Air Force F-22 Fighter Program: Background and Issues for Congress

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Summary

Procurement of Air Force F-22 fighters began in FY1999, and a total of 187 have been procured through FY2009. The issue for Congress is whether to approve the Administration's proposal in the FY2010 budget to end F-22 procurement at 187 aircraft, or reject that proposal and provide funding in FY2010 for the procurement of additional F-22s in FY2010 and/or subsequent years. The White House has vowed to veto any bill that supports the acquisition of F-22s beyond the 187 that have been procured through FY2009.

FY2010 defense authorization bill: The *House Armed Services Committee*, in its report (H.Rept. 111-166 of June 18, 2009) on the FY2010 defense authorization bill (H.R. 2647), recommends authorizing $368.8 million in FY2010 advance procurement funding for the procurement of 12 F-22s in FY2011. The report recommends $12.7 million in procurement funding for modification of in-service F-22s—a reduction of $338.0 million from the Administration's request. Section 131 of the bill would repeal a provision limiting the obligation of FY2009 F-22 advance procurement funding. Section 132 would require the Secretary of the Air Force to develop a plan for the preservation and storage of unique tooling related to the production of hardware and end items for F-22s. Section 1237 would require the Secretary of Defense to submit a report to Congress on issues relating to the potential sale of F-22s to Japan.

The *Senate Armed Services Committee*, in its report (S.Rept. 111-35 of July 2, 2009) on the FY2010 defense authorization bill (S. 1390), recommended authorizing $1.75 billion for the procurement of seven F-22s in FY2010. On July 21, 2009, *the Senate approved*, 58 to 40, an amendment to S. 1390 (S.Amdt. 1469) that strikes the authorization of the $1.75 billion for the procurement of seven F-22s in FY2010 and restores funding elsewhere in the bill that was reduced in order to authorize the $1.75 billion. S. 1390 as amended now supports the Administration's proposal to end F-22 procurement at 187 aircraft. Section 122 of S. 1390 would repeal a provision limiting the obligation of FY2009 F-22 advance procurement funding. Section 123 (as amended by S.Amdt. 1796) would require a report to Congress on issues relating to the potential sale of F-22s to Japan.

FY2010 DOD appropriations bill: The *House Appropriations Committee*, in its report (H.Rept. 111-230 of July 24, 2009) on the FY2010 DOD appropriations bill (H.R. 3326), recommends $368.8 million in FY2010 advance procurement funding for the procurement of 12 F-22s in a future fiscal year. The report recommends $187.3 million in procurement funding for modification of in-service F-22s—a reduction of $163.4 million from the Administration's request. Section 8041 would rescind $383 million in FY2009 F-22 advance procurement funding. Section 8057 would prohibit the use of funds made available in the bill from being used to approve or license the sale of the F-22 to any foreign government. On July 30, 2009, the House approved, 269 to 165, an amendment (H.Amdt. 392) that, among other things, redirects the $368.8 million in F-22 advance procurement funding to other purposes. H.R. 3326 as amended now supports the Administration's proposal to end F-22 procurement at 187 aircraft. The *Senate Appropriations Committee*, in its report (S.Rept. 111-74 of September 10, 2009) on H.R. 3326, recommends approval of the administration's request for $95.2 million in FY2010 procurement funding to end F-22 procurement at 187 aircraft. The report recommends a $173.4-million reduction to the administration's request for FY2010 procurement funding for the modification of in-service F-22s. Section 8040 of the bill as reported would rescind $383 million in FY2009 advance procurement funds for the F-22 program. Section 8056 as reported would retain the annual provision regarding foreign sales of the F-22, and modify the provision so as allow DOD to develop an export version of the aircraft. The committee's report urges the Air Force to start this effort.

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Introduction

The Air Force F-22 fighter, also known as the Raptor, is the world's most capable air-to-air combat aircraft. Procurement of F-22s began in FY1999, and a total of 187 have been procured through FY2009, including 24 in FY2009.[1]

The issue for Congress is whether to approve the Administration's proposal in the FY2010 budget to end F-22 procurement at 187 aircraft, or reject that proposal and provide funding in FY2010 for the procurement of additional F-22s in FY2010 and/or subsequent years. The issue emerged as a high-profile item of debate on the FY2010 defense budget. The White House has vowed to veto any bill that supports the acquisition of F-22s beyond the 187 that have been procured through FY2009.

The Administration argues, among other things, that 187 F-22s will be sufficient in conjunction with other U.S. tactical aircraft, such as the F-35 Joint Strike Fighter (JSF), to meet operational demands for U.S. tactical aircraft, and that funding additional F-22s would reduce funding for other defense programs, which could create operational risk in other areas.

Supporters of procuring additional F-22s in FY2010 and/or subsequent years argue, among other things, that Air Force officials have stated that 243 to 250 F-22s would be needed to meet operational demands at a moderate level of operational risk, and that a force of 187 F-22s would create a higher level of operational risk.

Additional issues for Congress for the F-22 program include the reliability and maintainability of in-service F-22s, the F-22 modernization program, and the potential sale of F-22s to Japan.

Congress' decisions on all these issues could affect DOD capabilities and funding requirements, the U.S. tactical aircraft industrial base, and U.S. relations with Japan and other countries.

Background

The F-22 in Brief

The F-22, known more formally as the F-22A,[2] is the world's most capable air-to-air combat aircraft. It also has an air-to-ground (i.e., attack) capability.[3] The F-22 incorporates a high degree

[1] The 24 F-22s procured in FY2009 include 20 aircraft that were fully funded in the FY2009 defense appropriations act (Division C of H.R. 2638/P.L. 110-329 of September 30, 2008) and four additional aircraft whose procurement cost was recently completed in the FY2009 supplemental appropriations act (H.R. 2346/P.L. 111-32 of June 24, 2009).

[2] The F-22 is referred to more formally as the F-22A, meaning the first version of the F-22. As no other versions of the F-22 are currently planned, this CRS report refers to the aircraft as the F-22.

[3] Although the F-22 was originally conceived as an air superiority fighter with minimal air-to-ground capability, the Air Force subsequently placed more emphasis on F-22's air-to-ground capability. In September 2002, in recognition of the aircraft's air-to-ground capability, the F-22 was redesignated the F/A-22, with the A standing for attack. In December 2005, the Air Force changed the aircraft's designation back to F-22.

of stealth, as well as supercruise,[4] thrust-vectoring for high maneuverability,[5] and integrated avionics that fuse information from on-board and off-board sensors.

The F-22 and the multi-service F-35 Joint Strike Fighter (JSF) are considered the world's first (and to date only) fifth-generation tactical aircraft. Fifth-generation aircraft incorporate the most modern technology, and are considered to be generally more capable than earlier-generation (e.g., fourth-generation and below) aircraft. An August 2009 press report quotes the designer of Russia's first fifth-generation fighter as stating that the aircraft is scheduled to make its first flight by the end of 2009, or perhaps in January or February 2010.[6]

The F-22 is intended to replace the Air Force's aging F-15 air superiority fighters, while the F-35A (the Air Force version of the F-35) is intended to replace the service's aging F-16 fighters and A-10 attack aircraft. The F-22 is a bit more stealthy than the F-35, and more capable than the F-35 in air-to-air combat. The F-35A is intended to be a more affordable complement to the F-22, and is a strike fighter—a dual-role aircraft with significant capability in both air-to-ground (strike) and air-to-air (fighter) operations.[7] If the F-15/F-16 combination represented the Air Force's earlier-generation "high-low" mix of air superiority fighters and more-affordable dual-role aircraft, then the F-22/F-35A combination might be viewed as the Air Force's intended future high-low mix of air superiority fighters and more-affordable dual-role aircraft.[8] The Air Force states that:

> 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....
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> 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. ...
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> 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

[4] 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.

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

[6] Dmitry Solovyov, "Sukhoi Says New Fighter Will Fly In '09," *Moscow Times,* August 21, 2009.

[7] For more on the F-35 program, see CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[8] The term high-low mix refers to a force consisting of a combination of high-cost, high-capability aircraft and lower-cost, more-affordable aircraft. Procuring a high-low mix is a strategy for attempting to balance the goals of having a certain minimum number of very high capability tactical aircraft to take on the most challenging projected missions and of being able to procure tactical aircraft sufficient in total numbers within available resources to perform all projected missions.

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.[9]

Program Origin and Milestones

The F-22 program was initiated in the early 1980s with the aim of developing a highly capable successor to the F-15 that would be capable of defeating all known and projected enemy fighters, including those being developed at the time by the Soviet Union.[10] The F-22 program was given Milestone I approval in October 1986. The first flight of an F-22 industry prototype occurred in August 1990,[11] and the first flight of a development version of the aircraft occurred in September 1997.[12] The program was granted approval for Low Rate Initial Production (LRIP) in August 2001, and the first LRIP F-22 was delivered in June 2003. The F-22 achieved Initial Operational Capability (IOC) in December 2005.[13]

Lockheed Martin in the past has studied the idea of a fighter-bomber version of the F-22 called the FB-22, but the Air Force currently has no program to develop or acquire such an aircraft.[14]

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[9] Department of the Air Force Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Subject: Air Force Programs, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5), Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ), [and] Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, pp. 7-8.

[10] In the early 1980s, the Air Force began to develop a stealth aircraft called the Advanced Tactical Fighter (ATF), which was then expected to enter service in the 1990s as the replacement for the F-15. The ATF program was initiated in response to advances in Soviet combat aircraft that were expected to occur in the 1990s. A naval variant of the ATF that could operate from aircraft carriers—the NATF—was initiated as the replacement for the Navy's F-14 fighter, but the NATF program was subsequently terminated.

[11] To help control ATF costs, DOD used competitive prototypes for ATF airframes, engines, and avionics. The Air Force selected two teams of contractors to develop ATF airframe prototypes: Lockheed teamed with Boeing and General Dynamics; and Northrop teamed with McDonnell Douglas. On October 31, 1986, the Air Force awarded each team a $691-million fixed-price contract to build two prototypes. Lockheed's prototype was designated the YF-22, while Northrop's was designated the YF-23. The prototypes were powered by new-design engines. One YF-22 prototype and one YF-23 prototype were powered by Pratt & Whitney's F119 engine, while the other YF-22 prototype and YF-23 prototype were powered by General Electric's F120 engine. The Air Force announced in 1989 that the full-scale development phase would be delayed to allow more time for development of engines and avionics. Each contractor team reportedly spent over $1 billion in company funds to develop competing their prototypes, which were flight-tested and evaluated in late 1990.

[12] On April 23, 1991, the Air Force selected the Lockheed's YF-22 design, as powered by Pratt & Whitney's F119 engine, for development as the F-22. Air Force Secretary Donald Rice stated that the choice was based on confidence in the ability of the Lockheed team and Pratt & Whitney to produce the aircraft and its engine at projected costs. Rice emphasized the importance of the Lockheed team's management and production plans, and added that the YF-22 offered better reliability and maintainability. Neither design was judged significantly more maneuverable or stealthy than the other. On August 2, 1991, contracts totaling $11 billion were awarded to Lockheed and Pratt & Whitney for engineering and manufacturing development (EMD) of the F-22, then including 11 development/prototype aircraft.

[13] On December 12, 2005, the Air Force's Air Combat Command declared that the first squadron of 12 F-22s—27th Fighter Squadron of the 1st Fighter Wing, based at Langley Air Force Base (AFB)—had achieved Initial Operational Capability (IOC). On January 21, 2006, the F-22 flew its first operational sorties, taking part in an on-going air superiority mission over the United States.

[14] The FB-22, which would employ a delta wing (i.e., a triangular shaped wing), would have double the F-22's range and a significantly larger internal payload. Some observers have estimated that the FB-22 could carry up to 30 250-lb Small Diameter Bombs. (Richard Whittle, "F-22 Bomber Studied," *Dallas Morning News*, July 30, 2002; Frank Wolfe, "Sambur: F-22 Must Prove Itself Before FB-22 Becomes Formal Program," *Defense Daily*, March 4, 2002.) These potential improvements in range and internal payload would likely result in reduced performance compared to the F-22 (continued...)

F-22 Contractors, Employment, and Production Line Shutdown

Contractors

The major contractors for the F-22 program are Lockheed Martin of Marietta, GA, and Fort Worth, TX, along with Boeing of Seattle, WA, for the F-22's airframe; and United Technologies of East Hartford, CT (the parent firm of engine maker Pratt & Whitney) for the F-22's F119 engines.

A map provided by Lockheed shows a total of roughly 1,040 F-22 supplier firms in 44 states (all but Alaska, Hawaii, North Dakota, South Dakota, West Virginia, and Wyoming).[15]

Employment

Lockheed states that the F-22 program in 2009 supports a total of 8,800 direct jobs at Lockheed's Marietta, GA, and Fort Worth, TX, locations, and at Boeing and Pratt & Whitney. Lockheed estimates, on the basis of purchase order receipts, that the F-22 program supports an additional 16,200 supplier-firm jobs in 44 states around the country. Lockheed combines these two figures to estimate that the F-22 supports a total of about 25,000 direct jobs. Using a multiplier of 2.8 to estimate jobs elsewhere in the economy that are indirectly supported by these 25,000 jobs, Lockheed estimates that an additional 70,000 jobs are indirectly supported by the F-22 program. Lockheed combines the figures of 25,000 and 70,000 to estimate that a total of 95,000 jobs are supported either directly or indirectly by the F-22 program.[16]

A map provided by Lockheed shows roughly 25,800 direct F-22-related jobs in 44 states. According to the map, states with more than 1,000 direct F-22-related jobs include California (6,532 jobs), Texas (3,526), Georgia (2,821), Connecticut (2,205), New Hampshire (2,197), Washington (1,491), and Florida (1,025). The map shows several states with a few hundred to

(...continued)

in other areas, such as acceleration and maneuverability.

Some Air Force leaders in the past have expressed some enthusiasm for the FB-22 idea. In 2002, Secretary of the Air Force James Roche reportedly favored the FB-22 as the potential platform of choice for providing better close air support for tomorrow's ground forces. (Ron Laurenzo, "Roche Envisions Close Air Support F-22," *Defense Week*, July 1, 2002.) Roche suggested in testimony to Congress in 2003 that up to 150 FB-22s could be procured, with full-rate production achievable by FY2011, if development funds were committed in FY2004. (Lorenzo Cortes, "Air Force Issues Clarification on FB-22, FY'11 Delivery Date Possible," *Defense Daily*, March 10, 2003.) Some Air Force leaders in the past have said the FB-22 could serve as a bridge between the current bomber force and a next-generation long-range bomber. Other Air Force leaders have reportedly shown less enthusiasm in the FB-22 concept. Air Force acquisition chief Marvin Sambur said in 2002 that the F-22A's difficulties would have to be solved before the FB-22 could be considered. (Bill Sweetman. "Smarter Bomber," *Popular Science*, June 25, 2002.)

Some observers argue that the FB-22 could be developed and produced economically by reusing the F-22's cockpit, engines, computer systems, production methods, and materials. Other observers argue that redesigning an aircraft to perform a new mission is difficult and usually expensive. Some observers estimate that developing the FB-22's modified airframe could cost up to $1 billion. Other observers have questioned the potential cost effectiveness attractiveness of a medium-range bomber with a payload smaller than that of current long-range bombers.

[15] Lockheed map entitled "F-22 Raptor[:] The 2009 Industrial Base," provided to CRS by e-mail on July 13, 2009. The map shows four states with no suppliers (North Dakota, South Dakota, West Virginia, Wyoming) and does not depict two other states (Alaska and Hawaii).

[16] Source: Lockheed e-mail to CRS, July 13, 2009.

several hundred direct F-22-related jobs each, and a number of states with fewer than 100 (in some cases fewer than 25) direct F-22-related jobs each. The map shows four states—North Dakota, South Dakota, West Virginia, and Wyoming—as having no direct F-22-related jobs in 2009. The map does not depict Alaska or Hawaii.[17]

Production Line Shutdown

The Administration's FY2010 defense budget submission states that the 20 F-22s procured in the regular (aka "base") FY2009 defense budget are to be delivered to the Air Force between January 2011 and December 2011, with one or two aircraft being delivered each month.[18] Lockheed states that the four additional F-22s funded in the FY2009 supplemental appropriations act will be built after these 20 aircraft.[19] If the four additional F-22s are delivered to the Air Force in monthly quantities of one or two aircraft, the last of these four aircraft might be delivered in February or March of 2012.

If no additional F-22s are procured in FY2010 and/or subsequent years, then the earlier parts of the F-22 production line (including F-22 suppliers who provide materials or components that are delivered during the earlier stages of the F-22 assembly process) will begin to shut down prior to the delivery of the final four F-22s, as those four aircraft move beyond the earlier parts of the production line. The Administration's FY2010 budget submission, for example, shows that although the 20 F-22s funded in the regular FY2009 defense budget are to be delivered starting in January 2011, the F119 engines for these aircraft are to be delivered starting in February 2010—11 months earlier.[20]

The Administration's FY2010 budget submission states that the $95.2 million in FY2010 procurement funding requested for the F-22 program "includes $64M [i.e., $64 million] to continue production line shutdown activities, which preserve necessary assets for long-term F-22 fleet sustainment."[21] The use of the word "continue" in this statement suggests that under the proposed FY2010 budget, some F-22 production line shutdown activities are anticipated to occur in FY2009.

Lockheed states:

> Since further orders have not yet been placed beyond the four aircraft in the FY09 Supplemental, F-22 Advanced Procurement suppliers are beginning to adjust their workforce and phasing out their F-22 production capability. Suppliers that will first experience the absence of continuing production work beyond the 4 aircraft authorization begin with raw material suppliers of titanium and other long lead raw materials, followed by forging houses

[17] Lockheed map entitled "F-22 Raptor[:] The 2009 Industrial Base," provided to CRS by e-mail on July 13, 2009.

[18] Department of the Air Force, *United States Air Force, Committee Staff Procurement Backup Book, Fiscal Year (FY) 2010 Budget Estimates, Aircraft Procurement, Air Force, Vol. 1, May 2009*, Exhibit P-21, Production Schedule, F-22 (Raptor). The 20 aircraft are to be delivered in monthly quantities of 2, 2, 1 2, 2, 1, 2, 2, 1, 2, 1, 2.

[19] Lockheed e-mail to CRS, July 15, 2009.

[20] Department of the Air Force, *United States Air Force, Committee Staff Procurement Backup Book, Fiscal Year (FY) 2010 Budget Estimates, Aircraft Procurement, Air Force, Vol. 1, May 2009*, Exhibit P-5A, Procurement History and Planning, F-22 (Raptor).

[21] Department of the Air Force, *United States Air Force, Committee Staff Procurement Backup Book, Fiscal Year (FY) 2010 Budget Estimates, Aircraft Procurement, Air Force, Vol. 1, May 2009*, Exhibit P-40, Budget Item Justification, F-22 (Raptor).

