

SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS,
AND INTERNATIONAL RELATIONS

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MEMORANDUM

To: Members of the Subcommittee on National Security, Emerging Threats, and International Relations

From: Christopher Shays
Chairman

Date: April 8, 2003

Subject: Briefing memo for April 11, 2003 Subcommittee hearing

Attached find the briefing memo required by Committee rules for the hearing on Friday, April 11, 2003 entitled, "*Controlling Costs in Tactical Aircraft Programs.*" The hearing will convene at 10:00 a.m., room 210 Cannon House Office Building.

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MEMORANDUM

To: Members of the Subcommittee on National Security, Emerging Threats, and International Relations

From: Vincent Chase, Chief Investigator

Date: April 8, 2003

Subject: Briefing memorandum for the hearing entitled, “*Controlling Costs in Tactical Aircraft Programs*”, scheduled for Friday, April 11th at 10:00 a.m., room 210 Cannon House Office Building.

PURPOSE OF HEARING

The purpose of the hearing is to examine the causes and implications of schedule delays and cost growth in the F/A-22 Raptor program.

HEARING ISSUE(S)

- 1. Why do F/A-22 Raptor program costs continue to escalate?**
- 2. How can DOD stabilize F/A-22 Raptor program costs?**

BACKGROUND

The F/A-22 Raptor¹ is part of the Department of Defense’s tactical aircraft modernization plan, which also includes the Joint Strike Fighter (JSF), and the Navy F/A-18 E/F Super Hornet. These aircraft are referred to as “tactical” aircraft to distinguish them from the Air Forces B-52, B-1, B-2, and the F-117 “strategic” bombers. When applied to aircraft, “tactical” generally refers to smaller and shorter-range fighter attack planes, while “strategic” generally refers to larger and longer-range aircraft. Fighter attack planes (also know as fighter bombers, strike fighters, or multi-role fighters) perform both air-to-air and air-to-surface missions. **(Web Resource 1)**

The F/A-22 is being built using the latest aviation technology. The aircrafts primary mission is to establish absolute control of the skies over any battlefield and provides a first-look, first-shot, first-kill capability. According to Air Force officials, the F/A-22 is an air superiority fighter with improved capability over current Air Force aircraft. The stealth, supercruise ability, integrated avionics and other features will make the F/A-22 the most potent fighter in the world. **(Web Resource 2)**

The primary mission of the F/A-22 is to clear the skies of enemy aircraft (air superiority) rather than attacking ground targets. The F/A-22 can carry two precision-guided munitions internally. The F/A-22 avionics systems may also have the ability to download information from satellites on targets and potential threats.

The development of the F/A-22 emerged from the considerable research effort the Air Force mounted during the Reagan administration. **(Attachment 1)** The Air Force initiated the development of a stealth aircraft called the Advanced Tactical Fighter (ATF), which was expected to enter service in the 1990's to replace F-15 fighter planes developed in the early 1970's. **(Attachment 2)**

The F/A-22, built by Lockheed Martin will contain the latest low-observable (stealth) technology to reduce detection by radar and will be equipped with more

¹ “F/A” stands for fighter/attack aircraft. The Air Force changed the designation from F-22 to F/A-22 in September 2002 to reflect the aircraft’s air-to-surface attack capability.

advanced engines manufactured by Pratt & Whitney and new avionics by Hughes Electronics and other subcontractors. The F/A-22 is expected to maintain U.S. Air Force capabilities against more sophisticated aircraft and missiles in the 21st century. **(Web Resource 1)**

In hopes of controlling program costs, the Department of Defense (DOD) required the development of competitive prototypes for airframes, engines, and avionics. As a result, the Air Force selected two teams of airframe contractors to develop the Advanced Tactical Fighter (ATF) prototypes: Lockheed Martin teamed with Boeing and General Dynamics, and Northrup teamed with McDonnell Douglas. In addition, Pratt & Whitney and General Electric were selected to compete for the development of the engines for the Advanced Tactical Fighter (ATF) prototypes. In 1986, the Air Force awarded each team a \$691 million fixed-priced contract to build two prototypes, Lockheed’s YF-22 and Northrup’s YF-23, which were flight tested in late 1990.

In 1991, the Air Force selected Lockheed’s YF-22 design **(Web Resource 2)** and Pratt & Whitney’s F-119 engine **(Web Resource 3)** for full-scale development, termed “engineering and manufacturing development” (EMD). Contracts totaling \$11 billion were awarded to the two contractors for engineering and manufacturing development (EMD) of the F-22, including 11 development/prototype aircraft.

