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CONTROLLING COSTS IN TACTICAL AIRCRAFT PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS AND INTERNATIONAL RELATIONS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

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CONTROLLING COSTS IN TACTICAL AIRCRAFT PROGRAMS

FRIDAY, APRIL 11, 2003

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON NATIONAL SECURITY, EMERGING THREATS AND INTERNATIONAL RELATIONS,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:06 a.m., in room 210 Cannon House Office Building, Hon. Christopher Shays (chairman of the subcommittee) presiding.

Present: Representatives Shays, Platts, Schrock, Duncan, Murphy, Kucinich, Maloney, Dutch, Ruppersberger, Bell, and Tierney.

Staff present: Lawrence Halloran, staff director and counsel; J. Vincent Chase, chief investigator; Robert A. Briggs, clerk; David Rapallo, minority counsel; and Jean Gosa, minority assistant clerk.

Mr. SHAYS. A quorum being present, the Subcommittee on National Security, Emerging Threats and International Relations hearing entitled, "Controlling Costs and Tactical Aircraft Programs," is called to order.

I would like to first thank the Budget Committee for allowing us to use their hearing room. I apologize for being a speck late. I am going to catch my breath by asking Mr. Kucinich to give his statement, then Mr. Tierney, and then I will recognize Mr. Schrock.

Mr. KUCINICH. I thank the chairman very much, and I promise you that my statement will not take your breath away.

I want to thank Mr. Tierney for the excellent work that he has done on this issue, and we both, I know, appreciate the Chair calling this hearing on the F–22.

If there is a single message this subcommittee can send to the Secretary of Defense at the conclusion of our work here today, let it be this: End this program. Let it be a resounding and unified statement to pull the plug on this ill-fated program before we waste billions and billions of dollars, which are hard earned dollars paid by the American taxpayers. I hope the Secretary has a chance to review the testimony of the head of the U.S. General Accounting Office.

Mr. Walker, thank you for being here today. It's a pleasure to have you before our committee.

I have reviewed Mr. Walker's statement, and I can say I have seldom seen a statement from the GAO that is so comprehensive, so thorough, and so damning as to the testimony he has provided to this committee. It highlights the F–22 program as a prime example of how not to develop an aircraft. This program will end up

being the poster child for a weapons development program gone awry.

I hope the Secretary also listens to our independent experts in the final panel. They come from outside government and have no stake in this other than ensuring our defenses are strong and our taxpayers' dollars are not wasted. And I think that equation is very important for the American people, because there is some assumption that simply by spending a lot of money you are going to get a lot of defense. Sometimes spending a lot of money just means spending a lot of money.

The people who are here who are the outside government experts are from the nonpartisan project on government oversight, the budget watchdog group, Taxpayers for Common Sense and the highly esteemed Center for Defense Information. I hope that the Secretary will listen to their unanimity expressed, and end this program. Listen to Colonel Everest Riccioni, one of the developers behind the F–16, who said: The cost of this aircraft are escalating to insane levels, so high, in fact that we will be able to afford only 100 to 175 planes. He says: This result is manifestly absurd because it will render our fleet impotent.

Listen to him. End this program.

Of course, everyone knows how badly the Air Force wants this aircraft, but production costs have increased nearly $20 billion since 1996. The number of planes the Pentagon can afford has plummeted to less than a third of their original goal.

I realize there are many devoted people working very diligently, both at the Pentagon and for the contractors trying to streamline this process and find production efficiencies. The fundamental issue, however, is the underlying program of cost and growth of cost that has never been addressed. Efforts to fund production improvement plans are an afterthought, a remedial effort to offset damage that has already been done and will continue far into the future. Judging from their actions, certain Air Force officials know they're trouble. They have lashed out, accusing the GAO of inaccurately portraying the state of the program.

Even worse, the Air Force and Department have simply begun to disregard the Federal statute that governs the overall costs of this program. The Air Force has argued, justified, and spun this as best they can. Their latest effort is called buy to budget. Or, maybe considering the cost of this, it should be good-bye to budget. I don't know what their slogan signifies, but if it means ignoring the congressional cost cap, consistently underestimating production cost growth, and then denying that they have a problem, they are definitely succeeding.

Mr. Chairman, I support the elimination of weapons systems like the F–22 that are spiraling out of control with no end in sight. I support the budget submitted by the Congressional Black Caucus and the Progressive Caucus, which cancels the F–22 and replaces it with the increased procurement of the F–16. We can have a strong defense without having to spend and waste the kind of money that's being wasted.

The Air Force will point out, correctly, that its fleet is aging rapidly and we need to replace hundreds of fighters. But buying fewer than 200 F–22s will do little to alleviate this problem. Instead, why

not buy 500 F–16s and save the taxpayers $25 billion over the next 10 years?

Mr. Chairman, again, I want to thank you for holding this hearing. I want to conclude my statement by urging the Secretary, in addition to listening to the chorus of voices coming from this committee today, to also listen to his own better judgment. This was what was told to him when he came to the Pentagon, and I think that this type of program which we are going through today is the kind that should be ended; and hopefully, the Secretary will agree with our assessment. Thank you, Mr. Chairman. Thank you, Mr. Tierney.

Mr. SHAYS. I thank the gentleman.

[The prepared statement of Hon. Dennis J. Kucinich follows:]

Opening Statement
Representative Dennis J. Kucinich

Ranking Member
Subcommittee on National Security,
Emerging Threats, and International Relations

April 11, 2003

MR. CHAIRMAN, THANK YOU FOR CALLING THIS HEARING ON THE F-22.

IF THERE IS A SINGLE MESSAGE THIS SUBCOMMITTEE CAN SEND TO SECRETARY OF DEFENSE DONALD RUMSFELD AT THE CONCLUSION OF OUR WORK HERE TODAY, LET IT BE THIS — **KILL THIS PROGRAM.**

LET IT BE A RESOUNDING AND UNIFIED STATEMENT TO PULL THE PLUG ON THIS ILL-FATED PROGRAM, BEFORE WE WASTE **BILLIONS** AND **BILLIONS** OF DOLLARS.

I HOPE SECRETARY RUMSFELD HAS THE CHANCE TO REVIEW THE TESTIMONY OF DAVID WALKER, THE HEAD OF THE U.S. GENERAL ACCOUNTING OFFICE. MR. WALKER, THANK YOU FOR BEING HERE TODAY. IT IS A RARE PLEASURE TO HAVE YOU BEFORE OUR COMMITTEE.

I HAVE REVIEWED MR. WALKER'S STATEMENT, AND I CAN SAY I HAVE NEVER SEEN A STATEMENT FROM G.A.O. THAT IS SO COMPREHENSIVE, SO THOROUGH, AND SO DAMNING AS THE TESTIMONY HE HAS PROVIDED TO THIS COMMITTEE.

IT HIGHLIGHTS THE F-22 PROGRAM AS A PRIME EXAMPLE OF HOW **NOT** TO DEVELOP AN AIRCRAFT. THIS PROGRAM IS THE POSTER-CHILD FOR DYSFUNCTIONAL WEAPONS DEVELOPMENT.

I HOPE SECRETARY RUMSFELD ALSO LISTENS TO OUR INDEPENDENT EXPERTS IN THE FINAL PANEL. THEY COME FROM OUTSIDE GOVERNMENT AND HAVE NO STAKE IN THIS OTHER THAN ENSURING THAT OUR DEFENSES ARE STRONG AND OUR TAXPAYER DOLLARS ARE NOT WASTED.

THEY ARE FROM THE NON-PARTISAN PROJECT ON GOVERNMENT OVERSIGHT, THE BUDGET WATCHDOG GROUP TAXPAYERS FOR COMMON SENSE, AND THE HIGHLY-ESTEEMED CENTER FOR DEFENSE INFORMATION. SECRETARY RUMSFELD, LISTEN TO THEIR UNANIMOUS STATEMENTS — **KILL THIS PROGRAM.**

LISTEN TO COLONEL EVEREST RICCIONI — ONE OF THE DEVELOPERS BEHIND THE F-16 — WHO SAYS THE COSTS OF THIS AIRCRAFT ARE ESCALATING TO "INSANE LEVELS." SO HIGH IN FACT THAT WE WILL BE ABLE TO AFFORD ONLY 100 TO 175 PLANES. HE

SAYS THIS RESULT IS "MANIFESTLY ABSURD" BECAUSE IT WILL RENDER OUR FLEET "IMPOTENT." LISTEN TO HIM — **KILL THIS PROGRAM.**

OF COURSE, EVERYONE KNOWS HOW BADLY THE AIR FORCE WANTS THIS AIRCRAFT. BUT PRODUCTION COSTS HAVE INCREASED NEARLY 20 BILLION DOLLARS JUST SINCE 1996. THE NUMBER OF PLANES THE PENTAGON CAN AFFORD HAS PLUMMETED TO LESS THAN A THIRD OF THEIR ORIGINAL GOAL.

I REALIZE THERE ARE MANY DEVOTED PEOPLE WORKING VERY DILIGENTLY BOTH AT THE PENTAGON AND FOR THE CONTRACTORS TRYING TO STREAMLINE THIS PROCESS AND FIND PRODUCTION EFFICIENCIES. THE FUNDAMENTAL ISSUE, HOWEVER, IS THAT THE UNDERLYING PROBLEM OF COST GROWTH HAS NEVER BEEN ADDRESSED.

EFFORTS TO FUND PRODUCTION IMPROVEMENT PLANS ARE AN AFTERTHOUGHT — A REMEDIAL EFFORT TO OFFSET DAMAGE THAT HAS ALREADY BEEN DONE, AND WILL CONTINUE FAR INTO THE FUTURE.

JUDGING FROM THEIR ACTIONS, AIR FORCE OFFICIALS KNOW THEY ARE IN TROUBLE. THEY HAVE LASHED OUT, ACCUSING G.A.O. OF "INACCURATELY PORTRAYING THE STATE OF THE PROGRAM."

EVEN WORSE, THE AIR FORCE AND THE DEPARTMENT HAVE SIMPLY BEGUN TO DISREGARD THE FEDERAL STATUTE THAT GOVERNS THE OVERALL COSTS OF THIS PROGRAM.

THE AIR FORCE HAS ARGUED, JUSTIFIED, AND SPUN THIS AS BEST THEY CAN. THEIR LATEST EFFORT IS CALLED "BUY-TO-BUDGET." I DON'T KNOW WHAT THIS SLOGAN SIGNIFIES, BUT IF IT MEANS IGNORING THE CONGRESSIONAL COST CAP, CONSISTENTLY UNDERESTIMATING PRODUCTION COST GROWTH, AND THEN DENYING THAT THEY HAVE A PROBLEM, THEY ARE DEFINITELY SUCCEEDING.

MR. CHAIRMAN, I SUPPORT THE ELIMINATION OF WEAPON SYSTEMS LIKE THE F-22 THAT ARE SPIRALING OUT OF CONTROL, WITH NO END IN SIGHT. I SUPPORT THE BUDGET SUBMITTED BY THE CONGRESSIONAL BLACK CAUCUS AND THE PROGRESSIVE CAUCUS, WHICH CANCELS THE F-22 AND REPLACES IT WITH INCREASED PROCUREMENT OF THE F-16.

THE AIR FORCE WILL POINT OUT, CORRECTLY, THAT ITS FLEET IS AGING RAPIDLY AND THAT WE NEED TO REPLACE HUNDREDS OF FIGHTERS. BUT BUYING FEWER THAN 200 F-22's WILL DO LITTLE TO ALLEVIATE THIS PROBLEM. INSTEAD, WHY NOT BUY 500 F-16's AND SAVE THE TAXPAYERS $25 BILLION OVER THE NEXT TEN YEARS?

MR. CHAIRMAN, I WANT TO THANK YOU AGAIN FOR HOLDING THIS HEARING. I CONCLUDE MY STATEMENT BY URGING

SECRETARY RUMSFELD, IN ADDITION TO LISTENING TO THE CHORUS OF VOICES COMING FROM THE CANNON BUILDING TODAY, ALSO TO LISTEN TO HIS OWN BETTER JUDGEMENT. IT TOLD HIM WHEN HE CAME INTO THE PENTAGON THAT THIS WAS EXACTLY THE TYPE OF PROGRAM THAT SHOULD BE KILLED.

THANK YOU, MR. CHAIRMAN.

Mr. SHAYS. Mr. Tierney, if you are ready, I would love it if you would give your statement. I would just say that you have been a very active member of this committee in general and very clearly interested in this issue. This is the fourth hearing we've had, and I will say it's good to have institutional knowledge because we remember the three before.

Mr. Tierney.

Mr. TIERNEY. Thank you, Mr. Chairman. Actually, I want to thank you. Under your leadership, this subcommittee has pursued our goal, and that is one of achieving the appropriate level of readiness to defend against and respond to the sophisticated threats that our Nation may be facing. As you said, over the past 4 years, and particularly on this issue, I think we have lived up to the oversight responsibility, aggressively monitoring waste, fraud, and abuse as it relates to the Pentagon's procurement process. I appreciate your convening this meeting, and I think this fourth meeting is going to be telling.

At past hearings, we questioned the Air Force and Defense Department personnel on the skyrocketing costs, on anticipated production and development delays, and recurrent infrastructure problems of the F/A–22. In response, we received assurances that these problems were being aggressively managed as various initiatives were being implemented. Unfortunately, today, in light of the new report released by GAO, we are here to ask the same questions and demand some real answers.

My skepticism about this program, Mr. Chairman, and the viability of the F/A–22 has grown exponentially. This program, which began over 15 years ago, has yet to yield the expected results. As far as I'm aware, there is no dispute that the F/A–22 program has had $20 billion of unanticipated cost growth since 1996. In addition, the number of aircraft the Defense Department can purchase has plummeted from 648 to less than 224. The program has also encountered critical testing programs, including buffeted vertical fins, weak horizontal tails, overheating, and persistent instability in the development of avionics. Last month, test planes were grounded because the landing gear on one aircraft collapsed after the weapons bay doors—under the weapons bay doors.

Rather than addressing all these issues on their merits, the Air Force and the Defense Department have chosen a different path. It appears that they have been less than forthcoming with us and with you, Mr. Chairman, and with the investigative arm of Congress, the General Accounting Office.

Let me give you just a few examples. Issued in February, the GAO report we are discussing today recommended that the Pentagon reconsider its plan to forge ahead prematurely with the production of additional aircraft, at least until testing problems were remedied. The Department of Defense appears to have rejected this recommendation. On March 28, a Washington Post article revealed that the Department of Defense's Defense Acquisition Board approve the purchase of 20 additional aircraft. In this report, GAO recommended that the Pentagon fully fund initiatives for production efficiencies, which was, after all, a program of production efficiencies proposed and planned by the Department and approved by Congress.

Apparently, the Department of Defense no longer intends to follow this course. In a January 2003 letter, they inexplicably blame the General Accounting Office for not proving that these plans would actually save money when, as I mentioned, in fact, it was the Pentagon's origination of that plan, that emanated from the Defense Department.

The General Accounting Office's report also recommended that the Pentagon provide Congress with information on additional cost growth that could occur if production efficiencies do not materialize. The Department of Defense wrote in that January letter to Mr. Allen Li of GAO that they found no reason to comply with GAO's recommendation. GAO recommended that the Pentagon provide Congress with information on precisely how many aircraft it can procure within current cost limitations. In this case, the DOD also found no reason to comply.

Mr. Chairman, more than just turning a blind eye to suggested recommendations of the General Accounting Office, those in charge of this program have not strictly adhered to actions taken by Congress, nor have they been responsive to requests of Members. For instance, in the fiscal year 1998, Department of Defense authorization bill, Congress directed the Pentagon to adhere to a production cost cap. Rather than proceeding as directed, it appears the Pentagon has now begun using its own cost cap, which is more than $6 billion higher than the one Congress established.

And, Mr. Chairman, in a letter to the Pentagon in August 2001, you requested information on projections and methodologies for future cost savings. To my knowledge, the Department of Defense did not comply with your request, and you were forced to write to the Appropriations and Armed Services Committees complaining that the Pentagon was obstructing the committee's oversight work.

In preparation for today's hearing, in a response to the GAO's February report, I wrote to Secretary Rumsfeld on March 19 asking him for similar information: The number of aircraft they expect to be able to purchase within the cost cap, and the various risks of future cost growth, and I asked for that information by April 7. I received a late response, which I think can fairly be characterized as unresponsive to the questions that were specifically raised. Let me just quote, Mr. Chairman, the response from this letter: "since the Department intends to seek legislation to increase the congressional cap on production, the Air Force does not estimate how many F/A–22 aircraft can be procured within that figure."

Translated, it means: Since we have no intention of complying with Congress's cost cap, we are not going to answer your question, and we are going to just try to make sure we get the votes to get that jacked up again and continue on with this folly.

Let me reiterate that this program has had $20 billion in cost growth since 1996, and the Department ultimately will procure less than one third of the amount of aircraft they originally planned.

When will the Department be held accountable for a failing program, and how much longer are we going to allow costs to skyrocket uncontrollably? I sincerely hope, Mr. Chairman, that at today's hearing we get some honest answers, not empty assurances and equivocations; that we get them from all of our witnesses on these issues, so we can reevaluate this program and assess if there

are wiser investments that we can make or not. We need straight talk from the Department today, because this issue has far-reaching effects. As we strive toward a leaner, more agile defense system, and in the midst of obligations in Iraq and Afghanistan and elsewhere, unabated deficits and many other urgent spending priorities, ultimately we have to make a decision in this program of whether it's worth it or not, whether it's worth the exorbitant funding, or whether we can put that to better military procurement or Homeland Security or other uses.

I look forward to hearing from our witnesses, Mr. Chairman. And, again, I thank you for your good work on this issue and others.

Mr. SHAYS. I thank the gentleman.

[The prepared statement of Hon. John F. Tierney follows:]

Congress
of the
United States
House of Representatives
JOHN F. TIERNEY
MASSACHUSETTS
SIXTH DISTRICT

Statement of Congressman John F. Tierney (MA-06)
Subcommittee on National Security, Emerging Threats, and International Relations
"Controlling Costs in Tactical Aircraft Programs"
April 11, 2003

Thank you. Mr. Chairman.

Under your leadership, this Subcommittee has pursued our goal of achieving the appropriate level of readiness to defend against, and respond to, the sophisticated threats our nation now faces.

Mr. Chairman, over the past four years, and particularly on this issue, this Subcommittee has lived up to its oversight responsibility, aggressively monitoring waste, fraud, and abuse as it relates to the Pentagon's procurement process.

I appreciate you convening what I believe is this Subcommittee's fourth hearing on the F/A-22 program.

At those past hearings, we questioned Air Force and Defense Department personnel on the skyrocketing costs, unanticipated production and development delays, and recurrent infrastructure problems of the F/A-22. In response, we received assurances that these problems were being aggressively managed, as various initiatives were being implemented.

Unfortunately, today, in light of a new, damning report released by GAO, we are here to ask the same questions and demand some real answers.

My skepticism about the viability of the F/A-22 has grown exponentially. This program, which began over 15 years ago, has yet to yield the expected results.

As far as I am aware, there is no dispute that the F/A-22 program has had $20 billion of unanticipated cost growth since 1996. In addition, the number of aircraft the Defense Department can purchase has plummeted from 648 to less than 224.

The program has also encountered critical testing problems, including buffeting vertical fins, weak horizontal tails, overheating, and persistent instability in the development of the avionics. Last month, test planes were grounded because the landing gear on one aircraft collapsed under the weapons bay doors.

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Rather than addressing all of these issues on their merits, the Air Force and the Defense Department have chosen a different path. It appears that they have been less than forthcoming with us, with you, Mr. Chairman, and with the investigative arm of Congress, the General Accounting Office.

Let me give you several examples.

Issued in February, the GAO report we are discussing today recommended that the Pentagon reconsider its plan to forge ahead prematurely with the production of additional aircraft, at least until testing problems are remedied.

> DOD appears to have rejected this recommendation. A March 28 Washington Post article revealed that DOD's Defense Acquisition Board approved the purchase of 20 additional aircraft.

In its report, GAO recommended that the Pentagon fully fund initiatives for production efficiencies, as planned by the Department and as approved by Congress.

> Apparently, DOD no longer intends to follow this course. In a January 2003 letter, they inexplicably blamed GAO for not proving these plans would actually save money, when the plan originated from Defense Department.

GAO's report also recommended that the Pentagon provide Congress with information on additional cost growth that could occur if production efficiencies do not materialize.

> DOD wrote, in that January letter to GAO, that they found "no reason" to comply with GAO's recommendation.

GAO recommended that the Pentagon provide Congress with information on precisely how many aircraft it can procure within current cost limitations.

> In this case, DOD also found "no reason" to comply.

Mr. Chairman, more than just turning a blind eye to suggested recommendations of GAO, those in charge of this program have not strictly adhered to actions taken by Congress nor have they been responsive to requests of Members.

For instance:

In the FY98 DOD Authorization bill, Congress directed the Pentagon to adhere to a production cost cap.

> Rather than proceeding as directed, it appears the Pentagon has now begun using its own cost cap, which is more than $6 billion higher than the one Congress established.

Mr. Chairman, in a letter to the Pentagon in August 2001, you requested information on projections and methodologies for future cost savings.

To my knowledge, DOD did not fully comply with your requests. You were forced to write to the Appropriations and Armed Services Committees, complaining that the Pentagon was obstructing the Committee's oversight work.

In preparation for today's hearing, and in response to GAO's February report, I personally wrote to Secretary Rumsfeld on March 19, asking him for similar information — the number of aircraft they expect to be able to purchase within the cost cap and the various risks of future cost growth – by April 7.

I received a belated response, which can be fairly characterized as unresponsive to the questions I specifically asked.

Let me reiterate: this program has had $20 billion in cost growth since 1996, and the Department ultimately will procure less than one-third of the amount of aircraft they originally planned.

When will the Department be accountable for a failing program?

How much longer are we going to allow costs to skyrocket uncontrollably?

I sincerely hope that today we get honest answers – not empty assurances and equivocations – from our witnesses on all these issues so that we can formally reevaluate the F/A-22 program and assess if there are wiser investments that we can make.

We need straight talk from the Department because this issue has far-reaching effects.

As we strive toward a leaner, more agile defense system, and in the midst of obligations in Iraq, in Afghanistan, and elsewhere, unabated deficits, and many other urgent spending priorities, ultimately, we have to make a decision if this program is worth it or if the exorbitant funding can be put to better military procurement or homeland security uses.

I look forward to hearing from the witnesses.

Thank you.

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John F. Tierney
Washington, DC 20515
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The Honorable John F. Tierney
Representative in Congress
Washington, DC 20515-2106

Dear Representative Tierney:

This is in response to your letter to the Secretary of Defense regarding the F-22 Low-Rate Initial Production (LRIP) decision.

The Department plans to add $2.0 billion in the LRIP phase of the program and $3.4 billion in Full-Rate Production (FRP). Accordingly, the new program estimate is $43 billion instead of $45 billion.

Based on OSD CAIG insights, the Department estimates that 295 aircraft can be procured under its revised acquisition plan and budget, not including the Production Representative Test Vehicle (PRTV) aircraft. If the program were to remain under the current congressional cost cap of $37.6 billion for production, the Department estimates that only 224 aircraft could be procured, not including the PRTV aircraft. If planned cost reduction initiatives prove more successful than the OSD CAIG estimates, the Air Force may procure more aircraft under the revised plan.

The Engineering and Manufacturing Development program is about 90 percent complete, and retention of the cap would not contribute appreciably to further cost control. The Department asked the Congress to drop the Research, Development, Test and Evaluation cost cap for the F-22 program in a letter dated August 1, 2001. The Department has implemented cost control measures in production and will continue to monitor progress closely. I believe the new estimate is evidence of the commitment we have made to more realistic costing for our major weapon system programs. Therefore, retention of a production cap would have a marginal effect on cost control, and I requested the Congress remove the current production program cost cap in a letter dated September 13, 2001.

Sincerely,

E. C. Aldridge, Jr.

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Congress
of the
United States
House of Representatives
JOHN F. TIERNEY
MASSACHUSETTS
SIXTH DISTRICT

March 19, 2003

The Honorable Donald Rumsfeld
Secretary of Defense
U.S. Department of Defense
Washington, DC 20301-1155

Dear Mr. Secretary:

Based on the results of a recent report from the U.S. General Accounting Office (GAO), I am writing to express my disappointment regarding cost overruns in the F/A-22 Raptor program. I am also concerned with GAO's findings that the Defense Department has failed to provide Congress with specific information related to the total estimated cost of the F/A-22 production program or the quantity of aircraft that can be purchased within the cost limitation set by Congress. In anticipation of an upcoming Committee on Government Reform Subcommittee hearing, I request that you provide the specific information requested below.

Last week, I released a GAO report entitled "Tactical Aircraft: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth," a copy of which I enclose.[1] In this report, GAO raised significant concern with the Defense Department failing to inform Congress "about specifics related to the total cost of the F/A-22 production program." GAO found that "OSD's latest cost estimate does not include costs identified by the Air Force during the development of the Air Force's current F/A-22 acquisition plan."

According to GAO, the Department failed to include in its production cost estimate $1.29 billion in cost overruns. GAO also reported that the Office of the Secretary of Defense (OSD) believes these costs "should be considered in any future OSD production estimate." GAO's finding that the Department did not provide Congress information about the total F/A-22 production costs was also supported by the Department's admission last fall that $876 million in overruns had not been included in the Department's development cost estimate at that time.[2]

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[1]U.S. General Accounting Office, *Tactical Aircraft: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth* (Feb. 28, 2003) (GAO-03-280).

[2]According to GAO, $763 million of this amount was transferred from the production program and $113 million from planned modernization funds to the research and development account to cover cost increases in development.

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GAO also raised concern with the Defense Department's failure to inform Congress about "the quantity of aircraft that can be purchased within the cost limitation." As you know, Congress placed a cap on the amount of funding the Department will have for the production of the F/A-22. Currently, that cap stands at $36.8 billion. Congress established this cap to keep the costs of this program under control, while allowing the Department to determine the number of aircraft it could procure for that amount.

Rather than reporting the number of aircraft the Department could acquire within the congressional cap, the Defense Department has been providing its own "estimate" of costs that exceeds the congressional cap. This estimate is currently $42.2 billion — $5.4 billion higher than the congressional cap. Because of the Department's actions, this number has often been reported in the press — incorrectly — as the congressional cap.[3]

As a result of using its own cost estimate rather than the congressional cost cap, the Defense Department has not been providing Congress with information about the number of aircraft it can procure within the cap. According to GAO, "official documentation provided to Congress to date has not provided the number of aircraft that can be purchased for this amount." Even for the Department's own higher cost estimate, there is apparently some dispute within the Pentagon as to the number of aircraft the Department could buy. For example, Air Force Secretary James Roche made this comment three weeks ago:

> If you use the CAIG [Cost Analysis Improvement Group] division you get 276. I don't care what the hell ours is. It's 310. Who cares?[4]

Aside from the dismissive suggestion that Congress has no interest in the number of aircraft the Department can procure, Secretary Roche's statement still did not answer the question of how many aircraft could be procured **within the congressional production cost cap.** His numbers referred to the Department's estimate of $42.2 billion. In order to obtain a direct answer to this question, I wrote to E.C. Aldridge, Jr., Under Secretary of Defense for Acquisition and Technology. In response, I received a letter on October 10, 2001, which included the following statement:

> If the program were to remain under the current congressional cost cap of $37.6 billion for production, the Department estimates that only 224 aircraft could be procured.[5]

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[3]*See, e.g., Potential F/A-22 Cost Overrun of $690 Million Is Announced,* Washington Post (Nov. 8, 2002) (reporting incorrectly that the program is "already capped by Congress at $45 billion for 295 planes").

[4]*Roche: F/A-22 Could 'Earn Its Own Way' to More Production Money,* Inside the Air Force (Feb. 28, 2003).

[5]Letter from E.C. Aldridge, Jr. to Representative John F. Tierney (Oct. 10, 2001

This is 86 fewer aircraft than the Air Force is publicly claiming that it can procure. In addition, this statement was made before revelations about further cost overruns, including $1.29 billion in cost overruns identified by GAO and $763 million transferred away from the production program last fall.

At the same time, industry representatives seem to be downplaying the significance of these cost overruns. According to *The Washington Post,* one contractor claimed that "production costs have declined over time," while another industry official predicted: "That $1 billion overrun might not mean anything in five or 10 years."[6]

It is evident that program officials have not demonstrated an ability to accurately predict or effectively control the costs of this program. Despite repeated assurances that estimates were sound, huge cost overruns continue to develop. The Department identified production cost overruns of $13. billion in 1997, $5.4 billion in 2001, and another $876 million in development cost growth last fall. In addition to GAO's latest finding of another $1.29 billion in production cost overruns, GAO officials found that "production costs are likely to increase more."