> and other long lead components. As production jobs and capability decline, the ability to recover those critical skills becomes increasingly expensive, particularly where F-22 comprises a large share of their overall business.[22]

The Air Force in 2007 estimated that of about 1,000 first-tier F-22 supplier firms, roughly 110, or about 11%, were also F-35 suppliers. The Air Force believes this figure probably has not changed significantly since 2007. The Air Force believes the percentage of F-22 supplier firms that are also F-35 supplier firms is not higher than about 11% because the F-35 program involves significant international participation and thus features a large number of foreign supplier firms.[23] On this basis, it would appear that if F-22 production ends, most F-22 supplier firms would not be supported by F-35 production.

Procurement Quantities

Planned Total Procurement Quantity

Since the submission to Congress in early 2005 of the FY2006 budget, DOD plans have called for procuring a total of about 187 F-22s—a figure that includes:

- 179 production aircraft;
- 6 Production Representative Test Vehicle (PRTV) II aircraft; and
- 2 Engineering and Manufacturing Development (EMD) aircraft funded with research and development funding.[24]

The figure of 179 production aircraft includes four F-22s whose procurement cost was recently completed in the FY2009 supplemental appropriations act. Prior to the funding of the four additional aircraft, the planned total was 183 F-22s, including 175 production aircraft.

The Air Force originally envisaged a production run of 750 F-22s. The figure was reduced to 648 in 1991. DOD's 1993 Bottom-Up Review (BUR) reduced the planned number of production F-22s to 438 (plus four pre-production versions, later reduced to two), which was enough to support four F-22 fighter wings in a total Air Force force structure of 20 wings (13 active; seven Reserve/National Guard). The 1997 Quadrennial Defense Review (QDR) reduced the planned number of production F-22s to 339, which was enough to support three F-22 fighter wings in a 20-wing force structure (12 active; eight Reserve/National Guard). **Table 1** shows planned total numbers of F-22s in the budget submissions for FY1999 to the present.

[22] Lockheed e-mail to CRS, July 15, 2009.

[23] Source: E-mail from Air Force Office of Legislative Liaison to CRS on July 15, 2009.

[24] Some DOD documents show slightly different planned procurement totals, such as 184 (a figure that includes one replacement test aircraft) or 181 (a figure that that includes 172 production aircraft and 9 non-production aircraft). The most commonly cited figure is 183.

Table 1. Planned Total Number of Production F-22s

As shown in budget submissions for FY1991 to the present

Budget submission	Planned number of production F-22s	Planned total number of F-22s[a]
FY1991	648	n/a
FY1992	648	n/a
FY1993	442	n/a
FY1994	442	n/a
FY1995	442	n/a
FY1996	442	n/a
FY1997	442	n/a
FY1998	341	n/a
FY1999	339	n/a
FY2000	339	n/a
FY2001	333	n/a
FY2002	333	339
FY2003	333	339
FY2004	270	276
FY2005	271	277
FY2006	172	179
FY2007	176	183
FY2008	175	183
FY2009	175	183
FY2010	175[b]	183[b]

Source: Prepared by CRS based on Air Force information paper of July 8, 2009, provided to CRS on July 9, 2009 (for FY1991-FY1998), and DOD budget submissions (for FY1999-FY2010).

a. This total includes production F-22s from the previous column, plus 6 Production Representative Test Vehicle (PRTV) II aircraft, plus (beginning in FY2006) 1 or 2 EMD aircraft funded with research and development funding.

b. The proposed FY2010 budget was submitted to Congress in early May 2009, prior to the completion of action on the FY2009 supplemental appropriations act, and consequently does not reflect the four additional F-22s whose procurement cost was completed in the FY2009 supplemental appropriations act. If these four aircraft had been included in the FY2010 budget submission, the submission would have shown 179 production F-22 and a total of 187 F-22s.

Annual Procurement Quantities

Table 2 shows annual procurement quantities for the 179 production F-22s procured through FY2009. The 179 aircraft shown in the table do not include six Production Representative Test Vehicle (PRTV) II aircraft and two Engineering and Manufacturing Development (EMD) aircraft funded with research and development funding. Including these eight aircraft would bring the total number of F-22s to 187.

The 64 F-22s procured in FY2007-FY2009 include 20 F-22s per year that were procured under a multiyear procurement (MYP) arrangement, plus the four additional F-22s whose procurement cost was completed in the FY2009 supplemental appropriations act.

Table 2. Annual Procurement Quantities of Production F-22s

(Figures shown do not include 6 Production Representative Test Vehicle (PRTV) II aircraft and 2 Engineering and Manufacturing Development (EMD) aircraft)

FY	Quantity
FY99	2
FY00	0
FY01	10
FY02	13
FY03	21
FY04	22
FY05	24
FY06	23
FY07	20[a]
FY08	20[a]
FY09	24[a]
Total through FY09	**179**

Source: Prepared by CRS based on DOD data.

Note: Figures shown do not include 6 Production Representative Test Vehicle (PRTV) II aircraft and 2 Engineering and Manufacturing Development (EMD) aircraft. Including these eight aircraft would bring the total number of F-22s to 187.

a. The 64 F-22s procured in FY2007-FY2009 include 20 F-22s per year that were procured under a multiyear procurement (MYP) arrangement, plus four additional F-22s in FY2009 whose procurement cost was completed in the FY2009 supplemental appropriations act.

Costs and Funding

Estimated Total Program Cost and Prior-Year Funding[25]

As of December 31, 2007, DOD estimated the total acquisition cost (meaning the sum of research and development cost, procurement cost, and military construction [MilCon] cost) of an 183-aircraft F-22 program about $64.5 billion in then-year dollars (meaning dollars across various years that are not adjusted for inflation). This figure includes about $30.4 billion in research and development costs, about $33.5 billion in procurement costs, and $650 million in MilCon costs.

Of the program's total estimated acquisition cost of $64.5 billion in then-year dollars, more than $62 billion has been provided through FY2009.

[25] Figures in this section are taken from the December 31, 2007, Selected Acquisition Report (SAR) for the F-22 program.

As of December 31, 2007, the 183-aircraft F-22 program had a Program Acquisition Unit Cost (or PAUC, which is the program's total acquisition cost divided by the total number of aircraft acquired [including non-production aircraft]) of $350.8 million in then-year dollars, and an Average Unit Procurement Cost (or APUC, which is the program's total procurement cost divided by 175 production aircraft) of $191.6 million in then-year dollars.

Legislated Limits on F-22 Costs

The F-22 program since FY1998 has operated under legislated limits on total engineering and manufacturing development (EMD) cost and on total production cost. The limit on EMD cost was repealed as part of action on the FY2002 defense budget, leaving in place the limit on total production cost.[26] The limit on total production cost is adjustable for inflation after September 30, 1997, and for changes in federal, state, and local laws enacted after September 30, 1997. For

[26] The history of the legislated limits is as follows:

- Section 217 of the FY1998 defense authorization act (H.R. 1119/P.L. 105-85 of November 18, 1997) limited the total cost of the F-22 program's engineering and manufacturing development (EMD) phase to $18.688 billion, and the total cost of the F-22 program's production phase to $43.4 billion. The section stated that both of these figures could be adjusted for inflation after September 30, 1997, and for changes in federal, state, and local laws enacted after September 30, 1997.
- Section 8125 of the FY2001 defense appropriations act (H.R. 4576/P.L. 106-259 of August 9, 2000) limited the combined cost of the F-22 program's EMD and production phases to $58.0282 billion. The section stated that figure could be adjusted for inflation as under Section 217 of the FY1998 defense authorization act (i.e., for inflation and for changes in federal, state, and local laws). In an apparent reference to Section 217 of the FY1998 defense authorization act (see above), Section 8125 also stated that "This section supersedes any limitation previously provided by law on the amount that may be obligated or expended for engineering and manufacturing development under the F-22 aircraft program and any limitation previously provided by law on the amount that may be obligated or expended for the F-22 production program."
- Section 219 of the FY2001 defense authorization act (H.R. 4205/P.L. 106-398 of October 30, 2000—the conference report on H.R. 4205 [H.Rept. 106-945 of October 6, 2000] enacted the provisions of H.R. 5408), which was signed into law after the FY2001 defense appropriations act (see above)—amended Section 217 of the FY1998 defense authorization act by permitting the cost limit on the F-22 program's EMD phase to be increased by not more than 1.5% if the Director of Operational Test and Evaluation, after consulting with the Under Secretary of Defense for Acquisition, Technology, and Logistics, determines that the increase is necessary in order to ensure adequate testing. In an apparent reference to Section 8125 of the FY2001 defense appropriations act (see above), Section 219 also stated that the individual cost limits on the EMD and production phases of the F-22 program established by Section 217 of the FY1998 defense authorization act shall continue to apply "without regard to any provision of law establishing a single limitation on amounts obligated and expended for engineering and manufacturing development and for production for that program."
- Section 213 of the FY2002 defense authorization act (S. 1438/P.L. 107-107 of December 28, 2001) repealed the limit on the total cost of the F-22 program's EMD phase established by Section 217 of the FY1998 defense authorization act, leaving in place Section 217's limit on the total cost of the F-22 program's phase. Section 213 also repealed Section 8125 of the FY2001 defense appropriations act, and repealed the part of Section 219 of the FY2001 defense authorization act that stated (in an apparent reference to Section 8125) that the individual cost limits on the EMD and production phases of the F-22 program established by Section 217 of the FY1998 defense authorization act shall continue to apply "without regard to any provision of law establishing a single limitation on amounts obligated and expended for engineering and manufacturing development and for production for that program."

FY2009, the adjusted limit on total production cost is $37.6432 billion in then-year dollars.[27] The 187-aircraft F-22 program appears to be more than $3 billion below this cap.[28]

FY2009 Funding for Procurement of F-22s

Table 3 summarizes FY2009 funding for the procurement of new F-22s. The F-22 program also includes procurement funding for purposes other than procuring new F-22s (such as modification of in-service F-22s), as well as research and development funding and military construction funding.

Table 3. FY2009 Funding for Procurement of New F-22s

In millions of dollars, rounded to nearest tenth

	Request	Appropriation	Adjusted[a]
FY2009 defense appropriations act (Division C of H.R. 2638/P.L. 110-329 of September 30, 2008)			
Procurement	3,054.2	2,907.2	2,897.8
Advance procurement	0	523.0	521.6
FY2009 supplemental appropriations act (H.R. 2346/P.L. 111-32 of June 24, 2009)			
Procurement	600.0	600.0	n/a

Source: Prepared by CRS based on DOD data.

a. Funding levels in the FY2009 defense appropriations act were adjusted by DOD after enactment.

The George W. Bush Administration wanted to end procurement of F-22s at 183 aircraft, and consequently did not request any advance procurement funding in FY2009 for F-22s to be procured in FY2010.

Congress, in acting on the FY2009 budget request, provided $523.0 million in advance procurement funding for the procurement of 20 additional F-22s in FY2010. After enactment of the FY2010 defense budget, DOD adjusted this figure to $521.6 million, which is what appears in the FY2009 column of the FY2010 budget request. Section 134 of the FY2009 defense authorization act (S. 3001/P.L. 110-417of October 14, 2008) prohibits obligating more than $140.0 million of FY2009 advance procurement funding for the F-22 program until the President certifies to the congressional defense committees that procurement of F-22s is in the national interest, or that the termination of the F-22 production line is in the national interest. The certification was to have been made not earlier than January 21, 2009 (the first full day of President Obama's term in office), and not earlier than March 1, 2009. The Senate Armed Services Committee states in its report (S.Rept. 111-35 of July 2, 2009) on the FY2010 defense authorization bill (S. 1390) that the President made no such certification.[29]

[27] Source: Air Force information paper of July 8, 2009 provided to CRS on July 9, 2009.

[28] As stated in the previous section, as of December 31, 2007, the 183-aircraft F-22 program had a total estimated procurement cost of $33.5 billion in then-year dollars. The four additional F-22s whose procurement cost was completed with $600 million in funding in the FY2009 supplemental appropriations act would increase that figure to something above $34 billion in then-year dollars.

[29] S.Rept. 111-35, page 15.

At a November 19, 2008, hearing before the Air and Land Forces subcommittee of the House Armed Services Committee, subcommittee members criticized John Young, the DOD acquisition executive, for not obligating the FY2009 advance procurement funds to purchase long-lead items for an additional 20 F-22s. Young testified that DOD was complying with provisions in the FY2009 defense authorization act, but some subcommittee members disagreed strenuously, and urged Young to immediately disburse sufficient funds for the advance procurement of long-lead time items for 20 F-22s. Subsequent to the hearing, DOD released funds sufficient for purchasing long-lead items for four Raptors.[30]

FY2010 Funding for Procurement of F-22s

The Obama Administration wants to end F-22 procurement at 187 aircraft, and consequently requests no funding in the its proposed FY2010 defense budget for the procurement of additional F-22s. The Administration's proposed FY2010 defense budget requests $95.2 million in FY2010 procurement funding for the F-22 program, but this funding is requested for activities associated with completing a 187-aircraft program and shutting down the F-22 production line, not for procuring additional F-22s. The Administration's proposed FY2010 defense budget also requests $350.7 million in FY2010 procurement funding for the modification of in-service F-22s, as well as additional research and development funding and military construction (MilCon) funding for the F-22 program.

F-22 Modernization Program

The Air Force in 2003 established a program to modernize its F-22s. The program includes upgrades to the aircraft's air-to-ground and intelligence, surveillance and reconnaissance (ISR) capabilities. In November 2008, DOD officials stated that modernizing F-22s would cost an estimated $8 billion that was not accounted for in the F-22 program of record.[31] The Air Force testified in May 2009 that:

> 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 six 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 187. 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

[30] Source: Transcript of hearing. See also Caitlin Harrington, "Pentagon Limits F-22 Buys Over Budget Concerns," *Jane's Defense Weekly*, November 21, 2008. See also Jason Sherman and Marcus Weisgerber, "Congress Plans F-22A Hearing This Week, Wants $140 Million Released," *Inside the Air Force*, November 14, 2009; Jason Sherman and Marcus Weisgerber, "DOD Partially Funds F-22, Leaves Final Production Decision To Obama," *Inside the Pentagon*, November 13, 2009.

[31] Bettina H. Chavanne. "DOD Acquisition Czar Outlines F-22 Reservations." *Aerospace Daily & Defense Report.* November 21, 2008.

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 Small Diameter Bombs (SDB). The Air Force will begin to field Increment 3.1 in FY11. 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 FY15.

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.[32]

GAO Assessment of F-22 Program

A March 2009 Government Accountability Office (GAO) report assessing major DOD weapon acquisition programs stated the following about the F-22 program (including both production and modernization):

Technology Maturity

One of the F-22A modernization program's three critical technologies—processing memory—is mature. The two remaining technologies-stores management system and cryptography-are approaching maturity, and have been tested in a relevant environment. The maturity of these technologies has not changed in the past year. According to program officials, the current F-22 production and modernization plans do not commit to incorporating new technology into developmental increments until the underlying technologies have been tested in a relevant environment and do not commit to fielding these technologies until they have been proven in developmental and operational testing. The number and mix of technologies identified by program officials have changed since the modernization effort began, reflecting changes in program direction, priorities, and work content. Some of these have been deferred to future modernization efforts, which the Air Force plans to undertake in a separate major defense acquisition program.

Design Maturity

The design of the first increment of the F-22A modernization program appears stable, almost 2 years after its critical design review. The program office reported that all expected engineering drawings have been released. According to program officials, they did not plan to release drawings at the design review because most of the design consisted of software changes or modifications of existing hardware. Even though the design of the first increment appears stable, additional design work may be necessary, and the program still needs to demonstrate two of its critical technologies in operational environments. In addition, the program is just beginning developmental and operational testing for a number of capabilities.

[32] Department of the Air Force Presentation to the House Armed Services Committee Subcommittee on Air and Land Forces, United States House of Representatives, Subject: Air Force Programs, Combined Statement of: Lieutenant General Daniel J. Darnell, Air Force Deputy Chief Of Staff For Air, Space and Information Operations, Plans And Requirements (AF/A3/5), Lieutenant General Mark D. Shackelford, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ), [and] Lieutenant General Raymond E. Johns, Jr., Air Force Deputy Chief of Staff for Strategic Plans And Programs (AF/A8), May 20, 2009, pp. 8-9.

According to the program office, two developmental test aircraft and six operational test aircraft are being modified in fiscal years 2008 and 2009 to prove out technologies before fielding or production incorporation.

Other Program Issues

According to the F-22 program office, implementation of the modernization program's three increments has been delayed by 3 years because of numerous budget decreases and program restructurings. Since fiscal year 2002, the F-22A's modernization budget has been decreased by over $450 million. Nearly $200 million of the reductions can be attributed to program restructuring by the Air Force and the Office of the Secretary of Defense. In fiscal year 2008, the conference report accompanying the Defense Appropriation Act recommended $611 million in research and development funds for the F-22A modernization program, about $132 million less than requested by the Air Force. The 2009 Defense Appropriation Act appropriated an additional $523 million for advance procurement for 20 additional aircraft. However, the 2009 Defense Authorization Act limited the obligation of the advance procurement funds to $140 million pending a certification by the President that the procurement of F-22A fighter aircraft is in the national interest of the United States or that the termination of the production line for F-22A fighter aircraft is in the national interest of the United States.

The current F-22A multiyear procurement contract for 60 aircraft will end the program's planned procurement when the final aircraft is delivered in 2011. Program officials reported that some contractors are already beginning to cease their F-22-related efforts and would need to be replaced if additional aircraft are purchased. According to the program officials, a decision on additional F-22 purchases needs to be made by in early 2009 to avoid losing additional contractors. Further, program officials stated, it is unclear how new aircraft would affect future modernization efforts. The additional aircraft could be configured the same as previous production models (Increment 2), or they could possibly be produced as the newest increment available (Increment 3.1).

Program Office Comments

The Air Force provided technical comments, which were incorporated as appropriate.[33]

Potential Sale of F-22s to Japan

Annual Provision Prohibiting Foreign Sales of F-22s (Obey Amendment)

Annual DOD appropriations acts since FY1998 have included a provision known as the Obey amendment that prohibits the use of funds made available in each act to approve or license the sale of the F-22 to any foreign government.[34] Congress from time to time has reconsidered this prohibition.

[33] Government Accountability Office, *Defense Acquisitions[:] Assessments of Selected Weapon Programs*, GAO-09-326SP, March 2009, p. 80.

[34] The provision typically states, "None of the funds made available in this Act may be used to approve or license the sale of the F-22 advanced tactical fighter to any foreign government." (In Section 8067 of the FY2006 defense appropriations act, the aircraft's designation was changed to F/A-22. For a discussion of this designation, see footnote 3. The aircraft's designation reverted to F-22 in Section 8058 of the FY2007 defense appropriations act.) The table below summarizes occurrences of the provision in annual defense appropriation acts since FY1998.

