealth capabilities (and, as a result, enhanced survivability). Notwithstanding DoD's emphasis on fielding aviation forces with greater flight endurance, the distance that newer aircraft could fly without requiring refueling ("unrefueled ranges") would not increase to the same extent.

Under DoD's fiscal year 2009 procurement *plans*, fighter inventories are likely to fall below the services' stated goals in the coming years. Nevertheless, many aggregate capabilities would remain equal to or improve relative to today's force because of the enhanced lethality and survivability that is expected from the new fighters. Some of those improvements might be offset by the increased capabilities of potential adversaries, however.

Alternative approaches that included purchasing additional F/A-18E/F Super Hornets or purchasing upgraded versions of so-called legacy aircraft—such as the F-16 Fighting Falcon and F-15E Strike Eagle, which are still in production but based on older designs—would offer an opportunity for short-term inventory relief, long-term cost savings, or both, albeit with lesser capability improvements (especially in terms of survivability) than would be realized by purchasing JSFs.

Compared with forces equipped solely with fighter aircraft, forces equipped with a mix of fighters (which are designed for supersonic speed and high maneuverability) and subsonic attack aircraft (designed, instead, to carry large payloads over long distances) would offer improved basing flexibility and persistence over the battlefield during air-to-ground missions. Force structures that replaced some fighters with smaller numbers of attack aircraft could provide air-to-ground weapons capacities comparable to those of today's forces and be fielded at costs similar to those projected for DoD's plans. Such forces would have fewer aircraft capable of air-to-air combat, however.²²

Aircraft Industrial Base

Another issue for Congress regarding tactical aircraft modernization in general concerns the implications that decisions on tactical aircraft acquisition programs can have for workloads, revenues, and employments levels in the U.S. military aircraft manufacturing industry, which employs thousands of aircraft designers, engineers, and production workers at both major aircraft manufacturing firms and supporting supplier firms. In addition to affecting employment levels, decisions on tactical aircraft acquisition programs can have implications for the structure of the industry. The United States currently has two active prime contractors for the production of tactical aircraft—Lockheed, the prime contractor for the F-22 and F-35, and Boeing, the prime contractor for the F/A-18E/F. When F/A-18E/F (and F-22) production winds down, the number of active U.S. prime contractors for the production of tactical aircraft might be reduced to one (Lockheed). Some observers have expressed concern about this prospective development on the grounds that it could reduce the potential for using competition between prime contractors in the future to spur innovation, constrain prices, and ensure schedule adherence and production quality in the development and procurement of future U.S. tactical aircraft.

Potential questions for Congress include the following: How many tactical aircraft prime contractors are needed to support U.S. military needs in the future? What is the value of

²² Congressional Budget Office, *Alternatives for Modernizing U.S. Fighter Forces*, May 2009, p. xi. Italics as in original.

competition at the prime contractor level in the development and procurement of tactical aircraft? What is the potential for a firm such as Boeing to use its work designing and building other types of aircraft to preserve key skills that would be needed to compete effectively in the future against a firm such as Lockheed for the role of prime contractor for the design and production of future tactical aircraft? How might decisions on tactical aircraft programs affect U.S. export earnings and the international competitiveness of the U.S. aerospace industry?

Legislative Activity for FY2010

This section presents legislative activity for FY2010 relating to tactical aircraft modernization in general. For legislative activity relating specifically to the F-35, F-22, or F/A-18E/F programs, see CRS Reports RL30563,²³ RL31673,²⁴ or RL30624, respectively.²⁵

FY2010 Defense Authorization Bill (H.R. 2647/S. 1390)

House

Section 133 of H.R. 2647 as passed by the House would require DOD to submit a report to Congress on the procurement of “4.5”-generation aircraft, which the provision defines as F-15s, F-16s, and F/A-18s that include certain upgrades. The text of the provision states:

SEC. 133. REPORT ON 4.5 GENERATION FIGHTER PROCUREMENT.