With this background, would like specific answers to the following questions

(1 As mentioned, in October 2001, the Department believed it could procure only 224 aircraft within the congressional cost cap. Taking into consideration the $1.29 billion in overruns identified by GAO and the $763 million the Department transferred away from the production program last fall, how many aircraft could be purchased now within the congressional production cost cap?

(2) GAO identified several other areas in which costs are likely to grow. These included additional program delays which would further delay multiyear procurement, potential increases in fiscal year 2005 production lot costs, reliance on concurrent production of the Joint Strike Fighter, the level of support cost funding, and the likelihood that cost reduction plans will not offset cost growth. For each of these five areas, please provide the following:

(a) A description of the specific risks involved in each area;

(b) An estimate of the potential cost increases in each area should these risks materialize; and

(c) An estimate of the number of aircraft the Department would have to forego as a result of increased costs in each area should these risks materialize, while still remaining within the congressional cost limitation.

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[6] *Lockheed Fighter Jet $1.3 Billion Deeper in Red,* Washington Post (Mar. 13, 2003).

The Honorable Donald Rumsfeld
Page 4

The Committee on Government Reform's Subcommittee on National Security, Emerging Threats, and International Relations intends to hold a hearing on these issues on April 11, 2003. With this in mind, I would appreciate if you could have your responses to me by April 7, 2003.

Sincerely,

John F. Tierney
Member of Congress

Enclosure
CC. The Honorable Christopher Shays, Chairman
The Honorable Dennis Kucinich, Ranking Member

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QUISITION,
CHNOLOGY
LOGISTICS

APR 7 2003

The Honorable John F. Tierney
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Tierney:

Thank you for your letter to Secretary Rumsfeld regarding your concerns about cost overruns in the F/A-22 Raptor program. I too am concerned about the cost growth that has occurred in this program and have taken steps to better guard further growth in the future.

Since the Department intends to seek legislation to increase the Congressional cap on production, the Air Force does not estimate how many F/A-22 aircraft can be procured within that figure. The Air Force's current program estimate of 276 aircraft ($43 billion in BY2001 dollars) accounts for all known issues, including those addressed in your letter and a five percent risk factor for future unknowns. The OSD's Cost Analysis Improvement Group (CAIG) also has performed an independent assessment of the Air Force production cost estimate and has not identified any major discrepancies with the Air Force's estimate. In fact, the current production cost estimates have converged and are now within three percent of one another. This high level of agreement between the Air Force and CAIG cost estimates increases our confidence in the fidelity of the current estimates. At the low-rate initial production Defense Acquisition Board review, the Department approved a procurement budget $5.4 billion higher than the Congressional cost cap (currently $37.6 billion in BY2001 dollars). This put the program on a better footing by budgeting to a more realistic cost estimate, consistent with the CAIG's assessment. If the Department were to estimate the production of aircraft under the existing Congressional cap, we likely would project production of 40 to 50 fewer aircraft than we estimate currently.

Your letter inquired about cost growth due to delays to multiyear procurement, 2005 production costs, concurrent Joint Strike Fighter (JSF) production, support cost funding, and the Program Cost Reduction Program. The $1.3 billion of cost growth highlighted in the GAO-03-280 report has already been incorporated in the Air Force estimates. Predicting additional cost increases, and the resulting off-sets in terms of aircraft production, is impossible at this time for

any of the GAO-proposed growth areas. As the program progresses, we will continue to evaluate any potential increased cost or schedule impact on a case-by-case basis and take appropriate actions. Notwithstanding this, the following discussion addresses our confidence in the areas that the GAO has highlighted.

- Additional Delays to Multiyear Procurement: Multiyear procurement is planned for FY07. Multiyear procurement is a critical element of achieving stability in the F/A-22 program. The loss of savings associated with this delay in multiyear start is accounted for in the current 276-aircraft estimate.

- 2005 Production Costs: Production costs will be based on Lockheed-Martin proposed and negotiated pricing. As the design matures, we expect the variables in the contractual process to stabilize, including the contractor's long-term commitments with suppliers. The current aircraft estimate is based on actual aircraft costs through Lot 3 and adjusted learning curve estimates for future lots.

- Concurrent Joint Strike Fighter (JSF) Production: We will leverage production and systems commonality with the JSF to reduce costs for both the F/A-22 and JSF. Overhead rate reductions, as well as commonality in parts and processes, offer savings. Examples of common systems include: the engine, which is derived from the F/A-22 engine; avionics, which share approximately 10 percent of total mission software; and the radar, which will be integrated into an F/A-22 future spiral.

- Support Cost Funding: The F/A-22 recently completed 3,000 flight test hours, and we continue to refine the program support cost estimates with higher fidelity information based on actual flight experience. The Department directed the Air Force to ensure support costs are fully-funded as part of the FY05 budget.

- Program Cost Reduction Program: The Air Force implemented a comprehensive Production Cost Reduction Program designed to address all aspects of F/A-22 affordability. This program includes multiyear procurement, lean manufacturing initiatives, aggressive management of Diminishing Manufacturing Sources, as well as direct investment in Producibility Improvement Plans (PIPs). The Air Force invested $360 million thru FY03, included $85 million in the FY04 budget, and plans to invest $20 million in FY05 and $10 million in FY06, satisfying the original $475 million investment plan. The current 276-aircraft estimate assumes a return-on-investment (ROI) of 5.6:1 for future cost reduction initiatives. We believe this is a reasonable approach.

The Department's goal is to ensure that the F/A-22 program meets established performance requirements, at an acceptable cost, and on an acceptable schedule. Our buy-to-budget strategy should help us achieve this goal.

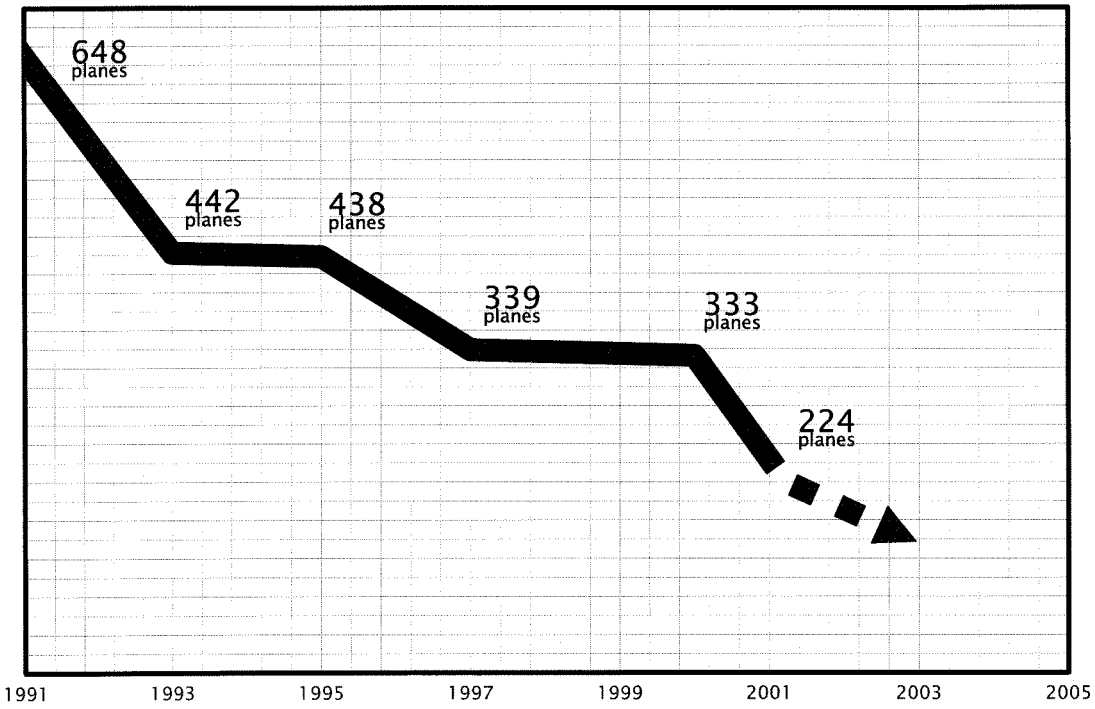
Sincerely,

E.C. Aldridge, Jr.

cc:
The Honorable Christopher Shays
The Honorable Dennis Kucinich

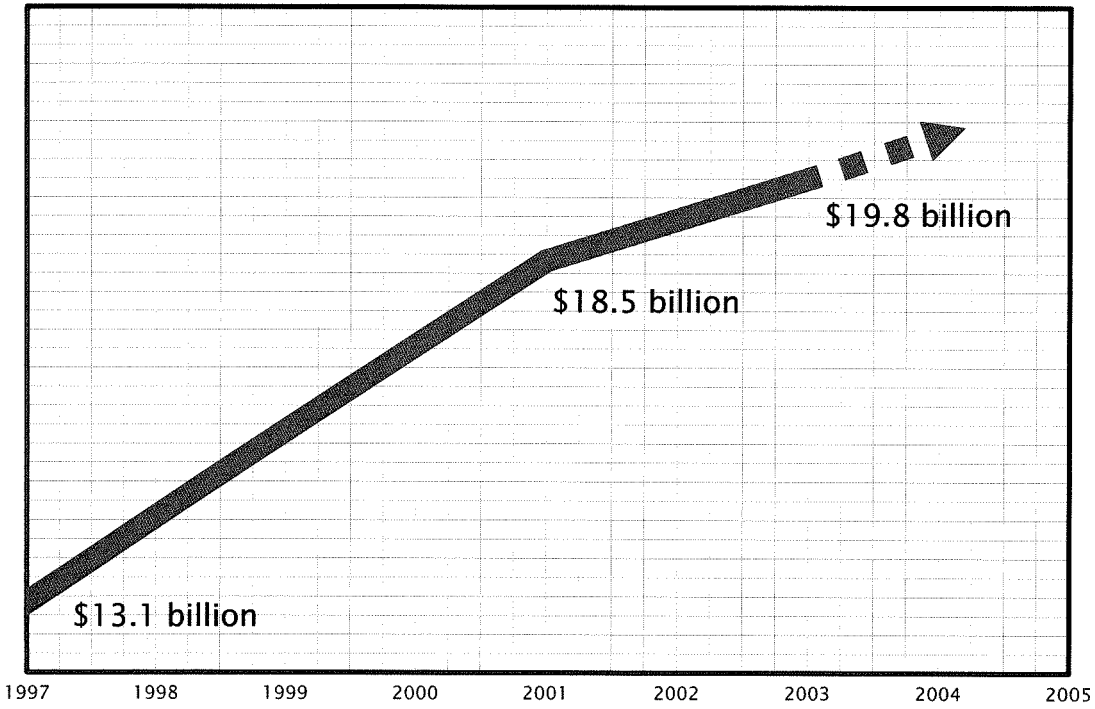
F/A-22: Number of Aircraft

Within Congressional Cap After Passage



F/A-22: Production Cost Growth

Cumulative Increase



Mr. SHAYS. At this time, we will recognize Mr. Schrock.

Mr. SCHROCK. Thank you, Mr. Chairman.

This is deja vu all over again for me. For about 38 years, most of which was spent in the U.S. Navy, I have heard discussions like this on every air frame that's come down the pike. All we are doing is changing the date from those that I used to hear about when I was active duty Navy.

We need to understand one thing. When you develop an air frame, it is going to cost a lot of money, it's going to take a lot of time. There are going to be a lot of changes, there are going to be a lot of unhappy people. Just use the C–17 as an example. Everybody thought that was a horrible waste of money, and we realize now it's been a workhorse in this conflict in Iraq, and we need more of them now. And it seems like we tinker with these programs so much, that's why we have today, that number tomorrow, and a week from now it will be another number.

I don't agree at all as the first speaker said that we should pull the plug on this program. We are 4 minutes from the last of the fourth quarter, we are about to win this thing. I am going to ask the Comptroller General at some point on page 7 of the GAO report it talks about the production improvement program. And you look at what it was in 2000, and you look at the incredible improvement it was in 2001. But I see nothing there for 2002. When I looked at my BlackBerry this morning, this is the fourth month of 2003; so I should certainly think that somewhere in this thing we should show what the improvements are for 2002, and I don't see that at all.

We are putting young men and women in air frames that are falling out of the sky. I am not unconvinced that some of the crashes we've had in all of the services in the last year or so are because they are riding, they're flying in old air frames that simply have just outlived their usefulness. And if we are truly going to change that, we have got to get some new air frames in production. And the F–22 is clearly one of them. I have sat in the simulator of the F–22; I have gotten a good strong briefing on it, and I for one, based on my military experience, am convinced that this is the air frame of the future for the U.S. Air Force. It does things that no other air frame can do. And, based on the threat we are going to be facing in the decades ahead, it certainly is something that we have to take into consideration. There is—the tax dollars are not being wasted on this. It costs a lot of money to develop these air frames, and we need to continue doing that.

Talk about institutional knowledge. I realize there is some institutional knowledge up here, but I would suggest that 38 years of institutional knowledge on my part makes me somewhat knowledgeable on what these programs can do and what we need to do to make them work. And sure it's taken 15 years in development. But look at the history of a lot of other aircraft; it has taken a long, long time to get these in the fleet in the case of the Navy and with the Air Force and the Army and the other two services. But it takes a long time to make sure you get it right. And that is the purpose of testing, you know; sure you are going to have problems, but that is what testing is all about. If the attitude I have heard here this morning had prevailed 100 years ago, we would still be

flying the Wright Flyer with Orville and Wilbur. And I think we need to change that, and we need to change that pretty quickly.

So I for one am anxious to hear what the testimony says today, and—that the people are going to testify will say today, and I have some questions for them as well.

So, Mr. Chairman, I just think when lives are at stake and when the future of our country is at stake, we cannot sit still and sit idly by and allow our folks to be flying in air frames that have simply outlived their usefulness. And I look forward to our hearing today. Thank you.

Mr. SHAYS. I thank the gentleman.

Mr. Murphy, I understand you don't have a statement.

Mr. MURPHY. No, sir.

Mr. SHAYS. Thank you.

I will just conclude, and then Mr. Walker, thank you for your statements. So we will swear you in then.

Acquisition reform at the Department of Defense [DOD], remains a promise unfulfilled. Despite much heralded intentions to shed cold war inefficiencies and bad habits, the Pentagon is still falling prey to rampant cost growth and interminable schedule slippage in the development of multi million dollar weapon systems. The gulf between promise and practice has been apparent for some time. In tactical aircraft acquisitions, particularly the Air Force F/A–22 Raptor program. As in the past, we appear posed to spend far more than planned for far fewer aircraft. In three previous hearings before this subcommittee on F–22, development and production reforms, successive projections have stabilized costs and realistic timetables have proven at best—at best, optimistic, with projected production costs now $6.7 billion over the $36.8 billion statutory cap, the magnitude and persistence of rosy but wrong estimates suggest problems far more fundamental than mere overconfidence.

For some time the General Accounting Office [GAO], has been studying F–22 acquisition strategies and DOD adherence to commercial best practices. At the request of our subcommittee, colleague Congressman John Tierney, GAO also examined current production cost projections and the extent to which those costs are being accurately conveyed to Congress. Today, we also release the GAO report done at the subcommittee's request that finds substantial waste stemming from the failure to develop standardized rather than system specific aircraft tests and maintenance equipment.

Unless aggressive cost controls and other acquisition reform strategies are embraced by F–22 program management, the aptly named Raptor is at risk of devouring itself.

As we will hear in testimony today, findings and recommendations by GAO and others on tactical aircraft acquisitions aimed to stop the hemorrhaging of time and money in the F–22 program and prevent those problems and other major procurements critical to fighter fleet modernization as our witnesses bring important information and expertise to our discussion, and we look forward to their testimony. All our witnesses bring important information and expertise to our discussion, and we look forward to their testimony.

We are particularly grateful to Comptroller General David Walker for his leadership of GAO on this issue, and we appreciate the continued and thoughtful work by Mr. Tierney on this oversight.

[The prepared statement of Hon. Christopher Shays follows:]

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Statement of Rep. Christopher Shays
April 11, 2003

Acquisition reform at the Department of Defense (DOD) remains a promise unfulfilled. Despite much-heralded intentions to shed Cold War inefficiencies and bad habits, the Pentagon is still falling prey to rampant cost growth and interminable schedule slippage in the development of multi-billion dollar weapon systems.

The gulf between promise and practice has been apparent for some time in tactical aircraft acquisitions, particularly the Air Force F/A-22 *Raptor* program. As in the past, we appear poised to spend far more than planned for far fewer aircraft.

In three previous hearings before this Subcommittee on F-22 development and production reforms, successive projections of stabilized costs and realistic timelines have proven, at best, optimistic. With projected production costs now $6.7 billion over the $36.8 billion statutory cap, the magnitude and persistence of rosy, but wrong, estimates suggest problems far more fundamental than mere overconfidence.

For some time, the General Accounting Office (GAO) has been studying F-22 acquisition strategies and DOD adherence to commercial best practices. At the request of our Subcommittee colleague, Congressman John Tierney (MA-6), GAO also examined current production cost projections and the extent to which those costs are being accurately conveyed to Congress. Today, we also release a GAO report done at the Subcommittee's request that finds substantial waste stemming from a failure to develop standardized, rather than system-specific, aircraft test and maintenance equipment.

Unless aggressive cost controls and other acquisition reform strategies are embraced by F-22 program management, the aptly named *Raptor* is at risk of devouring itself. As we will hear in testimony today, findings and recommendations by GAO and others on tactical aircraft acquisitions aim to stop the hemorrhaging of time and money in the F-22 program, and prevent those problems in other major procurements critical to fighter fleet modernization.

All our witnesses bring important information and expertise to our discussion, and we look forward to their testimony. We are particularly grateful to Comptroller General David Walker for his leadership of GAO on this issue, and we appreciate the continued, thorough and thoughtful work by Mr. Tierney in this oversight.

Welcome.

Mr. SHAYS. I understand we also have another Member who is on our side here on the left side of me here, I apologize, Mr. Ruppersberger of Maryland. And I welcome, if you have any statement.

Mr. RUPPERSBERGER. Yes. Thank you, Mr. Chairman, for calling this hearing on the F–22 Raptor and controlling costs in tactical aircraft programs.

I hope today we can have an honest discussion of this aircraft. I hope this is a balanced discussion between alleged cost overruns with performance and benefit to national security. The GAO report claims this project's cost overrun is due to several factors, including the delayed start of a multi-year production authorization contract, inflation increases as a result of a revised production rate, and because of the change in avionics suppliers for the F–22 Raptor.

We have to remember that we live in a new age where threats can come from anywhere and anyone. Because of these unknown threats, we have to make sure that our military, our men and women who serve and fight for our freedoms, have the most modern and technological advanced weapons. The F–22 Raptor is such a weapon. I represent many of our country's defense contractors. In my district, we have two Army bases, a Coast Guard yard. In my district, we build the radar that is used for the F–22 Raptor.

I am concerned about cost overruns in any endeavor, but we have to seek a balance. I understand that recent tests on performance of the Raptor has yielded remarkably successful results, both in terms of technical and operational requirements. The success of this aircraft seems clear to me. In fact, the Raptor is meeting or exceeding all eight aircraft performance-related key performance barometers. I hope that those issues are also remembered as we continue this hearing.

Now, I know some have said that the F–22 Raptor was designed for a cold war threat. I would have to strongly disagree with that statement. The F–22 Raptor is much more. This aircraft has transformed itself. While maintaining all the air to air capabilities of the original design, the F–22 Raptor has also added technologies that will combine air dominance with precision attack capabilities and joint close air support for ground troops. Also, the F–22 will be vital to our national security interests in the 21st century. It is the only aircraft that will be capable of countering anti-access threats, advanced SAMs cruise missiles, fighter aircraft theater, ballistic missiles, weapons of mass destructionsites from day one.

We have to remember that this was a project started almost 20 years ago. Technology in the past 2 decades has jumped leaps and bounds ahead of what we could have imagined. Issues will rise, but they will solve them, and our Nation will be safer and our Armed Forces will be stronger for it.

Also, we have to remember that this fighter is in cornerstone of the Air Force future capabilities. While we discuss the issues of the hearing, let's make sure that we do not inadvertently slow down this project, which in turn could hinder our Armed Forces capabilities. Now is the worst possible time to reduce production funds. The program is at a critical stage on the production ramp and learning curve. The tools, people, and training are in place for an orderly ramp-up to max rate production. Furthermore, reducing

procurement at this point will severely damage supplier confidence, which will reflect in increased prices to the contractor.

Currently, 65 percent of the cost of F–22 is in the supplier base. The resulting termination liability, increased supplier cost, and inflation impacts will further reduce the number of Raptors the Air Force will be able to procure. Delaying procurement will exacerbate the already critical logistics and operational impacts associated with retaining F–15s well past their planned retirement age.

Finally, the single greatest enabler for reducing 22 costs is program stability. Program stability leads to supplier confidence, which in turn yields increased supplier investments, increased program efficiencies, reduced production costs, and ultimately increased production quantity.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you, Mr. Ruppersberger. I appreciate your presence. I'm sorry I didn't notice that you were here earlier.

Mr. RUPPERSBERGER. I'm a little small. That's probably why.

Mr. SHAYS. This is really an ideal kind of hearing. We have members who have expressed a variety of concerns at either end of this issue, and we have extraordinarily good documentation and we have wonderful witnesses. So we will hope that we will all find the best answers to the problems that face us.

We have before us to start the Honorable David M. Walker, Comptroller General of the United States, the U.S. General Accounting Office. We appreciate, sir, that you are here. As you know, we swear in our witnesses, and I will ask you to stand.

[Witness sworn.]

Mr. SHAYS. Note for the record our witness has responded in the affirmative. I just will get one bit of housekeeping out of the way, and ask unanimous consent that all members of the subcommittee be permitted to place any opening statement in the record, and that the record remain open for 3 days for that purpose. Without objection, so ordered.

I ask further unanimous consent that all witnesses be permitted to include their written statements in the record, and without objection, so ordered.

I think what we will do is he'll have you give your testimony, and then I'm going to give 10 minutes to each witness—excuse me, each Member. We did go to bed at 3:30 last night, maybe a little later for some. At any rate, we will begin. Thank you, Mr. Walker.

STATEMENT OF DAVID M. WALKER, COMPTROLLER GENERAL OF THE UNITED STATES, U.S. GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY ALLEN LI, GENERAL ACCOUNTING OFFICE

Mr. WALKER. Thank you, Mr. Chairman, Mr. Kucinich, and other members of the committee. It is a pleasure to be here to talk about DOD acquisition practices, and the F/A–22 as an illustration of some of the challenges associated with historical DOD acquisition practices.

Let me also thank Mr. Schrock. At the outset on page 7 of the report that he refers to, he has found the one typo in that report. Those numbers for the graphs should be 2001 where it says 2000, it should be 2002 where it says 2001. And in fact, the text is cor-

rect, it just so happens that the graph contains a typo. And thank you for pointing that out. Normally, they don't happen in GAO products, but it did happen in this case, and I apologize for that.

Mr. SCHROCK. Mr. Chairman, then I rest my case. There is major improvement being made. So I will let that be said for the record.

Mr. SHAYS. I think the the amazing thing is this is the first time I have ever encountered this in the entire, whatever.

Mr. WALKER. Well, when it happens, we admit it, Mr. Chairman. And there is improvement, but there is still a gap. So, in any event.

Mr. SHAYS. Let me just say, without any hesitation, the work of the GAO, and particularly under your leadership, has been extraordinary, and we all appreciate it, even when we don't like what your reports say.

Mr. WALKER. Thank you, Mr. Chairman. Sometimes people don't like the facts, as we all know.

Before I begin to address the DOD acquisition process in general and the F/A–22 in particular, I think it is very important to provide a solid foundation and the broader context and why this is important. As you know, Mr. Chairman, and other members, GAO twice a year performs long-range budget simulations to project into the future and see what the future looks like. That latest simulation which was done in January shows that we face large and growing budget deficits due in large part to known demographic trends and rising health care costs. In addition, mandatory spending is far outpacing revenue growth.

Without significant changes in mandated programs or significant tax increases, discretionary spending will come under growing pressure. DOD will ultimately feel this squeeze as well.

When you take a look at discretionary spending, the largest accounts are in DOD. Weapons acquisitions alone account for $150 billion annually. Our weapons systems are far superior to any other nation, but DOD will continue to need to spend significant sums to maintain this advantage and to replace aging equipment. In doing so, it must consider needs versus wants along with overall affordability and sustainability issues. We must also keep in mind that it is not just the superiority of our platforms that count, it's the superiority of the people who man those platforms that counts.

With regard to the F/A–22, it's obvious that we are going to produce the F/A–22; we're in limited production at the present point in time. So it's not a question of whether or not it will be built, but how many, when, with what capabilities, at what cost, and, very importantly, with what ripple implications to other Air Force systems and to DOD overall, including readiness.

Given past experience and future challenges, in my opinion, Mr. Chairman, it is time for DOD to present a new business case as to how many F/A–22s are needed, why, at what cost, and with what ripple effect on other tactical air systems as well as other Air Force and DOD needs.

The Air Force must move away from its historical "plug" approach to the quantity of F/A–22 Raptors. Whether and how many platforms to fund is a policy issue to be decided by the Congress, and irrespective of what Congress decides in that regard, it's important that any design, development, and production effort follow a best practices approach unless there is a clear and compelling na-

tional security reason not to. A clear and compelling threat to our national security should be the only reason that one should not follow that approach, in the opinion of the GAO.

Our report shows that the Department has consistently made decisions with too little knowledge in connection within with the number of historical systems. That is, the DOD has started programs with immature technology and had to manage technology development at the time they should have focused on product development. At production start, they did not have mature designs or manufacturing processes in place.

Our first chart on the far left, which is also in the testimony, demonstrates that under DOD's historical approach, including with the F/A–22, systems take longer than anticipated to deliver and require performance compromises and cost growth increases that far outstrip initial estimates. The F/A–22 is a case in point. The F–22 started in 1986, yes, in the middle of the cold war era. Costs have increased 128 percent and delivery time has increased 104 percent. In addition, planned acquisition quantities have dropped from the initial 648 to 276 and still dropping.

Had the Air Force used the second chart, which is also in the testimony, the so-called evolutionary approach rather than the big bang approach, they would have avoided many problems including significant cost increases and delays, and they would have been able to field earlier versions of the tactical aircraft fighter quicker to the troops to help modernize——

Mr. SHAYS. Could you make that point again? I was just asking a question.

Mr. WALKER. Yes. Had the Air Force used an evolutionary approach rather than the big bang approach, they could have avoided many of the problems that they have experienced. Namely, they could have avoided the significant cost growth, the significant delays, and they could have fielded earlier versions of the aircraft or the platform much quicker to try to deal with the aging issue that has been mentioned before. Namely, the idea being spiral development, which I will come back to, which the Department is now embracing, where you try to develop versions and enhance those versions over time such that you are taking an evolutionary approach rather than a revolutionary approach, which is much more prudent, much more cost effective, must more consistent with best practices as we have reported.

I have no doubt, and I am sure that none of you have any doubt, that the aircraft that is ultimately delivered will have a high level performance. It will be the best in the world. There won't be anything that's even close. In America, with enough time and enough money, anything is possible. However, inefficiencies in this program can only negatively impact other investment decisions the Department must make. There is a very real ripple effect on other TACAIR—Air Force systems and DOD needs, especially given the increasing budget pressures that are here and are only going to grow in the future.

GAO's best practices reports in this area make recommendations to correct these problems, start programs with requirements that can be met with available resources, especially mature technologies, achieve design stability by critical design review, and

achieve statistical process control by production. While the Department has largely accepted many of GAO's recommendations with regard to best practices, and in fact has incorporated these into their new updated policy manual—which is laudable and commendable—their application in practice to individual programs is not always consistent with policy. In other words, in design, it's there; in practice, it's not always there. It's uneven. They are getting better. It's obviously too late to adopt this for part of the F/A–22 program, but at least hopefully from here on out, they can try to do that.

The Department's recent emphasis on evolutionary acquisition, or as they refer to it spiral-development, is clearly a step in the right direction. That is, focusing on fielding some capability earlier, and better managing the unknowns by improving weapons systems incrementally such that you go from a series one to a series two to a series three is a very logical approach. And, by the way, that's the approach that technology companies take as we see every day. And as we know, the fact of the matter is, that's not the approach that the F/A–22 took. It was the big bang approach, and we are paying a big price because of it.

Another challenge to effective acquisition of weapons systems in an efficient economical and meaningful way is the significant planned turnover or preprogrammed turnover in connection with key personnel responsible for the acquisitions effort.