(continued...)

Japan's Interest in Purchasing F-22s

Japan's fighter force includes, among other aircraft, about 200 F-15s and about 90 aging F-4s. To replace the F-4s, Japan reportedly wants to purchase 40 to 50 new fighters. The effort to procure the replacement fighters is called the FX program. (A projected subsequent effort to replace the F-15s is known as the FXX program.)

Japan reportedly would prefer to purchase F-22s as the F-4 replacements, but is considering five other candidate aircraft types as well: the F-35, a version of the F-15 designated the F-15FX, the F/A-18E-F Super Hornet (a strike fighter that has been procured for the U.S. Navy since FY1997), the Eurofighter Typhoon (an aircraft built by European consortium), and the Dassault Rafale.[35] In addition, Boeing, the manufacturer of the F-15, is offering for sale on the international market an upgraded version of the F-15 called the Silent Eagle, which incorporates some added stealth features and other improvements.[36]

Secretary of Defense Robert Gates reportedly recommended the F-35 over the F-22 and other candidates in a meeting with Japan's defense minister on May 1, 2009, but Japan reportedly still prefers to purchase the F-22. A July 1, 2009, article states:

(...continued)

Sections in annual defense appropriation acts prohibiting sale of F-22 to foreign governments

Fiscal Year	Bill/Public Law	Section
1998	H.R. 2266/P.L. 105-56	8118
1999	H.R. 4103/P.L. 105-262	8097
2000	H.R. 2561/P.L. 106-79	8092
2001	H.R. 4576/P.L. 106-259	8087
2002	H.R. 3338/P.L. 107-117	8088
2003	H.R. 5010/P.L. 107-248	8077
2004	H.R. 2658/P.L. 108-87	8075
2005	H.R. 4613/P.L. 108-287	8074
2006	H.R. 2863/P.L. 109-148	8067[a]
2007	H.R. 5631/P.L. 109-289	8058
2008	H.R. 3222/P.L. 110-116	8060
2009	H.R. 2638/P.L. 110-329	8059

Source: Compiled by CRS based on conference reports.

a. In Section 8067 of the FY2006 defense appropriations act, the aircraft's designation was changed to F/A-22. For a discussion of this designation, see footnote 3. The aircraft's designation reverted to F-22 in Section 8058 of the FY2007 defense appropriations act.

[35] Bradley Perrett, "Japan To Drop Arms Export Ban," *Aerospace Daily & Defense Report*, May 27, 2009: 1-2; Bradley Perrett, "Japan Likely To Delay F-X Order," *Aerospace Daily & Defense Report*, June 10, 2009: 5.

[36] Amy Butler, "Boeing Unveils New, Stealthy Silent Eagle F-15," *Aerospace Daily & Defense Report*, March 18, 2009: 1-2; Amy Butler, "Stayin' Alive," *Aviation Week & Space Technology*, March 23, 2009: 29-30; Alon Ben-David, "Boeing Unveils F-15 Silent Eagle," *Jane's Defence Weekly*, March 25, 2009: 4; Graham Warwick, "Boeing Studies Levels Of Stealth Available To Sell Silent Eagle," *Aerospace Daily & Defense Report*, June 11, 2009: 1-2; Amy Butler, "Donley Focuses On International Cooperation, Industrial Base Issues," *Aerospace Daily & Defense Report*, June 17, 2009: 1-2; David A. Fulghum, "Japanese Prove Patient For U.S. Tacair Opportunities," *Aerospace Daily & Defense Report*, June 23, 2009: 1-2; Amy Butler and Graham Warwick, "F-15 Silent Eagle Flight-test Dates Slip," *Aerospace Daily & Defense Report*, June 24, 2009: 1-2.

> Japan's F-15J force, once top of the line, is now "outclassed by the new generation of Chinese fighters" such as the Su-30MKK, former Chairman of the Joint Chiefs of Staff U.S. Air Force Gen. Richard Myers (ret.), tells Aviation Week.
>
> Moreover, China's air defenses, which include variants of Russian-made, long-range SA-10s and SA-20 (S-300 family) missiles, can only be penetrated by the fast, high-flying, stealthy Raptor.
>
> Japan's Defense Ministry has studied the problem closely and, at least internally, has produced "a very impressive tactical rationale" for buying the F-22 if its sale is approved by the U.S. Congress. Myers predicts that any resistance within the U.S. Air Force to selling Raptor technology to Japan, "an incredibly staunch ally," will be isolated and not critical.
>
> Such considerations are pressing because tensions are growing over Japan's far-flung island empire, some of it mineral rich, that stretches to within 125-150 miles of China. That distance, interestingly enough, is the range of the Raptor's advanced radar, compared to 56 miles for the F-15. Japan feels it must be prepared to defend its area of responsibility from a new generation of regional threats – including China's increasingly sophisticated fighter force, which boasts the J-10 – that can carry its new, small-radar-signature, air-launched cruise missiles. Japan also needs a precision bombing capability if any of its islands are occupied.[37]

A July 31, 2009, press report states:

> Japanese military officials continue to maintain that only the F-22 Raptor can meet their country's pressing defense needs, notwithstanding recent U.S. congressional action and anti-Raptor rhetoric from the White House and Pentagon that indicate the window of opportunity is closing quickly.
>
> The nation's requirements were spelled out in an exclusive interview with Aviation Week by Lt. Gen. Hidetoshi Hirata, the Japan Air Self Defense Force's (JASDF) Commander, Southwestern Composite Air Division.
>
> While U.S. critics worry about exporting the F-22 as a weapons system, the Japanese focus on other advantages the Raptor offers such as its command and control capability—like a miniature AWACS—and its intelligence, surveillance and reconnaissance role. It also offers higher speed (about half a mach), more altitude (an extra two miles) and better stealth (golf ball vs. marble) than the more exportable F-35 Joint Strike Fighter.
>
> "Our next fighters [including the F-X and F-XX] are expected to have a couple of critical capabilities to fulfill their mission," Hirata says. "Networking and ISR are important in the situations and environments where F-X will be operated. It will need to function ... as a node of the ISR network. That's why the F-X needs good sensors, radar, electronic surveillance and communications."
>
> Quality over quantity
>
> Moreover, since the number of fighters the JASDF can have is limited by the National Defense Posture Outline, they have to seek quality to make up for the lack of numbers as

[37] David A. Fulghum, "Converging Problems Argue For More F-22s, Officials Says," *Aerospace Daily & Defense Report*, July 10, 2009: 3.

surrounding countries are increasing the number of fourth generation fighters they operate in the region.

"Another issue is that this [southwestern area of Japan] is huge, with lots of small islands," Hirata says. "Currently we don't have enough airfields. This airbase [on Okinawa] is the only runway that we can operate fighters from. It is difficult to plan how we would use our fighters to defend the nation when many other countries have advanced fighters, air-launched cruise missiles and other advanced weaponry."

"So [supercruise] speed becomes very important, both to fly great distances quickly and to cope with cruise missiles," Hirata says. "I understand the current discussions and Defense Secretary [Robert] Gates' announcement regarding the F-22. We still believe we have a chance. It's not an officially closed option because the Obey Amendment is reviewed every year. We're still thinking about it and taking measures to extend the F-4's operational life."

The Japanese do not appear to have any interest in the new, reduced-signature F-15 Silent Eagle that Boeing has designed.

"Personally I have no interest in the Silent Eagle because it is only stealthy from the front," Hirata says, referencing a limitation shared by the Eurofighter Typhoon. "I am afraid that the F-15 Silent Eagle is not stealthy enough to meet our requirements. The F-35 is a very good aircraft. The problem is that it's still under development [and not ready for operational use]. A fifth generation fighter is a good choice for our F-X. Right now, F-22 is the only operational fifth generation fighter. We have not made a decision, but right now the F-22 is the most attractive."[38]

A September 4, 2009, news report states:

Tokyo's new governing Democratic Party of Japan is not expected to distance itself from the U.S. or to strip defense budgets—in fact, Japanese defense officials are looking at 2010 as the year that the U.S. may change its laws about exporting the F-22 Raptor.

Meanwhile, any policy changes in Japan would likely be minor and reflect the directions set by previous governments.

"We are seeing a transformation in our alliance with the Japanese," said U.S. Air Force Lt. Gen. Edward A. Rice, Jr., commander of the 5th Air Force and U.S. Forces Japan, prior to the recent election. "Part of that has to do with their internal discussions of what capabilities they need to defend Japan. It involves working as partners with each accepting some level of risk and each providing capabilities that the other may not have."

That cuts to the thorny issue of Japan's long-term desire to buy the F-22 so that its speed, altitude, stealth, precision bombing and long-range electronic surveillance capabilities could

[38] David A. Fulghum, "Raptor Still Best Fit For Japan, Official Says," *Aerospace Daily & Defense Report*, July 31, 2009: 4. Material in brackets as in the original. See also Marcus Weisgerber, "Gates Tells Japan No Dice on F-22A, Buy Joint Strike Fighter Instead," *Inside the Air Force*, May 8, 2009; Bradley Perrett, "Japan To Drop Arms Export Ban," *Aerospace Daily & Defense Report*, May 27, 2009: 1-2; David A. Fulghum, "Japanese F-22 Campaign Lives On, Despite Persistent Hurdles," *Aerospace Daily & Defense Report*, June 4, 2009: 3; Bradley Perrett, "Japan Likely To Delay F-X Order," *Aerospace Daily & Defense Report*, June 10, 2009" 5; "Missile Worry," June 15, 2009: 1. The second of these articles states that Japan is seeking to acquire 20 to 60 aircraft, as opposed to 40 to 50. See also David A. Fulghum and John M. Doyle, "Japan Wobbles On New Fighter As Washington Ponders F-22 Future," *Aerospace Daily & Defense Report*, June 19, 2009: 1-2; David A. Fulghum, "Japanese Prove Patient For U.S. Tacair Opportunities," *Aerospace Daily & Defense Report*, June 23, 2009: 1-2.

> make up for the dearth of Japanese airbases between Okinawa and China and North Korea. However, the F-22 line may shut down before sales to Japan can be approved.
>
> The U.S. is saying it will ensure that U.S. F-22s are available to defend Japan. The stealth fighters, along with F-15s equipped with advanced, long-range, small-target radars, are stationed at Kadena Air Base, Okinawa, on a rotating basis.
>
> But Japanese military officials tell Aviation Week that they must have positive, immediate control of the F-22 force, which they don't think will be possible if the aircraft belongs to the U.S.—which would doubtlessly require a complicated approval process—instead of the Japan Air Self Defense Force.
>
> "It is very important for Japan to have that capability in practical and tactical terms," says Lt. Gen. Hidetoshi Hirata, commander of the Southwest Composite Air Division headquartered in Okinawa, in a conversation with Aviation Week Sept. 3. "More importantly, it has great meaning in a strategic [and deterrent] sense. Even the U.S. stationing F-22s in Japan on a regular or permanent basis may not compensate strategically for [the lack] of Japan's possession of the F-22."
>
> Rice contends that it may require only a reformulation of forces to avoid redundancies and minimize gaps in capability between what each country supplies to the alliance.
>
> "The U.S. has invested in F-22 and it is a capability that we can make available to the alliance," Rice says. "It's not a capability that Japan must possess. There are various ways to get to an all-5th generation force structure."
>
> "The Japanese have a very clear view of [regional threats] and [unlike the U.S., they] aren't hampered in ... their analysis by having a low-tech war here-and-now that's distracting them," says a senior U.S. intelligence official who has studied Japanese issues for many years. "They're right to be concerned, although in the long term they have less to worry about in North Korea than they think. As their economy pulls out of its nosedive they'll be eager to apply some of our [defense] technology to their problems. I don't see any downside to that."
>
> The intersection of Japan's midterm and a longer-term defense reviews and the U.S. Quadrennial Defense Review may allow both countries to capture the transition in their thinking about defensive needs and security alliances.
>
> Even with a change in government, "I'm hopeful that we will work together over the next year or so to come up with an even more up-to-date set of goals and objectives," Rice says. "The signs are positive. My judgment is that [Japan has] made some significant decisions to be more engaged regionally and globally and will continue to make those decisions [in] the future."[39]

To facilitate a purchase of F-22s, Japan reportedly is willing to contribute $300 million toward the cost of developing an export version of the aircraft that lacks certain highly sensitive technologies,[40] and reportedly is willing to pay about $290 million for each F-22, or roughly

[39] David A. Fulghum, "F-22 Still A Priority For New Japanese Government," *Aerospace Daily & Defense Report*, September 4, 2009, p. 3.

[40] David A. Fulghum and John M. Doyle, "House Defense Appropriations Chair Lends Support To More F-22s," *Aerospace Daily & Defense Report*, June 25, 2009: 1-2.

twice the procurement cost of F-22s procured in recent years for the U.S. Air Force. A June 26, 2009, press report states:

> A letter from Sen. Daniel Inouye (D-Hawaii), chairman of the Senate Appropriations Committee, to Japan's ambassador in Washington lists an estimated average unit cost of $290 million per aircraft for a theoretical export sale of 40 F-22 Raptors....
>
> Inouye's letter to Ichiro Fujisake, Japan's ambassador to Washington, starts with the assumption of a letter of agreement in early 2010, with major development taking "approximately four years, followed by ground and flight testing." Procurement of long-lead materials would begin in 2011 with production to begin in mid-2014. The first mission capable aircraft could be delivered to Japan in 2017.
>
> "The estimate for non-recurring development and manufacturing cost is $2.3 billion," the letter continues. "The actual cost to produce forty aircraft is approximately $9.3 billion, bringing the total to $11.6 billion. Spreading that cost over an estimated forty aircraft leads to an average aircraft cost of $290 million."
>
> An associated letter to Defense Secretary Robert Gates says the figures were calculated using "information which was provided by the Air Force," Inouye's second letter says. "I believe the government of Japan is likely to be interested in purchasing the aircraft even at the relatively high price which has been estimated."[41]

If F-22s are not available, Japan reportedly would prefer to purchase F-35s or Typhoons. An August 10, 2009, news report states:

> Japan may be relinquishing its dream of buying F-22 Raptor fighter jets, and preparing to settle instead for the Eurofighter Typhoon or the F-35 Lightning II.
>
> The Japan Air Self-Defense Force (JASDF) has long sought to buy 40 to 50 Raptors to replace its F-4J Phantoms. But the Obama administration apparently has won its fight to end the program for the U.S. Air Force at 187 jets, and Congress shows no sign of overturning the Obey Amendment that pro-hibits exports of the Lockheed Martin-built stealth fighter.
>
> U.S. and Japanese officials have been meeting to discuss Japan's FX program, including at the Pentagon last week, one source said.
>
> The F-35 and Typhoon are seen as the likeliest F-22 replacements, but Boeing hints it may bid either the F/A-18EF or a new, stealthier version of the F-15.
>
> But there are problems with both alternatives to the F-22, which, combined with the upcoming election, could delay the start of the FX pro-curement effort for several years.
>
> "The F-35 is not as good as the F-22, but it has more of what the Japanese want over the Eurofighter," said one Tokyo-based defense analyst. "I think they are going to wait. Waiting increases their options. Right now they have very limited options. Could be 2011 or 2012 when they finally go forward on the FX." For one thing, Tokyo is not a partner in the Lockheed-led F-35 pro-gram, which means Japan would have a long wait to buy the plane.

[41] David A. Fulghum and John M. Doyle, "Japanese Officials Could Be Offered A $290 Million F-22," *Aerospace Daily & Defense Report*, June 26, 2009: 1-2. See also David A. Fulghum, "Converging Problems Argue For More F-22s, Officials Says," *Aerospace Daily & Defense Report*, July 10, 2009: 3; Kyodo News, "Japan Still Keen On F-22 Despite U.S. Obstacles," *Japan Times*, August 1, 2009.

"The Japanese have really gotten themselves in a horrible position," the analyst said. "If they had been on the F-35 program from the beginning, all this would be moot. Now if the Japanese came along and said, 'We want in,' then whose piece of the pie [among the F-35 international partnership] do you give them?" The analyst said that Japan had dreamed of buying 40 to 50 F-22s under its FX program and 200 F-35s under its FXX effort to replace F-15Js.

Meanwhile, chances seem to be rising that Japan might buy the Typhoon, making it the island nation's first non-U.S. fighter jet.

Some U.S. officials had hinted that buying the Eurofighter-made jet might damage Tokyo-Washington ties, but analysts downplayed that.

"The U.S. is not being fair to Japan on this score. On the one hand, it has closed the chance for Japan to buy F-22, and on the other, it is warning that a Japanese purchase of Eurofighters will harm the alliance," said Masashi Nishihara, president of the Tokyo-based Research Institute for Peace and Security. "The U.S., I feel, should be more reasonable. Other U.S. allies are buying both U.S. and non-U.S. arms. Japan is simply doing the same." A European defense industry executive said he had gone from a position where he believed Eurofighter partner BAE Systems had a minimal chance of selling the aircraft to Japan to a 50-50 chance now.

The Tokyo-based analyst said talk of licensed production of the Eurofighter in Japanese factories was far-fetched.

"Starting from scratch on an aircraft program like that is going to be astronomical in costs," he said. "The Japanese defense industry wants to get something out of the FX program, but who is going to start an entirely new assembly line for such a small order?"

Election Fever

The upcoming Aug. 30 election could further delay a request for proposals, especially if, as polls predict, the self-described pacifist Democratic Party of Japan (DPJ) unseats the ruling Liberal Democratic Party (LDP).

"If the Air Force pushes the FX decision before or shortly after the election, it will be seen largely by the DPJ as an LDP program" and marked for termination, the defense analyst said. "The DPJ is not overly interested in a strong national defense as is the LDP. So the Air Force might have to hold its breath until this all goes away" and the LDP returns to power, he said.

"Japan has massive expanses of water to patrol and that's why they wanted the F-22, due to range and its supercruise capabilities. The F-22 can cover a huge amount of territory without guzzling fuel," said the Tokyo-based defense analyst. "Its stealth capabilities also make it a great intelligence platform that can hover unseen over a target." The Raptor would also help compensate for China's growing force of fourth-generation fighters, which might overwhelm the JASDF and U.S. Air Force in Japan during a war, said Hideaki Kaneda, a retired vice admiral who directs the Okazaki Institute. Kaneda also pointed to re-ports that China is developing a fifth-generation stealth fighter.[42]

[42] Wendell Minnick, "As Hope for F-22 Ebbs, Japan Weighs Options," Defense news, August 10, 2009: 8. See also Kosuke Takahashi, "F-35 Is Top Of List To Fill Japanese FX Requirement," *Jane's Defence Weekly*, April 22, 2009: 16.