(a) In General- Not later than 90 days after the enactment of this Act, the Secretary of Defense shall submit to the congressional defense committees a report on 4.5 generation fighter aircraft procurement. The report shall include the following:

- (1) The number of 4.5 generation fighter aircraft for procurement for fiscal years 2011 through 2025 necessary to fulfill the requirement of the Air Force to maintain not less than 2,200 tactical fighter aircraft.
- (2) The estimated procurement costs for those aircraft if procured through single year procurement contracts.
- (3) The estimated procurement costs for those aircraft if procured through multiyear procurement contracts.
- (4) The estimated savings that could be derived from the procurement of those aircraft through a multiyear procurement contract, and whether the Secretary determines the amount of those savings to be substantial.

²³ CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program: Background and Issues for Congress*, by Ronald O'Rourke.

²⁴ CRS Report RL31673, *Air Force F-22 Fighter Program: Background and Issues for Congress*, by Ronald O'Rourke.

²⁵ CRS Report RL30624, *Navy F/A-18E/F and EA-18G Aircraft Procurement and Strike Fighter Shortfall: Background and Issues for Congress*, by Ronald O'Rourke.

(5) A discussion comparing the costs and benefits of obtaining those aircraft through annual procurement contracts with the costs and benefits of obtaining those aircraft through a multiyear procurement contract.

(6) A discussion regarding the availability and feasibility of F-35s in fiscal years 2015 through fiscal year 2025 to proportionally and concurrently recapitalize the Air National Guard.

(7) The recommendations of the Secretary regarding whether Congress should authorize a multiyear procurement contract for 4.5 generation fighter aircraft.

(b) Certifications- If the Secretary recommends under subsection (a)(7) that Congress authorize a multiyear procurement contract for 4.5 generation fighter aircraft, the Secretary shall submit to Congress the certifications required by section 2306b of title 10, United States Code, at the same time that the budget is submitted under section 1105(a) of title 31, United States Code, for fiscal year 2011.

(c) 4.5 Generation Fighter Aircraft Defined- In this section, the term '4.5 generation fighter aircraft' means current fighter aircraft, including the F-15, F-16, and F-18 [sic: F/A-18], that—

(1) have advanced capabilities, including—

(A) AESA radar;²⁶

(B) high capacity data-link; and

(C) enhanced avionics; and

(2) have the ability to deploy current and reasonably foreseeable advanced armaments.

Section 1047 would prohibit the Air Force from retiring fighter aircraft in accordance with the combat air forces restructuring plan announced by the Air Force on May 18, 2009, until 90 days after the Air Force submits to Congress a report on various aspects of the plan. The text of the provision states:

SEC. 1047. COMBAT AIR FORCES RESTRUCTURING.

(a) Limitations Relating to Legacy Aircraft- Until the expiration of the 90-day period beginning on the date the Secretary of the Air Force submits a report in accordance with subsection (b), the following provisions apply:

(1) PROHIBITION ON RETIREMENT OF AIRCRAFT- The Secretary of the Air Force may not retire any fighter aircraft pursuant to the Combat Air Forces restructuring plan announced by the Secretary on May 18, 2009.

(2) PROHIBITION ON PERSONNEL REASSIGNMENTS- The Secretary of the Air Force may not reassign any Air Force personnel (whether on active duty or a member of a reserve component, including the National Guard) associated with such restructuring plan.

(3) REQUIREMENTS TO CONTINUE FUNDING-

²⁶ AESA stands for active electronically scanned array.

(A) Of the funds authorized to be appropriated in title III of this Act for operations and maintenance for the Air Force, at least \$344,600,000 shall be expended for continued operation and maintenance of the 249 fighter aircraft scheduled for retirement in fiscal year 2010 pursuant to such restructuring plan.

(B) Of the funds authorized to be appropriated in title I of this Act for procurement for the Air Force, at least \$10,500,000 shall be available for obligation to provide for any modifications necessary to sustain the 249 fighter aircraft.

(b) Report- The report under subsection (a) shall be submitted to the Committees on Armed Services of the House of Representatives and the Senate and shall include the following information:

(1) A detailed plan of how the force structure and capability gaps resulting from the retirement actions will be addressed.

(2) An explanation of the assessment conducted of the current threat environment and current capabilities.

(3) A description of the follow-on mission assignments for each affected base.