In 1996, due to unanticipated cost growth in the program, the Assistant Secretary of the Air Force for Acquisition established the Joint Estimating Team (JET) consisting of personnel from the Air Force, Department of Defense, and private industry. The objective of the JET was to estimate the most probable cost of the program and to identify realistic initiatives that could be implemented to lower both EMD and production costs.

The F/A-22 production quantity has fluctuated considerably. Because of escalating program costs over the last twelve years, the F/A-22 Raptor program was reduced from 750 aircraft to 648 in 1991, then to 438 in late 1993, then to 339 in 1997, then to 333 in late 1999, and then to 276 in 2002.

In 1997 and in August 2001, the DOD conducted reviews of the F/A-22 Raptor program. During these reviews the Air Force attributed estimated production cost

growth to increased labor, airframe and engine costs. These factors totaled almost 70 percent of the overall cost growth. According to program officials, contractors and suppliers were unable to achieve the expected reductions in labor costs throughout the building of the development and early production aircraft as the primary reason for estimating this additional cost growth. **(Attachment 3)**

By 1997, the Joint Estimating Team (JET) concluded the cost of production would grow substantially from the amounts planned, but that cost reduction initiatives could be implemented to offset that cost growth. The team estimated production costs for 438 aircraft would increase by \$13.1 billion. As a result, the Office of the Undersecretary of Defense for Acquisition and Technology approved recommendations made by the Joint Estimating Team to slow manufacturing to allow a more efficient transition from development to low-rate initial production. The office also approved a plan to identify and implement cost reduction initiatives. In addition, the planned procurement quantity of the aircraft was reduced to 339 aircraft. **(Attachment 4)**

After the F/A-22 Raptor program review in August 2001, DOD approved the Air Force plan to begin the first production run of F/A-22s. DOD estimated an additional \$5.4 billion in cost growth for the production of the aircraft, bringing the total estimated production costs to \$43 billion.

Currently, the F/A-22 program is in both development and production. Development is in the final stages, and low rate initial production has begun. Since Fiscal year 1997, funds have been appropriated to acquire production aircraft, and the F/A-22 acquisition plan calls for steadily increasing annual production rates.

The F/A-22 budget request for FY 2004 would transfer \$876 million in production funding to help fund estimated cost increases in development. As a result, the current production cost estimate is \$42.2 billion. **(Attachment 3, p.5)**

Production Cost Reduction Plans (PCRP)

As a result of the 1997 Joint Estimating Team (JET) production cost analysis of the F/A-22, the airframe and engine contractors, with participation by the Air Force

program office, began identifying and implementing projects called production cost reduction plans (PCRP). Production cost reduction plans are documents showing changes to business design, processes, and practices to realize production cost savings. **(Attachment 5)**

The Air Force and airframe and engine contractors have established procedures to track the status of the production cost reduction plans. Production cost reduction plans are categorized as either “implemented” or “not yet implemented.” **(Attachment 3, p.21)**

In December 1999, the Subcommittee held an oversight hearing to examine how the Air Force had implemented cost control strategies and dealt with schedule overruns in the F/A-22 Raptor program. At that time, the Deputy Undersecretary of the Air Force indicated she needed at least \$15.1 billion in cost reduction plans from the airframe manufacturer and \$2.5 billion from the engine manufacturer to stay within the F/A-22 production program cost cap. **(Web Resource 5)**

In June 2000, the Subcommittee conducted a hearing to determine what progress DOD made implementing and achieving production cost reductions under the PCRP program. The Subcommittee learned the Air Force and contractors had implemented approximately \$10.2 billion in production cost savings and anticipated implementing an additional \$10.8 billion over the life of the program for a total of \$21.0 billion, which equates to about \$62 million per F-22 produced. **(Web Resource 6)**

In August 2001, the Subcommittee conducted a follow-up hearing to determine what progress DOD made implementing and achieving production cost reductions under the PCRP program. The Subcommittee learned the Air Force and contractors have implemented PCRPs valued at \$13.6 billion, and anticipate implementing an additional \$14.0 billion over the life of the program, which equates to about \$81 million per F-22 produced. **(Web Resource 7)**

Currently, the Air Force and the contractors have identified \$27.3 billion in production cost reductions of which \$14 billion have been implemented. The remaining \$13.3 billion represents plans defined but not meeting plan criteria. Criteria for determining if a cost reduction plan is implemented include whether

the contractor has submitted a firm-fixed price proposal that recognizes the impact of the cost reduction, whether the impact of the reduction has been reflected in the current contract price, or whether the contractor has reduced the number of hours allocated to a task.