The far right chart, which is also in my written testimony, shows the typical number of key players that you would have within a life cycle of a major program. There is, frankly, just too much preplanned turnover in order to appropriately affix responsibility and assure accountability for these programs.

In the final analysis, Mr. Chairman, there is no question that however many F–22s Congress decides to fund, this will be a superior weapons system. I have flown the simulator myself. It is very impressive. But we must, however, consider the ripple effect, and to focus on wants versus needs; and in that regard, we are happy to continue to work with the Congress in trying to provide information for your consideration in making the difficult choices that lie ahead.

Thank you, Mr. Chairman.

Mr. SHAYS. I thank the gentlemen. I thank him very much.

[NOTE.—The GAO report entitled, "Tactical Aircraft, DOD Needs to Better Inform Congress about Implications of Continuing F/A–22 Cost Growth," may be found in subcommittee files.]

[The prepared statement of Mr. Walker follows:]

United States General Accounting Office

GAO

Testimony

Before the Subcommittee on National Security, Emerging Threats, and International Relations, Government Reform Committee, House of Representatives

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BEST PRACTICES

Better Acquisition Outcomes Are Possible If DOD Can Apply Lessons from F/A-22 Program

Statement of David M. Walker,
Comptroller General of the United States

4/11/03

GAO-03-645T

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to participate in the Subcommittee's hearing on how the Department of Defense (DOD) can—and must—get better outcomes from its weapon system investments. DOD is on the threshold of several major investments in acquisition programs that are likely to dominate budget and doctrinal debates well into the next decade. These programs include such systems as the Missile Defense Agency's suite of land, sea, air, and space defense systems; the Army's Future Combat Systems; and the Air Force's and Navy's Joint Strike Fighter. Over the next 5 years, DOD's overall investments are expected to average $150 billion a year as DOD works to keep legacy systems as well as modernize and transform our national defense capabilities for the future. Therefore, to meet these challenges, it is essential that sound foundations for these and other weapon system investments be laid now so that the resulting programs can be executed within estimates of available resources.

Any discussion of improvements to DOD's modernization efforts must be set in the context of overall expected budget availability. There are important competing priorities. Health care costs are growing at double-digit rates, and spending on homeland security will likely grow as we seek to defeat terrorism worldwide. We face an oncoming demographic tidal wave, and by 2035 the number of people who are 65 or older will have doubled, creating much larger demands on the federal budget. The demand of funding for entitlement programs continues to grow, creating increasing pressures on discretionary funding for other federal priorities like education and defense. Therefore, it is critical that DOD manage its acquisitions in the most cost efficient and effective manner possible.

My testimony today is about improving the outcomes of major weapon system acquisitions by using best practices to capture and use the right product knowledge at the right time for better decision making during product development. As per your request, I will compare acquisition practices and decisions made for the F/A-22 with these best practices for developing new products. The divergence between F/A-22 experiences and best product development practices, we believe, largely explains why the F/A-22 has been in development for over 16 years and its cost has grown substantially. It is also a primary contributor to other performance issues that are currently faced by the program. My testimony will also include observations on what can be done at this time to limit further negative outcomes in the F/A-22 program. Lastly, I will discuss the need for enforcing DOD's newest acquisition policy, which on paper embraces best

practices but in operation does not always do so, if DOD really expects to get improved outcomes in its major weapon system acquisitions.

Improving Major Weapon System Acquisition Outcomes

Clearly, the acquisition process has produced superior weapons, but it does so at a high price. Weapon systems routinely take much longer time to field, cost more to buy, and require more support than investment plans provide for. These consequences reduce the buying power of the defense dollar, delay capabilities for the war fighter, and force unplanned—and possibly unnecessary—trade-offs in desired acquisition quantities and an adverse ripple effect among other weapons programs or defense needs. Because of the lengthy time to develop new weapons, many enter the field with outdated technologies and a diminished supply base needed for system support. Frequently, this requires upgrades to the capability as soon as the new system is fielded. As previously noted, these inefficiencies have often led to reduced quantities of new systems. In turn, legacy systems remain in the inventory for longer periods, requiring greater operations and support cost that pull funds from other accounts, including modernization. DOD is facing these problems with its tactical air force assets now. We believe DOD can learn lessons from the experiences with the F/A-22 program as it frames the acquisition environment for its many transformational investments.

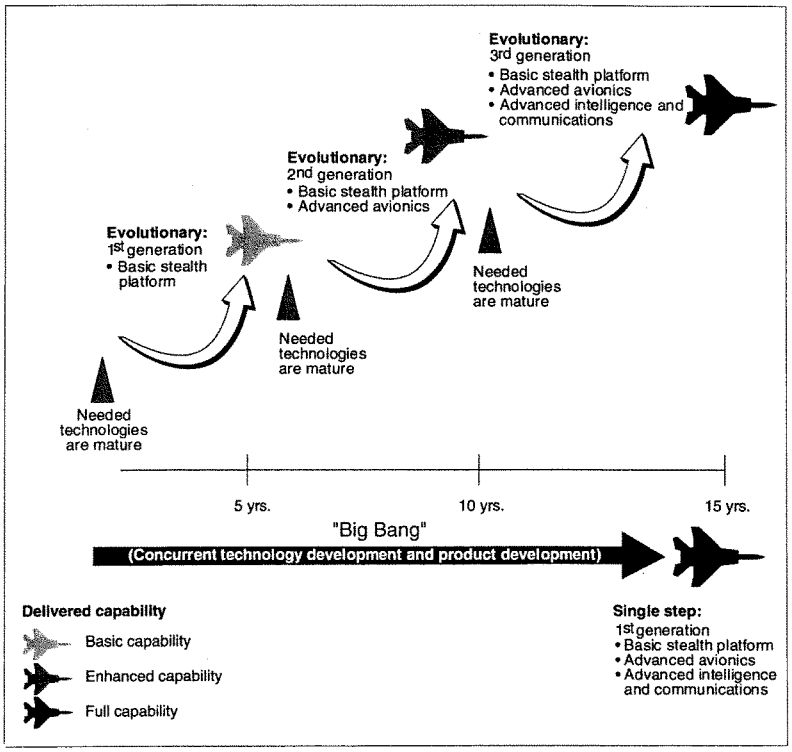
DOD recognizes the need to get better weapon system outcomes, and its newest acquisition policy emphasizes the use of evolutionary, knowledge-based acquisition concepts proven to produce more effective and efficient outcomes in developing new products. It incorporates the elements of a knowledge-based acquisition model for developing new products, which we have recommended in our reviews of commercial best practices. Our body of work focuses on how DOD can better leverage its investments by shortening the time it takes to field new capabilities at a more predictable cost and schedule. However, policy changes alone will not guarantee success. Unless written policies are consistently implemented in practice through timely and informed decisions on individual programs, outcomes will not change. This requires sustained leadership and commitment and attention to the capture and use of key product knowledge at critical decision points to avoid the problems of the past.

The Case for an Evolutionary Product Development Environment

A key enabler to the success of commercial firms is using an approach that evolves a product to its ultimate capabilities on the basis of mature technologies and available resources. This approach allows commercial companies to develop and produce more sophisticated products faster and

less expensively than their predecessors. Commercial companies have found that trying to capture the knowledge required to stabilize the design of a product that requires significant amounts of new technical content is an unmanageable task, especially if the goal is to reduce development cycle times and get the product to the marketplace as quickly as possible. Therefore, product features and capabilities not achievable in the initial development are planned for subsequent development efforts in future generations of the product, but only when technologies are proven to be mature and other resources are available. DOD's new policy embraces the idea of evolutionary acquisition. Figure 1 compares evolutionary and single step ("big bang") acquisitions.

Figure 1: Comparison of Evolutionary and Big Bang Acquisition Approaches



Source: GAO.

An evolutionary environment for developing and delivering new products reduces risks and makes cost more predictable. While the customer may not receive an ultimate capability initially, the product is available sooner, with higher quality and reliability, and at lower, more predictable cost. Improvements are planned for future generations of the product.

The Case for Knowledge-Based Product Development Process

Leading commercial firms expect that their program managers will deliver high-quality products on time and within budgets. Doing otherwise could result in losing a customer in the short term and losing the company in the longer term. Thus, in addition to creating an evolutionary product development environment that brings risk in control, these firms have adopted practices that put their individual program managers in a good position to succeed in meeting these expectations on individual products. Collectively, these practices ensure that a high level of knowledge exists about critical facets of the product at key junctures during its development. Such a knowledge-based process enables decision makers to be reasonably certain about critical facets of the product under development when they need to be.

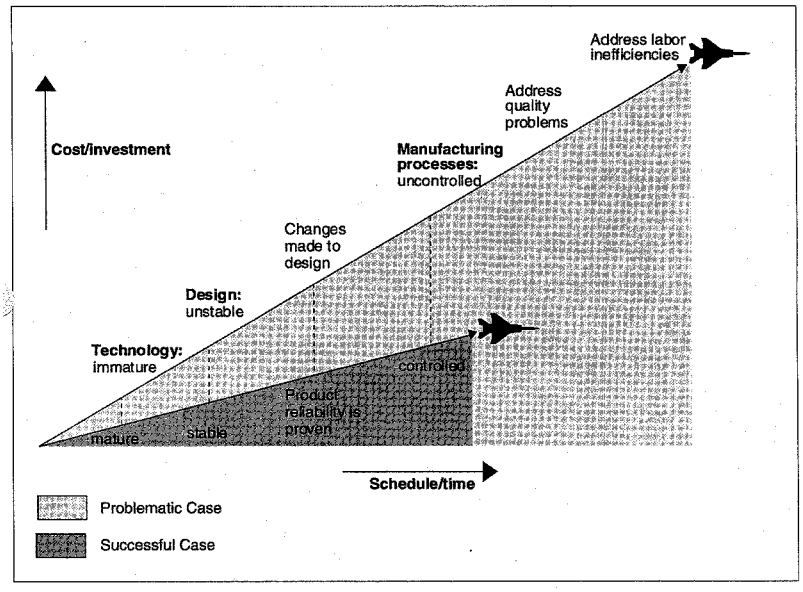
The knowledge-based process followed by leading firms is shown in detail in table 1, but in general can be broken down into three knowledge points. First, a match must be made between the customer's needs and the available resources—technology, engineering knowledge, time, and funding—before a program is launched. Second, a product's design must demonstrate its ability to meet performance requirements and be stable about midway through development. Third, the developer must show that the product can be manufactured within cost, schedule, and quality targets and is demonstrated to be reliable before production begins. The following table illustrates more specifically what we have learned about how successful programs gather knowledge as they move through product development.

Table 1: Highlights of Specific Best Practices for Acquisitions

Knowledge Point 1 (Should occur before program launch)
Separate technology from product development.
Have clear measures and high standards for assessing technology maturity—technology readiness levels.
Use a disciplined systems engineering process for translating and balancing customer's desires with product developer's technology, design, and production limitations; in other words, bring the right knowledge to the table when laying down a program's foundation.
Identify the mismatches between desired product features and the product developer's knowledge and either (1) delay the start of the new product development until knowledge deficit can be made up or (2) reduce product features to lessen their dependence on areas where knowledge is insufficient (evolutionary acquisition). The main opportunities for trading off design features to save time and money occur here, before a program is started.
When do you know you have achieved this knowledge point? When technologies needed to meet essential product requirements have been demonstrated to work in their intended environment and the producer has completed a preliminary design of the product.
Knowledge Point 2 (Should occur midway between system integration and demonstration)
Hold a major decision review between system integration and system demonstration that determines that the product design is stable and includes specific criteria to move into the system demonstration phase.
Use integrated engineering prototypes to demonstrate design stability and prove with testing that the design meets the customer's requirements. It is important that this happen before initial manufacturing begins—a point when investments are increased to produce an item.
Identify critical manufacturing processes and establish a plan to bring these under statistical control by the start of production; also establish reliability goals and a growth plan to achieve these by production. This facilitates the achievement of process control and reliability goals at the completion of knowledge point 3.
When do you know you have achieved this knowledge point? When 90 percent of engineering drawings are releasable to manufacturing organizations. Drawings are the language used by engineers to communicate to the manufacturers the details of the new product—what it looks like, how its components interface, how to build it and the critical materials and processes needed to fabricate it. This makes drawings a key measure of whether the design is stable or not.
Knowledge Point 3 (Should occur before production)
Demonstrate that all critical manufacturing processes are under statistical control and consistently producing items within the quality standards and tolerances for the overall product before production begins. This is important, since variation in one process can reverberate to others and result in defective parts that need to be repaired or reworked.
Demonstrate product reliability before the start of production. This requires testing to identify the problems, design corrections, and retest the new design. Commercial firms consider reliability important and its achievement a measure of design maturity.
When do you know you have achieved this knowledge point? When all key manufacturing processes have come under statistical control and product reliability has been demonstrated.

DOD programs often do not employ these practices. We found that if the evolutionary, knowledge-based acquisition concepts were not applied, a cascade of negative effects became magnified in the product development and production phases of an acquisition program. These led to acquisition outcomes that included significant cost increases and schedule delays, poor product quality and reliability, and delays in getting new capability to the war fighter. This is often the case in DOD programs as shown in our past work on systems like F/A-22 fighter, C-17 airlifter, V-22 tiltrotor aircraft, PAC-3 missile, BAT antitank munition, and others. We did find some DOD programs that employed best practice concepts and have had more successful program outcomes to date. These included the Global Hawk unmanned vehicle, AIM-9X missile, and Joint Direct Attack Munitions guided bomb. Figure 3 shows a notional illustration of the different paths and effects of a product development.

Figure 2: Different Paths That A Product's Development Can Take



Source: GAO.

It is clear that knowledge about the product's technology, design, and processes captured at the right time can reduce development cycle times and deliver a more cost effective, reliable product to the customer sooner than programs that do not capture this knowledge.

In applying the knowledge-based approach, the most leveraged decision point of the three, is matching the customer's needs with the developer's resources—technology, design, timing, and funding. This initial decision

sets the stage for the eventual outcome—desirable or problematic. The match is ultimately achieved in every development program, but in successful development programs, it occurs prior to program launch. In successful programs, negotiations and trade-offs occur before a product development is launched to ensure that a match exists between customer expectations and developer resources. The results achieved from this match are balanced and achievable requirements, sufficient investment to complete the development, and a firm commitment to deliver the product. Commercial companies we have visited usually limit product development cycle-time to less than 5 years.

In DOD, this match is seldom achieved. It is not unusual for DOD to bypass early trade-offs and negotiations, instead planning to develop a product based on a rigid set of requirements that are unachievable within a reasonable development time frame. This results in cost and schedule commitments that are unrealistic. Although a program can take as long as 15 years in DOD, the program manager is expected to develop and be accountable for precise cost and schedule estimates made at the start of the program. Because of their short tenures, it normally takes several program managers to complete product development. Consequently, the program manager that commits to the cost and schedule estimate at the beginning of the program is not the same person responsible for achieving it. Therefore, program accountability is problematic. Ironically, this outcome is rational in the traditional acquisition environment. The pressures put on program managers to get programs approved encourage promising more than can be delivered for the time and money allotted. They are not put in a position to succeed.

The differences in the practices employed by successful commercial firms and DOD reflect the different demands imposed on programs by the environments in which they are managed. Specific practices take root and are sustained because they help a program succeed in its environment. The way success and failure are defined for commercial and defense product developments differs considerably, which creates a different set of incentives and evokes different behaviors from managers. Attempts at reforming weapon system acquisitions have not succeeded because they did not change these incentives. All of the participants in the acquisition process play a part in creating incentives. The F/A-22 program, advertised as a flagship of acquisition reform in its early days, failed to establish this match before program launch and today we are discussing the resulting outcomes to-date.

F/A-22 Did Not Employ Evolutionary or Knowledge-Based Process

The F/A-22 provides an excellent example of what can happen when a major acquisition program is not guided by the principles of evolutionary, knowledge-based acquisition. The program failed to match requirements with resources and make early trade-offs and took on a number of new and unproven technologies. Instead of fielding early capability and then evolving the product to get new capabilities to the war fighter sooner, the Air Force chose a "big bang" product development approach that is now planned to take about 19 years. This created a challenging and risky acquisition environment that has delayed the war fighter the capabilities expected from this new aircraft. Program leaders did not capture the specific knowledge identified as key for each of the three critical knowledge points in product development. Instead, program managers proceeded through the F/A-22's development without the requisite knowledge necessary for reducing program risk and achieving more successful program outcomes. Now the optimism underlying these decisions has resulted in significant cost increases, schedule delays, trade-offs—making do with less than half the number of originally desired aircraft—and concerns about the capability to be delivered.

F/A-22 Program Outcomes

Since the F/A-22 acquisition program was started in October 1986, the F/A-22 cost and schedule estimates have grown significantly to where, today, the Air Force estimates the total acquisition unit cost of a single aircraft is $257.5 million.[1] This represents a 74 percent increase from the estimate at the start of development and a commensurate loss in the buying power of the defense dollar. Intended to replace the aging F-15 fighter, the F/A-22 program is now scheduled to reach its initial operational capability in December 2005—making its development cycle about 19 years. During this cycle, the planned buy quantity has been reduced 63 percent from 750 to 276 aircraft[2]. In addition, since fiscal year 2001, funding for F/A-22 upgrades has dramatically increased from $166 million to $3.0 billion, most of which is to provide increased ground attack capability, a requirement that was added late in the development program.

[1] All references to F/A-22 costs in this testimony are in then-year dollars in order to maintain consistent reporting with our prior reports on the F/A-22.

[2] Between 1986 and the start of engineering and manufacturing development in 1991, the quantity was reduced from 750 to 648 aircraft.

F/A-22 Did Not Use Evolutionary Acquisition or Capture Knowledge Required at Key Decision Junctures

The F/A-22 acquisition strategy from the outset was to achieve full capability in a "big bang" approach. By not using an evolutionary approach, the F/A-22 took on significant risk and onerous technological challenges. While the big bang approach may have allowed the Air Force to more successfully compete for early funding, it hamstrung the program with many new undemonstrated technologies, preventing the program from knowing cost and schedule ramifications throughout development. Cost, schedule, and performance problems resulted. The following table summarizes the F/A-22 program's attainment of critical knowledge and key decision junctures during the development program and the changes in development cost and cycle time at each point.

Table 2: Knowledge Attainment in the F/A-22 Program

	Program start—1986	Design review—1995	Production start—2001
Best practice	Attain knowledge point 1. Separate technology and product development, deliver mature technology, and have preliminary design.	Attain knowledge point 2. 90 percent of systems and structures engineering drawings releasable and subsystem design reviews completed.	Attain knowledge point 3. 100% of critical manufacturing processes in statistical control and reliability goals demonstrated.
F/A-22 practice	Knowledge point 1 not attained. Failed to separate technology and product development. Three critical technologies immature: Low-observable materials, propulsion, and integrated avionics. Knowledge point 1 not attained until September 2000.	Knowledge points 1 and 2 not attained. Only 26 percent of drawings released at the critical design review in February 1995. Knowledge point 2 not attained until September 1998, after delivery of second test aircraft.	Knowledge point 3 not attained. Less than 50 percent of critical manufacturing processes in control. Only 22 percent of reliability goal demonstrated with many outstanding deficiencies.
F/A-22's estimated development cost*	$12.6 billion	$21.2 billion (68 percent increase)	$28.7 billion (128 percent increase)
Estimated development cycle time	9.4 years	18.1 years (93 percent increase)	19.2 years (104 percent increase)

*The development estimate includes all F/A-22 RDT&E costs.

Technology—The F/A-22 did not have mature technology at the start of the acquisition program. The program included new low-observable (stealth) materials, integrated avionics, and propulsion technology that were not mature at this time. The Air Force did not complete an evaluation of stealth technology on a full-scale model of the aircraft until several years into development. It was not until September 2000, or 9 years into

development, that the integrated avionics reached a maturity level acceptable to begin product development. During development, the integrated avionics was a source of schedule delays and cost growth. Since 1997, avionics software development and flight-testing have been delayed, and the cost of avionics development has increased by over $980 million dollars. Today, the avionics still has problems affecting the ability to complete developmental testing and begin operational testing, and the Air Force cannot predict when a solution will be found.

Design—The effects of immature technologies cascaded into the F/A-22 development program, making it more difficult to achieve a stable design at the right time. The standard measure of design stability is 90 percent of design drawings releasable by the critical design review. The F/A-22 achieved only 26 percent by this review, taking an additional 43 months to achieve the standard. Moving ahead in development, the program experienced several design and manufacturing problems described by the F/A-22 program office as a "rolling wave" effect throughout system integration and final assembly. These effects included numerous design changes, labor inefficiencies, parts shortages, out of sequence work, cost increases, and schedule delays.

Production—At the start of production, the F/A-22 did not have manufacturing processes under control and was only beginning testing and demonstration efforts for system reliability. Initially, the F/A-22 had taken steps to use statistical process control data to gain control of critical manufacturing processes by full rate production. However, the program abandoned this best practice approach in 2000 with less than 50 percent of its critical manufacturing processes in control. In March 2002,[3] we recommended that the F/A-22 program office monitor the status of critical manufacturing process as the program proceeds toward high rate production.

The reliability goal for the F/A-22 is 3 hours of flying time between maintenance actions. The Air Force estimated that in late 2001, when it entered production, it should have been able to demonstrate almost 2 flying hours between maintenance actions. Instead, it could fly an average of only 0.44 hours between maintenance actions. Since then there has been a decrease in reliability. As of November 2002, development test

[3] U.S. General Accounting Office, *Tactical Aircraft: F-22 Delays Indicate Initial Production Rates Should Be Lower to Reduce Risks*, GAO-02-298 (Washington, D.C.: Mar. 5, 2002).

aircraft have been completing only 0.29 hours between maintenance actions. Additionally, the program was slow to fix and correct problems that had affected reliability. At the time of our review in July 2002, program officials had identified about 260 different types of failures and had identified fixes for less than 50 percent of the failures. To achieve reliability goals will require additional design changes, testing, and modifications. Therefore, additional problems and costs can be expected if the system is fielded with the level of reliability achieved to date.

It Is Too Late for the F/A-22 Program to Gain Full Benefit of a Knowledge-Based Process

The F/A-22 did not take advantage of evolutionary, knowledge-based concepts up front and now, the best it can hope for is to limit cost increases and performance problems by not significantly increasing its production until development is complete—signified by developmental and operational testing and reliability demonstrations. To that end, we have recommended that the Air Force reconsider its decision to increase the aircraft production rate beyond 16 aircraft per year.[4] The program is nearing the end of developmental testing and plans to start initial operational testing in October 2003. If developmental testing goes as planned, which is not guaranteed, operational testing is expected to be completed around September 2004. By the end of this fiscal year, 51 F/A-22s will be on contract as low rate production began in 2001.

Our March 2003 report identifies various problems still outstanding that could have further impacts on cost, schedule, and delivered performance that are in addition to undemonstrated reliability goals. The problems identified are of particular concern, given Air Force plans to increase production rates and make a full rate production decision in 2004. The problems include:

- unexpected shutdowns (instability) of the avionics,
- excessive movement of the vertical tails,
- overheating in rear portions of the aircraft,
- separations of the horizontal tail material,
- inability to meet airlift support requirements, and
- excessive ground maintenance actions.

[4] U.S. General Accounting Office, *Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production Rates While Development Risks Continue*, GAO-03-431 (Washington, D.C.: Mar. 14, 2003).

These problems are still being addressed, and not all of them have been solved as yet. For example, Air Force officials stated they do not yet understand the problems associated with the avionics instability well enough to predict when they would be able to resolve them, and certain tests to better understand the vertical tail problem have not yet begun. Despite remaining testing and outstanding problems, the Air Force plans to continue acquiring production aircraft at increasing annual rates and make the full rate production decision in 2004. This is a very risky strategy, given outstanding issues in the test program and the system's less than expected reliability. The Air Force may encounter higher production costs as a result of acquiring significant quantities of aircraft before adequate testing and demonstrations are complete. In addition, remaining testing could identify problems that require costly modifications in order to achieve satisfactory performance.

In a February 28, 2003 report to Representative John Tierney,[5] we found that F/A-22 production costs are likely to increase more than the latest $5.4 billion cost growth recently estimated by the Air Force and the Office of Secretary of Defense (OSD). First, the current OSD production estimate does not include $1.3 billion included in the latest Air Force acquisition plan. Second, schedule delays in developmental testing could further postpone the start of the first F/A-22 multiyear contract, which has already been delayed until fiscal year 2006. This could result in lower cost savings from multiyear procurement. Last, we found several risk factors that may increase future production costs, including the dependency of certain cost reduction plans on Air Force investments that are not being made to improve production processes, the availability of funding, and a reduction in funding for support costs. In addition, DOD has not informed Congress about the quantity of aircraft that can be procured within existing production cost limits, which we believe could be fewer than the 276 currently planned. Further details on F/A-22 cost growth and the Air Force's attempt to offset it are provided in appendix I.

[5] U.S. General Accounting Office, *Tactical Aircraft: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth*, GAO-03-280 (Washington, D.C.: Feb. 28, 2003).

Real Change in Acquisition Outcomes Requires Disciplined Enforcement of Acquisition Policy

While DOD's new acquisition policy is too late to influence the F/A-22 program, it is not too late for other major acquisition programs like the Missile Defense Agency's suite of land, sea, air, and space defense systems; the Army's Future Combat Systems; and the Air Force and Navy's Joint Strike Fighter. DOD's revised acquisition policy represents tangible leadership action to getting better weapon system acquisition outcomes, but unless the policies are implemented through decisions on individual programs, outcomes are not likely to change. Further, unless pressures are alleviated in DOD to get new acquisition programs approved and funded on the basis of requirements that must stand out, programs will continue to be compromised from the outset with little to no chance of successful outcomes. If new policies were implemented properly, through decisions on individual programs, managers would face less pressure to promise delivery of all the ultimate capabilities of a weapon system in one "big bang."

Both form and substance are essential to getting desired outcomes. At a tactical level, we believe that the policies could be made more explicit in several areas to facilitate such decisions. First, the regulations provide little or no controls at key decision points of an acquisition program that force a program manager to report progress against knowledge-based metrics. Second, the new regulations, once approved, may be too general and may no longer provide mandatory procedures. Third, the new regulations may not provide adequate accountability because they may not require knowledge-based deliverables containing evidence of knowledge at key decision points.

At a strategic level, some cultural changes will be necessary to translate policy into action. At the very top level, this means DOD leadership will have to take control of the investment dollars and to say "no" in some circumstances if programs are inappropriately deviating from sound acquisition policy. In my opinion, programs should follow a knowledge-based acquisition policy—one that embraces best practices—unless there is a clear and compelling national security reason not to. Other cultural changes instrumental to implementing change include:

- Keeping key people in place long enough so that they can affect decisions and be held accountable.
- Providing program offices with the skilled people needed to craft acquisition approaches that implement policy and to effectively oversee the execution of programs by contractors.

- Realigning responsibilities and funding between science and technology organizations and acquisition organizations to enable the separation of technology development from product development.
- Bringing discipline to the requirements-setting process by demanding a match between requirements and resources.
- Requiring readiness and operating cost as key performance parameters prior to beginning an acquisition.
- Designing and implementing test programs that deliver knowledge when needed, including reliability testing early in design.

Ultimately, the success of the new acquisition policy will be seen in individual program and resource decisions. Programs that are implementing knowledge-based policies in their acquisition approaches should be supported and resourced, presuming they remain critical to national needs and affordable within current and projected resource levels. Conversely, if programs that repeat the approaches of the past are approved and funded, past policies—and their outcomes—will be reinforced with a number of adverse implications.

Conclusions

DOD will continue to face challenges in modernizing its forces with new demands on the federal dollar created by changing world conditions. Consequently, it is incumbent upon DOD to find and adopt best product development practices that can allow it to manage its weapon system programs in the most efficient and effective way. Success over the long term will depend not only on policies that embrace evolutionary, knowledge-based acquisition practices but also on DOD leadership's sustaining its commitment to improving business practices and ensuring that those adopted are followed and enforced.

DOD's new acquisition policy embraces the best practice concepts of knowledge-based, evolutionary acquisition and represents a good first step toward achieving better outcomes from major acquisition programs. The F/A-22 program followed a different path at its beginning, a big bang, high-risk approach whose outcomes so far have been increased cost, quality and reliability problems, growing procurement reductions, and delays in getting the aircraft to the war fighter. Since this program is nearing the end of development and already into production, it is too late to adopt a knowledge approach, but it can limit further cost increases and adverse actions by not ramping up production beyond current levels until developmental and operational testing are completed and reliability goals have been demonstrated. Regardless of the F/A-22's current predicament, the new policy can and should be used to manage all new acquisition

programs and should be adapted to those existing programs that have not progressed too far in development to benefit. At a minimum, the F/A-22 should serve as a lesson learned from which to effect a change in the future DOD acquisition environment. The costs of doing otherwise are simply too high for us to tolerate.

Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or other members of the Subcommittee may have.

Appendix I: F/A-22 Production Cost Growth

Over the last 6 years, DOD has identified about $18 billion in estimated production cost growth during the course of two DOD program reviews. As a result, the estimated cost of the production program currently exceeds the congressional cost limit. The Air Force has implemented cost reduction plans designed to offset a significant amount of this estimated cost growth. But the effectiveness of these cost reduction plans has varied.

During a 1997 review, the Air Force estimated cost growth of $13.1 billion.[1] The major contributing factors to this cost growth were inflation, increased estimates of labor costs and materials associated with the airframe and engine, and engineering changes to the airframe and engine. These factors made up about 75 percent of the cost growth identified in 1997.

In August 2001, DOD estimated an additional $5.4 billion in cost growth for the production of the F/A-22, bringing total estimated production cost to $43 billion. The major contributing factors to this cost growth were again due to increased labor costs and airframe and engine costs. These factors totaled almost 70 percent of the cost growth. According to program officials, major contractors' and suppliers' inability to achieve the expected reductions in labor costs throughout the building of the development and early production aircraft has been the primary reason for estimating this additional cost growth.

Mixed Success With Cost Reduction Plans

The Air Force was able to implement cost reduction plans and offset cost growth by nearly $2 billion in the first four production contracts awarded. As shown in table 3, the total offsets for these contracts slightly exceeded earlier projections by about $.5 million.

[1] Based on a plan to procure 438 aircraft.

Table 3: Comparison of Planned Versus Implemented Cost Reduction Offsets for Awarded Production Contracts

Dollars in millions			
Production lot	**Planned offsets**	**Implemented offsets**	**Difference**
Fiscal year 1999 (2 aircraft)	$199.0	$200.5	$1.5
Fiscal year 2000 (6 aircraft)	329.3	336.4	7.1
Fiscal year 2001 (10 aircraft)	580.2	611.1	30.9
Fiscal year 2002 (13 aircraft)	827.2	788.2	(39.0)
Total	**$1,935.7**	**$1,936.2**	**$0.5**

Source: Air Force.

Cost reduction plans exist but have not yet been implemented for subsequent production lots planned for fiscal years 2003 through 2010 because contracts for these production lots have not yet been awarded. If implemented successfully, the Air Force expects these cost reduction plans to achieve billions of dollars in offsets to estimated cost growth and to allow the production program to be completed within the current production cost estimate of $43 billion.[2] However, this amount exceeds the production cost limit of $36.8 billion.

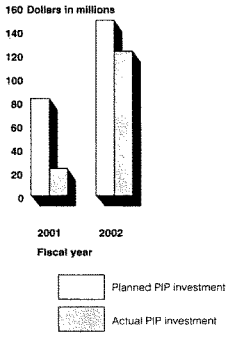
In addition, while the Air Force has been attempting to offset costs through production improvement programs (PIPs), recent funding cutbacks for PIPs may reduce their effectiveness. PIPs focus specifically on improving production processes to realize savings by using an initial government investment. The earlier the Air Force implements PIPs, the greater the impact on the cost of production. Examples of PIPs previously implemented by the Air Force include manufacturing process improvements for avionics, improvements in fabrication and assembly processes for the airframe, and redesign of several components to enable lower production costs.

As shown in figure 3, the Air Force reduced the funding available for investment in PIPs by $61 million for lot 1 and $26 million for lot 2 to cover

[2] The F/A-22 President's budget for fiscal year 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.

cost growth in production lots 1 and 2[3]. As a result, it is unlikely that PIPs covering these two lots will be able to offset cost growth as planned.

Figure 3: Planned Versus Actual F/A-22 Production Improvement Program Investment for Production Lots 1 (Fiscal Year 2001) and 2 (Fiscal Year 2002)

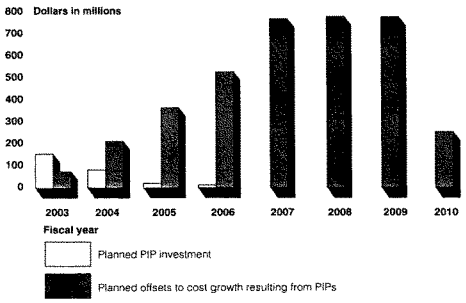


Source: U.S. Air Force.

Figure 4 shows the remaining planned investment in PIPs through fiscal year 2006 and the $3.7 billion in estimated cost growth that can potentially be offset through fiscal year 2010 if the Air Force invests as planned in these PIPs.

[3] Production lot 1 was awarded in fiscal year 2001 and production lot 2 was awarded in fiscal year 2002.

Figure 4: Planned Offsets to Cost Growth From Investing in and Implementing PIPs



Source: U.S.Air Force.

In the past, Congress has been concerned about the Air Force's practice of requesting fiscal year funding for these PIPs but then using part of that funding for F/A-22 airframe cost increases. [4] Recently, Congress directed the Air Force to submit a request if it plans to use PIP funds for an alternate purpose.

[4] Report 107-298, Nov. 19, 2001.

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Mr. SHAYS. We are joined by Mr. Duncan. Mr. Duncan, it's nice to have you here.

I am going to start out with Mr. Tierney, and then I'm going to go to Mr. Schrock, and then I'm going to go to Mr. Ruppersberger, unless Mr. Kucinich gets back, and we'll just keep going back and forth. I think it's better to do the 10-minute round of questioning and it will take us a little longer, but it's the best way to get information.

So Mr. Tierney, you have the floor for 10 minutes.

Mr. TIERNEY. Thank you.

Thank you for your testimony, Mr. Walker, and for the work that was done on this report by you and your able staff.

I want to just lay a little foundation here, if I could, on the issue of production cost growth. In your report, you said the Department established a joint estimating team in 1996 to examine production cost growth. In 1997, the team found $13.1 billion in unanticipated cost growth. Is that fairly accurate?

Mr. WALKER. That's my understanding.

Mr. TIERNEY. It seems to me that's a pretty astounding amount of unanticipated growth. But it didn't stop there. In 2001, the Defense Acquisition Board reexamined the issue, and found another $5.4 billion in cost growth, if I'm not mistaken; Right?

Mr. WALKER. That's correct.

Mr. TIERNEY. Another, I think, spectacular number, but it didn't stop there. In your report most recently, you identified yet another $1.29 billion in cost growth.

Mr. WALKER. That's correct.

Mr. TIERNEY. Now, did the Air Force include that amount in its estimate?

Mr. WALKER. It is, but it also causes problems with regard to the current cap, as you noted before.

Mr. TIERNEY. Right. It went right by it. Right? Now, the Office of the Secretary of Defense, did they include that amount in their estimate?

Mr. WALKER. No, they did not.

Mr. TIERNEY. How do we explain that, that they didn't include it in theirs, and the Air Force had it in their estimate?

Mr. WALKER. You would have to ask the SecDef that.

Mr. TIERNEY. OK.

Mr. SHAYS. Could I just ask, if the gentlemen would yield?

What's the significance of not including it?

Mr. WALKER. An unreconciled difference off the top of my head. If the Air Force, which is responsible for the program, is saying that this is what they think it's going to be, and then the Defense Department says no, they are going to go with a different number, you have to wonder why that gap exists, which is the more accurate number and what, if any, potential implication that can have on being able to stay within the cost cap? It's an unreconciled difference that needs to be explained. And I am saying maybe the Air Force can do that. I know you've got representatives of the DOD and the Air Force coming on after me.

Mr. SHAYS. Thank you.

Mr. TIERNEY. And part of it, Mr. Chairman, is that when you have the Air Force who is responsible for this system, telling us

that they are $1 billion plus over and the Office of Secretary of Defense just ignoring that and going on, and then in response to our questions just basically telling us it doesn't matter what we had set as a cap as Congress or whatever, they are going to ask for more money anyway and they are just blowing on right by. I think it goes a little bit to the forthrightness or lack of that to this committee in terms of our estimates of how we are going to plan out a budget here in defense. But we can also carry a little bit of that over on into the issue of the number of planes that are going to be built.

On your chart, you had six points of time; and during 1991 the plan development was 648 aircraft; am I right?

Mr. WALKER. Correct.

Mr. TIERNEY. In 1993, there was a bottom-up review done, and reduced that number to 442.

Mr. WALKER. That's correct.

Mr. TIERNEY. In 1995, it was reduced to 438 as part of the preproduction verification phase. And then during the 1997 Quadrennial Defense Review, it fell to 339.

Mr. WALKER. Correct.

Mr. TIERNEY. And then I think they took six aircraft over into production, and so that really reduced it to 333. Now, in 2001, Mr. Aldrich has written a letter to me. And if you extrapolate out amongst all the other jargon, it looks like the number now is 224 aircraft, while remaining—if they try to stay within the congressional cost cap.

Mr. WALKER. That's with the cap. That's correct, Mr. Tierney.

Mr. TIERNEY. Right. So we are now down from the original 648 aircraft down to 224 aircraft, and all of that the additional $1.29 billion in cost, production cost overgrowth. So we're in these charts going in opposite directions, the number of aircraft that are being built and the cost of the program going up. Were you able to determine just how much each one of these systems is going to cost, each plane is going to cost? My estimate is about $200 million a plane. Right?

Mr. WALKER. It's over $200 million.

Mr. TIERNEY. Over $200 million. And if we reduced it by another $2 billion because of these overruns, it would mean another 10 or so less planes. So you are really down about 214 if you keep them within the cost cap.

Mr. WALKER. It would be a reduction; correct.

Mr. TIERNEY. So I think, just getting those numbers down, part of our inquiry from the Department and from the Air Force is going to have to be, as I think you stated quite well in your—what was the number that we need? What's the mission here? Is the mission anywhere still related to where it was 648 that we originally need. And, if it isn't, how has it changed? Why is it now allowable that we can perform the same mission if we can with so few planes? What are the costs ultimately going to be? And, as you said, I think quite clearly, then what's the effect on all the other things that we think we need as we move forward in our defense posture?

But let me finish by just saying, one of the major conclusions that I got out of your report, Mr. Walker, was simply the Pentagon has not been providing Congress with the information that we

asked for, and with adequate information, really, to assess and evaluate this program. They are not telling Congress how much aircraft they can buy while staying within a production cost limit. And I'm just wondering, you know, what—describe for us, if you would—I think it would be interesting to put it on the record—what the congressional cost cap is, and, if you have an institutional memory, why we put that cost cap there.

Mr. WALKER. As I recall—and if you don't mind, Mr. Tierney, Mr. Chairman, I have Allen Li, who is head of our effort in this area. So he may supplement my efforts, if it's not a problem.

Mr. TIERNEY. The chairman may want to swear him in then.

Mr. WALKER. But I'll go ahead and start.

Mr. TIERNEY. Great. Thanks.

Mr. WALKER. Due to the significant increase in the estimated cost of this program, Congress was concerned with being able to maintain some type of control over it, and therefore ended up putting in a cost cap with regard to production as a means to try to control costs. Obviously, that's one way that you can end up determining that you are not going to spend more money, but it doesn't necessarily assure how many aircraft you are going to get if there is a continued escalation of what the cost is per aircraft.

What has happened in the past, quite frankly, is that the Air Force has just generally plugged the numbers. Whatever amount of money you will give them, they will produce whatever they can produce with that amount of money.

My personal opinion is, there have been huge subsequent events since 1986. And while you can clearly make a compelling business case for this platform in 1986, given the huge subsequent events since 1986 both as relates to the budget, our national security posture, the state of the world, etc., there is a need to fundamentally reassess the business case and find out what's the right number rather than what the "plug" is.

Mr. TIERNEY. I think you've hit the crux of this hearing right on the head. And the idea is that we had set that cap, and it was up to them to determine how many they could make. But I'm not sure we've ever heard back any of the justification or explanation for how the mission may or may not have changed and the goals and the other issues and questions that follow from that.

Mr. WALKER. Well, as you know, Mr. Tierney, originally it was for air superiority, and now it's an F/A platform. So the Air Force is seeking to expand the mission and utilization of the F–22.

Mr. TIERNEY. Right.

Mr. WALKER. That doesn't make it cheaper. I still think there is the need for the business case.

Mr. TIERNEY. Have you ever had an adjustment in so-called business case——

Mr. SHAYS. Will the gentleman suspend? I'll give him more time. Do we need to hear from Mr. Li? If so, I'll swear him in.

Mr. WALKER. Not yet. Well, we may, if it is all right, as a matter of caution.

Mr. SHAYS. Then let's do that. If you would stand please.

[Witness sworn.]

Mr. SHAYS. Thank you.

Just for the record, in the 9-years I have chaired hearings, the only person we didn't swear in was Mr. Byrd, because I chickened out. But I'm not going to have you get to that level.

OK. Mr. Tierney, you have the floor.

Mr. TIERNEY. Thanks.

You know, I'm concerned obviously for the fact that we set a cap, and it appears to have been blown by without any prior discussion with Congress or conversation. But you also made a recommendation that the Pentagon tell Congress how many aircraft they can buy within that cap. And, as far as I can see, your recommendation was flat out rejected. Would there be some other interpretation you would to put on it?

Mr. WALKER. We haven't been provided that number nor have you.

Mr. TIERNEY. All right. When I read the comments back, the information from the Department, seemed to think that they were indicating it would be redundant, and that they had already provided the information to Congress. Were you able to find anywhere that they provided that information to Congress?

Mr. WALKER. I'm not aware of that.

Mr. TIERNEY. Now, I've since—I sent that letter in my opening remarks or whatever, and got a nonanswer back on that. But in their letter, they indicated that the Department, not Congress—the Department had approved the procurement budget higher than the congressional cap. Does that mean anything to you in terms of the legality situation? Is there some law that I'm missing that allows the Department to set a cap different from the cap that Congress has set.

Mr. WALKER. They can propose a cap in excess, but I don't see how in the world they're going to be able to spend the money.

Mr. TIERNEY. You would think. Wouldn't you? When I compare that, their statement to Section 217 of the Public Law 105–85, it certainly looks to me as if they're actively and affirmatively violating the letter and intent of that Federal statute. I want to make that note to the chairman, because I think it's a fairly serious matter. You know, we go about trying to have some accountability in this Congress for large expenditures. We have a lot of security issues to deal with and we set a cap, and the next thing we get back is a letter saying that the Department—not Congress, but the Department approved a procurement budget higher than the congressional cap.

It seems to me to be a direct contravention of public law, and I think that we ought to take that under consideration, and decide what we are going to do about that.

Mr. LI. Mr. Tierney, can I clarify?

Mr. TIERNEY. Yes, Mr. Li.

Mr. LI. Can I clarify that, please?

Mr. TIERNEY. Sure.

Mr. LI. I'd like to clarify something relative to the cap. It is true what the Comptroller General said in terms of his explanation of the intent of the cap is financial discipline to ensure that the expectations are met. I should note to you that the DOD, in their statement to the subcommittee today, has identified the fact that they recognize that they will exceed the cap, but that they have not yet

exceeded that cap but that they will exceed that cap in 2009. And, as a result, they feel that what they need to do is to request from the Congress relief from that particular cap. So I wanted to make sure that I clarified that point.

Mr. TIERNEY. I appreciate your doing that. I'd just make the note that's not at all what they said in their letter. The letter clearly indicated—and this is a quotation—that the Department approved a procurement budget higher than the congressional cap.

Mr. LI. And that's correct. And as a matter of fact, Mr. Tierney, a few years ago, Mr. Aldridge had identified the fact that he was recommending termination of the cap. However, the current language, which I have just read from the Department, indicates that they would ask for relief. You would have to ask them whether or not relief means termination or an increase in the threshold.

Mr. TIERNEY. OK.

Mr. WALKER. Mr. Tierney, my experience has been is it's more the "plug and pray" approach. The plug is, you plug the quantities, and pray that you can get more money in order to increase the quantities. But you can ask the Air Force.

Mr. TIERNEY. I shall. Thank you.

Mr. SHAYS. Thank you.

Mr. Schrock, you have the floor for 10 minutes.

Mr. SCHROCK. Thank you, Mr. Chairman.

And General Walker, Mr. Li, thank you for being here. You came on a good day. You've got us all at a disadvantage because none of us got any sleep last night, so we are probably going to be victimized. But that's all right; we are used to it.

Mr. Walker, let me make just a couple comments on what you said, things I agreed with.

Your comments on spiral development is absolutely right, and clearly a lot has happened since 1996. And I think that's the problem I have with any military platform, whether it's a plane, a ship, a tank, or whatever: By the time you get it into the fleet or into the air, is the threat still there. We need to tighten that at some point. And I agree with you that defense budget pressures are horrendous. For each dollar they spend, we have to make sure we spend each one of them economically. So I am really right on with that.

Let me start by asking you, in your report titled, "DOD Should Reconsider the Decision to Increase F/A–22 Production Rates while Development Risks Continue," you recommended limiting the productions from 22 to 16 aircraft. Now, I've read a lot of this stuff and I may not have seen it, but did you do a cost analysis, cost benefit analysis on that report? And, if you did, what did it say?

Mr. WALKER. Allen, could you cover that?

Mr. LI. Yes, sir.

A risk analysis, risk assessment was produced by DOD about the same time that we issued that report. And there, what our recommendation was, sir, was that they update that particular risk assessment. And we still stand by that. Then the reason why is, their analysis was on the basis of the 303 aircraft; and now that it's reduced down to 276, we believe that, following operational tests and evaluation and all of them showing that all problems

have been fixed, I think it would be appropriate for them to revisit that risk assessment under those new conditions.

Mr. SCHROCK. Did you mean 333 or 303?

Mr. LI. It was down to the 303, because it was 295 plus——

Mr. SCHROCK. OK. I see. I see. That's right. Did you quantify the risk of retrofits? Because that can be mighty costly as well.

Mr. LI. Yes. And we recognize the fact that the cost would involve termination costs to their subcontractors. However, sir, the concern that we had expressed and that we have identified in several of our reports has been that it's more expensive to fix things after production. And it was a concern on our part that 73 aircraft would be on contract by the time operational tests and evaluation was completed. We thought that was a high risk.

Mr. WALKER. Our best practices work has clearly shown that the later you are in resolving these technology problems, you have an exponential growth in cost increases in order to solve those problems after the fact. And so that's the premise.

Mr. SCHROCK. Did you assess the impacts of limiting production?

Mr. WALKER. It depends on what you mean by the impacts. The impacts on the contractor, or the impacts on our defense posture? Which aspect?

Mr. SCHROCK. The cost estimate.

Mr. WALKER. Yes.

Mr. LI. As I indicated, we looked at their risk assessment, and we believe that indeed, several of the factors that they identified are correct. I think that you would incur termination liability charges. However, the amount is one in which you would have to weigh that versus the cost of the retrofit. And I think that's the difference in opinions, sir. The DOD thinks that the changes that they are making now address the issues that we have previously indicated in terms of the fin buffet problem, overheating, and whatever. We think that it would be wiser to wait until operational tests and evaluation is completed before you know what those changes would be.

Mr. WALKER. Part of the difficulty, as you know, is that you know what the termination charge is, that's something that you can calculate. It's a certain amount. You don't know with certainty what the additional retrofit costs are going to be. But our experience leads us to believe that they would be higher. But you don't have the same degree of certainty, obviously, as you do in the contract termination charge.

Mr. SCHROCK. Last year Congress authorized and appropriated funding for greater than 16 in lot No. 3 and lot No. 4. In fact, I believe the Defense Department recently approved lot 3 to be 20 aircraft and lot 4 increased procurement for up to 24 aircraft, if I have those figures right. What would the termination liability be by reducing those down to 16?

Mr. LI. I don't know what that figure would be, sir. But I recognize the fact that there would be some if you were to—that would only impact upon the long lead items that are under contract, not for the actual aircraft themselves, the long lead items for them.

Mr. SCHROCK. There is no way to determine that figure.

Mr. WALKER. No. I would suggest that something that might be more appropriate for the DOD to do. We would be happy to take a look at it and comment on it independently, if you would like.

Mr. SCHROCK. What about the inflationary impacts of delaying procurement?

Mr. WALKER. That's not the major driver of the cost. Inflation is not the major driver of the cost of this platform.

Mr. SCHROCK. Did you assess the increasing O&S costs of retaining our legacy aircraft longer? That is a real concern to me because every year they're in life it's costing more and more money, so it's like throwing good money after bad.

Mr. LI. No, we did not. However, we are aware of it. The fact of the matter is there is no guarantee that the F/A–22 would be able to be in place to replace, for example, the F–15 at that point in time.

Mr. SCHROCK. Was consideration taken into account on what the impact to the young men and women flying these planes would be? What the impact would be on them by delaying this capability?

As I said earlier, helicopters are falling out of the air at an alarming rate as far as I'm concerned. It happened a couple of times in Iraq. I'm wondering if it was from a hostile situation, a combat situation, or if the frames are just worn out and they had mechanical repairs that had been stretched to their limits.

Mr. WALKER. There is absolutely no question that the Air Forces faces a serious problem with regard to the aging of its airframes.

At the same point in time, I would respectfully suggest that part of the business case analysis that I had recommended earlier needs to take that into consideration. It may or may not be that the F/A–22 is the answer to that. Clearly, you're going to have the F/A–22, but how many do you need? And to the extent that you end up deciding that is going to be a different number, it may end up freeing up more dollars to be able to get more platforms to our airmen and women quicker than otherwise would be the case with the F/A–22. So there are tradeoffs there I think.

Mr. LI. If I could add to what the Comptroller General said, 2 years ago the General Accounting Office actually did an analysis on what the age of the fleet was; and we raised concerns to Secretary Rumsfeld in anticipation of the analysis that they would be doing for the Quadrennial Defense Review. We identified the fact that, even with the investments that they would be making in the F/A–22 and the JSF and the F/A–18 EF, that the average age of the tactical fleet was still going to be going up. As I'm sure you can recognize that's because the quantities, airplanes are costing more. So, therefore, the fleet is still aging.

Mr. SCHROCK. By bringing something like the F–22 into the fleet, it's going to drop—they can decommission some of the old aircraft. It would certainly bring the average age of that life down dramatically—I would perceive, anyhow.

Mr. WALKER. The problem is the numbers. Yes, you're right. If you can bring in the F/A–22, that helps, because it's obviously brand new. On the other hand, these cost so much per copy that it really—as our report shows, it really is not going to help the average that much. It might help with regard to the F–15, but it's not going to help with regard to the overall issue. Because the

quantities just aren't big enough, and they're getting smaller year by year.

Mr. SCHROCK. I'm led to believe that the current Air Force estimate in the fiscal 2004 President's budget is for 276 aircraft. Does the Air Force—does that current estimate account for your concerns?

Mr. WALKER. My view is, as I mentioned before, is I don't think that we should be plugging the numbers. I think a new business case is needed. A new business case is needed to say what is the right number, why, at what cost and what is the ripple effect. That was not done in coming up with that number is my understanding.

Mr. SCHROCK. Could it be——

Mr. WALKER. Oh, clearly it can be done and I think it should be done.

Mr. SCHROCK. OK. My time is expired.

Thank you very much, Mr. Chairman.

Mr. TIERNEY. If the gentleman would yield for one question through you to the witness, if we could.

One of the comments was made that the inflation wasn't the major driver of the cost of this aircraft. I'm wondering if you could ask the gentlemen if he could identify what is, in fact, is the major driver of cost to this aircraft or the one or other factors. Thank you.

Mr. LI. I'm sorry. I don't quite understand the question, Mr. Tierney.

Mr. TIERNEY. Mr. Walker indicated the major driver of cost to this aircraft was not inflation. What are the major drivers of cost to this?

Mr. LI. I'm sorry. Now I understand. Initially, in the $13.1 billion increase, inflation was a significant portion of that. Air frame was the second most important. Then in the $5.4 billion increase, the time when that occurred there was a flip-flop, that actually air frame and labor costs were the ones that—where it's most important with inflation being second. So the Comptroller General is correct in that the second, it's becoming less of an issue. But the fact of the matter remains that a lot of that cost is because of the air frame and labor costs associated with it.

Mr. MURPHY. The gentleman's time has expired.

Now recognize the gentleman from Maryland, Mr. Ruppersberger, for 10 minutes.

Mr. RUPPERSBERGER. That's why they call me Dutch. Either way.

Mr. MURPHY. We now recognize Dutch for 10 minutes.

Mr. RUPPERSBERGER. That's fine. That's great.

By the way, as far as sleep is concerned, it's been said sometimes that sleep is just a waste of time. So we should be OK with that.

Getting back to the subject matter first thing, Mr. Tierney, I think that you've—I praise you for bringing this issue to the table. Accountability is always important, especially when it deals with cost and especially what is happening with our economy.

Now the Defense Department is doing a tremendous job, in my opinion, with respect to the war. We're winning this war because of our technology, because of our military and our training of our men and women; and we want to be superior in this realm so we can have our freedoms.

But after hearing the testimony and what is happening here today, it seems to me that more—if we were more honest, if the Defense Department was more honest about cost and time estimates, these programs could be a lot more cost effective so that we all know what the ground rules are. If in fact there is a problem and we have to move forward because of development issues or whatever, then we lay that on the table. We come back. But we do have oversight. That's what makes this country so great. We cannot keep spending forever; and we have to understand where the programs are, how effective they are, and what the costs are and whether we can afford them.

Now, let me ask you this question. We talked about the GAO studies, that inflation is a factor in the cost overruns. Maybe we should give Chairman Greenspan credit for that since inflation hasn't grown as high in the last 10 years. But how about the issue of cost of technology in the advancement of technology? Has that increased the overruns as we're going through the process, the development process? And then technology is changing forever. Has that in any way increased the cost?

Mr. WALKER. Obviously, the cost of trying to deal with some of the technology problems, avionics, etc., has been a significant contributor to some of the additional costs in this program. But, as you know, generally, over time, as we have seen in the private sector, that once that technology has been—has matured, that over time advances in technology tend to drive costs down, not up. It's the development part, the research part.

Mr. RUPPERSBERGER. But it can go both ways. It depends on where——

Mr. WALKER. It depends on where you are in the cycle.

Mr. RUPPERSBERGER. Sure. The knowledge-based product development process has to show that it can be manufactured within cost schedule and quality targets. Did the manufacturers of the Raptor demonstrate that?

Mr. LI. I don't believe that has been done sufficiently. One of the concerns that we had expressed as part of our reviews has been—for example, the stability of the statistical process was not demonstrated. Earlier in the program, we had concerns about the stability in terms—and the proxy being how many of the drawings—engineering drawings themselves were completed at a certain time. Those would be indicative of a program that was ready to be produced in large quantities.

Mr. RUPPERSBERGER. In your testimony, you state that, because DOD did not follow the steps, that, "a cascade of negative effects became magnified." You continue by adding, these led to acquisition outcomes that included significant cost increases and scheduled delays, poor quality and reliability. Is it your contention that the F–22 is a bad, unreliable product?

Mr. WALKER. No, that's not what we're saying.

Mr. RUPPERSBERGER. That's why I asked the question.

Mr. WALKER. That's correct.

Mr. RUPPERSBERGER. Do you think if DOD applied knowledge-based product development process it would stop or kill the Raptor program?

Mr. WALKER. Well, you can't change history. You can try to learn from what has happened in the past to do two things: one, not make the same mistakes going forward with regard to the F/A–22 with regard to additional production and funding decisions; and, No. 2, to make sure we don't make these mistakes on other weapon systems platforms such as the JSF, etc., going forward.

Mr. RUPPERSBERGER. A concern of mine, and I think this is a part of the issue on DOD, and you have the vendors, will it make contractors and vendors hesitate in developing the best product to reach these goals? That happens where we set a certain limitation and in order to get those goals we don't have the quality product. Do you feel that will have any impact?

Mr. WALKER. We strongly believe at GAO, that following commercial best practices is in the interest of the government, that is in the interest of the contractors, that is in the interest of the warfighter, and that is in the interest of the taxpayers. There is absolutely no question about that.

Because when you have a situation such as the F/A–22 where you have delays, cost increases, compromised performance standards, nobody is a winner on that. All those parties are losers.

So, again, I don't want to unduly pick on the F/A–22 because we were asked to use that illustrative example, if you will, but there is no question that following commercial best practices is a win-win situation for everybody involved.

Mr. RUPPERSBERGER. In your testimony you also say that DOD is too rigid and because of that program managers are basically setting themselves up to fail. Now, do you think the most honest cost and time estimates—and you've really answered this—will make programs more cost effective?