Issues for Congress

Procuring Additional F-22s

Introduction

A key issue for Congress for FY2010 for the F-22 program is whether to approve the Administration's proposal in the FY2010 budget to end F-22 procurement at 187 aircraft, or reject that proposal and provide funding in FY2010 for the procurement of additional F-22s in FY2010 and/or subsequent fiscal years. The issue emerged as a high-profile item of debate on the FY2010 defense budget. The White House has vowed to veto any bill that supports the acquisition of F-22s beyond the 187 that have been procured through FY2009.

In past years, the issue of how many F-22s to procure has been a topic of apparent disagreement between the Office of the Secretary of Defense (OSD) and Air Force leaders, with OSD supporting a total of 183 (now 187), and Air Force officials supporting procurement of substantially more than that.[43] Disagreement on the issue appeared to come to a head in June 2008, when Secretary of Defense Robert Gates asked the Secretary of the Air Force and the Air Force Chief of Staff to resign. It was reported in press articles, and later confirmed by the former Air Force Secretary, Michael Wynne, that their reluctance to support a total of no more than 183 was the key factor leading to their resignations.[44] A total of no more than 187 F-22s is now supported by current Air Force leaders and officials from other military services.

Summary of Arguments

Supporters of ending F-22 procurement at 187 aircraft could argue one or more of the following:

- A total of about 183 F-22s has been planned by DOD since 2005. A total of 187 F-22s will be sufficient, in conjunction with other U.S. forces (including numerous F-35s), to counter highly capable enemy aircraft and surface-to-air missile systems that U.S. forces might encounter in a future conventional conflict against another country, such as China, that might field significant numbers of such aircraft and surface-to-air missile systems. It will be many years before China or other countries will field substantial numbers of fifth-generation fighters, by which time the United States will have thousands of F-35s in service.
- On July 9, 2009, U.S. Marine Corps General James Cartwright, the Vice Chairman of the Joint Chiefs of Staff, testified to the Senate Armed Services Committee that a recently completed DOD study concluded that a force of 187 F-22s would be sufficient, in conjunction with other U.S. forces, to meet the needs of a U.S. military strategy that is emerging in the current Quadrennial Defense

[43] The figure of 187 aircraft includes the four F-22s funded in the FY2009 supplemental appropriations bill. Prior to this, the apparent disagreement between OSD and Air Force officials was whether to end F-22 procurement at 183 aircraft or procure substantially more than 183.

[44] See, for example: "Wynne speaks out; Tell-all interview covers Iraq withdrawal, nuclear report, procurement and more." *Air Force Times.* July 21, 2008. and John T. Bennett. "Wynne Talks About His Tenure, Termination." *Defense News. July 14, 2008.*

Review (QDR). Cartwright said this emerging strategy focuses on preparing for future conflicts similar to those in Iraq and Afghanistan while also having forces sufficient to fight a single major regional peer competitor. Such a strategy, he said, would be in contrast to the defense-planning standard first established in the early 1990s, following the end of the Cold War, of having forces sufficient to fight two nearly simultaneous major regional conflicts.[45] Statements about a need

[45] A July 9, 2009 press report states:

> The Defense Department has completed a new analysis that affirms a requirement for 187 F-22A fighters, the vice chairman of the Joint Chiefs of Staff said today—a finding he said fits with a developing war-planning strategy that assumes the U.S. military must be prepared to fight one major theater war at a time.
>
> Gen. James Cartwright, during his confirmation hearing for a second two-year term as vice chairman, told the Senate Armed Services Committee the new study dovetails with Defense Secretary Robert Gates' decision—which the Marine Corps general said he supports—to cap the production of the fighter at 187 aircraft, a proposal some in Congress want to roll back.
>
> "There is a study in the Joint Staff that we just completed and partnered with the Air Force that said: Proliferating within the U.S. military fifth-generation fighters from all three services is going to be more significant than having them based solely in just one service, because of the way we deploy and because of the diversity of our deployments," Cartwright said, referring to plans to field the F-35 Joint Strike Fighter to the Air Force, Marine Corps and Navy.
>
> Press officials for the Joint Staff and the Air Force could not say, by press time today, exactly what study Cartwright was referring to. ...
>
> Cartwright said another factor that influenced the decision to limit the total F-22A buy was the need to support regular requests from combatant commanders for electronic warfare capabilities and, more specifically, the need to keep Boeing's F/A-18 aircraft assembly line—which produces an electronic warfare variant of the combat aircraft—hot, he said.
>
> Beyond the study, Cartwright explained how Pentagon leaders are adjusting their thinking about the need for tactical fighter aircraft in light of a major strategy revision now under way.
>
> "The military requirement right now [for the F-22A] is associated with the strategy that we are laying out in the Quadrennial Defense Review," Cartwright said. "And it is a departure from the two-major-theater-war construct that we have adhered to in the past and in which this aircraft grew up."
>
> "The strategy that we are moving towards is one that is acknowledging ... that the more likely conflicts are going to be similar to the ones we're in in Iraq and Afghanistan," he said. "But [also] that we do need to have a capability against a major peer competitor and that we believe that the sizing construct demands that we have fifth-generation fighters across all services rather than just one. And that the numbers of those fighters probably does not need to be sufficient to take on two nearly simultaneous peer competitors. We don't see that as the likely, we see that as the extreme." ...
>
> Sen. Saxby Chambliss (R-GA), an ardent supporter of the Raptor which is assembled in his state, said Cartwright's assertion that the requirement for F-22As does not exceed 187 was "not in accord" with statements made by key Air Force leaders.
>
> "You realize that is contrary to the opinion of the Chief of Staff of the Air Force Gen. [Norton] Schwartz?" Chambliss asked Cartwright.
>
> On May 19, Schwartz told the House Armed Services Committee that 243 F-22As "is the right number" while 187 "the affordable force."
>
> "I do not realize that," Cartwright parried. "He has said in several meetings with me and certainly in meetings with the chiefs that [187] has been the number he has espoused."
>
> Chambliss then asked about Gen. John Corley, the commander of Air Combat Command who is slated to retire this summer. In a June 9 letter to Chambliss, Corley said the Air Force needs between 250 and 381 F-22As.
>
> "He and I have spoken about that," Cartwright said. "He was speaking in the context of the two-major-theater-war context."
>
> (Jason Sherman, "Cartwright: New Tactical Air Assessment, War-Planning Strategy Affirm Need For 187 F-22As," *InsideDefense.com (DefenseAlert – Daily News)*, July 9, 2009. Bracketed material as in the original. The article was reprinted in the July 10, 2009, issue of sister publication *Inside the Air Force* under the title "Cartwright: Tacair Study, Military Strategy Affirm Need For 187 F-22As.")

for 243 to 250 (or more) F-22s relate to a defense-planning standard of having forces sufficient for fighting two nearly simultaneous regional conflicts.

- Procuring additional F-22s would reduce funding for other programs, such as the F-35, F/A-18E/F, and EA-18G aircraft programs, which could create operational risks in other areas. General Cartwright testified on July 9, 2009, that a desire to preserve funding for procurement of EA-18G Growler electronic warfare aircraft (an electronic warfare version of the Navy's F/A-18E/F Super Hornet strike fighter) was a key factor behind DOD's decision to propose ending F-22 procurement at 187 aircraft.[46]
- DOD in coming years needs to focus on improving its capabilities for irregular warfare operations, and the F-22 is not a key program for improving those capabilities. Secretary of Defense Robert Gates testified in February 2008 that "the reality is we are fighting two wars, in Iraq and Afghanistan, and the F-22 has not performed a single mission in either theater."[47]
- Although the F-22 achieved IOC in December 2005, in-service F-22s continue to experience relatively low mission-capable rates, and are expensive to maintain. (See "Reliability and Maintainability of In-Service F-22s" below.) Procuring additional F-22s would add to total F-22 fleet maintenance costs, reducing funding available for other Air Force programs.
- A projected Air Force fighter gap of up to 800 aircraft by 2024 that Air Force officials identified in 2008 testimony[48] is open to question, because the projection

[46] A July 9, 2009, press report states:

> The need for more F/A-18G electronic warfare aircraft played heavily in the decision to halt F-22 production at 187 jets, says U.S. Marine Corps Gen. James Cartwright, vice chairman of the Joint Chiefs of Staff.
> Cartwright told the Senate Armed Services Committee on July 9 that he was one of the "most vocal and ardent supporters" of ending the Raptor program at 187. Defense Secretary Robert Gates announced the decision, along with about 50 other program cuts, in early April.
> Cartwright, appearing before the panel for a confirmation hearing as part of his nomination for a second stint as vice chairman, said the Joint Staff and Air Force had just concluded a study on sizing the F-22 fleet.
>
> He said the study concluded it was more important to focus on fielding fighters for all three services "because of how we deploy." It ultimately endorsed ending the F-22 program at 187 jets and fielding more F-35s and both models of the F-18 fighter.
>
> Cartwright said the latter jet's Growler model, designed for electronic warfare tasks, became a key part of the decision to halt the F-22 program.
>
> That's because the military's war fighting commanders, in conversations with Cartwright, all expressed a desire for more aerial EW capability. And right now, that means more Growlers.
>
> Cartwright said Pentagon brass have three priorities for tactical aircraft: field fifth-generation fighters; "keep a hot production line"; and keep open the F-18 production line, largely to maintain the flow of new Growlers.
>
> The latter is key, he told the panel, because a hot F-18 line means "we can also produce front-line fighters"—the F/A-18 E and F models—for traditional fighter aircraft missions.
>
> (John T. Bennett, "Cartwright Talks F-22, Advocates JROC Changes," *DefenseNews.com*, July 9, 2009. A similar article was published on page 12 of the July 13, 2009, issue of the print version of the publication, *Defense News*, under the headline "U.S. Tactical Air Debate Heats Up.")

[47] Jen DiMascio. "Gates: F-22 Production Increase Could Hurt More Affordable JSF." *Defense Daily.* February 7, 2008.

[48] 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.)

is strongly influenced by assumptions on threats and whether the United States will fight alone or as part of a coalition.[49] Even if such a fighter gap does emerge, procuring F-22s is not necessarily the most cost-effective way to address it—other potential options for addressing the shortfall would include procuring less expensive aircraft, such as F-35s, upgraded F-15s, or upgraded F-16s.

- The Air National Guard (ANG) can perform its air sovereignty alert (ASA) mission sufficiently in the future with the F-35.[50] Shifting to a future ANG fighter

[49] For a press article that presents this perspective, see William Matthews. "Coming up short; Is the Air Force's 'Fighter-gap' truth or spin?" *Armed Forces Journal International*. July 2008. p. 26.

[50] A July 30, 2009 press report states:

> "All options are on the table" for U.S. Air Guard officials struggling to fill a gap in the number of fighters available for units in the near term to fly missions protecting the homeland, says Lt. Gen. Harry Wyatt, director of the Air National Guard (ANG).
>
> "I am basically platform agnostic," Wyatt says. "I don't care."
>
> This could include stealth aircraft—more F-22s or earlier fielding of F-35s—or the purchase of older, fourth-generation aircraft such as F-16s or F-15s. Technologies needed for the mission include an active, electronically scanned array radar (which can be used to detect small and stealthy air threats including cruise missiles), infrared search and track systems and beyond-line-of-sight communications, Wyatt told reporters during a July 29 Defense Writers Group breakfast in Washington....
>
> Most observers expect the testing and delivery schedule for the single-engine F-35 Joint Strike Fighter to experience slips, possibly widening the gap for receipt of the new aircraft. F-35s aren't due to the Guard until the middle of the next decade, he says.
>
> Many of the 250 fighters being retired early in FY '10 are F-16s assigned to the Guard, and many of them are apportioned to the air sovereignty alert (ASA) mission. Some of those units will lack a flying mission until the F-35 is introduced into the fleet.
>
> The U.S. Air Force has historically professed a preference to buy only fifth-generation fighters (F-22s or F-35s), closing the door to additional procurements of the Lockheed Martin F-16 and Boeing F-15.
>
> While Wyatt says he's open to all options, he also says "If you can get stealth [in the F-22 or F-35] at the same price, why not?" The general is not in favor of buying a particular aircraft and dedicating it to the ASA mission; he says the Guard should operate the same platforms as active duty units in order to handle the same missions as their active duty counterparts. Still, however, he says the Air Force is not "there yet" in terms of considering a buy of fourth-generation fighters to fill the gap.
>
> Wyatt says he was incorrectly characterized as an advocate of additional F-22s after sending a June 19 letter in response to an inquiry on the issue from Sen. Saxby Chambliss (R-Ga.). F-22s are assembled in Marietta, Ga.
>
> "While a variety of solutions abound, I believe the nature of the current and future asymmetric threat to our nation, particularly from seaborne cruise missiles, requires a fighter platform with the requisite speed and detection to address them," Wyatt wrote in his letter. "The F-22's unique capability in this arena enables it to handle a full spectrum of threats that the ANG's current legacy systems are not capable of addressing."
>
> Recapitalization is a major issue for the Air Guard. About 80 percent of its F-16s are expected to reach the end of their service lives in the next eight years; the Guard manages 16 of 18 ASA sites in the United States.
>
> A service-life extension program for 100-150 of the newest F-16s in the Guard is possible, and this option is made more attractive if combined with F-35 deliveries, Wyatt says. Air Force officials also are studying the option of a life-extension on some F-15s, he adds.
>
> Wyatt argues that the Guard should receive its F-35s earlier than planned. And, he adds that his Guard units should receive both F-22s and F-35s proportionally to the active duty force.
>
> That would give the Guard 60-70 F-22s that it doesn't have. Now, Guard units share aircraft with

(continued...)

force composed of a single aircraft type (F-35s) will permit economies in the operation and support of ANG fighters. The ANG's existing inventory of F-15s and F-16s can be maintained until it is replaced by F-35s through careful management of individual aircraft use and (if necessary) service life extensions.

- Although a total of 381 F-22s would be needed to permanently attach a certain number of F-22s to each of the Air Force's 10 Air Expeditionary Forces (AEFs),[51] certain Air Force aircraft—including bombers and intelligence, surveillance, and reconnaissance (ISR) aircraft—are too few in number to be permanently attached to each of the AEFs and are instead assigned to AEFs on an as-needed basis. The same can be done with F-22s. If F-22s are to be used infrequently, organizing them outside the AEF scheme and using them on an as needed basis would be appropriate.
- In light of the provision in annual DOD appropriations acts since FY1998 on sales of the F-22 to any foreign government, there would be little value in procuring additional F-22s for the U.S. Air Force for the purpose of keeping the F-22 production line open until a modified version of the F-22 could be made ready for a potential sale to Japan.
- F-22 procurement funding at this point is better spent on modernizing the 187 F-22s, so as to maximize their utility and realize a better return on the investment made in developing and procuring these aircraft.

Supporters of procuring more than 187 F-22s could argue one or more of the following:

- A force of 187 F-22s would be inadequate to meet operational demands at an acceptable level of risk. Although it will be many years before China or other countries will field substantial numbers of fifth-generation fighters, additional F-22s can help ensure that the United States would be able to achieve desired high kill ratios against larger numbers of fourth-generation and earlier-generation aircraft that China or other countries will operate before large numbers of F-35s enter service. Notwithstanding DOD assertions to the contrary, there is no formal DOD analysis supporting a conclusion that 187 F-22s would be operationally sufficient. Although Air Force and other DOD officials have stated this year that the they support a total of 187 F-22s, in part because the service cannot afford to procure more than 187 without reducing funding for other programs, Air Force officials in the past have stated that a total of 381 F-22s would be sufficient to meet operational demands at a low level of risk. In early 2009, prior to the submission of the proposed FY2010 defense budget, they reportedly were of the view that a total of 243 to 250 would be sufficient to meet operational demands with a moderate level of risk.[52]

(...continued)

some active duty squadrons. Only one squadron—with the Hawaii Air National Guard—will be equipped with 18 F-22s.

(Amy Butler and David A. Fulghum, "U.S. Air National Guard Struggles With Fighter Gap," Aerospace Daily & Defense Report, July 30, 2009: 1-2)

[51] The AEF is the primary organizational unit that the Air Force uses to rotate equipment and personnel among training, maintenance, and operational assignments.

[52] See, for example, Amy Butler, "USAF Chief Notes F-22s Are Needed, Defends Capabilities," *Aerospace Daily &* (continued...)

- According to a July 15, 2009, news item, the recently completed DOD study supporting a total of 187 F-22s that General Cartwright referred to in his July 9, 2009, testimony was not so much a formal analysis as a pair of briefings by DOD's Program Analysis and Evaluation (PA&E) office and the Air Force.[53] A July 16, 2009, news item quotes former Air Force Secretary Michael Wynne and a colleague as saying these analyses "were result-driven and false" and "were not objective."[54] In a letter dated June 9, 2009, General John Corley, the Commander of the Air Force's Air Combat Command, stated: "At Air Combat Command we have held the need for 381 F-22s to deliver a tailored package of air superiority to our Combatant Commanders and provide a potent, globally arrayed asymmetric deterrent against potential adversaries. In my opinion, a fleet of 187 F-22s puts execution of our current national military strategy at high risk in the near to mid-term. To my knowledge, there are no studies that demonstrate 187 F-

(...continued)

Defense Report, February 18, 2009; "Obama Dilemma," *Aerospace Daily & Defense Report*, March 2, 2009: 1; Marcus Weisgerber, "Air Force To Ask Gates For More F-22A Raptors In Coming Weeks, *Inside the Air Force*, February 20, 2009; Jason Sherman, "Pentagon Seeks F-22 Cost Proposals To Extend Production Into FY-10," *Inside the Pentagon*, March 12, 2009; Amy Butler, "Future U.S. Fighter Force To Include Reaper UAVs," *Aerospace Daily & Defense Report*, April 8, 2009: 1-2; Marcus Weisgerber, "House Panel Votes to Continue F-22A Production Beyond 187 Aircraft," *InsideDefense.com (DefenseAlert – Daily News)*, June 17, 2009.