Production Cost Caps

In an attempt to address the issue of production cost growth in the F/A-22 Raptor program, the 1998 defense authorization act imposed cost caps on both engineering and manufacturing development (EMD) and production.² The EMD cap was later eliminated in December 2001. The act also required the Secretary of the Air Force to adjust the cap to account for increases or decreases in economic inflation or changes in the law after September 30, 1997. The current production cost cap is \$36.8 billion. The current production cost estimate is \$42.2 billion or \$5.4 billion above the cap.

The Department of Defense identified production cost growth of \$13.1 billion in 1997 and \$5.4 billion in 2001, and another \$690 million in development cost growth in November 2002. **(Attachment 6)** However, GAO has learned³ the latest DOD production cost estimate does not include \$1.3 billion in additional costs identified by the Air Force during the development of the F/A-22 acquisition plan in September 2001. **(Attachment 3, p.9)** This additional cost would raise the production cost estimate to \$43.5 billion or \$ 6.7 billion above the cap.

According to GAO, DOD has not fully informed Congress about the potential cost of the production program if cost reduction efforts do not offset cost growth as planned. In addition, DOD has not informed Congress about the quantity of aircraft that can be procured within the existing production cost limit. If the production cost limit is maintained, and estimated production costs continue to rise, the Air Force will likely have to procure fewer than the 276 planned F/A-22 aircraft. **(Attachment 3, p.3)**

² According to Air Force officials, if the F/A-22 testing and production efforts stay on track, the Department intends to ask Congress to lift the production cost cap in FY 2005.

³ *TACTICAL AIRCRAFT: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth*, General Accounting Office Report, GOA-03-280, February 2003.

However, in a letter to Representative John F. Tierney dated October 3, 2001, the Under Secretary of Defense stated, “If the program were to remain under the current congressional cap of 37.6 billion⁴ for production, the Department estimates that only 224 aircraft could be procured, not including the Production Representative Test Vehicle (PRTV) aircraft.” (**Attachment 7**)

The April 11, 2003 session is the fourth Subcommittee hearing on the progress of F/A-22 development in terms of performance, schedule, and cost.

DISCUSSION OF HEARING ISSUE(S)

1. Why do F/A-22 Raptor program costs continue to escalate?

F/A-22 Raptor schedule delays and increased development and production costs have limited DOD’s ability to upgrade the tactical aircraft fleet. According to GAO, if the F/A-22 program had met its original goals, the Air Force could have been replacing older aircraft with F/A-22 aircraft over seven years ago. Now, however, it will not begin replacing aircraft until late 2005 at the earliest.

GAO found schedule delays in developmental testing would increase production costs. According to GAO, if F/A-22 development testing program continues to fall behind, there is a greater risk that operational testing, full-rate production, and multiyear procurement will be delayed as a result. Delays in production and multiyear procurement would likely increase production costs. The Air Force has not addressed ongoing problems with the developmental testing and therefore remains at high risk for further schedule delays.

As an example, GAO reported in March 2002⁵ that the Air Force’s plan to complete the developmental airframe testing necessary for the start of operational

⁴ DOD adjusted the production cost cap to \$36.8 billion in January 2003.

⁵ *TACTICAL AIRCRAFT: F-22 Delays Indicate Initial Production Rates Should be Lower to Reduce Risks*, General Accounting Office Report, GOA-02-298, March 2002.

testing was at high risk because (1) the planned number of test objectives per flight-hour was not being achieved and (2) most of the planned flight-test program was essentially being performed by only one test aircraft rather than the three originally planned. Air Force officials told GAO they understood that completing the tests as scheduled with only one developmental test aircraft was high risk. As a result of this strategy, the Air Force delayed the F/A-22 schedule, including the start of a multiyear contract designed to save production costs.

In addition, the Air Force reduced estimated funding for F/A-22 support costs by more than \$1.8 billion in the latest production cost estimate. Support costs are for such items as spare components for the aircraft and engines, and equipment used to support and maintain aircraft. F/A-22 program officials explained that the latest support cost estimates are more accurate than previous estimates. However, program officials could not provide GAO with detailed documentation to support this new estimate. At the same time, GAO found the Air Force added about \$1.8 billion to the estimated production costs associated with the aircraft and engine.

According to GAO, production cost estimates will increase if it is later determined the F/A-22 program will require the same level of support funding identified by the Defense Acquisition Board’s review in September 2001.