(4) An explanation of the criteria used for selecting the affected bases and the particular fighters chosen for retirement.

(5) A description of the environmental analyses being conducted.

(6) An identification of the reassignment and manpower authorizations necessary for the Air Force personnel (both active duty and reserve component) affected by the retirements if such retirements are accomplished.

(7) A description of the funding needed in fiscal years 2010 through 2015 to cover operation and maintenance costs, personnel, and aircraft procurement, if the restructuring plan is not carried out.

(8) An estimate of the cost avoidance should the restructuring plan move forward and a description of how such funds would be invested during the future-years defense plan to ensure the remaining fighter force achieves the desired service life and is sufficiently modernized to outpace the threat.

(c) Exception for Certain Aircraft- The prohibition in subsection (a)(1) shall not apply to the five fighter aircraft scheduled for retirement in fiscal year 2010, as announced when the budget for fiscal year 2009 was submitted to Congress.

Section 1051 expresses the sense of Congress regarding Navy carrier air wing force structure. The text of the provision states:

SEC. 1051. SENSE OF CONGRESS REGARDING CARRIER AIR WING FORCE STRUCTURE.

(a) Findings- Congress makes the following findings:

(1) The requirement of section 5062(b) of title 10, United States Code, for the Navy to maintain not less than 11 operational aircraft carriers, means that the naval combat forces of the Navy also include not less than 10 carrier air wings.

(2) The Department of the Navy currently requires a carrier air wing to include not less than 44 strike fighter aircraft.

(3) In spite of the potential warfighting benefits that may result in the deployment of fifth-generation strike fighter aircraft, for the foreseeable future the majority of the strike fighter aircraft assigned to a carrier air wing will not be fifth-generation assets.

(b) Sense of Congress- It is the sense of Congress that—

(1) in addition to the forces described in section 5062(b) of title 10, United States Code, the naval combat forces of the Navy should include not less than 10 carrier air wings (even if the number of aircraft carriers is temporarily reduced) that are comprised of, in addition to any other aircraft, not less than 44 strike fighter aircraft; and

(2) the Secretary of the Navy should take all appropriate actions necessary to make resources available in order to include such number of strike fighter aircraft in each carrier air wing.

The House Armed Services Committee, in its report (H.Rept. 111-166 of June 18, 2009) on H.R. 2647, summarizes **Section 133** on page 125 and **Section 1051** on page 393. The report summarizes **Section 1047** on page 392, and states further in connection with Section 1047 that:

The committee is concerned about Air Force plans to accelerate the retirement of 249 legacy fighter aircraft in fiscal year 2010, in addition to the five fighter aircraft previously scheduled for retirement. The additional aircraft scheduled for retirement are 112 F-15s, 134 F-15s and 3 A-10s. The committee notes that such actions could lead to serious gaps in force structure and capability since these actions are being taken while replacement aircraft are still being tested and are not yet available for fielding. Additionally, the committee is concerned that the Air Force has not identified, for all of the affected bases, the follow-on missions that will serve to fill force structure and capability gaps.

The committee has identified \$143.7 million in unjustified program growth in the Air Force operation and maintenance administrative budget, specifically service-wide technical support, service-wide administration, and service-wide other activities. Additionally, the committee has identified \$200.9 million in unexecutable peacetime operations due to deployments in the Air Force operating forces, air operations budget activity. The committee recommends that these funds totaling \$344.6 be used for the continued operation and maintenance of the 249 legacy fighters that were slated for retirement during fiscal year 2010 until such time as the reporting requirement above is met. In addition, the committee recommends that \$10.5 million of funds for aircraft procurement be available for obligations for modifications necessary to sustain the 249 fighter aircraft. (Pages 392-393)

The report states the following regarding the projected Air Force fighter shortfall:

The committee notes that for the past year, the Department of the Air Force has informed Congress that it requires 2,200 fighter aircraft, and that the Department projects a shortfall in its fighter aircraft inventory that would begin in fiscal year 2017 and grow to approximately 800 aircraft by 2024. The committee believes that such a shortfall will adversely affect the ability of the active duty forces and air reserve forces to meet future requirements for both air expeditionary forces and for the air sovereignty alert mission in the United States.