[53] The news item stated:

> It now turns out that a recent "study" touted by Pentagon leadership as the justification for terminating the F-22 fighter isn't really a study at all, but a series of briefings by DOD's Program Analysis and Evaluation shop and the Air Force. That word comes from the Pentagon's top spokesman, Geoff Morrell, who told the Daily Report late Tuesday that the study, ah, whatever it is, is "not so much a 'study'" as "work products." Joint Chiefs of Staff vice chairman Gen. James Cartwright told the Senate Armed Services Committee last week, "There is a study in the Joint Staff that we just completed and partnered with the Air Force" which, he said, nailed the F-22 requirement at 187 aircraft—not the 243 that the Air Force says is the minimum requirement. Asked to describe the nature and timing of this study, Morrell told the Daily Report , "What I think General Cartwright was referring to … is two different work products"—one by the PA&E shop and one by the Air Force—"and not so much a 'study.'" Morrell said work on the F-22 issue was done by "both entities" and that each was likely "informed by the other," but they didn't amount to "formal studies," and they had no formal name, such as the last known DOD analysis of fighter requirements, "Joint Air Dominance," dating to about 2004. Cartwright, in his testimony before the committee, wasn't clear about how many studies had been done, but said that 187 F-22 s would be enough for a one-war strategy. He assured SASC chairman Carl Levin (D-Mich.) that he'd get whatever justifying analysis exists to the committee right away. However, Morrell said yesterday that "I don't know that it has been provided, yet." Defense Secretary Robert Gates has been claiming a rigorous analytical basis for stopping the F-22 since early this year. Congress has been pressing the Pentagon for a vetted analysis of F-22 requirements since 2007, when then-Deputy Secretary of Defense Gordon England was directed to provide, within a year, a comprehensive tacair plan that would specifically explain how the number of F-22s had been determined. According to various members of Congress, he never complied with this directive. (John A. Tirpak, "Not So Much A Study," *AirForce-Magazine.com Daily Report*, July 15, 2009. See also John M. Doyle and David A. Fulghum, "Senate Shelves Debate On Capping F-22 Buy For Now," *Aerospace Daily & Defense Report*, July 16, 2009: 1-2, which references the AirForce-Magazine.com news item.)

[54] The news item stated:

> Mr. Wynne, who was asked by Mr. Gates to resign in June 2008 over Air Force nuclear mishaps, stated in an e-mail produced with former special assistant John Wheeler that the Air Force did not carefully study the cut in required F-22s.
>
> "The analyses were result-driven and false," Mr. Wynne and Mr. Wheeler stated. "They were not objective."
>
> Gen. Corley, they said, "is a war-fighting general and his voice is the one to trust."
>
> "Why [has] no analytical support been made available to support the lower number of aircraft? Because there never was any," they said.
>
> (Bill Gertz, "Inside the Ring," *Washington Times*, July 16, 2009: B1.)

22s are adequate to support our national military strategy. Air Combat Command analysis, done in concert with Headquarters Air Forces, shows a moderate risk force can be obtained with an F-22 fleet of approximately 250 aircraft."[55]

- In light of the QDR now in progress, it is premature for DOD to declare that 187 F-22s would be sufficient. DOD has deferred a number of other defense program questions to the QDR; it is inconsistent for DOD to not do so with the F-22, particularly if the QDR is considering a possible change in U.S. military strategy. Until the final report on the QDR is issued next year—and then reviewed by Congress—it is not certain whether future U.S. defense strategy will (or should) drop the defense-planning standard that has been in place since the early 1990s of being prepared to fight two nearly simultaneous regional conflicts.
- Procuring additional F-22s could help mitigate a projected fighter shortfall of up to 800 aircraft by 2024 that Air Force leaders identified in 2008 testimony. Procuring additional F-22s would also provide a hedge against the risk of unexpected age-related problems developing in the Air Force's legacy force of F-15 fighters. The breaking apart of an F-15 in flight in November 2007 suggests that these risks are not fully known and are potentially catastrophic.[56]
- Procuring additional F-22s could begin a needed recapitalization of the ANG's inventory of aging F-15 and F-16 fighters, which is responsible for providing homeland aerial defense for the United States and is primarily responsible for executing the ASA mission as part of the national defense strategy. The F-22's speed and detection ability gives it a unique capability for defending the country against seaborne cruise missiles. Given the age of ANG F-15s and F-16s and the

[55] Letter dated June 9, 2009, from General John D. W. Crowley, USAF, Commander, Air Combat Command, to Senator Saxby Chambliss, available online at http://www.airforce-magazine.com/DRArchive/Pages/2009/June%202009/June%2017%202009/HighRisk.aspx. The full text of the letter states:

> Thank you for your letter and the opportunity to comment on the critical issue of F-22 fleet size. At Air Combat Command we have held the need for 381 F-22s to deliver a tailored package of air superiority to our Combatant Commanders and provide a potent, globally arrayed asymmetric deterrent against potential adversaries.
>
> In my opinion, a fleet of 187 F-22s puts execution of our current national military strategy at high risk in the near to mid-term. To my knowledge, there are no studies that demonstrate 187 F-22s are adequate to support our national military strategy. Air Combat Command analysis, done in concert with Headquarters Air Forces, shows a moderate risk force can be obtained with an F-22 fleet of approximately 250 aircraft.
>
> While OSD [the Office of the Secretary of Defense] did not solicit direct input from Air Combat Command, we worked closely with our Headquarters in ensuring our views were available. We realize the tough choices our national leadership must make in balancing current warfighting needs against the fiscal realities our Nation faces.
>
> The F-22, a critical enabler of air dominance, plays a vital role and indispensable role in ensuring joint freedom of action for all forces and underpins our ability to dissuade and deter. Thank you for your continued support of the US Air Force and Air Combat Command.

See also Marina Malenic, "Top Air Force General Warns of 'High Risk' In Halting F-22 Procurement," *Defense Daily*, June 17, 2009: 4-5.

[56] On November 2, 2007, an F-15 broke apart during a training mission, and the entire F-15 fleet was grounded until the cause could be determined. An investigation discovered that the event was caused by the failure of a structure (the "longeron") that holds together the F-15 cockpit and fuselage, and that longerons in other F-15s were suspect. The F-15 fleet was grounded a second time on November 28, 2007, when a more sensitive test found that the longeron problem was evident in more F-15s than previously believed. (Michael Sirak, "Moseley: Questions Remain Over F-15C Crash As F-15Es Returning to Flight," *Defense Daily*, November 19, 2007; Gayle Putrich, "F-15s Ordered Out of the Air Again; Could Help USAF Make Case for More F-22s," *Defense News*, December 3, 2007; "USAF Orders F-15s Grounded ... Again," *Air Safety Week*, December 3, 2007.)

costs and technical uncertainties associated with possibly attempting to extend their service lives, it would not be prudent to wait until F-35 production ramps up before beginning to recapitalize the ANG fighter force. A recapitalized ANG fighter force consisting of two types of aircraft (F-22s procured now and F-35s procured later) can be operated and supported economically because it will take advantage of operation and support facilities created for the Air Force's future fighter force of F-22s and F-35s.[57]

- As the Air Force continues to gain operating experience with F-22s, the aircraft's mission-capable rate will increase, and F-22 maintenance costs per flight hour will come down. F-22 mission-capable rates are increasing. (See "Reliability and Maintainability of In-Service F-22s" below.) Although the F-22 is an expensive aircraft to operate, the F-22's capabilities are worth the costs.
- Allocating F-22s to the AEFs on an as needed basis would obviate the principal benefit of the AEF system, which is to provide predictability and stability for airmen.
- Procurement of F-35s has only recently begun, and has not yet increased to planned higher annual rates. Until production of the F-35 has been successfully demonstrated at these planed higher annual rates, it would be imprudent to shut down the F-22 production line, which is the only other U.S. production line for a fifth-generation aircraft.
- Congress could reconsider the current prohibition on sales of the F-22 to foreign governments, so procuring additional F-22s for the U.S. Air Force could be of

[57] A letter from Lieutenant General Harry M. Wyatt III, USAF, Director, Air National Guard, to Saxby Chambliss, undated but described in a press report (Amy Butler and David A. Fulghum, "U.S. Air National Guard Struggles With Fighter Gap," Aerospace Daily & Defense Report, July 30, 2009: 1-2) as being dated June 19, 2009, and posted on *InsideDefense.com* states the following (emphasis as in the original):

> Thank you for your inquiry and the opportunity for me to discuss what I believe to be a serious threat to the Air National Guard's ability to fulfill our Nation's highest strategic priority; *defending the homeland*. The ANG has proudly performed the bulk of this mission, while simultaneously participating in overseas contingency operations, with aircraft that are rapidly nearing the end of their service life. While I believe our Nation has the capacity to recapitalize the ANG, I am not aware of any plan that commits to doing so. As such, we are in need of an immediate solution in order to ensure that America's most cost effective force can continue to perform its most important mission.
>
> While a variety of solutions abound, I believe the nature of the current and future asymmetric threats to our Nation, particularly from seaborne cruise missiles, requires a fighter platform with the requisite speed and detection to address them. The F-22's unique capability in this arena enables it to handle a full spectrum of threats that the ANG's current legacy systems are not capable of addressing. I am fond of saying that "America's most important job should be handled by America's best fighter."
>
> Indeed, I am keenly aware of the severe strain that our current economic situation has placed on the Department of Defense as it attempts to modernize for an ever evolving threat environment. Given this reality, finding more efficient ways to protect our Nation's interests at home and abroad is the new imperative. Many say this will mean making *tough* choices, but I believe we can maintain our vitality by making *smart* choices; leveraging the cost effective and dual use nature of the ANG is the answer. Basing F-22s (and eventually F-35s) at strategic ANG locations through the United States while simultaneously making them available to rotationally support worldwide contingency operations is the most responsible approach to satisfying all of our Nation's needs.
>
> Again, thank you for your inquiry and your continued support of the Air National Guard.

For a news report discussing the letter, see John M. Donnelly, "Top Air National Guard General Backs F-22 Production," *CQ Today*, July 9, 2009. For an additional news report discussing ANG support for procuring more F-22s, see John M. Donnelly, "Jet Supporters Flout Veto Threat," *CQ Today*, July 14, 2009.)

value in keeping the F-22 production line open until a modified version of the F-22 could be made ready for a sale to Japan.

- Although the F-22 modernization program will maximize the utility of existing F-22s, it will not mitigate operational risks that can arise from not having enough F-22s to conduct operations in multiple locations at the same time.

Reliability and Maintainability of In-Service F-22s

Introduction

A second issue for Congress for the F-22 program concerns the reliability and maintainability of in-service F-22s. In February 2009, it was reported that the F-22's mission capable rate (MCR), one measure of an aircraft's reliability and maintainability, was a disappointing 60%. Critics of the F-22 noted that a 60% MCR is unacceptable by the Air Force's own standards. Air Force leaders defended the F-22, arguing that the aircraft was experiencing typical growing pains.[58]

July 10, 2009, News Report

On July 10, 2009, it was reported that the F-22

> has recently required more than 30 hours of maintenance for every hour in the skies, pushing its hourly cost of flying to more than $44,000, a far higher figure than for the warplane it replaces, confidential Pentagon test results show.
>
> The aircraft's radar-absorbing metallic skin is the principal cause of its maintenance troubles, with unexpected shortcomings—such as vulnerability to rain and other abrasion—challenging Air Force and contractor technicians since the mid-1990s, according to Pentagon officials, internal documents and a former engineer.
>
> While most aircraft fleets become easier and less costly to repair as they mature, key maintenance trends for the F-22 have been negative in recent years, and on average from October last year to this May, just 55 percent of the deployed F-22 fleet has been available to fulfill missions guarding U.S. airspace, the Defense Department acknowledged this week. The F-22 has never been flown over Iraq or Afghanistan. ...
>
> "It is a disgrace that you can fly a plane [an average of] only 1.7 hours before it gets a critical failure" that jeopardizes success of the aircraft's mission, said a Defense Department critic of the plane who is not authorized to speak on the record. ...
>
> But other defense officials—reflecting sharp divisions inside the Pentagon about the wisdom of ending one of the largest arms programs in U.S. history—emphasize the plane's unsurpassed flying abilities, express renewed optimism that the troubles will abate and say the plane is worth the unexpected costs.

[58] "F-22 Raptor Plagued by Stealth Maintenance Woes," *National Journal's Congress Daily PM*, February 20, 2009; Marcus Weisgerber, "F-22A Stealth Maintenance Issues Part of the Learning Process," *Inside the Air Force*, February 27, 2009; Marcus Weisgerber, "Lockheed: F-22A Raptor Meets All Key Performance Parameters," *Inside the Air Force*, January 30, 2009.

Skin problems—often requiring re-gluing small surfaces that can take more than a day to dry—helped force more frequent and time-consuming repairs, according to the confidential data drawn from tests conducted by the Pentagon's independent Office of Operational Test and Evaluation between 2004 and 2008.

Over the four-year period, the F-22's average maintenance time per hour of flight grew from 20 hours to 34, with skin repairs accounting for more than half of that time—and more than half the hourly flying costs—last year, according to the test and evaluation office.

The Air Force says the F-22 cost $44,259 per flying hour in 2008; the Office of the Secretary of Defense said the figure was $49,808. The F-15, the F-22's predecessor, has a fleet average cost of $30,818.

'Compromises'

Darrol Olsen, a specialist in stealth coatings who worked at Lockheed's testing laboratory in Marietta, Ga., from 1995 to 1999, said the current troubles are unsurprising. In a lawsuit filed under seal in 2007, he charged the company with violating the False Claims Act for ordering and using coatings that it knew were defective while hiding the failings from the Air Force.

He has cited a July 1998 report that said test results "yield the same problems as documented previously" in the skin's quality and durability, and another in December that year saying, "Baseline coatings failed." A Lockheed briefing that September assured the Air Force that the effort was "meeting requirements with optimized products."

"When I got into this thing ... I could not believe the compromises" made by Lockheed to meet the Air Force's request for quick results, said Olsen, who had a top-secret clearance. "I suggested we go to the Air Force and tell them we had some difficulties ... and they would not do that. I was squashed. I knew from the get-go that this material was bad, that this correcting it in the field was never going to work."

Olsen, who said Lockheed fired him over a medical leave, heard from colleagues as recently as 2005 that problems persisted with coatings and radar absorbing materials in the plane's skin, including what one described as vulnerability to rain. Invited to join his lawsuit, the Justice Department filed a court notice last month saying it was not doing so "at this time"—a term that means it is still investigating the matter, according to a department spokesman.

[David G. Ahern, a senior Pentagon procurement official who helps oversee the F-22 program,] said the Pentagon could not comment on the allegations. Lockheed spokeswoman Mary Jo Polidore said that "the issues raised in the complaint are at least 10 years old," and that the plane meets or exceeds requirements established by the Air Force. "We deny Mr. Olsen's allegations and will vigorously defend this matter."

There have been other legal complications. In late 2005, Boeing learned of defects in titanium booms connecting the wings to the plane, which the company, in a subsequent lawsuit against its supplier, said posed the risk of "catastrophic loss of the aircraft." But rather than shut down the production line—an act that would have incurred large Air Force penalties—Boeing reached an accord with the Air Force to resolve the problem through increased inspections over the life of the fleet, with expenses to be mostly paid by the Air Force.

[Pierre Sprey, a key designer in the 1970s and 1980s of the F-16 and A-10 warplanes,] said engineers who worked on [the F-22] told him that because of Lockheed's use of hundreds of subcontractors, quality control was so poor that workers had to create a "shim line" at the Georgia plant where they retooled badly designed or poorly manufactured components.

"Each plane wound up with all these hand-fitted parts that caused huge fits in maintenance," he said. "They were not interchangeable."

Polidore confirmed that some early parts required modifications but denied that such a shim line existed and said "our supplier base is the best in the industry."

The plane's million-dollar radar-absorbing canopy has also caused problems, with a stuck hatch imprisoning a pilot for hours in 2006 and engineers unable to extend the canopy's lifespan beyond about 18 months of flying time. It delaminates, "loses its strength and finish," said an official privy to Air Force data.

In the interview, Ahern and Air Force Gen. C.D. Moore confirmed that canopy visibility has been declining more rapidly than expected, with brown spots and peeling forcing $120,000 refurbishments at 331 hours of flying time, on average, instead of the stipulated 800 hours.

There has been some gradual progress. At the plane's first operational flight test in September 2004, it fully met two of 22 key requirements and had a total of 351 deficiencies; in 2006, it fully met five; in 2008, when squadrons were deployed at six U.S. bases, it fully met seven.

"It flunked on suitability measures—availability, reliability, and maintenance," said [Thomas Christie, the top weapons testing expert from 2001 to 2005,] about the first of those tests. "There was no consequence. It did not faze anybody who was in the decision loop" for approving the plane's full production. This outcome was hardly unique, Christie adds. During his tenure in the job from 2001 to 2005, "16 or 17 major weapons systems flunked" during initial operational tests, and "not one was stopped as a result."

"I don't accept that this is still early in the program," Christie said, explaining that he does not recall a plane with such a low capability to fulfill its mission due to maintenance problems at this point in its tenure as the F-22. The Pentagon said 64 percent of the fleet is currently "mission capable." After four years of rigorous testing and operations, "the trends are not good," he added.

Pentagon officials respond that measuring hourly flying costs for aircraft fleets that have not reached 100,000 flying hours is problematic, because sorties become more frequent after that point; Ahern also said some improvements have been made since the 2008 testing, and added: "We're going to get better." He said the F-22s are on track to meet all of what the Air Force calls [the F-22's] KPP[s]—key performance parameters—by next year.

But last Nov. 20, John J. Young Jr., who was then undersecretary of defense and Ahern's boss, said that officials continue to struggle with the F-22's skin. "There's clearly work that needs to be done there to make that airplane both capable and affordable to operate," he said.[59]

Rebuttals to July 10, 2009, News Report

On July 14, it was reported that Lockheed on July 13 had

[59] R. Jeffrey Smith, "Premier U.S. Fighter Jet Has Major Shortcomings," *Washington Post*, July 10, 2009: 1, 4. The phrase in brackets "[an average of]" appears in the original; the other bracketed material was inserted by CRS for clarity. Bracketed material that identifies people being quoted reproduces wording used elsewhere in the article.

> circulated an unsigned document on Capitol Hill saying that the plane has "performed extremely well" and that its maintenance problems are abating. The paper was a response to a report in The Washington Post last week [the July 10 news report cited above] disclosing that the Defense Department had calculated the hourly flying cost for an F-22 at $49,808 and that tests last year showed that the mean time between critical failures during an F-22 flight was 1.7 hours.
>
> Lockheed's document confirmed that "structural retrofit repairs" are still being made to F-22s and said the plane's canopy has been redesigned because of problems in maintaining its transparency. But it said that the new canopies will meet requirements and that maintenance downtime is diminishing. Responding to criticism that the plane has never flown over Afghanistan and Iraq, the company said, "The best weapon may be the one that isn't used but instead deters a conflict before it begins."
>
> A separate document circulated by the Air Force in response to the report confirmed that Defense Department tests showed that 30 hours of maintenance were needed for every hour of F-22 flying time and said the F-22 fleet's "mission capable rate" – a measure of its readiness to meet military requirements – improved from 62 percent to 68 percent between 2004 and 2008.
>
> A spokeswoman for the Office of the Secretary of Defense said last week that this rate measures only the readiness of planes that are not in depots for repair and noted that the F-22 program and the Air Force traditionally focus on a separate measure of the fleet's availability for missions. That availability, she said, was improving but stood at 55.9 percent for the past five months.[60]

On July 14, 2009, Senator Saxby Chambliss inserted into the Congressional Record a document he described as an Air Force rebuttal to points made in the July 10, 2009, article cited above. Below is the document as printed in the Congressional Record:[61]

[60] R. Jeffrey Smith, "Obama Vows A Veto In Dispute Over F-22s," *Washington Post*, July 14, 2009: 2.