Mr. WALKER. Partially what we need is a cultural transformation, quite frankly. I would describe historically that part of the pressures that DOD—and part of the culture has been get the money, spend the money, hit the milestones. That's basically what has happened. If you don't end up getting the money, spending the money, hitting the milestones, then there can be negative ramifications to one's career.

There hasn't been a whole lot of positive reinforcement for individuals to make tough choices and enhance transparency when things are not going as you would like it to; and so I think, you know, there is a cultural issue here.

I think part of the problem is what I put up before. If you're going to change program managers so frequently, you know, that's a fundamental problem in assuring a reasonable degree of continuity and an appropriate degree of accountability for positive outcomes over time.

Mr. RUPPERSBERGER. What you're really talking about is the management issue of accountability, and that accountability—and yet I'll say this. My impression is, trying to change the culture of DOD at a time of war when we're hopefully all behind what—at least our military and what's going on to protect our freedom, that's going to be very difficult. That's why I praise Mr. Tierney for bringing up this issue on a very, very—a piece or era of F–22 that is something that's very important to our freedoms but yet it's something that seems to be totally lack of accountability.

I would hope that we would somehow—this program would help us in that regard and also not send a chilling effect to the vendors, the manufacturers that are in a very difficult position because they have to move into an arena where they're told this is what we have to do and DOD says do what you have to do and you have Congress here trying to make them accountable.

Mr. WALKER. If I can, Mr. Chairman, I think you're right that you need some stability. You need some certainty. But I would respectfully suggest that the way you get that is by basing the decisions on what you're going to do, when you're going to do it, how many you're going to have based upon an up-to-date business case and then, after you've done that, to employ these commercial best practices with regard to the execution on that number. Both of those things I think will help to provide increased certainty and stability which you talked about that the contracting community needs.

I think if you talk about DOD—I have a son who is a company commander in Iraq right now with the Marines. There is no question that we are No. 1 in the world in fighting and winning armed conflicts. There's nobody even close. It's not just because of our platforms. It's because of our people and our technology. But the fact of the matter is DOD is a—they're an A in that, No. 1 in the world in effectiveness. They're a D in economy, efficiency and accountability. And with the budget pressures that we face, it's not in our collective interest or, frankly, in their interest not to deal with these issues.

Mr. RUPPERSBERGER. If it weren't for hearings like this, it might even get worse.

Let me say one other issue I think needs to be addressed, too; and that is the issue of flexibility. Because we still do have—we talked about inflation, which you're saying right now doesn't have an impact, the advance in technology. We still need flexibility, but maybe that can be looked at on an annual or biannual basis.

Thank you, Mr. Chairman.

Mr. MURPHY. Thank you.

The Chair recognizes himself for 10 minutes. I just want to followup on some questions you were just asked.

You referred to there is not real positive reinforcement. There's cultural issues which interfere. Could you elaborate on what you mean by what sort of positive reinforcement and cultural issues are not there that you need to have there?

Mr. WALKER. Well, the fact of the matter is, to the extent that you experience problems, human nature being what it is, you want to try to solve those problems. At the same point in time, if additional transparency associated with those problems could lead to reduced funding or could—then obviously there is a conflict there.

My view is that for any system to work, you know, whether it's an acquisition system, you know, whether it's a health care system or a corporate governance system, you have to have three things: incentives for people to do the right thing, including knowing when to say no; two, reasonable transparency to provide some assurance that people will do the right thing because somebody is looking, and that's what oversight is all about, in part, and periodic report-

ing; and, third, appropriate accounting mechanisms if they don't do the right thing.

Mr. MURPHY. Do we have the first one?

Mr. WALKER. We don't have the right incentives, I don't believe. No, I don't believe that the incentives there right now are there for people to make tough choices, to say no in appropriate circumstances. Whether that be with regard to platforms, whether it be with regard to quantities, whether it be with regard to delay moving into the next stage because we don't have the technology, maturity, the right level. That's a victory. You get the money, you spend the money, and you don't really hit the milestone. In form you may hit the milestone, but in substance you don't. Everybody is a loser on that. I think people need to understand we need to move away from that.

Allen, you're closer to it day to day.

Mr. LI. I absolutely agree with the Comptroller General. The issue is there is obviously a disincentive to be able to tell your superiors that you have problems with your program because that might translate into reduced funding in the following year. When the evolutionary approach that we have identified in terms of making sure that we have the sort of technologies that would match those expectations and the resources, I think that would be the answer, sir.

Mr. MURPHY. So in practical terms, how do we do that? What is standing in the way of that implementation?

Mr. WALKER. One thing in—so much in government, we need to end up defining how do you measure success. You need to end up aligning institutional and individual performance measurement and reward systems with a modern definition of success.

I will tell you there are dedicated professionals, both in uniform and civilians, working on this program and other DOD programs. They're not the problem. The problem is the system. The system and the process and the historical ways of measuring success. People are doing their best to try to make this system and others work. I have no doubt about that.

Mr. MURPHY. That's frustrating.

Let me move to another area. Since the F/A–22 is still in development, why is it too late to adopt a knowledge-based acquisition approach? What is its impact upon the joint——

Mr. WALKER. It's not too late prospectively for what's left. It's obviously too late for the stages that we've been through.

I think part of that has to do with the issue that was raised before. What type of quantity should we be producing at this point in time? What is the maturity of the technology and do we want to increase production rates?

We should use the commercial best practices maturity of technology concept as part of that decisionmaking process, not as to whether you're going to produce but when and how many you're going to produce.

Mr. LI. Mr. Chairman, the F/A–22 is both in development and in low-rate production. It has been in low-rate production since 2001. Development is about 95 percent complete. That is the reason why it is very difficult to apply those principles.

Mr. MURPHY. I guess when I look at the numbers of what was estimated that would first be developed of where we are now over time, how many do we really need then? Do we need 300, 400, 500, 200? This is very frustrating to see these numbers floating all over.

Mr. WALKER. It's not our job. We're not in a position tell you how many we need. I think that's where the Department of Defense has to make a business case. I think they need to make that business case based upon today and tomorrow, not the past. What's the situation in the world today? What do we expect it to be in the future, to the best of our ability? What are the types of threats that we face? What type of capabilities do we need? To what extent does this address that threat, and at what cost and what ripple effect on the JSF, on the space systems, on, frankly, programs for other services as well?

Mr. MURPHY. One other category I want to ask about is the timeframe on production and development here. When I look at some of the numbers, look at inflation and change orders or whatever else is in there, I'm puzzled on this when we look at the cost overruns. Are those pretty clearly in the initial estimates of cost of production when it was set up years ago? There would be anticipation of this inflation, there would be anticipation of change orders, anticipation of technological changes?

Mr. LI. Not the change orders.

Mr. WALKER. The change orders you wouldn't. The inflation you would. Obviously, you know, there's going to be some change orders. Honestly, change orders, you know, affect many different types of things, including, for example, the Capitol Visitors Center. There are change orders on the Capitol Visitors Center; and, therefore, that ends up costing more money.

So it's a basic concept, but let's not go into that concept right now.

Mr. MURPHY. I just think of whether—and people may be watching this, may know nothing about these planes, recognize where they're adding a room on to their home and building a new school building in a local school district that very often one gets these estimates, and it sounds like—good and affordable, and inevitably there's changes that come through. So I'm wondering if that's part of what we ought to put into our initial estimates of where things are, to recognize that's an inevitable part of any production, instead of getting hopes up on the Department of Defense and Congress that we can build this many planes for this amount of money and this amount of time. I would think any business would be anticipating that is part of the cost of building production, that there will be those changes.

Mr. WALKER. Well, I would respectfully suggest there's a strategic level for this discussion and kind of a tactical level.

On the strategic level, when you're talking about the platform itself, whatever platform it is, whether it's F/A–22 or whatever it might be, you know, you have to say not what you want but what you need. I think to a certain extent one could debate whether or not this platform—it may have been a need in 1986. It may or may not be a need now. It may be more of a want. I don't know. That's the business case. You've got to be able to develop a business case.

So, as I said before, in America we can do anything with time and money. We can build all kinds of things, but we have limited resources. So we have to figure out what should we be doing based upon credible threats, what can we afford to do, what are the ripple implications of that.

Mr. MURPHY. Thank you. I yield back.

Mr. TIERNEY. Ask the gentleman to yield so I don't have to ask for additional time. I will squeeze this in on that.

One thing I wanted to make clear, however, in the original estimates of this program and others, people make predictions of some element of change. I mean, they understand there's going to be some change orders, some inflationary factors, whatever.

We're talking here originally of some $13 billion plus of unaccountable, unforeseen expenses that should probably—some portion of those, not a great portion of those—should have been foreseen.

Mr. Walker, has the Department of Defense or the Air Force ever indicated to the GAO any change in their plans for the number needed from the original plan? Have they ever said to you, we've made a determination that we're going to need a different number from that 600 and whatever it was in the beginning, and here is the reason why? Have they ever come forward with that?

Mr. WALKER. I haven't seen that; and, candidly, I haven't seen the business case that I talked about before.

Mr. TIERNEY. So I guess we can follow right down the line. So they haven't indicated why they need those numbers, they haven't indicated what the cost per plane would be at that number, and then I guess we can assume that then there has never been any analysis done of what the effect of that final number would be on other plans for the Air Force or other plans for the Department of Defense systems and things of that nature. This would be a good area for us to start looking at here, from what I gather.

Mr. WALKER. We haven't seen it. But I will say this: The Department is making progress in many regards. There is no doubt about that. They're making progress not only with regard to the adoption of spiral development, they're also making progress with regard to trying to match the POM with the budget, the program planning with the budget.

They're doing that. That's a positive step. But they're only looking out 1 and 2 years.

The problem is, you need to consider longer-range implications and total life-cycle cost. So you can manage that for the next year or two, but the implications over the longer term are much greater on the ripple effect than the short term.

Mr. TIERNEY. Has the Department of Defense or the Air Force ever indicated to the General Accounting Office if you made less of these F/A–22s with the money not spent on those what other platforms or systems could be increased and how that would effect the mission of the Air Force or the Department of Defense generally?

Mr. WALKER. They haven't, but I think it's something they need to do. Because there's a very real issue of aging platforms. There is no doubt about that.

Mr. TIERNEY. Thank you.

Mr. MURPHY. Recognize Mr. Duncan for 10 minutes.

Mr. DUNCAN. Thank you, Mr. Chairman.

I was interested in, Mr. Walker, in your statement you said, the problem is the system, not the people, that you would give the Pentagon an A on the people and technology or something—and a D in efficiency, economy and accountability or something to that effect.

I think, actually, there are many fiscal conservatives who would make that D and F when it comes to programs like this.

I was told by staff that in 1991—they don't have the original cost estimate. The old shell game in Washington is to low-ball the cost of any program when it first starts and then allow all these cost overruns and add-ons and everything else—that they said they don't have what the original estimate was in 1996. But in 1991 they estimated that these planes were to cost $93 million apiece, and now you said a few minutes ago it's now over $200 million. They tell me it's $257 million. Is that roughly correct?

Mr. WALKER. Allen.

Mr. LI. Mr. Duncan, it's nice to see you again. A few years ago I testified before you on transportation issues.

Mr. DUNCAN. I remember.

Mr. LI. It's different now to talk about defense.

But, switching gears to defense, they are different numbers because the Air Force in their explanation, for example, in today's statement identifies how it's decreased by lot. The figure that the Comptroller General gave to you is an average figure for the entire program.

Mr. DUNCAN. That leads me into something else. You know, unfortunately, here in Washington it seems that too many people forget that $1 billion is a lot of money. $1 billion is a lot of money. What I have from the staff says the current production cost cap is $36.8 billion. Apparently, this is what was set by the Defense Authorization Act of 1998. The current production cost estimate is $42.2 billion, according to the Air Force, and $43.5 billion according to the GAO. Therefore, the project is $6.7 billion above the cap.

I mean, that should be mind-boggling or shocking to most people. It doesn't seem to shock anybody around here, but it sure should.

What is the difference—where is the $1.3 billion that the Air Force and the GAO disagree on? Do you know—even that should be considered a lot of money.

Mr. LI. It wasn't a disagreement between the Air Force and GAO. As we identify in the report, the Air Force acquisition plan identified that figure of $1.3 billion. What we were indicating in the report was that the Office of the Secretary of Defense's number of $43 billion initially did not include that $1.3 billion. That's what we were pointing out, that were they to consider the full—all of the cost that came subsequent to their decision in August 2001 they would include that.

In direct answer to your question, the $1.3 billion part of that, for example—and we heard about this earlier—is the change in subcontractor. For example, initially, a subcontractor, the avionics—one of the avionics subcontractors actually was part of Lockheed Martin. Subsequent to that, that particular subcontractor was sold. So the savings that they originally thought that they would get from somebody being within and not having to pay for profit, now they're having to incur that extra cost.

Mr. DUNCAN. Well, you know, I love my children, but I'm always on to them about not wasting money. In the same way, I've always considered myself to be a pro-military type person. But that doesn't mean that I just want to sit back and watch the Pentagon waste billions and billions of dollars. It seems to me if we can justify this we can justify almost anything, I mean just anything. I know these companies are making obscene profits out of this, but this is wrong. This is just wrong to have these kinds of overruns.

I know this is a time of great patriotism, and we're all proud of the job the troops have done, and there is certainly nothing against them, but this doesn't mean because everybody is pleased about the quick and decisive victory in Iraq that we should just sit around and justify billions and billions in cost overrun and that we can just sit back and cavalierly accept anything that happens in the Defense Department.

Because when we just lose billions and billions of dollars it hurts poor and lower income and working families all over this country, and we seem to forget that.

Then we talk about these change orders. You know, I guess some people would like to have a Rolls Royce, but maybe they have to settle for a Mercedes. And I think that's the way it is with some of these planes. We can buy a plane with every bell and whistle on the world on it, but we might be able to buy one for $100 million less that could would be just as safe and do just as good a job.

I'm a low-tech person living in a high-tech world, but they tell me that a computer is obsolete on the day that it's placed on a desk. That's is how fast technology is moving.

So if we're going to have research and development and then we start production and then 2 or 3 years down the road we come in with all these change orders because we've got some new high-tech gadget that somebody wants on there—I mean, where is it going to stop? What we're going to see in the future, we're going to see worse cost overrun and explosions in programs than what we're seeing here today. If we don't stop this, we're in bad trouble in the years ahead.

Yes, sir, Mr. Walker.

Mr. WALKER. In fairness, Mr. Duncan, I think the DOD has adopted most of our recommendations with regard to their acquisition policy. They are moving to an evolutionary or spiral development approach. With regard to some of the newer systems—not the F/A–22—but with regard to some of the newer systems, we have definitely seen improvement.

The biggest problem of late has been that sometimes they'll adopt a policy that embraces commercial best practices evolutionary development, rather than the big bang approach, etc., but in practice they don't always implement that policy. It's getting better.

This amount of money—we can't afford it as a Nation. Frankly, DOD can't afford it. Because with the budget pressures that are coming it's going to have a very real effect. There are going to have to be tradeoffs. So they can't afford these kinds of overruns either, I would suggest.

Mr. DUNCAN. You know, I'm for a strong national defense, but we're spending more on defense than just about all other nations

in the world combined. It seems to me that if we're going to do all the other things that people want us to do we have to limit some way.

I'm glad to hear that you're saying that things are improving or getting better.

Mr. LI. I'll like to build on what the Comptroller General just said.

In terms of the way that the program has recently been managed, DOD has itself—and I would assume that Dr. Sambur, when he comes on in a few minutes, he will tell you that he was not satisfied when he came on board when he found out that the development costs had increased by $876 million. They have made and they have told me they have made significant management changes both at the Air Force level and also insisted that occur at the contractor level. So the concern is there, and I think that's encouraging.

Mr. DUNCAN. I'll tell you this, if people aren't concerned or upset or shocked about what's happening in this program, they've been in Washington too long.

Thank you, Mr. Chairman.

Mr. MURPHY. Thank you, Mr. Duncan.

The Chair recognizes Mrs. Maloney for 10 minutes.

Mrs. MALONEY. I thank the chairman for calling this important hearing.

I would like to be identified with the comments of my colleague on the other side of the aisle, Mr. Duncan.

But, first, I'd like to welcome Mr. Walker and all the panelists. I just came from the floor where I put into the record the entire GAO report that you did on the Royalty in-Kind Program and how that is going to end up costing taxpayer dollars. So I congratulate you on the work that you've done to help us manage government better.

If there was ever a program that needs to be managed better—this program was called the flagship of acquisition reform when it started. Now it looks like a disaster personified. You've done a good job in sort of pointing out what went wrong.

I'd like to join with my colleagues on the other side of the aisle asking Mr. Walker to come forward with some suggestions on how we prevent this in the future. We obviously need stricter guidelines, more accountability and more honesty in contracting.

One of the things that we did in New York City when I worked there when companies had huge overruns in the—we kept a record of it so that when they came back for city contracts they got demerits for poor performance, and their ability to get a future contract was diminished. So that contractors then tried to be more honest about how much it's going to cost.

But going into a program where we're going to get 648 planes—and I see one of my colleagues who was an officer in the military, Mr. Schrock, in the Navy before this, I know he must be outraged that we could—when we went in there we were going to get 648 planes. Now we can only get 224 because of the tremendous $20 billion cost overrun.

My question is, how can we put more accountability into the cost overrun situation so that it doesn't get so out of hand?

You know, granted, if the military comes in and says I want to redesign the plane, that's another thing, but when they happen—it's usually the contractor saying I need more money. So how do we put more government control or accountability or better planning on this? As Mr. Duncan said, we spend more than the whole world combined on our defense. We are ready for the next war. We are ready for any war. But we've got to get some control on this military spending or our deficits are going to go up and we're not going to have the money for education or for child care or for health care here at home.

So, Mr. Walker, how do you——

Mr. WALKER. We have made a number of recommendations. Let me deal with it on several tiers just briefly.

Mrs. MALONEY. On cost overruns, how would you control the cost overruns?

Mr. WALKER. I think the primary way you do it is twofold. No. 1, you adopt the evolutionary best practices approach that we talked about, where you make sure that you're trying to use spiral development, which is what the Department is talking about, to mature the technologies, to develop certain levels of capability such that you can get some platforms delivered earlier. Then you end up upgrading over time as new technologies mature and as they become available to do that. I think that makes eminent good sense.

That was not done in the case of the F/A–22. They're trying to adopt that practice with regard to other systems.

I think, in addition to that, you have to look at your contracting terms. You have to make sure that your contracting terms provide for the appropriate incentives and accountability mechanisms to the contractors to make sure that, you know, if things go better than you thought, then somehow they will suffer—they will gain from that, if it goes better than you thought. If it doesn't go as well as you thought, they may have some penalty associated with that.

Frankly, many of our contracts don't work that way. We need to make sure that we have an adequate amount of transparency in the interim to know how things are going so not only DOD can manage it better but the Congress can oversee it better in order to try to help intervene earlier rather than after it's too late to really do much about it.

So those would be a few things off the top of my head.

Mrs. MALONEY. But how would you build the incentive in? It sounds good. Put incentives in that they perform better. Specifically, how would you do that? We're going to pay you more if you keep your contract or line or we're going to keep a record of your overruns and penalize you the next contract? How do you build in the carrot and the accountability?

Mr. WALKER. Well, frankly, this happens in a lot of different types of contracting arrangements, not just weapons systems. It can happen with regard to information technology systems. It can happen in a whole range of areas where you end up defining what you want. You define, you know, key success factors. You develop appropriate milestones. Cost, quality, timing and performance being other elements.

To the extent that people end up exceeding those expectations, they may have some gain from it. To the extent they don't, they may suffer some penalty as a result of it.

The problem is that many of the contracts, frankly, that we have at DOD are so complicated that it's almost impossible to understand, much less to administer. We could have days of hearings, I think, on this.

But I'll be happy to visit with you individually on this, if you want.

Mrs. MALONEY. Thank you.

Mr. MURPHY. The Chair recognizes Mr. Shays for 10 minutes.

Mr. SHAYS. Thank you, Mr. Walker, for being here. I thank my colleagues for the questions we asked.

We had a hearing and December 7, 1999. The purpose of the hearing was to examine how the Air Force implemented cost control strategies and dealt with scheduled overruns in the F–22 program.

We had a hearing on June 15, 2000. The purpose of the hearing was to examine the status of the Air Force production cost reduction plans in the F–22 program.

We had a hearing on August 2, 2001. The purpose of that hearing was to continue the subcommittee's examination of production cost reduction plans for the F–22 program and to determine why the DOD and the Air Force were projecting different production cost estimates.

Nw we are having a hearing on April 11, 2003. I was thinking that we have kind of missed a gap here, but when I look at the hearing, we had the third hearing—it was August 2, 2001. And something quite significant happened on September 11, 2001.

But this is a hugely important hearing. It's hugely important in my judgment for just the terms of what we can learn in the process and how we can see what happens in the future. And it's very important based on the actual program itself.

I agree with my colleague, Mr. Schrock, that we need the plane. I also agree with Mr. Tierney that this is short of an outrage. To go from 750 planes in 1991 and make it 648 to 438 in 1993, to 339 in 1997, to 333 in 1999, to 276 in 2002, to maybe 224 today and not get the same numbers from the Air Force and from DOD—and, frankly, the arrogance of not—their lack of willingness to tell us how many planes.

For instance, I want to know from the Air Force how many planes can they build under the cap of $36.8 billion. That's what I want to know.

The other thing I want to know is what we can do with 276 or 224? What planes are they replacing? The F–15, Mr. Walker, is that the only plane that would be replaced by this?

Mr. LI. Because of the age of the F–117s, the attack version of the F/A–22 would also enable them to replace the F–117s.

Mr. SHAYS. So am I to make an assumption, though, when we're doing—we have replaced all those planes with a number of 224 or 276?

Mr. WALKER. No.

Mr. SHAYS. So what am I to assume and what is the Air Force assuming?

Mr. WALKER. That's why I say I believe you need a business case. You need to demand a business case and to try to understand that.

I think what's been happening is that the numbers have just been going down in order to fit whatever appropriation is there, and that is not the way to do it.

Mr. SHAYS. I think that is fairly obvious. I just wanted that on the record.

The challenge I have, Mr. Schrock, is coming to grips with the fact that we have an DOD and Air Force that is not cooperating with the committee or Congress in helping us sort out this mess. It has become a gigantic mess.

In terms of process in general, I'm intrigued by the evolutionary approach versus the so-called revolutionary approach. And I'm interested that you make the claim evidently, Mr. Walker, that we would have had—we would have planes—some of the F–22s would be in operation today, that they would cost less, and we'd be able to buy more of them. That's really what you're saying to us. But I don't know how you get there.

Mr. WALKER. Well, basically, what it comes down to, Mr. Chairman, is I would characterize that what happened on the F–22 is that in 1986 we were in a very different security environment. We faced very different adversaries. The Air Force decided that we needed to maintain air superiority over time and therefore developed this F–22 concept. The concept was, to a great extent, based upon wants rather than—not just needs; and there was some need—there's no question—but also wants. They wanted to design the Rolls Royce, as was mentioned. Why can't we do this? Wouldn't it be nice if we had this? And even when they came up with that, the definition of this evolved over time.

My point is that spiral development says, what type of capabilities do you need versus what would you—what do you want, which you may not need. It says, determine what those capabilities are and start to build systems in an evolutionary approach where you end up, you know, maybe getting an 80 percent solution for the first batch and then you end up—as technologies mature, you get a 90 percent solution for the second batch, and you get a 100 percent solution for the third batch.

This is oversimplifying it, but that's basically the concept, rather than putting, you know, all your money and trying to build the Rolls Royce when technologies have not been, you know, have not matured, experiencing significant problems, having to deal with, you know, retrograde, retrofit and all these other issues, just not the way to do it. It's not the way it's done in best practices, not the way it should be done at DOD.

Mr. SHAYS. One of the most instructive points that was made to me by a Congressman who is no longer here, but when I was a newer member he said, the decisions you make in defense—and he was saying that to me as a new Member, given that I was in a State House of Representatives and the one area that was totally new to me was defense expenditures. He said to me, whatever decision you make today will only have impact 10 years later. Or basically—not only—but in a sense he was saying what I do today is going to impact the military of 10 years and beyond.

So in 1991 I was thinking—and we were fighting the Gulf war. I was thinking, thank gosh that people in the early 1980's and late 1970's made us look good in 1991. I'm a Member of Congress, but I had only been in for 4 years.

He also told me something else. He told me our job in Congress is to make sure it's never a fair fight. That my job is to make sure when your son is in battle he has the best equipment and the best training. That's my job, and we never want it to be a fair fight.

So what I'm thinking right now is we could keep the F–15, and we are still slightly superior. The Russians, that's the one area that they seem to do well, is make planes. The French make a pretty good plane. So I'm going through this kind of dialog, is this my—you know, a moment of truth for us? Is this what makes sure it's never a fair fight?

But now, looking at the war right now, we control the air; and I'm wondering, so we didn't need fighter to fighter in this war. And I'm wondering when we'll need it. And so it strikes me, one, we have to monitor what other planes are being made.

Sorry for this long introduction, but I believe in the concept of opportunity costs, which is what, you know, was drilled into me in graduate school. That was the clear concept that if you spend your money here you're not going to be able to spend it here.

I would say to Mrs. Maloney it's not just an issue of opportunity costs in terms of education and so on, it's within DOD. They're going to have to make some really tough decisions.

So it gets me to this question. In your judgment, Mr. Walker, are we so far along that it makes sense just—even if we can only make 224 planes, does it make sense for us to continue, given all the investment we've made? So the opportunity cost is—we have kind of already been at the opportunity cost level.

Mr. WALKER. Well, the opportunity cost is what I refer to as the ripple effect. If you have negative variances, what is the ripple effect of that negative variance? My personal view is—and we're already making the plane. We're in limited production right now. So we're going to have some F–22s.

I think the real question is I believe the business case needs to be focused on how many do we need, for what purpose, at what cost, and with what ripple effect. Looking forward with regard to 10 years from now or more, what do we think we're going to face? That's what I think has to be done.

How many that is, I don't know. I wouldn't want to speculate. But it should be based on a need, not a want and not a plug.

Mr. SHAYS. But in one sense we should almost separate the cost out and have a very studied approach as to you are replacing some plane, how many planes are you needing to replace. So technically what number you need—it might even lead you potentially—I wouldn't make the assumption now—that you would rebuild a plane that we've made in the past at a lower cost and make the F–22. We don't know that, right?

Mr. WALKER. No, you could decide that you might make some adjusted number of the F/A–22 which is, you know, obviously the most advanced system that is on the drawing board right now and redeploy some of those dollars, keep it in defense and redeploy it

to buy larger quantities of either existing systems that have been upgraded or the JSF or whatever.

That's not my job. I can't do that. But that is part of the analysis that has to happen here.

We can't look at these programs in isolation. We can't be wedded to what we wanted years ago and what we may or may not need today.

Mr. SHAYS. Thank you.

I notice we have another colleague.

My time has run out. I do thank you for all your good work on this and other issues.

I will say to you that I think that this committee will devote some time to the whole concept of—that is being done now, but examine it in other programs and maybe ask you to show us some cases that are working well in the evolutionary versus the revolutionary.

Mr. WALKER. We do have some of those, and I think it's important to note those for the record.

I would like to thank you, Mr. Chairman, for allowing me to have Mr. Li here, who is on the point for our F–22 effort.

Mr. SHAYS. Well, you have good people working for you; and he is one of them. Let me say it differently: You only look good because of your good people.

Mr. WALKER. We're only as good as our people, Mr. Chairman. We all know that.

Mr. SHAYS. I have a great committee.

Mr. MURPHY. Thank you, Mr. Shays.

The Chair recognizes Mr. Bell for 10 minutes.

Mr. BELL. Thank you, Mr. Chair.

I want to commend Chairman Shays and Ranking Member Kucinich for their leadership on this issue, as well as Representative Tierney, who I know has demonstrated a commitment over the years, too, on the issue.

For just a moment I want to focus on the past—and sometimes it can be a good guide to the future—and, more specifically, some of the risk that GAO had identified several years back with the program, such as tactical problems. If you could, Mr. Walker, if you could tell us how those problems that were identified were addressed and tell us if it's fair to say that a lot of the problems that were pointed out by GAO were successfully addressed.

Mr. WALKER. We have pointed out a number of problems in the past. I'll answer briefly and then ask Mr. Li to provide some additional details since he has been involved with this a lot longer than I have.

The basic problem that we've found is the failure to follow commercial best practices with regard to the maturity of technology before you move between different stages, design to development to limited production, for example. That's the basic problem. There have been avionics problems. There have been various aspects that I would ask Allen to get into as to what some of the details are there.

Mr. BELL. Can you talk about how they are addressed?

Mr. LI. Indeed, yes, sir. Thank you for your question.