Related to the issue of support costs, DOD faces major challenges with aging and increasingly obsolete aircraft test equipment (ATE). These problems include the high costs of maintaining and replacing ATE. DOD acquisition reform policy requires commonality for ATE acquisition and modernization efforts. GAO reviewed ATE acquisition for the F/A-22 and JSF and found ATE modernization and acquisition planning is being done with little consideration to commonality. As an example, officials said they have not had contact with the F/A-22 project office concerning ATE development since 1994. **(Attachment 8)** Some are speculating the F/A-22 program office is missing an opportunity to save support costs by not making commonality a priority, but has pursued unique ATE solutions for each weapon system. Because the Air Force has not made concerted efforts to use one system to service multiple aircraft platforms, it has not taken advantage of efficiencies and potential savings.

Another cost reduction plan would implement multi-year procurement of F/A-22 production aircraft over 5 years. The estimated cost reduction for this plan is \$1.5 billion. This saving is speculative as to timing and amount since multi-year procurement on this scale must meet stringent criteria.

Under 10 U.S.C. 2306b, a multiyear contract must meet specific criteria and be approved by Congress. The criteria must include the following:

1. The contract must result in substantial savings compared with the awarding of annual contracts.
2. The item being bought must have a stable design and not have excessive technical risks.
3. The estimated cost of the system and the estimated cost avoidance from the multiyear procurement must be realistic.

In addition, GAO found the cost of the fiscal year 2005 production lot could increase because that lot is not currently included in plans to help control productions costs. **(Attachment 3, p.10)**

In late 1996, as part of a F/A-22 program review, the Air Force and major F/A-22 contractors entered into a Target Price Curve agreement designed to help reduce production costs and ensure production affordability. The agreement established production cost goals for the first five production lots (fiscal years 1999-2003) and provided the contractors with incentives if they achieved these cost goals. However, since the Air Force delayed the start of multiyear procurement from fiscal year 2004 to fiscal 2006, fiscal 2005 is now not covered either by the agreement with the contractors or the planned multiyear procurement contract. Therefore, there is less assurance that the cost of the fiscal year 2005 production lot will match the current estimate. If a method to help control costs is not implemented for the fiscal year 2005 production lot, the cost of this lot could increase more than expected.

2. How can DOD stabilize F/A-22 Raptor program costs?

The F/A-22 Raptor estimated production costs continue to exceed the cost production cap imposed by Congress in 1998. Over the last 6 years, \$17.7 billion in estimated cost growth has been identified during the course of two program reviews. To stem the growth in production costs the Department has implemented various production cost reduction plans (PCRPs). This production cost reduction effort is critical to an affordable F/A-22 program.

However, despite the success of early cost reduction plans, GAO identified estimated cost growth beyond the amounts recognized by the Air Force and DOD. According to GAO, the effectiveness of cost reduction plans is questionable for a variety of reasons.

One class of PCRPs identified by GAO is the Production Improvement Programs (PIPs). PIP is a type of cost reduction strategy in which the government makes an initial investment to realize savings by funding contractor manufacturing process improvements for avionics, and improvements in the fabrication and assembly processes for the airframe to realized lower production costs. GAO found the Air Force reduced the funding available for investment in PIPs because of cost growth in production lots awarded in FY 2001 and FY 2002. According to GAO, PIPs can be an important mechanism for offsetting cost growth. However, the failure to invest in PIPs at planned levels will not allow estimated cost growth to be offset as planned and therefore may affect the quantity of aircraft that can be acquired.

In addition, some have questioned why DOD is paying contractors to find ways to improve their manufacturing, fabrication and assembly processes when these improvements should be part of the contractor’s best business practices.

DOD disagrees with GAO’s findings and recommendation regarding PIPs. According to DOD, “GAO failed to provide credible evidence that investments in Production Improvement Programs reduce costs. The Department intends to implement PIPs on a case-by-case basis using expected return-on-investment criteria, rather than using a generalized formula that is not sufficient across the wide range of (PIP) projects.” **(Attachment 3, p.18)**

The General Accounting Office (GAO) also reviewed a number of yet-to-be implemented production cost reduction plans. According to GAO, some of the plans are beyond the Air Force’s ability to control. Joint Strike Fighter related savings are on Air Force plans to use many of the same contractors and subcontractors as in the F/A-22 program, thereby lower overhead rates and increasing buying power.

However, this cost reduction is contingent on decisions being made on a program external to the F-22. If not approved, or if the JSF program is delayed, then the F-22 production program will not achieve the anticipated cost reductions.

Some believe the production cost reduction program (PCRP) process should be considered a largely cosmetic accounting exercise to evade congressional spending caps, not a genuine acquisition reform.