[61] Congressional Record, daily edition, pp. S7463-S7467.

RESPONSE TO F-22 WASHINGTON POST ARTICLE BY JEFF SMITH

<table>
<tr><td>CLAIM</td><td>…30 hours of maintenance for every hour in the skies… (Para 1)</td></tr>
<tr><td>AF RESPONSE</td><td>True based on the DOT&E Report from 2007 at 34 hours.</td></tr>
<tr><td>CLAIM</td><td>…hourly cost of flying to more than $44,000… (Para 1)</td></tr>
<tr><td>AF RESPONSE</td><td>The total variable cost per flying hour includes: aircraft part repairs (depot level repairs [DRLs]), replenishment spares, consumables, engine parts and aviation fuel. The F-22 FY08 total variable cost per flying hour (17,711 total hours flown) was $19K and the F-15 FY08 total variable cost per flying hour (122,762 total hours flown) was $17K.

Costs included in the variable cost per flying hour are a subset of total operational cost per flying hour. For the F-22, contractor support is included in both the variable cost per flying hour and the operational cost per flying hour. Contractor costs which meet the definition of a variable cost are included in the $19,750 Variable CPFH, along with appropriate government costs. Other contractor support costs are added in, along with appropriate government costs, to obtain the total $49,808 Operational CPFH.

F-22 vs. F-15
2008 Cost Comparison Breakdown
<table>
<tr><td></td><td>Costs Variable w/ Flying Hours</td><td>Costs Variable w/ # of a/c</td><td>Fixed Costs</td></tr>
<tr><td>F-22</td><td>$19,750 CPFH*</td><td>$2.5M cost per a/c</td><td>$276M total</td></tr>
<tr><td>F-15</td><td>$17,465 CPFH*</td><td>$2.4M cost per a/c</td><td>$318M total</td></tr>
<tr><td>Major Activities: (by category)</td><td>Repairs (DLRs)
Spares
Consumables
Fuel</td><td>Depot Maintenance
Base Operations</td><td>Engineering
Tech Data
Program Mgmt
Indirect Costs</td></tr>
</table>
Cost comparison includes all O&S costs (both CLS and organic)
Once costs are bucketed into categories, F-22 and F-15 costs are similar
Note: * Costs variable with flying hours are preliminary estimates.</td></tr>
<tr><td>CLAIM</td><td>…radar-absorbing metallic skin is the principal cause of its maintenance troubles, with unexpected shortcomings --… (Para 2)</td></tr>
<tr><td>AF RESPONSE</td><td>True.</td></tr>
</table>

CLAIM	…such as vulnerability to rain and other abrasion… (Para 2)
AF RESPONSE	Not true. Rain is not the cause of skin issues.
CLAIM	… aircraft fleets become easier and less costly to repair as they mature, key maintenance trends for the F-22 have been negative in recent years, and on average from October last year to this May…(Para 3)
AF RESPONSE	Not true. Have been improving.
CLAIM	…just 55 percent of the deployed F-22 fleet has been available to fulfill missions guarding U.S. airspace, the Defense Department acknowledged this week. The F-22 has never been,…(Para 3)
AF RESPONSE	Fleet average 64.5 and Operational Fleet (LAFB, EAFB, HAFB) 61.5. The mission capable rate has improved from 62% to 68% percent from 2004 to 2009.
CLAIM	… only 1.7 hours …. (Para 5)
AF RESPONSE	True based on the FOT&E Report. The F-22 program does not measure mean time between critical failure. However, Mean Time Between Maintenance (MTBM) has dramatically matured from 0.97 in 2004 to 3.22 as demonstrated by Lot 6 aircraft performance.
CLAIM	…$350 million apiece…. (Para 5)
AF RESPONSE	$350 million then-year cost is true for the programs average unit cost (PAUC) for 184 aircraft, which includes all RDT&E and procurement costs. The fly away cost of the F-22 is $142.6M each for Lot 9 aircraft.
CLAIM	…Structural problems that turned up in subsequent testing forced retrofits to the frame …(Para 19)
AF RESPONSE	Misleading. The F-22 had a series of structural models that were tested throughout its development in a building block manner. Lockheed Martin completed static and fatigue testing in 2005 on two early production representative airframes. The results of those tests required upgrades to the airframe in a few highly stressed locations. Follow up component level testing was completed and structural redesigns were verified and implemented into the production line. For aircraft that were delivered prior to design change implementation, structural retrofit repairs are being implemented by a funded program called the F-22 Structural Retrofit Program.
CLAIM	… changes in the fuel flow…(Para 19)…
AF RESPONSE	False. The F-22 fuel system has NOT required redesign. The F-22 program has improved the reliability of individual fuel system components as part of our reliability and maintainability improvement program.

CLAIM	…forced the frequent retesting of millions of lines of code,…(Para 19)
AF RESPONSE	False. Diagnostic software is designed to automatically detect and isolate system faults. Currently it detects system faults 64% of the time and isolates the fault 92% of the time. This is up from 42% and 63% respectively in 2006. The F-22 program continues to incorporate diagnostic improvements as part of our reliability and maintainability improvement program. We do not see anything inherent in the way the software is written that makes it hard to change. The avionics systems, air vehicle systems and engine systems and their operating software require highly qualified personnel to implement changes and require an increased amount of system-level integration testing. Very strict coding and documentation standards are used in the design and development of the F-22 software. Adherence to these standards is what positions the code to allow for future changes.
CLAIM	… Skin problems …(Para 20)
AF RESPONSE	The issues noted from the FOT&E 2 Report are: 1 abrasion, 1 canopy, 3 missing filler, 4 roll up, 12 tip breaks and ~150 tip/edge damages.
CLAIM	…Over the four-year period, the F-22's average maintenance time per hour of flight grew from 20 hours to 34, …(Para 21)
AF RESPONSE	Misleading, the two numbers cited are from FOT&E 1 and FOT&E 2 averages respectively. The F-22 program does not measure mean time between critical failure. However, Mean Time Between Maintenance (MTBM) has dramatically matured from 0.97 in 2004 to 3.22 as demonstrated by Lot 6 aircraft performance.
CLAIM	…The Air Force says the F-22 cost $44,259 per flying hour in 2008; the Office of the Secretary of Defense said the figure was $49,808. The F-15, the F-22's predecessor, has a fleet average cost of $30,818. …(Para 22)
AF RESPONSE	The total variable cost per flying hour includes: aircraft part repairs (DLRs), replenishment spares, consumables, engine parts and aviation fuel. The F-22 FY08 total variable cost per flying hour (17,711 total hours flown) was $19K and the F-15 FY08 total variable cost per flying hour (122,762 total hours flown) was $17K. Costs included in the variable cost per flying hour are a subset of total operational cost per flying hour. For the F-22, contractor support is included in both the variable cost per flying hour and the operational cost per flying hour. Contractor costs which meet the definition of a variable cost are included in the $19,750 Variable CPFH, along with appropriate government costs. Other contractor support costs are added in, along with appropriate government costs, to obtain the total $49,808 Operational CPFH. **F-22 vs. F-15** **2008 Cost Comparison Breakdown**

	<table><tr><td></td><td>Costs Variable w/ Flying Hours</td><td>Costs Variable w/ # of a/c</td><td>Fixed Costs</td></tr><tr><td>F-22</td><td>$19,750 CPFH*</td><td>$2.5M cost per a/c</td><td>$276M total</td></tr><tr><td>F-15</td><td>$17,465 CPFH*</td><td>$2.4M cost per a/c</td><td>$318M total</td></tr><tr><td>Major Activities: (by category)</td><td>Repairs (DLRs) Spares Consumables Fuel</td><td>Depot Maintenance Base Operations</td><td>Engineering Tech Data Program Mgmt Indirect Costs</td></tr></table> Cost comparison includes all O&S costs (both CLS and organic) Once costs are bucketed into categories, F-22 and F-15 costs are similar **Note: * Costs variable with flying hours are preliminary estimates.**
CLAIM	… of "catastrophic loss of the aircraft."…(Para 28)
AF RESPONSE	False. The Air Force has determined that there is no need for costly repairs, now or in the future. Boeing reported to USAF that for a limited number of F-22 titanium fuselage boom structures fabricated up to that time period, the titanium material used did not meet stringent F-22 specifications. It had different fatigue mechanical properties than what was certified for production. After extensive review of the titanium by Program experts it was determined that the as-fabricated fuselage boom structural assemblies did not require costly production repairs or scrapping of these high-cost fuselage boom assemblies. However, additional structural inspections had to be imposed on these particular parts to satisfy airworthiness certification requirements per the F-22 Aircraft Structural Integrity Process. These inspections are now in place and conducted in a routine manner per F-22 maintenance instructions.
CLAIM	…through increased inspections over the life of the fleet, with expenses to be mostly paid by the Air Force….(Para 28)
AF RESPONSE	False. Fair and reasonable consideration was provided by the contractor to the AF for additional inspection burden.
CLAIM	…It delaminates, "loses its strength and finish"….(Para 31)
AF RESPONSE	False. Each F-22 canopy costs $120k. Canopies do not lose strength over time and are removed due to optical degradation NOT safety of flight. The F-22 canopy coating life requirement is 800 hrs. Canopy coatings are unique to the F-22 system. The requirement was achieved and demonstrated in laboratory tests in Engineering and Manufacturing Development. During early operation usage the program discovered previously unknown impacts due to environmental effects that reduced coating durability. Presently, canopy coatings last an average of 331 flight hours. The program

	has incorporated several coating improvements. Coating life continues to improve.
CLAIM	…$120,000 refurbishments at 331 hours of flying time, on average, instead of the stipulated 800 hours…(Para 32)
AF RESPONSE	Misleading. Each F-22 canopy costs $120k. Canopies do not lose strength over time and are removed due to optical degradation NOT safety of flight. The F-22 canopy coating life requirement is 800 hrs. Canopy coatings are unique to the F-22 System. The requirement was achieved and demonstrated in laboratory tests in Engineering and Manufacturing Development. During early operation usage the program discovered previously unknown impacts due to environmental effects that reduced coating durability. Presently, canopy coatings last an average of 331 flight hours. The program has incorporated several coating improvements. Coating life continues to improve.
CLAIM	… it fully met two of 22 key requirements…(Para 33)
AF RESPONSE	There are only 11 key performance parameters.
CLAIM	… After four years of rigorous testing and operations, "the trends are not good…(Para 35)
AF RESPONSE	False. The mission capable rate has improved from 62% to 68% percent from 2004 to 2009. The F-22 program does not measure maintenance time per repair. Direct Maintenance Man-Hours per Flying Hour (DMMH/FH) has improved from 18.10 DMMH/FH in 2008 to 10.48 DMMH/FH in 2009.
CLAIM	….It will, among other things, give F-22 pilots the ability to communicate with other types of warplanes; it currently is the only such warplane to lack that capability…. (Para 38)
AF RESPONSE	Provides the F-22 to transfer digital data to other (Multi-function Advanced Data Link) MADL equipped aircraft.
CLAIM	… One of the last four planes Gates supported buying is meant to replace an F-22 that crashed during a test flight north of Los Angeles on March 25, during his review of the program…(Para 40)
AF RESPONSE	Misleading. All 4 Lot 10 aircraft will be combat coded.
CLAIM	Paragraph 40-41
AF RESPONSE	Cannot comment on this information because the report has not been released yet.

F-22 Modernization Program

A third potential issue for Congress for the F-22 program concerns cost effectiveness of the F-22 modernization program. Supporters of the program could argue that upgrading the F-22's air-to-ground and ISR capabilities will expand the aircraft's mission flexibility and thereby realize a greater return on the significant investment made in developing and procuring the aircraft. Air

Force officials have emphasized the F-22's potential to execute many of the ISR missions that UAVs have performed in support of counter insurgency and low-intensity conflicts.[62]

Skeptics could argue that upgrading the F-22's air-to-ground and ISR capabilities is not critical in light of the substantial air-to-ground capability of the F-35, which is to be procured in large numbers, and the ISR capabilities of other existing or planned DOD systems, including unmanned aerial vehicles (UAVs). They could argue that resolving instability problems with the F-22's advanced avionics has been a significant contributor to the program's development cost, and that adding a new feature such as an air-to-ground radar or new communications capabilities could jeopardize the progress that has been made in the F-22's avionics software. They could argue that controlling the F-22's electronic emissions is a key component of making the aircraft elusive to enemy defenses, and that if the upgrades make the F-22 less stealthy, the benefits of these modifications might not be worth the risks.

Potential Export to Japan

A fourth issue for Congress for FY2010 for the F-22 program concerns the potential export of the aircraft to Japan. As mentioned earlier, Congress from time to time has reconsidered the legislated prohibition on foreign sales of the F-22. Some Members in 2009 reportedly have expressed interest in reconsidering the prohibition.[63] An August 24, 2009, article in *CQ.com* discusses some congressional perspectives regarding potential foreign sales of F-22s.[64]

Summary of Arguments

Supporters of selling F-22s to Japan could argue one or more of the following:

- Selling F-22s to Japan would enable Japan to effectively counter highly capable combat aircraft and surface-to-air missile systems that have been or will likely be deployed by regional neighbors such as Russia and China. The F-35 Joint Strike Fighter is less capable in countering these highly capable enemy fighters and surface-to-air missile systems.[65] Given the long flying distances in Japan's theater

[62] See, for example, Michael Bruno. "Air Force ISR Chief Foresees Downplaying 'F' in F-22, F-35." *Aerospace Daily & Defense Report*. June 22, 2007. Although the F-22 may have effective on-board sensors and the ability to receive additional information from other ISR platforms, it has limited ability to transmit targeting information to other platforms or command and control (C^2) assets. This restricted communications capability was intended to make the F-22 more elusive to enemy defenses. In August 2008, it was reported that Air Force officials wanted to reprogram $85 million to accelerate an upgrade that would enable the F-22 to more effectively share information with other aircraft. (Marcus Weisgerber, "Air Force Loots to Shuffle $85 Million to Accelerate F-22A Mods," *Inside the Air Force.* August 8, 2008.)

[63] See, for example, Marcus Weisgerber, "Rep. Granger Would Take Another Shot At Repealing F-22A Export Ban," *Inside the Air Force*, March 27, 2009; Tony Capaccio, "Inouye Wants To Study Possibility Of Lockheed F-22 Export Model," *Bloomberg.com*, June 4, 2009; Sam Lagrone, "U.S. Senator Talks of Selling F-22s to Allies," *Defense News*, June 8, 2009; Michael Bruno, "F-22 Concerns Persist In Senate," *Aerospace Daily & Defense Report*," June 10, 2009: 3; Marcus Weisgerber, "Murtha, Young to Discuss F-22 Exports with Obey," *InsideDefense.com (DefenseAlert – Daily News)*, June 24, 2009; David A. Fulghum and John M. Doyle, "Japanese Officials Could Be Offered A $290 Million F-22," *Aerospace Daily & Defense Report*, June 26, 2009: 1-2.

[64] John M. Donnelly, "Export Sales Of F-22 Fighters Not Likely, Some Supporters Say," *CQ.com*, August 24, 2009.

[65] For an example of an article that presents this argument, see David A. Fulghum, "Converging Problems Argue For More F-22s, Officials Says," *Aerospace Daily & Defense Report*, July 10, 2009: 3. The article states in part:

Japan's F-15J force, once top of the line, is now "outclassed by the new generation of Chinese fighters" such as (continued...)

of operations, the relatively small number of Japanese air bases in forward locations, and constraints on the numbers of fighters that Japan can operate, Japan needs the F-22's greater speed, its long-range surveillance capabilities, and its superior air-to-air combat capability to effectively counter potentially large numbers of enemy aircraft. The U.S. Air Force procured F-22s because it does not believe that a U.S. force composed entirely of F-35s will be sufficient to effectively counter highly capable enemy aircraft and surface-to-air missile systems. Although U.S. commitments to use U.S. F-22s in defending Japan are helpful, Japan needs its own F-22s, over which it can have positive, immediate control, to be fully effective in countering enemy aircraft on a timely basis. Improving Japan's ability to effectively counter highly capable enemy aircraft and surface-to-air missile systems would enhance regional deterrence and dampen a regional arms race,[66] contributing to regional stability, and reduce requirements for U.S. forces in the region.

- Selling F-22s to Japan would demonstrate continued U.S. support for Japan as a high-priority U.S. ally more powerfully than would selling F-35s to Japan. Since the United States sold its previous front-line air superiority fighter (the F-15) to Japan, a decision by the United States to not sell its new front-line air superiority fighter (the F-22) to Japan might be perceived by some observers, correctly or not, as a signal of reduced U.S. support for Japan as a high-priority U.S. ally.
- Selling F-22s to Japan would maximize interoperability between Japanese and U.S. Air Force front-line fighters defending the western approaches to Japan.
- Concerns about a sale of F-22s to Japan creating a risk of inadvertent technology transfer can be mitigated by selling Japan an export version of the F-22 that lacks highly sensitive technologies. Japan reportedly is willing to contribute $300 million toward the cost of developing an export version of the F-22 lacking such technologies.[67] Although an export version of the F-22 would take time to develop, it could be delivered to Japan more quickly than could the F-35, production of which is only beginning, and thus permit Japan to improve its

(...continued)

the Su-30MKK, former Chairman of the Joint Chiefs of Staff U.S. Air Force Gen. Richard Myers (ret.), tells Aviation Week.

Moreover, China's air defenses, which include variants of Russian-made, long-range SA-10s and SA-20 (S-300 family) missiles, can only be penetrated by the fast, high-flying, stealthy Raptor.

Japan's Defense Ministry has studied the problem closely and, at least internally, has produced "a very impressive tactical rationale" for buying the F-22 if its sale is approved by the U.S. Congress. Myers predicts that any resistance within the U.S. Air Force to selling Raptor technology to Japan, "an incredibly staunch ally," will be isolated and not critical.

Such considerations are pressing because tensions are growing over Japan's far-flung island empire, some of it mineral rich, that stretches to within 125-150 miles of China. That distance, interestingly enough, is the range of the Raptor's advanced radar, compared to 56 miles for the F-15. Japan feels it must be prepared to defend its area of responsibility from a new generation of regional threats – including China's increasingly sophisticated fighter force, which boasts the J-10 – that can carry its new, small-radar-signature, air-launched cruise missiles. Japan also needs a precision bombing capability if any of its islands are occupied.

[66] For an example of op-ed column making the argument that selling the F-22 to Japan would dampen a regional arms race, see Richard D. Fisher Jr., "F-22 Fighter For Japan," *Washington Times*, July 19, 2009: B3.