Accordingly, the committee directs the Secretary of the Air Force, in consultation with the Chief of the Air National Guard and the Chief of the Air Force Reserve, to provide a report to the congressional defense committees by March 1, 2010. The report should include statements from both the Chief of the Air National Guard and the Chief of the Air Force

Reserve describing their separate and independent views to Congress, as applicable. The report should address the so-called “fighter gap” issue in the long- and short-term with alternative solutions including but not limited to: accelerated procurement of fifth generation fighters such as the F-22 and F-35; an interim procurement of so-called “4.5 generation” fighters; and fleet management options such as service life extension programs. The report must include a detailed analysis of the effect that any shortfalls will have on the Air National Guard and the air sovereignty alert mission specifically, including the loss of Air National Guard flying missions throughout the United States and the resultant loss of Air National Guard pilot and maintenance capability. (Page 101)

The report states the following regarding the projected Navy-Marine Corps strike fighter shortfall:

The committee is concerned regarding the current and forecasted strike-fighter aircraft inventory of the Department of the Navy. The committee understands that the Department of the Navy has a fiscal year 2009 strike-fighter inventory shortfall of 110 aircraft and predicts a fiscal year 2010 shortfall of 152 aircraft, with a potential peak strike-fighter shortfall of 312 aircraft by fiscal year 2018. The committee believes such drastic shortfalls in strike fighter-inventory are unacceptable.

The committee understands that a variety of factors cause the current and projected strike-fighter shortfall. Those factors include a fiscal year 2002 decision to reduce F/A-18A through D inventory by 88 aircraft, a reduction in the program of record quantity for F-35B/C by 409 aircraft, delays in development of the F-35B/C program, and F/A 18A through D aircraft reaching forecasted service life sooner than expected.

The committee remains unconvinced that naval strike-fighter shortfalls should be viewed against the totality of Department of Defense strike-fighter inventory. The capabilities of the naval strike-fighter force are inherent in the capability of the aircraft carrier as a strike platform and, as such, force structure requirements for naval aviation must be viewed as those required to support sufficient carrier air wings (CVW) to match the number of statutorily mandated aircraft carriers.

The committee supports procurement of additional F/A-18E/F aircraft to mitigate the naval strike-fighter inventory shortfall and believes that procurement of additional F/A-18E/F aircraft through a multi-year procurement contract is more cost effective and prudent than procuring new aircraft through an annual contract or applying \$25.6 million of additional fiscal resources per aircraft to extend the service life of the F/A-18A through D fleet. Therefore, the committee includes a provision in title I of this Act that would authorize the Secretary of the Navy to enter into a multi-year procurement contract for the purchase of additional F/A-18E/F and EA-18G aircraft and also includes a provision in title X of this Act [Section 1051] that expresses a sense of Congress that the Department of the Navy should maintain no less than ten carrier air wings with no less than 44 strike-fighters each. Additionally, the committee directs the Director of the Congressional Budget Office to submit a report to the congressional defense committees by February 2, 2010, that evaluates the operational effectiveness and costs of extending and modernizing the service-life of F/A-18A through D aircraft to 10,000 flight hours versus procuring, either through an annual or multi-year procurement contract, additional F/A-18E/F aircraft beyond the current program of record. (Page 61)

Senate

The Senate Armed Services Committee's report (S.Rept. 111-35 of July 2, 2009) on S. 1390 includes a section on the F/A-18E/F program that states the following regarding the projected Navy-Marine Corps strike fighter shortfall:

The committee has expressed concern that the Navy is facing a sizeable gap in aircraft inventory as older F/A-18A-D Hornets retire before the aircraft carrier variant (F-35C) of the Joint Strike Fighter (JSF) is available. The committee raised this issue in the committee reports accompanying S. 1547 (S.Rept. 110-77) of the National Defense Authorization Act for Fiscal Year 2008 and accompanying S. 3001 (S.Rept. 110-335) of the National Defense Authorization Act for Fiscal Year 2009. The committee is disappointed that the Navy has failed to provide the report comparing single versus multiyear procurement costs mandated by the second of those committee reports.