Testimony

Panel One

Mr. David M. Walker, Comptroller General will discuss F/A-22 cost growth, schedule delays, and how the program has deviated from promised acquisition reform initiatives.

Panel Two

Mr. Michael W. Wynne, Principal Deputy, Under Secretary of Defense for Acquisition will discuss F/A-22 production cost estimates and why Congress should eliminate the production cost cap.

Dr. Marvin Sambur, Assistant Secretary of the Air Force will discuss how the test program continues to make progress and why production cost reduction plans will stabilize cost growth.

Panel Three (Minority Witnesses)

Mr. Christopher Hellman, Senior Analyst, Center for Defense Information will discuss the impact of F/A-22 cost growth and schedule delays.

Mr. Steven Ellis, Vice President of Programs, Taxpayers for Common Sense will discuss F/A-22 *sticker shock*. According to Taxpayers for Common Sense, it will cost taxpayers about \$43 billion to pay for the 295 planes DOD is planning to purchase.

Mr. Eric Miller, Senior Defense Investigator, Project On Government Oversight will discuss why the F/A-22 is overpriced and not needed.

ATTACHMENTS

1. Report for Congress, Congressional Research Service (CRS), Christopher Bolkin, Specialist in National Defense, Foreign Affairs, Defense, and Trade Division, *F/A-22 Raptor*, Updated February 4, 2003.
2. *The Cutting Edge: A Half Century of U.S. Fighter Aircraft R&D*, Mark A. Lorell and Hugh P. Levaux, 1998, RAND, Washington, DC.
3. *TACTICAL AIRCRAFT: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth*, General Accounting Office Report, GOA-03-280, February 2003.
4. Department of Defense, Joint Estimating Team (JET) F-22 Report, pg. 12-16, January 1997.
5. F/A-22 Raptor Briefing by Lockheed Martin for Congressional Staff, Production Cost Reduction Plans (PCRP) Briefing Slides, May 31, 2000.
6. *Potential F/A-22 Cost Overrun Of \$690 Million Is Announced*, Vernon Loeb, Washington Post Staff Writer, Washington Post, November 8, 2002.
7. Letter to Representative John F. Tierney (MA-06) from the Under Secretary of Defense E.C. Aldridge, Jr., October 3, 2001.
8. *MILITARY READINESS: DOD Needs to Better Manage Automatic Test Equipment Modernization*, General Accounting Office Report, GOA-03-451, March 2003.

WEB RESOURCES

1. CRS Issue Brief for Congress, *Tactical Aircraft Modernization: Issues for Congress*, Updated March 5, 2003, CRS, IB-92115, Christopher Bolkin, Foreign Affairs, Defense, and Trade Division, The Library of Congress.
< <http://www.congress.gov/erp/ib/pdf/IB92115.pdf> >

2. Lockheed Martin Aeronautics Company
< http://www.lmtas.com/products/combat_air/f-22/index.html>

3. Pratt & Whitney
< <http://www.pratt-whitney.com/>>

4. Air Force Link, *The F-22 Deters, Defends, Attacks*,
< <http://www.af.mil/lib/airpower/>>

5. Subcommittee on National Security, Veterans Affairs, and International Relations (NSVAIR) hearing entitled, *F-22 Cost Controls*, Serial No. 106-144, December 7, 1999.
< <http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi>>

6. Subcommittee on National Security, Veterans Affairs, and International Relations (NSVAIR) hearing entitled, *F-22 Cost Controls: Will Production Cost Savings Materialize*, Serial No. 106-221, June 15, 1999.
< <http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi>>

7. Subcommittee on National Security, Veterans Affairs, and International Relations (NSVAIR) hearing entitled, *F-22 Cost Controls: How Realistic Are Production Cost Reduction Plan Estimates*, Serial No. 107-101, August 2, 2001.
< <http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi>>

WITNESS LIST

Panel One

The Honorable David M. Walker

Comptroller General of the United States
U.S. General Accounting Office

Panel Two

Mr. Michael W. Wynne

Principal Deputy
Under Secretary of Defense (Acquisition)
Department of Defense

Dr. Marvin Sambur

Assistant Secretary of the Air Force (Acquisition)
Department of the Air Force
Department of Defense

accompanied by

General Thomas Owen, USAF

F/A-22 Raptor Program Office
Department of the Air Force
Department of Defense

Panel Three

Mr. Eric Miller

Senior Defense Investigator
Project On Government Oversight

Mr. Christopher Hellman

Senior Analyst
Center for Defense Information

Mr. Steven Ellis
Vice President of Programs
Taxpayers for Common Sense