[67] David A. Fulghum and John M. Doyle, "House Defense Appropriations Chair Lends Support To More F-22s," *Aerospace Daily & Defense Report*, June 25, 2009: 1-2.

fighter force sooner than would be possible with the F-35.[68] Agreeing on the configuration of an export version of the F-35 can pose its own challenges.[69]

- Producing F-22s for Japan could reduce the cost of any F-22s that are produced at the same time for the U.S. Air Force by more fully spreading the fixed overhead costs associated with F-22 production, and could reduce the cost of any F-22s that are later produced for the U.S. Air Force by moving F-22 production further down the production learning curve.
- Producing F-22s for Japan could increase or preserve U.S. jobs related to F-22 production.

Opponents of selling F-22s to Japan could argue one or more of the following:

- Japan does not need the F-22 to be able to effectively counter highly capable enemy aircraft and surface-to-air missile systems. Like the U.S. Navy and U.S. allies in Europe, Japan can effectively counter highly capable enemy combat aircraft and surface-to-air missile systems with the F-35 Joint Strike Fighter. The U.S. Navy, which cannot always count on the presence of Air Force F-22s, plans to counter enemy aircraft and surface-to-air missile systems in the future with a combination of F-35s and earlier-design F/A-18E/Fs. U.S. allies in Europe, including the United Kingdom, plan to rely on F-35s to effectively counter highly capable enemy aircraft and surface-to-air missile systems. The Untied States is committed to the defense of Japan and will use its own F-22s to help defend Japan. The F-35 is more affordable than the F-22, so Japan could purchase more F-35s than F-22s for a given amount of funding, and thus provide one-for-one replacements for a larger portion of its fighter force than would be possible through an equal-cost purchase of F-22s.
- Selling F-35s to Japan would sufficiently demonstrate U.S. support for Japan as a high-priority U.S. ally.
- Selling F-35s to Japan would maintain substantial interoperability between Japanese and U.S. tactical aircraft, particularly since the F-35, unlike the F-22, is to be purchased in large numbers by multiple U.S. military services.
- Selling F-22s to Japan could prompt a destabilizing regional arms race in northeast Asia, which would not be in the U.S. interest. Even absent an arms race, selling F-22s to Japan could complicate U.S. relations with China and Russia, and perhaps also with South Korea – a U.S. ally that has maritime territorial disputes with Japan, and whose relationship with Japan is influenced by memories of Japan's 40-year annexation of the Korean peninsula.
- Even with a financial contribution from Japan, developing an export version of the F-22 could require a substantial expenditure of U.S. funds. The F-35, in contrast, was designed from the beginning with sales to other countries in mind, so a version suitable for Japan could be developed at relatively little additional

[68] For an article presenting this argument, see David A. Fulghum and John M. Doyle, "House Defense Appropriations Chair Lends Support To More F-22s," *Aerospace Daily & Defense Report*, June 25, 2009: 1-2.

[69] See, for example, David A. Fulghum, "U.S. JSF Sales to Israel Getting More Complicated," *Aerospace Daily & Defense Report*, February 24, 2009.

cost. Removing highly sensitive technologies from F-22s sold to Japan would make the aircraft less capable, and thus closer in capability to the F-35.

- Producing F-35s for Japan could reduce the cost of F-35s that are produced at the same time for the U.S. Air Force, Marine Corps, and Navy by more fully spreading the fixed overhead costs associated with F-35 production, and could reduce the cost of any F-35s that are later produced for these three services by moving F-35 production further down the production learning curve.
- Producing F-35s for Japan could increase or preserve U.S. jobs related to F-35 production.

Additional Discussion of Factors to Consider

The following sections provide further discussion of some factors relating to a potential sale of F-22s to Japan.[70] The sections were authored primarily by Emma Chanlett-Avery, Specialist in Asian Affairs (echanlettavery@crs.loc.gov; 7-7748).

Japan's Defense Policy

For the United States, its alliance with Japan provides a platform for U.S. military readiness in Asia. About 53,000 U.S. troops are stationed in Japan and have the exclusive use of 89 facilities throughout the archipelago. Okinawa, hosting 37 of the facilities, is the major U.S. forward logistics base in the Asia-Pacific region. Echoing his predecessors, President Obama has labeled the U.S.-Japan alliance the "cornerstone of East Asian security." High-level U.S.-Japan bilateral initiatives since 2001 declared an expanded commitment to security cooperation by outlining major command changes and calling for greater interoperability between the two militaries.[71] Several of the agreements have stalled, however, due to resistance to base realignment by local host governments and political gridlock in Tokyo.

Japan faces a challenging regional context: both direct and potential security threats, as well as suspicion from other states that changes to Tokyo's defense policy indicate a return to its militarist past. North Korea poses a particularly acute and proximate threat to Japan, heightened by Pyongyang's ballistic missile and nuclear explosive device tests in 2006. Historical enmity and contemporary competition for influence with China makes Beijing's military modernization worrisome for Japanese defense planners. The Japanese Self Defense Forces (SDF, the official name for Japan's military) has detected periodic Chinese military activities in areas surrounding Japan's outlying islands, including submarine incursions close to Okinawa and a fleet of warships near a disputed gas field. Tokyo also faces difficult relations with South Korea because of Korean distrust based on the memory of Japan's 40-year annexation of the peninsula and some territorial disputes.

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[70] The material in this section previously appeared in CRS Report RS22684, *Potential F-22 Raptor Export to Japan*, by Christopher Bolkcom and Emma Chanlett-Avery. In addition to the factors discussed here, Congress in the late 1980s debated and denied a DOD request to co-develop a fighter aircraft with Japan based on the F-16. Some of the issues considered during that debate may be relevant today. For a discussion of those issues, see CRS Report 90-309 F, *Japanese FSX Fighter Controversy*, by Richard Grimmett (out of print; available upon request).

[71] See CRS Report RL33740, *The Changing U.S.-Japan Alliance: Implications for U.S. Interests*, by Emma Chanlett-Avery and Weston S. Konishi, and CRS Report RL33436, *Japan-U.S. Relations: Issues for Congress*, coordinated by Emma Chanlett-Avery.

Technology Transfer

Air Force leaders have consistently described the F-22 as the world's most technologically advanced and capable fighter aircraft. Protecting U.S. intellectual property in F-22 technologies and denying adversaries access to these technologies are high national security priorities.

It is unclear whether the United States and Japan could agree on the terms and conditions for selling F-22s to Japan. Japan would likely want version of the F-22 that is the same as, or similar to, the version flown by the U.S. Air Force. Japan might also want to license or co-manufacture the aircraft, which would create manufacturing jobs in Japan and permit Japan to acquire F-22 engineering and design knowledge.[72] U.S. officials, on the other hand, might want to sell Japan a version of the F-22 that is less capable than what Japan might prefer, in part to protect key F-22 technologies, and might not support licensing or co-production.

The potential for technology transfer touches upon both military and economic concerns. Unlike some countries, Japan does not have a track record of re-exporting technology that it acquires through import. However, an inadvertent leak of U.S. technology or knowledge could also be a threat. The leak of secret data associated with the Aegis weapon system by Japanese military personnel in 2002 is an example of this potential danger.[73] Japan is a military ally, but also considered by some to be an economic rival. Many of the F-22 technologies or industrial processes could have commercial application. Some may be concerned that F-22 technology or knowledge could find their way into a myriad of Japanese products, to the competitive detriment of U.S. industry.

A second proliferation issue relates to the effect an F-22 sale could have on other countries. Other countries in the region could perceive the F-22 as causing an imbalance of military power in favor of Japan, and inciting them to seek their own advanced aircraft or defensive systems. Once Japan sets the precedent of F-22 export, other countries might pressure U.S. policy makers to sell them F-22s. Israel, for example, has reportedly expressed interest in the F-22.

Interoperability and Interdependence

Bilateral agreements aim to expand the benefits of the alliance by increasing the interoperability of the U.S. and Japanese militaries, therefore multiplying their collective capability. Several joint facilities are planned, including an air operations coordination center at Yokota Air Base, to be operational by 2010. Japan's acquisition of the F-22 would boost interoperability because both militaries could use identical, state-of-the-art equipment. Because of the U.S. security guarantee to Japan, Japan's possession of the F-22s may allow the United States to rotate its own aircraft out of the region when necessary. Similarly, by fielding the F-22, Japan could make up for the deficit of 198 *Raptors* the U.S. Air Force says it needs but cannot afford.

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[72] Japan has traditionally placed great value on developing industrial defense "autonomy," that is, indigenous weapons production, although this imperative has relaxed somewhat in recent years, in part to cooperate with the United States on missile defense. (Richard J. Samuels, "Give & Take; The Outlook for U.S.-Japan Defense Industrial Cooperation," *Armed Forces Journal*. February 1, 2006.)

[73] "High Barriers for Introduction of F-22," *Asahi News*. June 4, 2007. From the Daily Summary of Japanese Press, U.S. Embassy Public Affairs Section.

Despite these ambitions, however, achieving true interoperability is a difficult task. Constitutional, legal, and normative constraints limit SDF participation in many of the operations and training that traditionally integrate different national forces (see section below). Increasing the sophistication of bilateral training requires funding and facilities, currently under pressure because of SDF's budget requirements. Language barriers and differences in military doctrine also present challenges. In addition, localities affected by the noise of military bases, particularly those hosting aircraft, have been vocally opposed to many of the U.S. troop realignment proposals.

Regional Security

China and South Korea have voiced concern about Japan's intention to upgrade its military capabilities, largely grounded in suspicions that Japan will inch toward returning to its pre-1945 militarism. Some analysts caution that selling the F-22s to Japan could destabilize the region, possibly even sparking an arms race, and contribute to an image of Japan becoming America's proxy in the region. The sale could complicate the U.S. effort to manage its relationship with China. South Korea has already registered its unease at Japan acquiring F-22s, and at one point suggested that it may seek a deal to purchase the aircraft in order to match Japan's capabilities.[74] Although the Lee Myung-bak government has made moves to strengthen U.S.-South Korean alliance, the Seoul-Washington relationship has been strained at times over the past several years, and some South Koreans chafe at indications that the United States prioritizes defense ties with Japan above those with Korea.

Japanese defense officials have pointed to China's acquisition of increasingly sophisticated air capabilities to justify their request for the F-22s, asserting that China's modern air fleet will soon dwarf Japan's. Despite the relatively strong state of relations between Tokyo and Beijing, the two nations remain wary of each other's intentions. Although the risk of military confrontation is considered small, there is the potential that territorial disputes over outlying islands could escalate into armed clashes, or that conflict could break out in the Taiwan Strait between the United States and China, which could involve Japan. For this reason, some U.S. and Japanese commentators have supported the sale of F-22s to Japan as necessary to maintain the "Taiwan balance."

Japanese Restraints

Japan faces an array of legal and budgetary concerns about enhancing its military, raising questions about whether Tokyo could follow through on an F-22 sale. Article 9 of the Japanese constitution, drafted by American officials during the post-war occupation, outlaws war as a "sovereign right" of Japan and prohibits "the right of belligerency." Although Article 9 states that "land, sea, and air forces, as well as other war potential, will never be maintained," the Japanese SDF is in practice a well-funded and well-equipped military. Constitutional concerns do not appear to be significant for the purchase of the F-22, but provide a sense of the overall context and challenges to acquiring advanced weapons systems in a country with a strong pacifist sentiment.

Under a self-imposed ban on exporting arms, Japan cannot in principle participate in joint development that requires it to export weapons parts and research data to other countries. This

[74] In 2008, South Korea purchased 39 F-15ks and plan to buy 21 F-15K level aircraft between 2010-2012.

ban has been loosened to allow Japan to work on missile defense with the United States, but the issue remains contentious. Japan's aversion to military export led to Tokyo's decision not to participate in the international consortium to co-develop the F-35 Joint Strike Fighter.

A second legal issue that could generate debate in Japan, and therefore affect the sale, is the question of whether the F-22 is an offensive weapon; under the current interpretation of the Japanese constitution, the SDF is only allowed to possess defensive capability. Military aircraft are almost inherently flexible weapon systems and can be difficult to classify as "offensive" or "defensive." They can be used in primarily defensive roles, such as defending indigenous airspace from attack, or to attack an adversary's homeland or air forces. When the F-22 program was threatened by congressional budget cuts, advocates argued that its offensive capabilities mandated its continuation. Consistent emphasis on the F-22s' ability to penetrate contested airspace and destroy enemy defenses could lead many to believe that the *Raptor* is primarily an offensive weapon.

At $44 billion (2007), Japan's defense budget is among the largest in the world.[75] However, Japanese leaders are under pressure to stem government spending, and many ministries face budget cuts as part of ongoing fiscal reform. Overall, Japan's defense budget has steadily if modestly declined over the past several years. Defense spending in Japan has traditionally been capped at 1% of GDP; most leaders are wary of surpassing that symbolic benchmark, although the cap is not a law. Tokyo's defense expenditures include ongoing host nation support for U.S. forces stationed in Japan (totaling $110 billion from 1978-2007)[76] and an estimated $20 billion for the realignment of U.S. troops in the region. Based on these burdens, some analysts have voiced concerns that the SDF runs the risk of becoming a "hollow force" because of its insufficient procurement system. Budget pressure is likely to remain high in Japan due to the demographic reality of an aging and shrinking population with a shortage of workers.

Legislative Activity in 2009

FY2010 Funding Request

The Administration's proposed FY2010 defense budget requests $95.2 million in FY2010 procurement funding for the F-22 program, but this funding is requested for activities associated with completing a 187-aircraft program and shutting down the F-22 production line, not for procuring additional F-22s. The Administration's proposed FY2010 defense budget also requests $350.7 million in FY2010 procurement funding for the modification of in-service F-22s, as well as additional research and development funding and military construction (MilCon) funding for the F-22 program.

[75] According to Stockholm International Peace Research Institute (SIPRI) data.

[76] CIA World Factbook; Japan. CIA (2007-03-15).

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

House

The House Armed Services Committee, in its report (H.Rept. 111-166 of June 18, 2009) on H.R. 2647 recommends authorizing $368.8 million in FY2010 advance procurement funding for the procurement of 12 F-22s in FY2011, with the funding to be transferred from funding requested for the Defense Environmental Cleanup program. The recommendation was approved by a vote of 31 to 30 at the full committee's markup of the bill.[77] The committee's report states, in the section on the Defense Environmental Cleanup program, that:

> the committee believes that the need to sustain the F–22 production line warrants an additional transfer from Defense Environmental Cleanup of $368.8 million. The committee recommends that the Secretary of Energy also derive this decrease from among sites that are projected to meet regulatory milestones ahead of schedule in fiscal year 2010, or that are at greatest risk of being unable to execute P.L. 111-5 [the American Recovery and Reinvestment Act of 2009] and fiscal year 2010 funding as planned in fiscal year 2010. (Page 586)

The report also recommends $12.7 million in procurement funding for modification of in-service F-22s—a reduction of $338.0 million from the Administration's request. The committee's report states:

> The committee notes that $523.0 million was authorized and appropriated for the advance procurement of 20 F–22As for fiscal year 2009, that the Department of the Air Force will procure only four additional F–22As, and that the Department of the Air Force plans to obligate only $185.0 million of that amount, leaving $338.0 million that could be applied to meet fiscal year 2010 F–22A modification requirements. (Page 100)

Regarding the projected shortfall in Air Force fighter aircraft, the committee's report states:

> 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

[77] The vote reportedly occurred at about 2:30 am in the morning on June 17, after more than 16 hours of debate on various provisions of H.R. 2647. (See, for example, William Matthews, "F-22 Funds Approved in Wee-Hours Vote," *DefenseNews.com*, June 17, 2009; Marcus Weisgerber, "House Panel Votes to Continue F-22A Production Beyond 187 Aircraft," *InsideDefense.com (DefenseAlert – Daily News)*, June 17, 2009; William Matthews, "F-22 Fights Divides Gates, U.S. Lawmakers," *DefenseNews.com*, June 18, 2009; Emelie Rutherford, "HASC-Passed Bill Calls For More F-22s, Study On Exporting To Japan," *Defense Daily*, June 18, 2009.

> 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)

Section 131 of H.R. 2647 would repeal Section 134 of the FY2009 defense authorization act (S. 3001/P.L. 110-417 of October 14, 2008), which prohibits obligating more than $140.0 million of FY2009 advance procurement funding for the F-22 program until the Obama Administration certifies to the congressional defense committees that procurement of F-22s is in the national interest, or that the termination of the F-22 production line is in the national interest. The certification was to be made by March 1, 2009.

Section 132 of H.R. 2647 would require the Secretary of the Air Force to develop a plan for the preservation and storage of unique tooling related to the production of hardware and end items for F-22s that would (1) ensure that the Secretary preserves and stores such tooling in a manner that allows the production of such hardware and end items to be restarted after a period of idleness; (2) identify, with respect to the supplier base of such hardware and end items, the costs of restarting production; and (3) identify any contract modifications, additional facilities, or funding that the Secretary determines necessary to carry out the plan. The provision also states that none of the amounts authorized to be appropriated by the bill or otherwise made available for FY2010 for the Aircraft Procurement, Air Force appropriation account for F-22s may be obligated or expended for activities related to disposing of F-22 production tooling until a period of 45 days has elapsed after the date on which the Secretary submits the report to Congress.

Section 1237 of H.R. 2647 would require Secretary of Defense, in coordination with the Secretary of State and in consultation with the Secretary of the Air Force, to submit a report to the congressional defense committees, the House Foreign Affairs Committee, and the Senate Foreign Relations Committee on the potential sale of F-22s to Japan. The report is to include assessments of (1) the cost of developing an exportable version of the F-22, (2) whether an exportable version of the F-22 is technically feasible and executable, and the timeline for achieving such an exportable version; (3) the potential strategic implication for allowing the sale of the F-22s to Japan; (4) the impact of foreign military sales of the F-22 on the U.S. aerospace and aviation industry; and (5) any changes to existing law needed to allow foreign military sales of the F-22 to Japan.

The committee's report contains additional views of several members of the committee on various issues relating to the bill. The F-22 program is discussed in these additional views on pages 672 and 677-678 of the report.

The above provisions and funding levels were not altered by any floor amendments when the full House considered, amended, and passed H.R. 2647.