The Air Force in the previous reports that we identified—we identified problems, for example, with their canopy, the fact that cracks were occurring in the canopy. That has since been resolved.

We had identified—this year, we're identifying issues regarding the fin buffeting issue; and they have said that they have a fix to that. The fix that they have has been demonstrated above 10,000 feet. Under 10,000 feet has still not been demonstrated. So while that shows their commitment and their progress, they have not finished that.

The last thing I would identify is avionics. We've identified that as an issue and a problem area for several years, and that still remains a problem. Dr. Sega and Dr. Sambur are in the midst right now of trying to resolve those problems. They think they have a fix to some of those avionics problems. It's going to take a few months for them to get that resolved.

Mr. BELL. Looking back to the past for a guide and moving forward to the March 2003, report, do you think it's fair to say that, given the past response, that there will be a similar response to the problems identified in the 2003 report or are we talking about a different set of hurdles that simply can't be overcome?

Mr. LI. I don't have a crystal ball to be able to identify whether or not in operational test and evaluation something will crop up. I am encouraged by the fact that the Air Force is responsive to the identification of problems and is trying to find solutions to them.

Mr. BELL. Mr. Walker, I wanted to go back when you were talking about the question of how many and trying to determine how many will be needed. How would you recommend going about figuring that out and basing it on what?

Mr. WALKER. First, I think intellectually what we ought to be doing is figuring out—we ought to be looking at current and expected future threats, which presumably should be part of the national security strategy. That then should translate to the national military strategy. That should then translate to what type of capabilities do we think we'll need at what relative timeframes to be able to do that and also what relative quantities we think we'll need not just to replace what we have—because the number we have may not be what we need. The number that we have and had for the cold war era may not be the appropriate number that we need for the future.

So my view is that there is a need to fundamentally step back and to say not what path we committed to in 1986 that we're still basically going down. The only difference is, how many of those are we going to buy and when are we going to get them? We need to take this point and look forward and say, what type of capabilities do we need and what relative quantities?

If you assume that the Defense Department is going to have a budget cap, which I think is a reasonable assumption, given our long-range budget simulations, then for them to make more conscious tradeoffs as to what the long-term effect might be on JSF, what it might be on space systems and what the effect might be on other military services as well, I don't think that has happened.

I don't think that's happened.

Now, I will say for the record that the Defense Department is doing a better job on evolutionary development. I will also say they

are doing a better job of matching the POM, which is the program planning, with the budget. But they are only looking out 2 years. You need to look much longer than 2 years, because the ripple effect on some of these things gets much greater over time.

Mr. BELL. I was going to ask you that. How often do you think that assessment needs to be made in terms of how many? How often should we be coming back to that question? Because I think what you are recommending is a pretty large degree of flexibility based on what's going on.

Mr. WALKER. I would respectfully suggest that I'm not aware that it's been done in years, and so it would be good to start with one. Then after that I would suggest that we look at the changing environment. If there are material subsequent events in the global condition, in the security condition, in our budget situation or whatever, then it might make sense to relook at it. But we need to start with one.

Mr. BELL. So when you say it hasn't ever been done, would you believe it was always done as far as fixing the number was always done in somewhat arbitrary fashion?

Mr. WALKER. I don't believe that it was arbitrary. I believe that it was a plug. It's not arbitrary. In fairness, now, this is not the only plug. I mean, I am the audit partner on the consolidated financial statements of the U.S. Government. There was a $17.1 billion plug in coming up with the last audited financial statements with the U.S. Government. So this is not the only plug that exists in government, and that's real money too.

Mr. BELL. Thank you.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you. We have 11 minutes to go—I'm going to recognize Mr. Platts, but you probably won't want to use your full 10 minutes.

Mr. PLATTS. Thank you, Mr. Chairman. Actually, I will be very brief. I appreciate the focus of the subcommittee on this issue. And thank goodness for C–SPAN radio. I was delayed because of the weather and a traffic accident in getting in here this morning. I got to hear most of the testimony from Mr. Walker and questions. So I appreciate that opportunity via the radio.

Mr. Walker, I do have maybe just one question. I appreciate your testimony previously in the Subcommittee on Government Efficiency and Financial Management. And one of the things we talked about there is Chief Financial Officer, a career position, perhaps a 10-year term or so, to try to have some better direction. Would that type of position translate to a benefit in what some of the problems we saw here from the financial management side of the Raptor program if we had that type of position in place today?

Mr. WALKER. As you know, there's a level two position, the Under Secretary of Defense for Acquisitions. My personal view is, is that the importance of the acquisitions process and all related activities and the amounts of money involved clearly justify having a level two person focused full time on those issues. The position that you are referring to that we talked about a couple days ago was GAO has talked about the fact that we believe that it may be appropriate for the Department of Defense and certain selected other entities who have had years of problems in dealing with basic

management infrastructure items, you know, things like financial management, information technology, knowledge management, these types of issues, procurement, to have a chief operating officer, chief management officials at the level two level who would be responsible for planning, integration, and execution of the—dealing with the issues that frankly just don't get dealt with under our current structure.

I mean, DOD has six of the high-risk areas on GAO's high risk list plus each one of the governmentwide areas they are subject to. I think you need to consider having somebody with proven experience and track record on that with something like a 7-year term with a performance contract who could stay focused on the things that need to be done, including the cultural transformation efforts which, based on my experience in the public and private sector, when you're talking about cultural transformation, it takes 7-plus years to make it work and make it stick. We don't have anybody that sticks around that long. And you know, with all the turnover on the acquisitions part that I showed before—and I'm not saying you need 7 years for a program manager, but for this kind of position, the chief operating officer, chief management official, I think it makes eminent good sense, and I think it would help tremendously at the Department of Defense to deal with a lot of these high-risk areas and help improve economy, efficiency, effectiveness, and accountability.

Mr. PLATTS. Thank you, Mr. Walker, and, Mr. Chairman, thank you. And my hope is through some of the efforts of the Government Efficiency and Financial Management Subcommittee working with Chairman Shays that we will have that cultural change that will benefit not just the F/A–22 program and how that's going forward but DOD in total.

Mr. WALKER. And, Mr. Platts, as you know, you are familiar with the $17.1 billion plug that we talked about a couple of days ago, Right?

Mr. PLATTS. We had a good discussion about that plug. And, as you said, it is real money, and trying to account for it is somewhat challenging apparently right now for the Treasury. So thank you.

Mr. SHAYS. Thank the gentleman.

Mr. Walker, we thank you for your testimony. You have made it very clear to us in other hearings where we dealt with cost overruns, programs, technology that isn't working and so on that we need a chief operating officer, chief management officers. They need to have continuity. I will just emphasize, as I've looked at this political process, that these are deputy positions, that sometimes they are not assigned when a President takes over for a year. They may take another year to go through the process. And so they are in office for about 2 years, and Lord knows who is doing those positions during the transition.

So we look forward to working with you on that issue in general.

Let me just ask, is there anything you need to put on the record before we adjourn?

Mr. WALKER. No, Mr. Chairman, I don't.

Mr. SHAYS. Before we recess, I'm sorry.

Mr. WALKER. No, there's not. But I would mention one thing. We do right now—as you know, at DOD you have two level two posi-

tions that I'm aware of. You have the Deputy Secretary and you have the Under Secretary for Acquisitions. I would respectfully suggest that they both have full-time jobs. And so what I'm talking about is another level two person who would be this chief operating officer or management official in order to deal with these basic infrastructure items.

Thank you.

Mr. SHAYS. Thank you for clarifying that.

Let me say to our next panelists that we are going to expect from DOD and from the Air Force that they tell us, without any reluctance, how many planes they can build with the statutory cap of $36.8 billion. That is the least that this committee can expect to get from the Air Force and DOD, and so I hope that is forthcoming without even needing to ask that question.

So we will duct empanel, our next panel as soon as we have this vote. I'm not sure, is it a one vote that we have? I don't see a clock. It's two votes. Thank you. So it probably is going to take us about 20 minutes, give or take.

Thank you again, Mr. Walker and Mr. Li. We are recessing and will be back.

[Recess.]

Mr. SHAYS. We will call the hearing to order, and we will welcome Mr. Michael Wynne, Principal Deputy Under Secretary of Defense, Acquisitions, Department of Defense, and Dr. Marvin Sambur, Assistant Secretary of the Air Force, Acquisition, Department of the Air Force, Department of Defense.

And to say that I know that Mr. Wynne in particular has an important meeting with some of our congressional colleagues at 3, and we will definitely get you out of here 15 minutes before and, who knows, maybe sooner. If you give us all the right answers, you can be out of here real quick.

And the right answers are just the honest answers. I don't mean that you wouldn't be honest. But in other words, if we can get right to the point, we will probably cover a lot.

I need to swear both of you in, and if you would rise, please.

[Witnesses sworn.]

Mr. SHAYS. I would note before calling on you, Mr. Wynne, that this is an issue that basically goes from one administration to another administration to another administration. But ultimately right now both of you are in command of this program, have responsibilities. We are just trying to understand where we are, where we are going, and the logic to, you know, to both issues and to be clear as to what contribution our committee can make.

So, Mr. Wynne, you have the floor.

STATEMENTS OF MICHAEL W. WYNNE, PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION), DEPARTMENT OF DEFENSE; AND DR. MARVIN SAMBUR, ASSISTANT SECRETARY OF THE AIR FORCE (ACQUISITION), DEPARTMENT OF THE AIR FORCE, DEPARTMENT OF DEFENSE

Mr. WYNNE. Thank you, Congressman Shays.

Mr. SHAYS. Thank you.

Mr. WYNNE. Mr. Chairman, members of the committee, I am pleased to come before you today to talk about the F–22 program,

and the acquisition that is and has been managing the cost, schedule, and technical aspects that together make a program that has as its goal to bring to the defense of America the best tactical fighter aircraft that this country has ever produced. The aircraft, now designated the F/A–22, has characteristics to address the threats to our freedom for many years into the future. Though this aspect is not the direct thrust of this hearing, it is important to keep the purpose of the acquisition in mind as we progress.

Secretary Aldridge set out five goals as we set out to improve the acquisition process in general, and the first among them was the restoration of the credibility in the budgeting process to gain your confidence that year after year cost increases on our weapons systems could in fact be minimized. This provided the opportunity for the inclusion of the independent cost estimate in the determination of annual and program budgets, reconciling differences and making informed judgment if there were variances between the independent cost estimate and the program budget. This policy has in fact led to dramatic reduction in cost driven changes and allowed some focus on stability in other areas that impact cost, such as technical risk and changes in quantity.

The F/A–22 program, which has been in existence for some time prior to this policy, had in fact suffered from previous steps to manage cost using caps for R&D and caps for production. The cap for research and development had the program coping with inadequate test articles and a single consolidated avionics integration laboratory as well as a clear erosion in the area of systems engineering, which appeared on the surface to be redundant engineering on this highly integrated weapons system.

During this same period, the acquisition work force was being steadily downsized. Program offices were directed to be of a certain size in attempting to comply with downsizing pressure, yet expected to retain the fiduciary, financial, and legal oversight. This led to a reduction in analytic engineering capability within the program offices in general and for in particular the F/A–22 program office in the area of systems engineering and integration. This pressure continues and has the potential to introduce yet more risk in the process. The areas that suffer are areas that seem redundant when things go well and then seem essential when things don't.

Disciplined systems engineering is essential as software and integrated systems are becoming the vogue for defense. Two million lines of diversified distributed software code are being integrated for the F/A–22, and 6 million are forecast for the Joint Strike Fighter, and I believe triple that again for the Future Combat Systems in total.

I have spoken out on the need for increased systems engineering in the community at large, and firmly believe that, as we have addressed the cost risk, we must also address technical risks by restoring and agreeing to pay for our supplier capability in this critical software skill area, and, within our own community, stop the erosion of our capability to be smart buyers.

Here we have turned to another capable group, the federally funded research and development centers, to assist in reviewing the current crop of problems and advise us on a good path forward. Although their primary role is in research and not troubleshooting,

they are also great sources for talented engineers who can and have helped. I would ask that as you deliberate the complex budget, that you consider them as yet another part of the engineering talent pool that the Department has to draw on and that has over time been reduced in numbers using the rubric of budgetary savings and often accused of being redundant to the Department work force.

I digress to emphasize that we are here today talking about an effect, cost increase for a specific weapons systems, and recognize that to get at it in a systemic way, we must as well look at all the causes. For if we are blind to the causes, then we are destined to confront the same issues in another forum like this. As one author put it, "History doesn't repeat itself, but it rhymes well."

Turning to the present situation with the F/A–22, we have a case where the airframe has proven to be superior in its characteristics while the software lags in development. The F/A–22 is meeting or exceeding the key performance parameters regarding aircraft performance. Flight testing today demonstrates the capabilities that meet the requirements for the air combat warriors. Thus far, the structural fix with the titanium substitute for carbon graphite has in fact provided additional structural strength, reducing the risk of fin buffet for the aircraft that the GAO refers to in their report. And it appears to be an acceptable fix. Yes, testing in the harsher environment below the 10,000-foot altitude, currently scheduled for June, has not been accomplished, but it is not expected to change that outlook, according to the computer simulations that have been accomplished.

From a technical risk perspective, this leaves as the highest risk area the integration of the software and the embedded instabilities being discovered in the avionics software. At our request and with great cooperation from the Air Force, the Director of Defense Research and Engineering formed the Avionics Advisory Team, made up of software experts from DOD, academia, and industry, to do two primary tasks: First, to identify underlying systemic flaws, and to advise OSD as to the likelihood of a fix requiring a major change to the avionics architecture and/or the flight weapons control computers. Second, they will identify impediments to resolving the issue and provide suggested approaches to the Air Force and contractor design teams.

Let me address each in turn. First, the team reported that they have not uncovered any evidence that the architecture is fatally flawed, And they added that radical change to the architecture would likely make it harder, not easier, to resolve the underlying software integration issue in any kind of a timely manner.

Second, the team identified systems engineering concerns which likely contributed to the problem and trouble shooting software tools that they suggested would help reduce the schedule for resolution.

The F/A–22 has embraced the Avionics Advisory Team's recommendation in the areas of instrumentation and testing modalities to assist in detecting and correcting root causes for the software instabilities. The Air Force, as you will hear, has allocated 60 additional days to this resolution process. We want dedicated independent operational testing and evaluation to be event driven, not

schedule driven, and have established some objective criteria representing the product we want for the air combat warrior. This includes a run time stability measure which will allow testing to be performed in an efficient manner.

While we are encouraged by recent reports of progress, we remain concerned about meeting the criterion within the allocated 60 days. We have scheduled a review in mid-June to determine courses of action to best address all of our concerns, and we are following the F/A–22 design team's progress.

I have been briefed recently on actions and progress which, if accomplished, should make a difference. That having been said, I have to be skeptical until hard metrics allow me to be otherwise.

On behalf of all the men and women in uniform, I want to thank you for your support and encouragement, which led to the magnificent performance of our total force thus far. I am prepared to address your questions.

Thank you.

[The prepared statement of Mr. Wynne follows:]

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House Committee on Government Reform

Statement of

Michael W. Wynne

Principal Deputy
Under Secretary Of Defense
(Acquisition, Technology and Logistics)

Before the
Subcommittee on National Security, Emerging Threats, And International Relations

of the

House Committee on Government Reform

on

Acquisition Reform: Controlling Costs in Tactical Aircraft Programs

April 11, 2003

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Mr. Chairman and Members of the committee, I am pleased to come before you today to talk about the F-22 program, and the acquisition system that is and has been managing the cost, schedule, and technical aspects that together make a program that has as its goal to bring to the defense of America the best tactical fighter aircraft that this country has ever produced. The aircraft, now designated the F/A-22, has characteristics to address the threat to our freedom for many years into the future. Though this aspect is not the thrust of this hearing, it is important to keep the purpose of the acquisition in mind.

Secretary Aldridge set out five goals as we set out to improve the acquisition process in general, and the first among them was the restoration of credibility in the budgeting process to gain your confidence that year after year cost increases on weapons systems could be minimized. This provided an opportunity for the inclusion of the independent cost estimate in the determination of annual and program budgets, reconciling differences and making an informed judgment if there were variances between the estimates. This policy has in fact led to a dramatic reduction in cost-driven changes, and allowed some focus on stability in other areas that impact cost, such as technical risk and changes in quantity.

The F/A-22 program, which has been in existence for some time prior to this policy, had in fact suffered from previous steps to manage cost using caps for

R&D and Production. The cap for R&D had the program coping with inadequate test articles and consolidated Avionics Integration as well as a clear erosion of systems engineering, which looked like redundant engineering, on this highly integrated weapons system. During this same period, the acquisition workforce was being steadily downsized. Program offices were directed to be of a certain size in attempting to comply with downsizing pressures, yet expected to retain the fiduciary and legal oversight. This led to a reduction in analytic engineering capability within the program offices in general, and for the F/A-22, particularly in the area of systems engineering and integration. This pressure continues, and has the potential to introduce more risk in the process. The areas that suffer are areas that seem redundant when things go well, but seem essential when things don't.

Disciplined systems engineering is essential as software and integrated systems are becoming the vogue for defense. Two million lines of diversified distributed software code are being integrated for F/A-22, and 6 million are forecast for Joint Strike Fighter; and I believe triple that again for the Future Combat Systems. We've also seen the same occurrence in the area of space products. I have spoken out on the need for increased systems engineering in the community at large, and firmly believe that as we have addressed the cost risk, we must also address technical risk by restoring and agreeing to pay for our supplier capability in this critical software skill area; and within our own community, stop the erosion of our capability to be smart buyers.

Here we have turned to another capable group, the Federally-Funded Research and Development Centers to assist in reviewing the current crop of problems and advising on a good path forward. Though their primary role is in research, and not troubleshooting, they are also great sources for talented engineers who can and have helped. I would ask that as you deliberate the complex budget, you consider them as yet another part of the engineering talent pool that the Department draws on, that has over time been reduced in numbers using the rubric of budgetary savings and often accused as being redundant to the Department workforce.

I digress to emphasize that we are here today talking about an effect, cost increase for a specific weapons system; and recognize that to get at it in a systemic way; we must as well look at causes. For if we are blind to the causes, then we are destined to confront the same issues in another forum like this. As one author put it 'History doesn't repeat itself, but it rhymes well'

We have also introduced the concept of spiral development and evolutionary acquisition. These are concepts to allow difficult requirements to be time-phased; and difficult engineering problems to be resolved in follow-on development cycles. If we are ever to get at shortening the cycle time for acquisition, we cannot be confronted at every turn with concurrency and test

deficiencies that in the end lead to lengthened cycles. This is another way to parse the technical risk, while maintaining a focus on the ultimate warfighter requirements.

Turning to the present situation with the F/A-22, we have a case where the airframe has been proven to be superior in its characteristics. I refer to Lt. General Corley's previous testimony regarding the fact that the F/A-22 is meeting or exceeding the Key Performance Parameters regarding aircraft performance. These parameters were covered in flight testing to date to demonstrate the capabilities that meet the requirements for the Air Combat Warriors. Vertical fin buffet problems, that the GAO refers to, have been with us since the F-111, through the F-14, F/A-18, and now the F/A-22. Though we still have flight testing to go on this highlighted deficiency, thus far the structural fix with the titanium substitute for carbon graphite has provided additional structural strength reducing the risk of fin buffet to the aircraft, and appears to be an acceptable fix . Testing below the 10,000 foot altitude, a harsher environment, is not expected to change that outlook, according to the computer simulations. Flight testing is currently scheduled for June of this year.

From a technical risk perspective, this leaves as the highest risk area the integration of the software and the embedded instabilities being discovered in the avionics software. There are two sides to this issue. We felt that we needed to

bound the direct impact, from a cost perspective, of the resolution to this problem. Second, we needed to consider the secondary, but still important impact of the resolution to this problem, duration, and see if we could bound that as well. At our request, and with great cooperation from the Air Force, the Director, Defense Research and Engineering, formed the Avionics Advisory Team made up of software experts from DoD, academia, and industry to do two primary tasks. First, to identify underlying systemic flaws, and to advise OSD as to the likelihood of a fix requiring a change to the avionics architecture and flight/weapons control computers. Second, to identify impediments to resolving the issue, and to provide suggested approaches to the Air Force and contractor design teams.

Let me address each in turn. First, the team reported that they have not uncovered any evidence that the architecture is fatally flawed, and they added that radical changes to the architecture would likely make it harder, not easier, to resolve the underlying software integration issue in a timely manner. This was very good news to all, in that this now changed the outlook, in a similar way to your home computer, that one CD with a changed program would clear up the problem. Now for their second report, the team identified systems engineering concerns which likely contributed to the problem and trouble shooting software tools that they suggested would help reduce the schedule for resolution.

The F/A-22 team has embraced the Avionics Advisory Teams recommendations in the areas of instrumentation and testing modalities to assist in detecting and correcting root causes for the software instabilities. The Air Force, as you will hear, has allocated 60 additional days to the resolution process. We want Dedicated Independent Operational Test and Evaluation to be 'event driven', not schedule driven, and have established some objective criteria representing the product we want for the Air Combat warrior. This includes a run time stability measure to allow testing to be performed efficiently.

While we are encouraged by recent reports of progress, we remain concerned about meeting this criterion within the allocated 60 days. We have scheduled a review in mid-June to determine courses of action to best address all of our concerns, and we are following the F/A-22 design team's progress.

Discussion on F/A-22 Cost

In your invitation letter you requested that we focus on cost. Cost, schedule, and performance challenges are not unusual for a program with technologies as advanced as the F/A-22. Nonetheless, F/A-22 cost control has been, and remains, a key item for the Department for some time. We continue to

use special Defense Acquisition Executive quarterly reviews to examine cost and schedule trends and track program progress.

You questioned why program costs continue to rise. I will address this in two parts – engineering and manufacturing development, or EMD, and production – and explain the steps the Department is taking in these areas.

For EMD, we have had a rough year in terms of cost. Flight testing progress was impeded in the past year due to delays in the delivery of test aircraft and slower than anticipated accomplishment of the test points. Flight testing progress has improved during the past year, but not in all areas. Flight envelope expansion, known as flight sciences, has improved since the Air Force and its contractor made changes in the flight sciences test program. Mission avionics testing, which was not affected by these changes, has been impeded by late software deliveries and instability. Consistent start-up performance and run time before reset are the key stability metrics we track. We are not yet satisfied with either. During the summer months, the Air Force had a "Red Team" of software experts review the software architecture and make recommendations. In the fall, the Department's Director of Defense Research and Engineering led two additional teams to provide assistance to the Air Force. An Avionics Review Team, comprised of members from government and Federally-Funded Research and Development Centers, focused on potential near-term fixes to the stability

issues. A Science and Technology-based Avionics Advisory Team of recognized experts from government, industry, and academia focused on long-term solutions to systemic design weaknesses and implementation errors. Both teams made numerous recommendations. The Air Force is looking to implement all but two; those two are still being investigated. The good news was that hardware changes do not appear necessary and there was no evidence to indicate that the architecture is fatally flawed. However, the software engineering process needs better discipline. A way to capture embedded data to diagnose and resolve the stability problems is currently being added to the software and should shortly provide a good foundation for fixing software issues. The Defense Acquisition Board reviewed the program in December 2002 and March 2003, and will do so again in mid-June.

The test delays and avionics challenges, as well as several unexpected engineering design issues, contributed to a delay in the planned start of Dedicated Initial Operational Test and Evaluation (DIOT&E) and an EMD cost overrun. The Air Force critically reviewed the funding requirement, redefined the content of modernization spirals, and prepared the Fiscal Year 2004 President's Budget request for F/A-22 to ensure EMD was appropriately funded. Consistent with the Department's buy-to-budget strategy for F/A-22, this $876M EMD overrun was sourced primarily from production funding within the total F/A-22 program budget. Buy-to-budget means that the total program budget remains constant, and

any program adjustments should be made from within that topline amount. Therefore, cost overruns are sourced from within the program funding, typically lowering the quantity of aircraft; and conversely, reductions in the unit prices allow for additional quantities to be procured within the programs budget. It is an effective way to control the total program cost, and we will continue to follow this strategy.

At this juncture, I would like to point out that we have assessed the impact of reducing numbers of aircraft in lieu of reducing planned modernization. The Air Force and the Department have separately confirmed that modernization, particularly enhanced air-to-ground capability, provides significant benefits which can offset some reductions in aircraft quantities.

For Production, cost growth can be attributed to higher prices bid by contractors who remain concerned about program stability, and to the loss of economies-of-scale when aircraft quantities are reduced. During this year's budget preparation, the Department undertook a detailed look at the overall Combat Air Forces force structure, including plans to retire aging aircraft and buy new F/A-18E/Fs, F/A-22s, Joint Strike Fighters, and Unmanned Combat Aerial Vehicles. As a result, we reduced the F/A-22 maximum production rate to 36 aircraft per year from the Fiscal Year 2003 President's Budget planned peak level of 56. This rate adjustment contributes to unit cost increases, but we believe that

the adjustment was prudent to reduce the production rate to a more-realistic level and to ensure that the production line is synchronized to accommodate a smooth introduction of Joint Strike Fighter.

There is no way to guarantee that costs will not rise in this program, especially until we start seeing measurable improvement with avionics stability – our biggest challenge. However, we believe that actions taken over the past year are critical to stabilizing F/A-22 program costs. Improving test practices, disciplining software development and test, adding another avionics laboratory, resolving the EMD cost using buy-to-budget, reducing to a reasonable production rate, and planning for a multi-year procurement all put us on a firmer foundation, which should stabilize program quantity and budget.

A good example of positive progress is in our production cost estimate. Both the Department's Cost Analysis Improvement Group, or CAIG, and the Air Force updated their production cost estimates in preparation for the Defense Acquisition Board review in March 2003 of lot 3 aircraft production. The Air Force estimate indicates a total of 276 aircraft can be procured within the program budget, and the CAIG estimates 270~~3~~ aircraft. These estimates were within 3% of each other. This gives us good confidence in the production cost estimates. Differences were noted in the estimates of modernization and retrofit costs, that is to say the cost of the content associated with future spirals to enhance capabilities.

The Air Force and CAIG will continue to work to refine their methods to ensure that we have a good estimate of all costs.

The remainder of my comments will address the two F/A-22 related Government Accounting Office, or GAO, reports published this year. The Department respects the role of the GAO and values its insights and advice. However, in the case of these two F/A-22 reports, we do not agree with their recommendations.

GAO-03-280 "DoD Needs to Better Inform Congress about the Implications of Continuing F/A-22 Cost Growth." As stated above, the Department non-concurred on the recommendations of this report. The GAO's recommendations were primarily focused on Producibility Improvement Projects, or PIPs, a major component of the F/A-22 Production Cost Reduction Projects, or PCRPs. PCRPs included initiatives in areas of producibility improvements, process changes, adoption of new manufacturing techniques, dealing with parts obsolescence, and implementation of acquisition reform principles. The Department agrees in general with the GAO that the PCRPs will have a reducing effect on cost and are well worth undertaking. This is not an issue. There are, however, disagreements between the estimators about the magnitude of the reductions to be achieved by the PCRPs and about how cost experience to-date will apply in the future.

The first GAO recommendation, requiring the Secretary of the Air Force make funding of PIPs at the planned level a priority, is unfounded. While the yearly phasing has been a bit different, from Fiscal Year 2000-2003 the AF has funded PIPs to the originally planned level. Furthermore, the AF has budgeted for the 2004-2006 projections, bringing the total PIP funding through 2006 to $475.3M. PIPs, which are investments to improve manufacturing processes or incorporate new technology, are being prioritized and implemented based on their expected return-on-investment. The Department believes this implementation strategy is prudent.

The second GAO recommendation, results in the Secretary of Defense providing Congress with documentation showing PIPs are being funded at the planned level or justify why not. The Department will provide information to Congress, by virtue of the Conference Report for the FY2003 Appropriations Act, which requires the Air Force to submit a request justifying any reprogramming of PIP funds used for alternative purposes. Further, this recommendation suggests the Secretary project for Congress the potential cost of F/A-22 production if PCRPs do not offset cost growth as planned and the resulting impact on the quantity of aircraft. The GAO report itself states that the GAO agrees "that there are many factors that can cause F/A-22 production costs to rise," and that "projected offsets generated by PIPs and other costs reduction plans are uncertain

and may not materialize, even if investments are made as planned." It goes on to state, "Shifts in these realities are frequent and create a constantly changing picture of F/A-22 production costs, offsets and aircraft quantities." Therefore, it is the Department's position that it is neither practical nor appropriate to formally report on projected PCRP savings and speculate on the resulting aircraft quantity changes. The Department regularly reviews the program and adjusts funding and quantities in the Planning, Programming, and Budgeting System process and reflects those changes in the annual President's Budget request.