Last year, the committee received testimony from the Navy of a projected shortfall in Navy tactical aviation. The Navy indicated that, under assumptions current at that time, it would experience a shortfall of 69 tactical aircraft in the year 2017, a number that swells to 125 when requirements of the United States Marine Corps are included. The committee believes that the Navy's projection of this shortfall was, however, based on a series of questionable assumptions.

This year, the Chief of Naval Operations said that the projected gap may be as high as 250 aircraft total for the Department of the Navy. The committee believes that the Navy has failed to present a budget in fiscal year 2010 that takes effective action to deal with this substantially increased projected shortfall in the Department of the Navy's tactical air fleet and is concerned about the potential risk such a shortfall could pose to national security. The committee also notes that this shortfall figure is still predicated on an initial operation capability of the F-35C in 2015 but that achieving this is considered optimistic by many observers. The Navy's delay in taking action causes concern that it: (1) is continuing to accept the substantial security risks associated with the projected shortfall; (2) remains overly reliant on a potentially costly service life extension program (SLEP) for legacy F/A-18s as a means to mitigate the gap until the Joint Strike Fighter achieves full operational capability; and (3) is not adequately considering realistic, fiscally responsible long-range procurement plans to address the carrier strike aircraft shortfall, such as a multiyear procurement of F/A-18E/F aircraft as opposed to a series of single year purchases.

The committee is concerned that, in response to possible further delays, expanding costs and technological immaturity with the JSF, the Navy appears increasingly reliant on its proposal to extend the life of select legacy F/A-18's from 8,600 to 10,000 flight hours through a SLEP currently estimated to cost on average \$26.0 million per plane. This life extension would be in addition to the 2,600-hour service life extension that the Navy already plans for most legacy F/A-18s. By the Navy's own testimony, it is unclear how many of the planes are capable of reaching 10,000 flight hours even with a SLEP. The committee is concerned that the cost uncertainties of a SLEP achieving an additional 1,400 flight hours make such a plan risky. In any case, the committee believes such SLEP may be inefficient when compared with the benefits of procuring new F/A-18E/F's, which might cost less than \$50.0 million each in 2009 constant dollars under a multiyear procurement acquisition strategy. Normalizing costs for the expected return in additional service life, a SLEP to achieve the additional 1,400 hours would cost approximately \$18,571 per flight hour gained, versus \$8,333 per flight hour provided by a new F/A-18E/F (at a 6,000 flight hour life, the cost per flight hour of a new F/A-18E/F would fall even further to \$5,814 if those planes are similarly extended to 8,600 flight hours as have legacy F/A-18s). In light of such costs, the committee

believes the Navy must more carefully evaluate costs and benefits of new F/A-18E/F procurements, compared to investing in a SLEP of legacy aircraft.

The committee further notes that new F/A-18E/F models come equipped with improved technological capabilities over the legacy F/A-18's, including active electronically scanned array radar, modernized avionics, advanced aerial refueling system capability, and added weapon hard points, among other features that would not be part of a SLEP upgrade package for the older aircraft. These factors would tend to increase the benefit of purchasing new F/A-18E/Fs compared to conducting a SLEP on legacy aircraft. The Navy projects that the F/A-18E/F will remain in the fleet until at least 2040, and should be able to use most or all of the full service life of any newly purchased aircraft.

The committee understands that the Department of Defense intends to review the whole issue of tactical aircraft forces in the pending Quadrennial Defense Review. The committee expects the Department to conduct and submit the analysis of multiyear procurement for the F/A-18 as directed in the committee report last year to include cost differentials between single year and multiyear procurement strategies and tradeoffs between a SLEP and new procurements of the F/A-18E/F. The Department should include such information derived from that analysis in deciding how to implement the results on the ongoing Quadrennial Defense Review regarding tactical aviation.

The committee expects that the Department's tactical aviation procurement strategies will be informed by the Quadrennial Defense Review. In light of the significant increase in the strike-fighter shortfall testified to before the committee this year, additional actions to address that shortfall cannot be delayed too long. (Pages 20-22)

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