A June 24, 2009, statement of Administration policy on H.R. 2647 as reported in the House states:

> ***F-22 Advance Procurement***: The Administration strongly objects to the provisions in the bill authorizing $369 million in advanced procurement funds for F-22s in FY 2011. The collective judgment of the Service Chiefs and Secretaries of the military departments suggests that a final program of record of 187 F-22s is sufficient to meet operational

> requirements. ***If the final bill presented to the President contains this provision, the President's senior advisors would recommend a veto***.[78]

Senate (Committee Markup)

The Senate Armed Services Committee, in its report (S.Rept. 111-35 of July 2, 2009) on S. 1390, recommended authorizing $1.75 billion for the procurement of seven F-22s in FY2010. The recommendation was approved by a vote of 13 to 11 at the full committee's markup of the bill.[79]

In discussing the originally recommended authorization of $1.75 billion, the committee's report stated:

> The budget request included $95.2 million in Aircraft Procurement, Air Force (APAF), for the F–22A aircraft program, including $64.0 million for shutting down the production line.
>
> The committee recommends an increase of $1.75 billion to purchase an additional seven F-22A aircraft in fiscal year 2010. The committee also directs that the production shutdown costs be applied to other program requirements.
>
> The Air National Guard is charged with providing homeland aerial defense for the United States and is primarily responsible for executing the air sovereignty alert (ASA) mission as part of the National Defense Strategy. In carrying out this mission on a daily basis, the Air National Guard relies on more than 1,600 Air National Guard men and women who operate legacy F-15 and F-16 fighter aircraft. The committee has been informed that the projected retirements of these legacy aircraft with which the Air National Guard currently executes the ASA mission will leave the Guard short of the required number of aircraft to execute this mission. Additionally, the Government Accountability Office has commented that ''unless the Air Force modifies its current fielding schedules or extends the service lives of its F-15s and F-16s ... it will lack viable aircraft to conduct ASA operations at some of the 18 current ASA sites after fiscal year 2015.''
>
> The committee is concerned that no plan has been developed to fill this shortfall, either through modernizing legacy aircraft or buying new aircraft. Of specific concern is the fact that 80 percent of the F-16s will be gone in 8 years and since the majority of the ASA mission is accomplished by these F-16s, this will negatively impact the Air National Guard's ability to execute the ASA mission.
>
> In a recent letter, the Director of the Air National Guard commented, ''While a variety of solutions abound, I believe the nature of the current and future asymmetric threats to our Nation, particularly from seaborne cruise missiles, requires a fighter platform with the requisite speed and detection to address them. The F-22's unique capability in this arena enables it to handle a full spectrum of threats that the Air National Guard's current legacy systems are not capable of addressing ... basing F-22 (and eventually F-35s) at strategic Air National Guard locations throughout the United States while simultaneously making them

[78] Executive Office of the President, Office of Management and Budget, *Statement of Administration Policy, H.R. 2647 - National Defense Authorization Act for Fiscal Year 2010*, p. 1. Emphasis as in original.

[79] S.Rept. 111-35, p. 276, which states that the roll call vote was as follows: "In Favor: Senators Kennedy, Byrd, Lieberman, Begich, Inhofe, Sessions, Chambliss, Thune, Martinez, Wicker, Burr, Vitter and Collins. Opposed: Senators Levin, Reed, Akaka, Nelson of Florida, Nelson of Nebraska, Bayh, Webb, McCaskill, Udall of Colorado, Hagan, and McCain."

> available to rotationally support worldwide contingency operations is the most responsible approach to satisfying all of our Nation's needs.''
>
> For these reasons, the committee directs the Secretary of the Air Force to develop a plan, including force structure and basing requirements, for executing the ASA mission over the next 2 decades. The Secretary shall deliver that plan to the congressional defense committees no later than March 1, 2010. The plan shall give full consideration toward: (1) stationing the additional F-22s procured in fiscal year 2010 at strategic Air National Guard locations; (2) creating new or expanding current Active/Guard associate units in which both active-duty and Air National Guard personnel could operate these additional aircraft, as well as F-22s and F-35s procured in the future; and (3) transitioning earlier model F-22s as well as F-35s procured in the future to the Air National Guard at the first possible opportunity. (Pages 24-25; ellipses as in original)

The committee's report also recommends rejecting the Administration's request for $350.7 million in procurement funding for modification of in-service F-22s, and reducing by $32.3 million the Administration's request for F-22 procurement funding that was to be used for purposes other than procuring new F-22s.

Section 122 of S. 1390 would repeal would repeal Section 134 of the FY2009 defense authorization act (S. 3001/P.L. 110-417 of October 14, 2008), which prohibits obligating more than $140.0 million of FY2009 advance procurement funding for the F-22 program until the Obama Administration certifies to the congressional defense committees that procurement of F-22s is in the national interest, or that the termination of the F-22 production line is in the national interest. The certification was to be made by March 1, 2009.

Section 122 also states that "Subject to the provisions of appropriations Acts and applicable requirements relating to the transfer of funds, the Secretary of the Air Force may transfer amounts authorized to be appropriated for fiscal year 2009 by section 103(1) for aircraft procurement for the Air Force and available for advance procurement for the F-22A fighter aircraft within that subaccount or to other subaccounts for aircraft procurement for the Air Force for purposes of providing funds for other modernization priorities with respect to the F-22A fighter aircraft."

Regarding Section 122—as well as the committee's recommendation to reject the Administration's request for $350.7 million in procurement funding for modification of in-service F-22s, and the committee's recommendation to reduce by $32.3 million the Administration's request for F-22 procurement funding that was to be used for purposes other than procuring new F-22s—the committee's report states:

> In section 134 of the National Defense Authorization Act for Fiscal Year 2009 (P.L. 110-417), Congress authorized $523.0 million in funds for F-22A advance procurement, but prohibited obligation of more than $140.0 million of that amount until the President certified to the congressional defense committees that: (1) the procurement of F-22A fighter aircraft is in the national interest of the United States; or (2) the termination of the production line for F-22A fighter aircraft is in the national interest of the United States. The certification was required to be submitted before March 1, 2009.
>
> The President made no such certification. The Department has determined that, since the President did not make a determination under section 134 of P.L. 110-417, the remaining $383.0 million is unavailable for obligation.
>
> The President's budget request includes a proposal to terminate production for the F-22A and includes no funds for additional F-22A aircraft. The budget request also includes a

> request for $95.2 million to fund various activities related to the F-22A production line, and $350.7 million to purchase and install various modifications for the F-22A fleet.
>
> The committee recommends a provision [Section 122] that would: (1) repeal section 134 of P.L. 110-417 to lower the fence around the $383.0 million that might have been used for advance procurement; and (2) allow the Secretary of the Air Force to reallocate those funds for other priorities. Lowering that fence would allow the Secretary to use these fiscal year 2009 funds to pay for fiscal year 2010 F-22A funding needs. The committee believes that, subsequent to action on the Supplemental Appropriations Act, 2009 (P.L. 111-32) the Air Force should have $383.0 million available for such purposes.
>
> Therefore, the committee recommends a decrease of $383.0 million to Aircraft Procurement, Air Force, with $350.7 million of that amount applied to the F-22A modifications request, and $32.3 million applied to the full funding line. (Pages 14-15)

Section 123 would require the Secretary of Defense, in coordination with the Secretary of State and in consultation with the Secretary of the Air Force, submit to the congressional defense committees, the Committee on Foreign Relations of the Senate, and the Committee on Foreign Affairs of the House of Representatives a report on potential foreign military sales of the F-22A fighter aircraft. The report is to include assessments of (1) the cost of developing an exportable version of the F-22; (2) whether an exportable version of the F-22 is technically feasible and executable, and the timeline for achieving such an exportable version; (3) the potential strategic implication for allowing the sale of the F-22s to Japan; (4) the impact of foreign military sales of the F-22 on the U.S. aerospace and aviation industry; and (5) any changes to existing law needed to allow foreign military sales of the F-22 to Japan. The committee's report summarizes Section 123 on page 15. The text of Section 123 is as follows:

> SEC. 123. REPORT ON POTENTIAL FOREIGN MILITARY SALES OF THE F-22A FIGHTER AIRCRAFT.
>
> (a) Report Required- Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall, in coordination with the Secretary of State and in consultation with the Secretary of the Air Force, submit to the congressional defense committees, the Committee on Foreign Relations of the Senate, and the Committee on Foreign Affairs of the House of Representatives a report on potential foreign military sales of the F-22A fighter aircraft.
>
> (b) Elements- The report required by subsection (a) shall include the following:
>
> (1) An estimate of the costs to the United States Government, industry, and any foreign military sales customer of developing an exportable version of the F-22A fighter aircraft.
>
> (2) An assessment whether an exportable version of the F-22A fighter aircraft is technically feasible and executable, and, if so, a timeline for achieving an exportable version of the aircraft.
>
> (3) An assessment of the potential strategic implications of permitting foreign military sales of the F-22A fighter aircraft.
>
> (4) An assessment of the impact of foreign military sales of the F-22A fighter aircraft on the United States aerospace and aviation industry, and the advantages and disadvantages of such sales for sustaining that industry.

> (5) An identification of any modifications to current law that are required to authorize foreign military sales of the F-22A fighter aircraft.

A July 15, 2009, statement of Administration policy on S. 1390 as reported in the Senate states:

> ***F-22 Procurement***: The Administration strongly objects to the provisions in the bill authorizing $1.75 billion for seven F-22s in FY 2010. The collective judgment of the Service Chiefs and Secretaries of the military departments determined that a final program of record of 187 F-22s is sufficient to meet operational requirements. ***As the President wrote in his letter to the Chairman and Ranking Member of the Senate Armed Services Committee on July 13, if the final bill presented to him contains this provision, the President will veto it.***[80]

Senate (Floor Consideration)

On July 21, 2009, as part of its consideration of S. 1390, the Senate approved, 58 to 40 (Senate Roll Call Vote 235), an amendment (S.Amdt. 1469) that strikes the authorization of the $1.75 billion for the procurement of seven F-22s in FY2010 and restores funding elsewhere in the bill that was reduced in order to authorize the $1.75 billion. S. 1390 as amended now supports the Administration's proposal to end F-22 procurement at 187 aircraft. The text of S.Amdt. 1469 is as follows:

> SEC. 106. ELIMINATION OF F-22A AIRCRAFT PROCUREMENT FUNDING.
>
> (a) Elimination of Funding.—The amount authorized to be appropriated by section 103(1) for procurement for the Air Force for aircraft procurement is hereby decreased by $1,750,000,000, with the amount of the decrease to be derived from amounts available for F-22A aircraft procurement.
>
> (b) Restored Funding.—
>
> (1) OPERATION AND MAINTENANCE, ARMY.—The amount authorized to be appropriated by section 301(1) for operation and maintenance for the Army is hereby increased by $350,000,000.
>
> (2) OPERATION AND MAINTENANCE, NAVY.—The amount authorized to be appropriated by section 301(2) for operation and maintenance for the Navy is hereby increased by $100,000,000.
>
> (3) OPERATION AND MAINTENANCE, AIR FORCE.—The amount authorized to be appropriated by section 301(4) for operation and maintenance for the Air Force is hereby increased by $250,000,000.
>
> (4) OPERATION AND MAINTENANCE, DEFENSE-WIDE.—The amount authorized to be appropriated by section 301(5) for operation and maintenance for Defense-wide activities is hereby increased by $150,000,000.
>
> (5) MILITARY PERSONNEL.—The amount authorized to be appropriated by section 421(a)(1) for military personnel is hereby increased by $400,000,000.

[80] Executive Office of the President, Office of Management and Budget, *Statement of Administration Policy, S. 1390 - National Defense Authorization Act for Fiscal Year 2010*, p. 1. Emphasis as in original.

> (6) DIVISION A AND DIVISION B GENERALLY.—In addition to the amounts specified in paragraphs (1) through (5), the total amount authorized to be appropriated for the Department of Defense by divisions A and B is hereby increased by $500,000,000.

On July 23, 2009, as part of its consideration of S, 1390, the Senate approved by unanimous consent an amendment (S.Amdt. 1796) that strikes subsection (a) of Section 123 as reported by the Senate Armed Services Committee and inserts the following:

> (a) REPORT REQUIRED.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall provide for a federally funded research and development center which will submit to the congressional defense committees, the Committee on Foreign Relations of the Senate, and the Committee on Foreign Affairs of the House of Representatives, through the Secretary of Defense, a report on potential foreign military sales of the F-22A fighter aircraft.

FY2010 Defense Appropriations Bill (H.R. 3326)

House (Committee Markup)

The House Appropriations Committee, in its report (H.Rept. 111-230 of July 24, 2009) on H.R. 3326, recommends $368.8 million in FY2010 advance procurement funding for the procurement of 12 F-22s in a future fiscal year. (Page 187; see also page 184) The report recommends $187.3 million in procurement funding for modification of in-service F-22s—a reduction of $163.4 million from the Administration's request. Included in the recommended reduction of $163.4 million is a recommended reduction of $158.4 million for "Common Configuration – Early to need" and a recommended reduction of $5.0 million for "Warfighter Urgent Requirements." (Page 188; see also page 185)

Section 8041 of H.R. 3326 would rescind $383 million in FY2009 F-22 advance procurement funding. (See pages 323 [bottom] and 324 [top] of the committee's report.) Note that this provision would rescind FY2009 (not FY2010) F-22 advance procurement funding.

Section 8057 would prohibit the use of funds made available in the bill from being used to approve or license the sale of the F-22 to any foreign government. This is the so-called Obey amendment on the F-22 program that has been included in annual DOD appropriation acts since FY1998.

Page 465 of the committee's report presents the additional views of Representatives Jerry Lewis and C.W. Bill Young on the F-22 program.

A July 28, 2009, statement of Administration policy on H.R. 3326 as reported in the House states:

> *F-22 Fighter*. The Administration strongly objects to $369 million in unrequested advanced procurement funding provided for 12 F-22 fighter aircraft in FY 2011, rather than ending the production program as requested by the President. The collective judgment of the Service Chiefs and Secretaries of the military departments has determined that 187 F-22s are sufficient to meet operational requirements. Consistent with the President's letter to the Chairman and Ranking Member of the Senate Armed Services Committee on July 13, 2009,

> concerning the National Defense Authorization Act, if the final bill presented to him contains this provision, the President will veto it.[81]

House (Floor Consideration)

On July 30, 2009, as part of its consideration of H.R. 3326, the House approved, 269 to 165 (House Roll No. 661), an amendment (H.Amdt. 392) that, among other things, redirects the $368.8 million in F-22 advance procurement funding recommended in H.Rept. 111-230 to other purposes. H.R. 3326 as amended now supports the Administration's proposal to end F-22 procurement at 187 aircraft. The portion of H.Amdt. 392 that redirects the F-22 advance procurement funding became Section 8120 of H.R. 3326. The text of Section 8120 is as follows:

> Sec. 8120. None of the funds appropriated or otherwise made available in this Act may be used for advance procurement of the F-22 aircraft: Provided, That $368,800,000 of the funds made available in title III under the heading `Aircraft Procurement, Air Force' may be available for the following programs in the following amounts:
>
> (1) $64,000,000 for production line shut down activities for the F-22.
>
> (2) $138,800,000 for spare engines for F-22 and C-17 aircraft.
>
> (3) $79,000,000 for LAIRCM [Large Aircraft Infrared Countermeasures] kits for the Air National Guard.
>
> (4) $37,000,000 for advanced targeting pods.
>
> (5) $50,000,000 for advanced radar development.

Senate

The Senate Appropriations Committee, in its report (S.Rept. 111-74 of September 10, 2009) on H.R. 3326, recommends approval of the administration's request for $95.2 million in FY2010 procurement funding to end F-22 procurement at 187 aircraft. (Page 129) The report recommends a $173.4-million reduction to the administration's request for FY2010 procurement funding for the modification of in-service F-22s. (Page 130) The recommended $173.4-million reduction includes a recommended reduction of $158.4 million for "Common configuration early to need," and a recommended reduction of $15 million for "insufficient justification." (Page 133, line 33)

Section 8040 of the bill as reported by the committee would rescind prior-year funds. The committee's report states that among the funds that would be rescinded are $383 million in FY2009 advance procurement funds for the F-22 program. (Page 231)

Section 8056 as reported by the committee would retain and modify the annual provision regarding foreign sales of the F-22. The text of the provision as reported by the committee is as follows:

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[81] Executive Office of the President, Office of Management and Budget, *Statement of Administration Policy, H.R. 3326 - Department of Defense Appropriations Act, 2010*, p. 2. Emphasis as in original.

> *Sec. 8056*. None of the funds made available in this Act may be used to approve or license the sale of the F-22A advanced tactical fighter to any foreign government: Provided, That the Department of Defense may conduct or participate in studies, research, design and other activities to develop a future export version of the F-22A that protects classified and sensitive information, technologies and U.S. warfighting capabilities.

The committee's report discusses Section 8056 on pages 199-200, stating:

> F–22.—The Committee includes a general provision that would allow the Department of Defense to develop an export version of the F–22 aircraft. The Committee urges the Air Force to start this effort within the funds appropriated in Research, Development, Test and Evaluation, Air Force for the F–22 aircraft.

FY2009 Supplemental Appropriations Act (H.R. 2346/P.L. 111-32)

Request

As part of its proposed FY2009 supplemental appropriations bill, the Administration requested $600 million in procurement funding to complete the procurement cost of four F-22s for which Congress had provided advance procurement funding in the FY2009 defense appropriations act. (As discussed earlier in this report, Congress, as part of its action on the FY2009 defense budget, provided $523 million in advance procurement funding for the procurement of 20 F-22s in FY2010. In late 2008, DOD released enough of this funding to fund the procurement of long-lead time items for four of these 20 F-22s.)

House

The House Appropriations Committee report (H.Rept. 111-105 of May 12, 2009) on the FY2009 supplemental appropriations bill (H.R. 2346) recommended approving the Administration's request for $600 million in procurement funding to complete the procurement cost of four F-22s (see page 21).

Senate

The Senate Appropriations Committee report (S.Rept. 111-20 of May 14, 2009) on the FY2009 supplemental appropriations bill (S. 1054) recommended $498 million in procurement funding to complete the procurement cost of four F-22s—a reduction of $102 million from the Administration's request. The report also recommended an additional $45 million in procurement funding for the F-22 program for "Full funding for fiscal year 2009," and recommended reduction of $147 million in procurement funding for the F-22 program so as to "Delete shut-down funding" (see page 43).

Conference

The conference report (H.Rept. 111-151 of June 12, 2009) on the FY2009 supplemental appropriations bill (H.R. 2346) recommended approving the Administration's request for $600 million in procurement funding to complete the procurement cost of four F-22s (see page 93). The conference report also stated:

> The Air Force has informed the Congress that funding in the amount of $45,000,000 is required for the F-22 Raptor program to avoid a work stoppage in material processing and fabrication activities during fiscal year 2009. The conferees direct the Secretary of the Air Force to use $45,000,000 from within the funds provided to ensure that work proceeds on schedule. None of the funds provided in this Act shall be used to finance activities to shut-down the F-22A production line. Funds may be used to explore options to develop an export variant of the F22A. (Page 97)

The four F-22s whose procurement cost was completed by H.R. 2346/P.L. 111-32 are recorded as having been procured in FY2009, along with the 20 F-22s procured in the FY2009 defense appropriations act (Division C of H.R. 2638/P.L. 110-329 of September 30, 2008).

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