A finding in the report alludes to the fact that the Department will formally request legislation to change to the Congressionally-mandated production cost cap. This has been the case since the Low Rate Initial Production review in August 2001, when the Defense Acquisition Executive directed the Air Force to fully fund the F/A-22 program to the Department's independent cost estimate of $43 billion ($5.4B higher than the congressionally directed production cost cap of $37.6 billion). This was documented on September 13, 2001, when the Department submitted a revised acquisition plan to Congress in accordance with Section 131(b) of the National Defense Authorization Act for Fiscal Year 2000.

Finally, within the report GAO asserts that the production estimate does not include approximately $1.3 billion in cost factors. Unfortunately, the GAO's assessment is based on an old program estimate. Both the Air Force and the

CAIG's estimates prepared for the Lot #3 Defense Acquisition Board review include all of these cost factors that the GAO cites.

GAO-03-431 "DoD Should Reconsider Decision to Increase F/A-22 Production Rates While Development Risks Continue." The Department formally non-concurred with this report. The GAO recommendation suggests the Secretary maintain an annual production rate of no more than 16 aircraft until operational testing is completed to gain greater knowledge of any need for modifications. As was the case in the Department's November 2002 certification to the Congressional defense committees, restricting the quantity to 16 will incur termination costs, manufacturing inefficiencies, and inflation effects for later purchases that are greater than the likely cost to retrofit. We believe the current risk for expensive retrofit on the F/A-22 program is low. F/A-22 systems having retrofit potential, structures and air vehicle subsystems, are tested and mature. The highest risk, that of avionics stability, does not drive a retrofit risk since it will likely be limited to software fixes. The Department will continue to monitor program costs closely, and maintains the flexibility to adjust the production rate, if warranted.

The Department's objective is to ensure that the F/A-22 program, meeting established performance requirements, will be accomplished for an acceptable cost

and on an acceptable schedule. The Department's senior leadership believes it has an obligation to Congress and the American taxpayer to achieve this objective.

Thank you very much.

Mr. SHAYS. Thank you, Mr. Wynne. At this time we will recognize Dr. Sambur.

Dr. SAMBUR. Thank you. Good afternoon, Chairman Shays, Ranking Member Tierney, and Congressman Schrock. Thank you for this opportunity to discuss with you the Air Force's efforts and progress on acquisition reform. Mr. Wynne and I are proud to come before you today and discuss our acquisition reform policies to increase agility and provide credibility in the cost and schedule of our development programs. Our intent is not to make excuses for our performance of the past, but rather to spell out what we are doing to significantly improve our future performance.

The Secretary and Chief of Staff of the Air Force gave me a mandate to improve the way we do business in delivering capabilities to the warfighter. From slipping development times to reducing deliveries to increased costs, programs have not met established baselines and goals. During this past year, I have been working to determine the root cause of these execution problems. The findings identify several factors that lead to poor performance, including unstable requirements, faulty cost estimates, lack of test community buy-in, inadequate systems engineering, and unstable funding. For the Air Force, these program execution problems result in the average cost growth of 30 percent and an average development time of nearly 10 years.

Given the problems noted above and the resulting increases in program costs and delays in program schedules, I have formulated a series of policies to address the underlying causes. These policies, as they say, are in violent agreement with those you heard this morning from Mr. Walker.

First, in order to overcome our inadequate requirements process, I have implemented an agile acquisition policy.

Mr. SHAYS. Could you just make sure—you said "violent agreement?"

Mr. WALKER. Agreement.

Mr. SHAYS. A violent disagreement? Or——

Dr. SAMBUR. A violent agreement, meaning I concur.

Mr. SHAYS. OK.

Dr. SAMBUR. I'm sorry if I said it incorrectly.

Mr. SHAYS. Oh, no. You said it correctly; it's just the word "violent" is a word usually associated with disagreement. But in this case, that means that you are in strong agreement.

Dr. SAMBUR. I agree with the policies for improvements for the future. In particular, in order to overcome our inadequate requirements process, I have implemented an agile acquisition policy that demands collaboration; that is, active, cooperative dialog between the warfighter, acquirers, engineers, and testers. This creates a team from the outset and throughout the requirements and development process. This team approach results in a true understanding and buy-in to the requirements and leads to a stable requirement foundation. As the policy states, it encourages spiral approach and is opposed to the big bang that you heard this morning.

Second, not having test community buy-in created problems within the acquisition process. To resolve this issue, we are developing a seamless verification process to ensure that both the development tests and operation tests occur in a single process. If the oper-

ational testers are involved early in the process, then they can assess the operational value of development testing and reduce the duplication of effort.

Third, we need to instill a strong systems engineering foundation within the acquisition process. I have implemented a process by which all future milestone decisional authorities will not sign out any future acquisition strategy plans that lack the necessary attention to systems engineering. Additionally, I am demanding that systems engineering performance be linked to contract award fees and to the incentive fee structure.

Fourth, unstable funding is a constant problem, one that will be better managed by instituting a more disciplined program priority process and by insisting on the use of spiral development methods.

We have had several successes based on these new policies and procedures. One such example is the Passive attack Weapon. This weapon was developed as a result of a 180-day quick reaction program at Air Combat Command. It was available to the warfighter at the 98-day mark. Other successes are detailed in my written statement.

As the paramount reason for your subcommittee meeting is the poor performance of the F/A–22, I will also give you a status update on the program. Again, my intent is not to justify the programmatic performance, but rather to give you an appreciation of some of the changes we have made and the positive improvements that have resulted.

It has been a busy year for both the development and production phases of the F/A–22 program, and I am pleased to let you know we have made tremendous strides in both. We have seven Raptors flying almost daily at Edwards Air Force Base. These jets have accumulated over 3,000 flying hours to date. In the summer of last year, we organized and we made changes so that we could execute the envelope expansion testing in order to clear the full 9-G point. We put a new plan in place and we have been executing a two and a half fold increase to our testing rate over the past 6 months. We have successfully fired 16 missiles, 4 of which were guided. It is important to note that one of these shots was an AMRAAM shot at supercruise. In the future we will drop JDAM at supercruise.

To prove the strength and durability of the airframe itself, we completed static and first lifetime of fatigue testing. These tests traditionally uncover potential redesign or retrofit issues, but very importantly we found no—let me repeat that—no major issues from either test.

This program tackled technologies others have never faced, and we are getting it done. We are attacking avionics stability the same way. We've made fundamental changes in our avionic development effort, and I am confident, very confident that revolution of avionic stability will be resolved in the future.

In our production program, we are also getting it right. The operation on the production floor at Marietta is rapidly gaining momentum. As expected in our production program, in its infancy we've had growing pains which have manifested themselves in late aircraft deliveries. To address these late deliveries, we have been working closely with Lockheed Martin to implement a number of initiatives for reducing bill cycle time. The changes we are putting

in place are making very visible impacts. During calendar year 2002 alone, Lockheed reduced late aircraft deliveries from 12 months late to 7 months late. At the current rate of improvement, we expect aircraft deliveries to be back on contract schedule by July 2004 at Aircraft 4035.

Cost is also important to us. That is why we are very focused on production affordability. One visible way we are striving for more is through the production cost reduction program. We have invested $475 million, including $85 million in fiscal year 2004, in producibility improvements. When we first established this program, we said we would invest $475 million. We have not wavered from that commitment.

I think it is important to recognize that the ground we are paving on the Raptor in many ways enables our future force. The F/A–22 is developing and implementing state-of-the-art technology, fusing leading edge capabilities and pioneering manufacturing techniques that will ultimately yield not only the world's greatest aircraft but will also establish an invaluable set of lessons learned for developing future complex weapons systems.

The F/A–22's unique combination of capabilities complement and increase the effectiveness of the entire joint forces. The F/A–22 is the kick-down-the-door system. It establishes air dominance. It opens the door for follow-on persistence forces. It makes, as you said this morning, Chairman Shays, an unfair fight. The Raptor is the pathfinder. We have to get it right. The Raptor will propagate the American standard of air dominance for the decades to come.

In summary, the Air Force remains focused on providing the necessary capabilities to the warfighter in order to win America's wars. These capabilities can only be achieved through effective and efficient management during the development, production, and fielding of systems. By incorporating a strong collaborative process, implementing spiral development, and infusing systems engineering in our acquisition process, we can overcome the tough challenges ahead.

We are committed to pursuing these actions necessary to make transformation work. I appreciate the support provided by Congress, and I look forward to working with this committee to best satisfy our warfighters' needs in the future.

Again, thank you for the opportunity to provide this statement, and I will be glad to answer any questions.

[The prepared statement of Dr. Sambur follows:]

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DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE

SUBCOMMITTEE

ON NATIONAL SECURITY, EMERGING THREATS, AND

INTERNATIONAL RELATIONS

OF THE

HOUSE COMMITTEE ON GOVERNMENT REFORM

SUBJECT: Acquisition Reform: Controlling Costs in Tactical Aircraft Programs

STATEMENT OF DR. MARVIN SAMBUR
Assistant Secretary of the Air Force (Acquisition)

April 11, 2003

NOT FOR PUBLICATION UNTIL RELEASED

BY THE HOUSE COMMITTEE ON GOVERNMENT REFORM,

UNITED STATES HOUSE OF REPRESENTATIVES

Chairman Shays, Ranking Member Kucinich and Members of the Subcommittee:

Thank you for this opportunity to discuss with you the Air Force's efforts and progress on acquisition reform. Mr. Wynne and I are proud to come before the National Security, Emerging Threats, and International Relations panel today and discuss our acquisition reform policies to increase agility and provide credibility in the cost and schedule of our development programs. Our intent is not to make excuses for poor performance of the past, but rather to spell out what we are doing to significantly improve our future performance and in particular, to give you an appreciation of some the positive momentum on the F/A-22 program.

Changing Our Acquisition Process

The Secretary and Chief of Staff of the Air Force gave us a mandate to improve the way we do business to deliver capability to the warfighter. From slipping development times, to reduced deliveries, to increased costs, programs have not met established baselines and goals. During this past year, I have been working to determine the root cause of these execution problems. The findings identify several factors that lead to poor program execution including: unstable requirements, faulty cost estimates, lack of test community buy-in, inadequate system's engineering and unstable funding. For the Air Force, these program execution problems result in the average cost growth of 30% and an average development time of nearly 10 years.

Given the problems noted above and the resulting increases in program costs and delays in program schedules, I have formulated a series of policies to address the underlying causes.

First, in order to overcome our unstable requirements process, I have implemented an Agile Acquisition Policy that demands collaboration: that is active, cooperative dialogue between the warfighter, acquirer, and tester working as one team at the outset and throughout the requirements and development process. This will ensure that warfighter requirements are clearly articulated, the acquirers communicate what can be delivered and the testers understands what needs to be verified. Surprises are kept in check when the user provides a concept of operations up front and a consistent, continuous dialogue between all stakeholders provides a robust definition of a requirement, which the acquisition community can deliver and the tester can verify.

These changes set the goal of institutionalizing collaboration throughout the Air Force and DoD acquisition to include our operations, test and sustainment communities. Collaboration must start well before a product is delivered in order to control costs and to provide the user with the required capability. When the Acquisition Enterprise, consisting of the Warfighter, Acquisition, Test, and the Sustainment community, starts working together a better product is produced.

By demanding collaboration between all the parties, we can ensure the right trade-offs are made throughout the acquisition process to meet the required goals. It is imperative that, both the warfighting and acquisition communities work together to make tradeoffs of non-critical elements within programs to buy down risk, throughout the acquisition cycle. Bottom line: credibility means delivering what we promise, on time and on budget.

Second, not having test community buy-in created problems further along in the acquisition process. As such, we have started to work with the test community on processes to reduce the number of serial events for testing. This is different from the current process of serial and overlapping Development and Operational Testing, which can take several years. We are developing a seamless verification process to ensure that both the developmental test and operation test occur in a single process, not fragmented as it has been in the past. If the operational testers are involved early in the process, then they can assess the operational value of developmental testing and reduce duplication of effort.

Again collaboration is a vital part of this process change. By involving all members of the acquisition enterprise early and continuously, we can all come to agreements on what are the operational requirements, what can be delivered and how we will verify the systems being built meet those needs.

Third, we need to instill an adequate systems engineering foundation within the acquisition process. Systems engineering is one of the bedrocks of sound management for acquisition programs as it ensures that contractor-proposed solutions are consistent with sound engineering principals. Decisions based on a solid a systems engineering approach, will ensure our program managers will be better prepared to assess their programs health and will help to keep programs on budget and schedule. As such, I am implementing a process by which all future Milestone Decision Authorities will not sign out any future Acquisition Strategy Plans that lack the necessary attention to system's engineering. Additionally, I am demanding system-engineering performance be linked to the contract award fee or incentive fee structures. This link will help ensure the industry will also follow a sound systems engineering approach.

Additionally, we are rebuilding our organic system engineering foundation to provide the necessary expertise throughout the Air Force Acquisition Community. Recently, the Center of Excellence for Systems Engineering has been opened at the Air Force Institute of Technology. Our goal is to create a reservoir of knowledge and source of best practices, which can be applied to our current and future acquisition programs.

Fourth, unstable funding is a constant problem, one that can be better managed by a more disciplined program-priority process while leveraging spiral development methods. Through our complementary processes to review warfighting capabilities and the associated execution of the programs comprising the capabilities, I firmly believe that we will have in place the ability to better manage funding instability. As funding perturbations, both external and internal, arise within our programs, our reviews will ensure that a disciplined process exists for allocating resources to programs in relationship to their contribution to warfighting capabilities. This in effect will minimize the overall perturbation to programs that provide the most "bang for the buck" and eliminating our time-honored process of applying a "peanut-butter spread" to all.

Spiral Development Is Our Preferred Acquisition Process

The Air Force has identified the spiral development methodology of acquisition as the preferred approach to acquiring systems. As the pace of technology has quickened, so must the pace of our Acquisition process. Spiral development allows the Air Force to incrementally deliver weapon system capability quickly -- providing the warfighter technology as it matures within acceptable program risk. As each spiral is more clearly defined and shorter in duration, schedules are better managed due to the shorter time exposure of the development process to internal and external change. Mutual expectations on spiral content, cost, and schedule are also commonly understood and agreed to up-front between all stakeholders, as collaborative practices are paramount to the spiral development process.

Spiral development will also assist in mitigating funding instability by allowing the Service to compartmentalize each individual spiral such that a funding cut in the far term won't compromise a capability that is complete and ready to go to the field today. In the past our "big bang" theory of releasing weapon system capability to the field held all aspects of the weapon system hostage to any perturbation in the process. With spirals we release smaller, more tightly focused capability sooner, and minimize the risk of a long drawn-out development process being affected by funding instability in either the mid- or far-term.

Another beneficial spin-off of spiral development acquisition is the flexibility to insert the latest technology into the development and production lines. This is where the importance of a robust science and technology capacity is crucial in truly reaping the benefits of a spiral release process.

Acquisition Success through new Business Practices

The Air Force has also enacted new business practices from an integrated enterprise perspective, examining every process and process link. I have expressly given our people the latitude to make the right decisions by relaxing our past prescriptive policies. My implementation of a reality-based acquisition policy, which replaced the highly prescriptive Air Force Instruction (AFPD 63-1/AFI 63-101), provided guidance emphasizing innovation and risk management and will delegate decision authority to appropriate levels. Additionally, I have empowered our people through the use of High Powered Teaming

with the warfighters, to deliver initial capability to warfighters more quickly, and add capability increments in future spirals.

Our transformation of Acquisition practices are only the beginning of a comprehensive and aggressive approach to reforming business practices. Our efforts today will have a direct effect on efficient and effective air and space capability acquisition both immediately, and in the future.

Initiatives Show Results

During the last year we have had several successes based on these principles outlined above. From increased Predator deliveries, to improved C2 systems, to the fielding of new weapons such as Passive Attack Weapon (PAW), we are making progress.

Predator: Accelerated deliveries of Predator UAVs, not only tripling the production rate, but reducing the time to build an air vehicle from 12 to 8 months. We also accelerated the production for the Multispectral Targeting System laser ball from the planned 18 months, to only 8 months. We fielded the split operations concept for Predator reachback in only 3 months--in time to support OPERATION IRAQI FREEDOM.

Roll On Beyond Line of Sight Enhancement (ROBE): Awarded ROBE contract in less than 2 months. This capability provides the Link 16 tactical air picture beyond-line-of-sight via satellite communications to the Aerospace Operations Center. This reachback capability completed its initial demonstration in Jul 02, less than 45 days after contract award. The first planned delivery of ROBE is this Jun with final delivery in Oct 03 (18 months earlier than requirement).

PAW: This weapon was developed as a result of a 180-day Quick Reaction Program at Air Combat Command, and was available to the warfighter at the 98-day mark. To date, we have delivered 58 weapons and completed all aircraft integration. Support elements have been delivered, and our seamless verification of the system is complete. Production was completed on time, with 15% more weapons delivered than originally proposed as we completed the program under budget.

F/A-22 PROGRAM STATUS

As the paramount reason for your subcommittee meeting is the poor performance of F/A-22, I will also give you a status update on the program. My intent is not to justify the programmatic performance, but rather to give you an appreciation of some of the changes we have made and the positive improvements that have resulted.

Engineering and Manufacturing Development (EMD)

Before discussing the EMD program's recent cost estimate-at-completion (EAC) increase and remaining hurdle—avionics software stability—I'd like to express just how well this aircraft is performing.

The aircraft performance-to-date has been nothing short of outstanding. *In fact, the F/A-22 is meeting or exceeding all eight aircraft performance-related Key Performance Parameters (KPPs).* KPPs represent the select subset of requirements the warfighter is simply not willing to fight without or trade-off to save cost or schedule. These KPPs derive directly from the F/A-22s key attributes of stealth, supercruise, advanced maneuverability, and integrated avionics. Flight testing-to-date demonstrates that these key attributes, when

combined, create the unmatched set of capabilities needed to implement the Global Strike CONOPS and to overcome anti-access environments.

All-aspect stealth reduces the enemy's ability to find, track, and target; and allows access to areas inaccessible to non-stealth platforms. The F/A-22 radar cross section has now been verified on three airframes. In all three cases, the measured radar cross section is better than the requirement. Supercruise, defined as the ability to fly in excess of 1.5 Mach without the use of fuel-consuming after-burner, dramatically increases battlefield access and control, reduces exposure to threats, and increases weapons delivery ranges. Supercruise is not about "going fast"; rather it is about the battlespace effects of "going fast". The F/A-22's supercruise performance exceeds the warfighter's requirement by 12%. Advanced maneuverability assures a distinct advantage in a within-visual-range engagement. Flight test data shows the F/A-22's airframe design, in combination with its pioneering thrust-vectoring engine exhaust nozzles, meets the stringent maneuverability requirement. The F/A-22's integrated avionics--again, being done for the first time by this program--tasks, processes, de-conflicts, and displays multiple sensor inputs for the pilot. Integrated avionics gives the pilot unprecedented and instantaneous situational awareness that allows him to manage the air battle rather than interpreting multiple sensor inputs. Though we're working to increase the integrated avionics software run-time (a topic I will return to momentarily), between software re-starts the performance of the integrated avionics package, to include the underlying radar, communication, navigation, and identification (CNI), and electronic warfare (EW) sensors and sub-systems, meets the warfighter's requirements. All the Raptor avionics sub-systems are working very well.

The remaining three Key Performance Parameters are related to supportability and are defined to be system maturity KPPs, meaning the warfighter expects these parameters to be achieved by 100,000 flight hours. (The Raptor flight test program is currently at 3,000 flight hours.) To assess progress toward the supportability KPPs, the F/A-22 program office runs an analytical model that requires numerous inputs and assumptions. According to the model, we are currently meeting two of the three supportability KPPs (the independent airlift KPP is estimated to be 8.8 C-141 equivalents per aircraft squadron, vice the requirement of 8.0). The model lags changes we make to how we support the aircraft (e.g., parallel tasks), and therefore requires frequent updates. We fully anticipate we will meet the airlift KPP by system maturity.

In addition to strong performance on the KPPs, the EMD program also successfully completed *every* calendar year 2002 development exit criteria. In particular, we finished the year with two highly successful end-to-end guided missile shots, one a supercruise AMRAAM shot and the other a supersonic AIM-9 shot.

Though the EMD program continues to make strong progress, it has not been without cost growth. The EMD program has been forced to resolve and pay for unplanned development-related issues, and past decisions to assume risk in order to cut costs. The most prominent development-related issues include properly characterizing the F/A-22's fin buffet response, and resolving avionics instability. The net effect of these issues is cost growth driven by schedule extensions that extend the completion of EMD to November 2005 (from March 2004). The schedule extension affords more time to complete flight envelope expansion (which was slowed while we conducted fin buffet response testing), and avionics development and flight testing.

We completed all fin buffet response testing above 10,000 feet, resulting in only minor structural modifications to the tails (replacement of composite vertical fin rear spar with Titanium and strengthening of a rudder fastener). We incorporated these modifications into the production line for Lot 2 and are incorporating low cost retrofits on all prior aircraft ($2M). The aircraft has no flight envelope restrictions in the fin buffet region above 10,000 feet. Fin buffet response testing for the region below 10,000 feet will begin in May 2003, in conjunction with planned <10,000 feet envelope expansion testing. Based on analysis of the fin buffet region below 10,000 feet, we currently predict no need for further modifications.

In response to the additional costs incurred to resolve these issues, in August 2002 the F/A-22 program office completed a bottom-up 50% confidence cost estimate review of the remaining EMD work and concluded that the EMD budget required an additional $690M. Senior Air Force leadership then chartered an independent "Red Team" to investigate both the existence and magnitude of EMD cost growth. In December 2002, the Red Team outbrief confirmed an increase in the EMD in the range of $700M to $1B. To regain confidence in the program, senior Air Force leadership directed the F/A-22 program to increase the F/A-22 budget by $876M. They also directed that the $876M be sourced from within the F/A-22 overall budget. Shortly thereafter (also in December 2002), the Air Force briefed the Professional Staff Members (PSMs) from the Defense Committees of the EMD EAC increase. As a result, the FY04 President's Budget (PB) submittal reflects $113M sourced from the F/A-22 post-EMD modernization RDT&E account and $763M sourced from the F/A-22 aircraft production account. With the additional $876M, the F/A-22 EMD total program budget stands at $20.3B (then-year dollars); a 4.5% increase.

Part of the $876M pays for infrastructure previously declined in order to reduce costs (i.e., the adage "you can pay me now or pay me later" rings true). For example, early in the program we opted not to fund a second Avionics Integration Laboratory (AIL). We are now standing up a second laboratory in Marietta, Georgia in order to alleviate the software burden at the AIL in Seattle. The Marietta AIL (formally called the Raptor AIL, or RAIL) will allow the Seattle AIL to focus efforts on improving software stability.

It is important to recognize that the *EMD cost growth does not indicate a concern regarding aircraft performance, nor does it represent an increase in retrofit risk*. As already stated, the EMD program is making significant strides toward completion of all development requirements, the aircraft is performing well, developmental issues are being resolved, and past cost-cutting "sins" are now being funded. In short, the Air Force will complete the EMD program to deliver an ORD-compliant aircraft to the warfighter.

Looking ahead, the next major program milestone is entry into DIOT&E. Consistent with the F/A-22 program philosophy, DIOT&E is an event-driven milestone—we will not begin DIOT&E until we are ready to succeed. Accordingly, because the EMD program is taking longer, we moved the projected start date for DIOT&E from August 2003 to October 2003. To fully understand the move, we need to review our four prerequisites for entry into DIOT&E. First, we must complete Logistics preparations to include Technical Order Data (TOD) deliveries, maintainer training, and maturation of the Integrated Maintenance Information System (IMIS). All these logistics items are on-track and are going well. TOD deliveries are ahead of previous jets at this phase of development. Currently, 91% of all aircraft procedural tasks are completed. The IMIS software recently completed a very successful integration test to ensure it interfaces with

the overarching Air Force logistics management system called the Core Automated Maintenance System (CAMS). Maintainer training at Nellis AFB, Nevada, has already begun. We expect no logistics issues in meeting an October 2003 DIOT&E start date.

Second, in order to execute DIOT&E, the Air Force Operation Test and Evaluation Center (AFOTEC) requires four production representative jets, and one spare. Aircraft #4008-4011 are allocated for that purpose and have already been delivered to the government. Because these jets were placed on contract concurrent with the EMD development, changes resulting from EMD must be folded into these jets to ensure they are production representative. These modifications are nearing completion at Palmdale, California. These four jets will be used to train the OT pilots, and, in fact, OT familiarization pilot training has already commenced using other EMD jets. OT pilot training will ramp-up in earnest soon and we expect it to last approximately six months.

Third, we must release the DIOT&E flight envelope. In July 2002, we dramatically changed the way we execute flight envelope testing. Since then, we've experienced a 2 1/2 fold increase in the rate of test point execution and project that the DIOT&E flight envelope will be cleared by mid-September 2003, giving sufficient time prior to the start of DIOT&E.

Finally, we must to deliver a stable and fully-tested version of 3.1.2 (the nomenclature "3.1.2" simply denotes a specific level of required functionality) avionics software to the OT testers before DIOT&E can begin. This prerequisite represents the F/A-22 program's key challenge. As previously stated, when the avionics software is up and running, the performance of the weapon system is outstanding. The issue is not how *well* it performs; rather it is how *long* it runs. Since December 2002, we have been successful in

improving avionics run-time in the AIL. We must find a way to translate these improvements to the flight test jets. Current software run-times in the flight test jets sit at 1.3 hours Mean Time Between Instability Events (MTBIE). Our efforts to resolve software instability is another contributor to the EMD EAC increase because we have had to release additional unplanned software builds and the software instabilities affect how efficiently we conduct flight test.

In December 2002, Secretary Aldridge chartered the OSD Avionics Advisory Team (AAT), an independent team made up of software experts from DoD, industry, and academia to assess the state of the current F/A-22 avionics software and assist in the resolution of stability issues. The AAT effort is already providing benefits to the F/A-22 program. The team offered recommendations in the areas of tooling and testing methodologies to assist in determining and correcting the root causes of the software instabilities. The F/A-22 program office is currently implementing the AAT recommendations. The difficulties with avionics software stability are the main drivers for slipping DIOT&E start to October 2003.

To summarize the state of the avionics instability issue, we have an OSD/Air Force joint plan to improve software run-time, the plan is based on sound systems engineering principles and the advice of recognized industry experts, and the plan is executable within the re-baselined EMD cost and schedule parameters. The software integration techniques we're employing on the Raptor are quite complex. Though we are the first program doing this level of integration, we are already not alone. We are the pathfinder. Other programs, like JSF, will leverage our efforts. There are engineering lessons to be learned, as well as exposure to the types of problems associated with an integrated avionics application.

Furthermore, providing this capability to the warfighter will help crystallize what is desired on the JSF.

Production

The FY 1998 Defense Authorization Act implemented a $43.4B production cost cap and instructed that this cost cap be adjusted annually for inflation. The current cost cap value sits at $36.8B ($FY03), after adjusting for annual inflation effects and subtracting the cost of the six PRTV II aircraft paid for using RDT&E funds.

In a 14 September 2001 Acquisition Decision Memorandum (ADM), the Defense Acquisition Executive, Secretary Aldridge, approved a revised program baseline and acquisition strategy that added $2.0B to LRIP and $3.4B to full rate production (total of $5.4B), and directed the Air Force to fully-fund the production program accordingly. This action established a threshold quantity of 297 production aircraft (includes the two PRTV I jets), and incentivized the Air Force to strive for an objective quantity of 333 aircraft. *This ADM instilled the "Buy-to-Budget" acquisition strategy, which is still in effect today.* "Buy-to-Budget" means the Air Force can maximize aircraft quantity within the OSD-approved $43B budget cap.

Of note, the OSD-approved budget cap exceeds the current inflation-adjusted Congressional production cost cap. In recognition of that fact, Secretary Aldridge sent a 13 September 2001 memorandum to the defense committees that relayed his approval of the new acquisition strategy and revised production cost baseline, and requested Congress remove the Congressional production cost cap.

In the FY03 PB, the DoD submitted an F/A-22 production program budget consistent with the $43B OSD-approved budget cap, in accordance with the "Buy-to-

Budget" strategy and 14 September 2001 ADM. This means that cost savings initiative return multiples, learning curves, savings from a future Multi-Year procurement contract, and ultimately, total aircraft quantity are all predicated on a total production budget of $43B. At the current buy profile, the F/A-22 program will not eclipse the $36.8B Congressional production cost cap until FY09. Therefore, the apparent disconnect between the Congressional production cost cap and the OSD-approved budget cap is not yet an issue. That said, before the program can enter into an Economic Order Quantity (EOQ) and Multi-Year Procurement (MYP) agreement, currently planned for FY 2006 and FY 2007 respectively, the Air Force will need relief from the Congressional production cost cap. Predicated on successful completion of DIOT&E and a positive full rate production decision, we will formally seek relief from the Congressional production cost cap via language in the FY 2005 Defense Authorization Act. Securing FY 2005 language provides adequate time to proactively plan for a FY 2006 EOQ.

Based on OSD and Air Force leadership direction, the F/A-22 *production* program sourced $763M of the EMD EAC increase. Consistent with that direction, the DoD submitted an FY04 PB that reflects an F/A-22 production total budget of $42.2B ($43B minus $763M). In summary, it is my hope that this explanation clears up much of the confusion surrounding why there are three different production budget figures. Please note that all my comments from here forward are with respect to the FY04 PB production position of $42.2B.

As I mentioned under the discussions on 'Program History,' Lockheed and the suppliers were building their proposals for Lot 3 full award and Lot 4 Advanced Buy right at the same time the program was experiencing external production quantity discussions.

With that as a background, the Lot 3 and 4 quantities now stand at 20 and 22 (vice 23 and 27 as documented in the FY03 PB). These reductions in both lots are due to two factors: the transfer of production funds to the EMD account to source the EMD EAC increase, and the higher-than-expected Lot 3 and 4 Advanced Buy negotiated price (i.e., aircraft affordability).

At this point in the program, we can model price performance-to-date and predict a total aircraft quantity within the $42.2B budget with confidence. Our current estimate is that we will be able to procure 276 total F/A-22s. This estimate is based on a number of conservative assumptions that get to the heart of why the DoD non-concurred with the GAO's recommendations and findings. Simply stated, this revised estimate already includes the factors annotated by the GAO. Further, in their independent cost estimate, the OSD/CAIG predicted that for $42.2B, the Air Force can procure 270 F/A-22s, which is within 3% of the Air Force estimate. This is remarkable; in the past the OSD/CAIG and Air Force production estimates differed by as much 11%. The gap has closed because, with three lots plus PRTV jets on contract (51 jets total), we now have a better understanding of production costs and assumptions for future expected production savings.

At the 27 March 03 DAB, Secretary Aldridge approved the Lot 3 full award contract and the program office subsequently finalized the Lot 3 contract for 20 aircraft. Hence, the current state of the program has LRIP Lots 1 –3 on contract, and Lot 4 Advanced Buy on contract.

It is worth noting that, though the aircraft affordability is not what we initially hoped, and contrary to many misconceptions, *the aircraft are getting cheaper*. At this point, we expected to be following an 85% learning curve, when actual performance shows

us closer to an 88% learning curve. *The below table shows the downward trend in fly-away costs* for lots on contract.

Aircraft Lot Fly Away Costs (TY $M)				
PRTV I (2 a/c) FY99	PRTV II (6 a/c) FY00	Lot 1 (10 a/c) FY01	Lot 2 (13 a/c) FY02	Lot 3 (20 a/c) FY03
$319M	$298M	$210M	$214M*	$184M

* The Lot 2 flyaway is artificially higher than Lot 1 because, starting in FY02, Producibility Improvement Plans (PIPs) were funded strictly from the procurement account and the level of PIP funding rose significantly that same year. A downward trend in fly-away cost is still clearly evident.

With that as an understanding of the current state and estimate for total quantity, let me say I am *not* satisfied with the estimate of 276--and we are taking steps to increase it. Maximizing final quantity involves two key elements.

The first key element is production stability. I believe the Summer 2002 DPG Study, as well as all the quantity discussions that continue to surround the program, had a direct negative impact on the Lot 3 proposals and eventual Lot 3 contract settlement. Any program office is at a disadvantage during negotiations whenever the contractor and suppliers perceive uncertainty and lack of long-term commitment. Now would be the worst time to decrement production funds; we're at a critical stage in the production ramp and the affordability learning curve. The tools, training, and people are in place for an orderly ramp up to max rate production. Let me spend a few minutes sharing our progress in getting up to max rate.

The operation on the production floor at Marietta is rapidly gaining momentum. As expected in any production program in its infancy, we've had growing pains. These growing pains are best evidenced by the number of months aircraft are delivered late. To address these late deliveries, Lockheed-Martin and the Air Force have been working together to implement initiatives in the areas of manpower, lean manufacturing,

Producibility Improvement Plans (PIPs), parts availability, quality assurance, facilities, and management systems. Our efforts are paying dividends. We track key production metrics to ensure these initiatives translate to decreased costs. Some of these metrics include span time (amount of work days required from the first final assembly station to aircraft delivery), parts shortages (number of parts not available when they are needed), and out-of-station work hours (number of hours performing manufacturing tasks that should have been performed at a previous station). For all three metrics, we've made significant decreases just in the last six months. Between aircraft #4010 (delivered October 2002) and #4012 (delivered December 2002), we've reduced span time by 11%. Since September 2002, we've reduced parts shortages by 72%. And, since November 2002, out-of-station work hours are down 56%. Of course, the real proof is in aircraft deliveries. During calendar year 2002, Lockheed reduced late aircraft deliveries from 12 months late to 7 months late. At the current rate of improvement, we expect aircraft deliveries to be back on contract schedule by July 2004, at aircraft #4035.

The Air Force has now taken delivery of the first three production Raptors, the third being the first Raptor for Air Combat Command (#4012). With the arrival of #4012 at Nellis Air Force Base, we formally stood up the first operational Raptor squadron, on 17 January 2003.

It is important to recognize lessons learned from the C-17; we can never fully recover lost efficiencies in that program. Cutting the C-17 total quantity from 210 down to 40 and then increasing it back again to 180 cost the DoD 79% more per aircraft, or over $22B total. Supplier confidence is a key element to a program success. In the case of the F/A-22, 65% of the aircraft cost is wrapped up in the supplier base. In addition, our

investments today in the F/A-22 program are on the "critical path" for achieving aggressive JSF goals.

The second key element for maximizing final aircraft quantity is something the program office and contractor team have much more explicit control over: *Production Cost Reduction Projects (PCRPs)*. Because this is an area emphasized within this year's GAO reports, I need to discuss the genesis and current status of the overall PCRP program, and its categories.

Production cost control and affordability have long been critical focus priorities for the F/A-22 team. In June 1996, the Air Force Assistant Secretary for Acquisition commissioned a joint government/contractor team of experts, the F/A-22 Joint Cost Estimating Team (JET). The team was chartered to develop the most probable F/A-22 production cost and identify realistic initiatives to promote lower production costs. When the JET presented their findings and results in 1997, the initial estimate for F/A-22 production of 339 aircraft, without the benefit of the PCRP, was $61.0 billion. Leveraging JET recommendations to reduce production costs, the Air Force and contractor team initiated a comprehensive cost reduction program in 1997. To meet the production program affordability goals, the Air Force and contractor team identified a set of PCRPs to lower production costs.

The initial PCRPs included initiatives in areas of producibility improvements, process changes, adoption of new manufacturing techniques, and implementation of Acquisition Reform principles. The airframe and engine contractors have on-going programs to identify additional cost savings initiatives. The F/A-22 team (government and contractor) manages the PCRP program using jointly-developed contractor-executed

tracking and measurement procedures. In addition, the results are briefed quarterly to Secretary Aldridge. To facilitate tracking of PCRPs, the contractor developed a computer database, which provides the team on-line access to get immediate and accurate status of any given PCRP effort. We have several categories of PCRPs.

- Producibility Improvement Projects (PIPs): PIPs are investments to improve manufacturing processes or incorporate new technology to reduce costs, and are key to the long-term affordability of the F/A-22. PIPs require up-front investments to bring down the unit cost of the system. The tables below compare the actual F/A-22 PIP investments to the original plan. In Fiscal Years 2001 and 2003, we funded PIPs at a higher level than the original plan, while in Fiscal Year 2002, we funded PIPs below the original plan. *However, in the aggregate, we have funded PIPs at the originally planned total level.*

Actual Investment Profile (TY $M)								
	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
PIP Investment								
Air Vehicle			97.00	172.80	68.85	16.20	8.10	362.95
Air Vehicle	7.50	16.50						24.00
Engine (Proc)		5.50	26.30	34.20	16.15	3.80	1.90	87.85
Engine (PRTVII)	0.50							0.50
							Total Investment	475.3

Originally Planned Investment Profile (TY $M)								
	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
PIP Investment								
Air Vehicle			138.00	145.80	68.85	16.20	8.10	376.95
Air Vehicle	7.50	2.50						10.00
Engine (Proc)		5.50	26.30	34.20	16.15	3.80	1.90	87.85
Engine (PRTVII)	0.50							0.50
							Total Investment	475.3

It is important to note that PIP return multiples range in "quality." For example, our PIP for implementing a new forging process that reduces the amount of raw titanium and machining time for four bulkheads has a return multiple of 55. With an investment of $1.3M, this forging PIP will save over $70M. Of course, we do not expect all PIPs to bear that amount of fruit; hence, we rack and stack expected PIP performance and fund those PIPs with the largest expected pay-off. *Our current estimate of 276 aircraft is based on full PIP funding and a conservative average return multiple for all past and planned future PIPs. We believe this is a prudent approach.*

- Lean Enterprise: The application of Lean principles optimizes process flows, improves quality, and reduces cycle times and inventories. Lean application uses the "Lean tool kit" developed by academia and industry to focus all involved personnel on the elimination of waste at three levels within the F/A-22 Program: on the factory floor, above the factory floor (office and engineering improvements), and at the suppliers. Lean training has and continues to encourage idea generation at all levels within the program. An example of one of our Lean initiatives involved improving the process sequence for coating the wing stub lower access panel. We were able to reduce the cycle time for this process from 608 to 341 hours.
- Diminishing Manufacturing Sources (DMS): As parts are no longer produced (also referred to as an out of production part or OPP), a strategy on redesign rather than remanufacture has the potential to reduce recurring unit costs through the utilization of newer, improved technology.
- Material Efficiencies: Utilizing improved buying strategies and supplier alliances are lowering the cost of raw material and purchased parts (e.g., team-wide and company-

wide raw material and hardware procurements).

- Performance Based Contracting (PBC): PBC flows down acquisition reform principles into subcontractor business arrangements. Examples include Modified Requirements Contracting, Partnership Analysis and Source Selection processes, selective use of financial incentives to motivate cost management, and effective use of Single Process Initiatives. Since the majority of F/A-22 work is done via subcontractors, acquisition reform flowed down to subcontractors is an important part of the F/A-22 affordability strategy.
- Multi-year Procurement (MYP): Permitting the acquisition of known requirements for more than one year allows the contractor to conduct production and capitalization planning in a more efficient manner, even though total funds required for subsequent lots are not available at the time of contract award. We currently plan to enter in a MYP contract in FY 2007, for Lots 7-11. This represents a delay in our original plan of one year; the delay is necessary, commensurate with a delay in completing DIOT&E and securing a positive full rate production decision. *The savings lost from delaying the MYP are already included in the new quantity estimate of 276 aircraft.*
- Rate Savings Due to Joint Strike Fighter (JSF): The increased business base at the prime site and at the suppliers due to the procurement of the JSF will result in savings to both programs through reductions in manufacturing and general and administrative overhead rates. Additionally, the commonality in parts and processes will offer savings to both programs. These savings are captured in Forward Pricing Rate Agreements (FPRA) used to price out cost estimates. Since these savings are embedded within our estimates, there is no separate break-out of cost savings due to JSF. *The most*

current expected savings due to concurrent F/A-22 and JSF workload are already included in the new quantity estimate of 276 aircraft.

The process of defining PCRPs has been on-going since the JET program review. With the criticality of PCRPs to meet program affordability objectives, the F/A-22 team built an efficient management structure to jointly oversee the development and implementation of PCRP projects. The management effort includes an on-line interactive database that allows real time reporting of PCRP status spanning idea generation, approval, implementation and tracking. We will continue to aggressively manage the PCRP program, to include fully funding the originally planned PIP program.

ISSUES RAISED BY GAO REPORTS

The GAO published two reports in 2003 related to the F/A-22. These reports were GAO-03-280 "DoD Needs to Better Inform Congress about the Implications of Continuing F/A-22 Cost Growth" and GAO-03-431 "DoD Should Reconsider Decision to Increase F/A-22 Production Rates While Development Risks Continue." The DoD formally non-concurred with both of these reports; however, I'd like to take this opportunity to provide the Air Force perspective.

GAO-03-280: Recommendations and Air Force Position

1. The Secretary of the Air Force make funding of PIPs at the planned level a priority

   Air Force Position: The SECAF has committed to funding $475M in PIP investments, consistent with the originally planned level. These investments were fully funded in FY03 and are fully funded in the FY04 budget submission.

2. SECDEF provide Congress with documentation showing PIPs are being funded at the planned level, reflecting the potential cost of F/A-22 production if cost reductions do not

offset cost growth as planned, and reflecting the quantity of aircraft DoD believes can be procured with the existing production cost limit

Air Force Position: the Air Force is committed to full disclosure with the Congress. We have consistently provided updates to Congress on the status of our production program, planned investments, and projected returns on those investments.

GAO-03-280: Air Force Comments on other Findings

- DoD still estimates that the cost of production will exceed the cost limit established by Congress

  Air Force Position: The Defense Acquisition Board, in Aug 01, approved the Air Force to plan and program for a $43B production program. The Air Force recognizes that this program exceeds the Congressional Cost Cap by ~$5.4B. The Air Force has informed the Defense Committees of this plan and is working with OSD and the Congress to get relief from the existing cap; however, the USAF recognizes that relief must be granted prior to exceeding the Congressional cap.

- The Air Force has not fully funded certain cost reductions plans called PIPs

  Air Force Position: As of FY03, the Air Force has fully funded all planned PIPs. The GAO is correct in that the Air Force did defer some PIP investments in FY02; however, those investments were funded in FY03. The FY04 PB submission also fully funds PIPs.

- The OSD current production estimate does not include about $1.3 billion in costs that should be considered in future cost estimates and lists several contributing factors (delayed multiyear, inflation increases due to the new ramp, revised JSF savings, and change in avionics subcontractor)

Air Force Position: This assertion is incorrect; the GAO's assessment is based on an old program estimate. The latest 276 aircraft program office estimate, as documented in the FY04 PB, includes all of these factors.

- Schedule delays in developmental testing could delay the start of multiyear.

  Air Force Position: The Air Force recognizes multiyear may well be impacted by delays in the start of DIOT&E and has accounted for these delays in the latest program estimate.

GAO-03-431: Recommendations and Air Force Position

1. SECDEF reconsider the decision to increase the annual production rate beyond 16 aircraft until greater knowledge of any need for modifications is established through completion of operational testing

   Air Force Position: The Air Force fully supports the OSD position in this regard. Based on the cost analysis performed in support of the DoD's certification to the Congressional defense committees, in December 2002, we believe the costs associated with reducing the annual production rate to 16 aircraft would exceed the retrofit costs for these aircraft.

2. SECDEF update the 2002 risk assessment and certification with sufficient detail to allow verification of the conclusions

   Air Force Position: The Air Force does not believe there is justification for updating the risk assessment and certification. The Air Force believes the current risk for retrofit on the F/A-22 program is low. F/A-22 systems having retrofit potential (structures and air vehicle subsystems) are tested and mature. Static testing and 1st lifetime fatigue testing are complete; in fact, we are currently 38% complete on the 2nd lifetime fatigue test. To date, we've identified no significant

structural issues. For fin buffet, we've incorporated minor structural modifications to the tails (replacement of composite vertical fin rear spar with Titanium and strengthening of a rudder fastener). These modifications were folded into the production line for Lot 2 and we are incorporating low cost retrofits on all prior aircraft ($2M). Our highest risk (software stability) does not drive a retrofit risk; incorporation of stability fixes is anticipated to be a software-only issue.

GAO-03-431: OTHER AIR FORCE COMMENTS

Recent flight test activity has been extremely successful; the aircraft is meeting or exceeding all key performance parameters, except airlift, which is not required until system maturity at 100,000 hours. We also believe the GAO fails to adequately document the impacts of their recommendation in terms of increased F/A-22 program costs: inefficient ramp rate (learning curve), decreased supplier confidence (cost initiatives), inflationary penalties (delayed procurement), increased O&S costs due to delayed F-15 replacement (F/A-22 is 28% cheaper to operate than F-15), and increased operational risk (due to decreased combat capability caused by delayed fielding of F/A-22's revolutionary capabilities).

The GAO has essentially made the same recommendation relative to delaying F/A-22 production since March 2000. In March 2000, the GAO recommended decreasing Lot 1 production from 10 aircraft to 6 aircraft. The rationale was increased retrofit risk due to delayed testing. In March 2001, the GAO recommended decreasing Lot 2 production from 13 aircraft to 10 aircraft. The rationale at that time was increased retrofit risk due to the fact static and fatigue testing were not complete. In addition, the GAO highlighted horizontal tail disbonds and canopy cracks as contributory factors. In March 2002, the

GAO recommended decreasing Lot 3 from 23 aircraft to 16 aircraft. The rationale at that time was that 1st lifetime fatigue testing was not complete. GAO identified fin buffet as an additional potential risk. The key takeaway is that despite the GAO recommendations, the program has successfully progressed through and resolved all the risk areas identified by the GAO since March 2000. There is no reason to believe this will not also be the case for the issues and risks identified in the March 2003 report.

Conclusion

The Air Force remains focused on providing the necessary capabilities to the warfighter in order to win America's wars. These capabilities can only be achieved through effective and efficient management during the development, production, and fielding of systems. By incorporating a strong collaborative process, re-establishing our credibility, implementing spiral development, and infusing systems engineering in our acquisition process, we can overcome the tough challenges ahead.

Through our new business practices, we are providing our workforce with the tools to make decisions and changes, but this is not enough. The Air Force must provide strong support to program mangers and the necessary latitude to manage systems development, production, and sustainment with limited interference. Only then can we meet the agile acquisition needs of our warfighters.

Given the limited budget and increasing needs, this is a challenge that must be met head on. We are committed to pursuing those actions necessary to make transformation work.

I appreciate the support provided by Congress and look forward to working with this Committee to best satisfy our warfighter needs for the future.

Thank you for the opportunity to provide this statement for the record.

Mr. SHAYS. I thank both of you.

I want to say we are going to be able to—there are just three committee members and the two of you. We are going to be able to really sort this out. So, you know, my point to you is that right now it's not sorted out for me, and I am a little disappointed with one aspect of your testimony. I had hoped that you would basically, either one or both of you, tell us what our $38.6 billion would buy if we had the cap. So—and Mr. Tierney was mentioning to me, in spite of our request to that, we are still not getting that. So you force me just to ask the question. I hoped you would voluntarily do it. So, Mr. Wynne, how many aircraft will we get for the $36.8 billion?

Mr. WYNNE. Sir, my estimate—and it is an estimate because we have only produced seven so far. And it does depend upon whether or not the predicted cost reduction projects come into being and impact these airplanes. And it does depend upon how such a lower, reduced quantity would be planned out, whether you would get more or less inflation, etc. But I estimate the impact to be between 225 and 235 airplanes would be achievable, again depending upon how the cost reductions would be impacted. I have not conducted a thorough review, but I have a lot of time in the world of estimating. This is not too bad.

Mr. SHAYS. Thank you.

Dr. Sambur, what would your estimate be?

Dr. SAMBUR. I think Mr. Wynne is correct, about the 225 range.

Mr. SHAYS. Now, sort this out for me. First off, as I used to do in hearings, and I'll have to expose my ignorance. But I have forgotten as to—this is to replace the F–15, but is it also to replace some F–16s? Is this solely going to be Air Force?

Dr. SAMBUR. I think by looking at it as a replacement jet, you're looking at it from the wrong way. This is basically a technology leap forward to encounter the threats we perceive and are actually happening right now in——

Mr. SHAYS. Let me ask you this. Who is going to use the plane, Air Force or Navy or both?

Dr. SAMBUR. Air Force.

Mr. SHAYS. OK. So does the Air Force fly any F–16s?

Dr. SAMBUR. The Air Force flies the F–16s.

Mr. SHAYS. And the F–15s?

Dr. SAMBUR. Yes, sir.

Mr. SHAYS. So it is basically—and Navy does not fly either?

Dr. SAMBUR. No. It flies the F–18.

Mr. WYNNE. It specifically flies the F–14s and the F–18s.

Mr. SHAYS. Thank you.

Mr. WYNNE. Yes, sir.

Mr. SHAYS. But when I look at the complement that we have now, we have approximately 1,600, give or take. What is going to replace those planes as they wear down? We are not going to go from 1,600 to 235, even taking your highest amount. What takes the place of that plane? Of both?

Mr. WYNNE. We have a fairly comprehensive look into the future on tactical aviation, and we are concerned, as you indicate, that the cost of replacement aircraft has caused us to reconsider our tactics, strategy, etc. Right now we are forecasting that we can extend the

life of the F–18 as well as the F–15, F–16 until the Joint Strike Fighter comes aboard.

You asked a great question, if I could follow on, sir, about what airplane does the F–22 replace. I would liken it to making sure that we have air dominance as we have achieved air dominance over every projected threat that we can see in the future. Right now it is not limited to the population of Iraq, as we were often accused of fighting the last war. We are actually in this case looking forward to the next war.

That being the case, I would say that the F–117 is probably the most reflective of the capabilities we have, but it is not an air-to-air or an air-to-ground, it is—but it does do some of those missions.

Mr. SHAYS. OK. I am still—it would strike me that almost any reasonable person would conclude—first off, since September 11, we have used these airframes in lots of different ways, the no-fly zone, north and south. We are using these planes to fly periodically over cities. These aircraft, both the F–15 and 16, have gotten a tremendous amount of use in the last few years, and I am told that it is much like a racecar. You bring an airliner in from overseas, it just turns around in a few hours and goes back, and it might come back again. It just is a real workhorse. It is high performance. But I'm told that our fighter aircraft are high performance and wear out quickly and parts have to be replaced quite often.

So what I need to know is—maybe more from you, Mr. Wynne—are we looking then at replacing the F–15 and F–16 with more of those planes? Building more of them? I mean, is that——

Mr. WYNNE. I think we are continuing to buy the F–15 and the F–16. I think they are planned to be in our fleet for many, many years to come, if not decades. As far as their capability is concerned, they are not anywhere close to being as capable as the F/A–22 or the Joint Strike Fighter when it comes on live. So longer term, I would say that they will be replaced, and they will be replaced with a combination of the F/A–22 and the Joint Strike Fighter.

Mr. SHAYS. When we went down from 750 in 1991 to 648 in 1993 to 438 in 1997 to 339 in 1999 to 333 in 2002 to 276, and while it's not certain that we would go at the cap, I mean, it's possible Congress will decide to increase the cap level. But if we went with a cap level of 235, what did we have in its place as we kept bringing these numbers down and the amount of time it took to build the F–22? What did we do? Did we just leave this gap, or?

Dr. SAMBUR. Can I just have an opportunity to answer that? I would like to correct one of the things that Mr. Wynne said. We are not in the process of building F–15s and F–16s. We are doing some enhancements to them, but we are not in the process of doing that.

Mr. WYNNE. That's right.

Dr. SAMBUR. Earlier this morning you heard a plea from Mr. Walker about a business plan. We have made that business plan. As you probably recognize, about several minutes ago there was a concern within the Department of Defense as to whether or not the F/A–22 was the right way to go, and they challenged the Air Force to actually prove the viability of this plane for the future, whether

or not it was meeting the needs, whether or not we had an adequate plan forward.

So we actually presented to the DOD a comprehensive business plan that included the requirements that we felt that this F/A–22 needed to meet, a business plan that talked about the aging assets of the F–15, and it was very comprehensive. And obviously some of it is classified, but some of the business aspects are open and you can obviously share that, and be happy to share those parts that are not classified with you.

Mr. SHAYS. Thank you. The bottom line is, it's good that we have that business plan. It needs to be, I think, shared with the appropriate committees, including this committee as well.

Let me just say to you both that you are certain both to appear before us again, because we are going to—we missed one step along the way after September 11, but we are going to be back monitoring this. We know that you all are newer to the program, but I think you can recognize there needs to be some, you know, sense of statements made and then an assessment of how we are doing on those.

Dr. SAMBUR. Well, as you said at the beginning, the right way to testify is to tell the truth. We are telling you as we see it. We recognize the issues you have, and they are good issues. And as I said in my testimony, I'm not here to give you excuses for performance in the past, which has not been exactly great, to use that expression. And we are trying to make improvements for the future. And the point that we are trying to make here, at least from the Air Force's point of view, is that we have taken a comprehensive look at the need for this F–22 and have balanced it with all of our other needs, and felt that this is the way to go forward. We are not happy with the number of 224 if the cap is not lifted or 276. You know, we feel that we need something in the order of 381. And as we see stability on this program and we get some of these processes in place, we hope to see improvement. And I will be very happy to appear before you in the future and really show you what we have done and be accountable if we have not been there.

Mr. SHAYS. Fair enough. Let me say that in our third panel we have a witness who believes that the number to stay within the cap will be closer to 175, and the per unit cost of that almost becomes, in his words, manifestly absurd. It's very possible that—I mean, obviously in this business plan it will share with us if we build, say, 300, what the per unit cost would be. I mean, I would imagine that you are giving people, decisionmakers certain options as to——

Dr. SAMBUR. Absolutely.

Mr. SHAYS. And also what our number is regardless of the cost, what we need?

Dr. SAMBUR. Let me say, Mr. Chairman, that the type of questioning that you are giving to me and to Mr. Wynne is not unheard of within the DOD itself. There is a tremendous amount of questionings associated with this program, and the Air Force has time and time again been asked to prove whether or not this is the right way forward. And we have had lots of exercises like this, a lot of data we have brought forward. And if I may, I would like to correct some of the impressions that you heard this morning on the

GAO report with respect to the $1.3 billion, which I think there was some confusion on that.

Basically, the question was whether or not the Air Force has accounted for that in our latest numbers, and let me just make sure what those items are that were claimed to have been missing by the GAO. The first was whether or not we would get the multi-year procurement in a timely fashion as we have projected, because if you don't get a multi-year procurement your costs will go up. We actually were much more conservative. We assumed that we would not get a multi-year until 2007.

The second concern in the GAO report was whether or not we would reap benefits from the JSF program, which had a lot of commonality with the F/A–22. We assumed a minimal amount. We actually were very conservative in that.

There also was a claim about inflation, that we did not adequately put in enough for inflation due to some of the schedule moving forward. We also put that in. And proof of the fact that our estimates are now more conservative is that for the first time, almost first time ever, the CAIG, which is the independent cost group within the DOD, now substantiates the Air Force number. It is highly unusual when the CAIG actually comes in and says, yes, the services have actually done a good job in validating their number. And we had a chance to——

Mr. SHAYS. I am going to admit my ignorance. I thank my colleagues for allowing me to go beyond my 10 minutes, and I will be very generous with their time as well. But just tell me, when you say CAIG?

Dr. SAMBUR. CAIG, and that's the Cost Analysis Independent Group. It is a function within the DOD to give an independent look at the services' cost estimates. Historically, and almost every time, those estimates differ. In this case, they corroborated and agreed with our numbers. And we went through a very thorough exercise to make sure that we accounted for all the sources of potential problems in the past. As a matter of fact, what we tried to do is give what we call an 80/20 cost view. That means that 80 percent of the time you will be right and 20 percent be incorrect. Historically, the view is usually 50/50, and we've tried to be more conservative. And one of the benefits of that is we are now experiencing this avionics stability. And you might have read about it.

Mr. SHAYS. Let me do this, because I have really gone over my time. Let me make sure that you cover what you need to cover, but it's going a little beyond what I've asked.

Dr. SAMBUR. Sure.

Mr. SHAYS. We will go to Mr. Tierney for a very generous 10 minutes plus.

Mr. TIERNEY. Thank you, And thank you both for testifying.

Mr. Wynne, what happened with the prior intent to use funding that you requested from Congress and got for production efficiencies?

Mr. WYNNE. Well, sir, I believe there was a chart provided to you by David Walker, the Chair, that we are starting to use it when the projects are coming into our attention span.

Mr. TIERNEY. Started to use it is not quite the same as having told us sometime back that you needed additional funds so that you

could use them. And, to my information, the GAO had not been implementing them to date, and in fact the indication to me was that you sort of indicated to GAO that they hadn't proved that in fact these efficiencies would be effective. And I thought that was sort of a bizarre approach, that the Department of Defense proposed this plan, and then when GAO came back and said, well, we haven't seen the plan implemented, haven't seen these savings from it, your comment back, DOD's comment was, well, you haven't proven that those things would be effective, seemed a little disingenuous. Could you explain that little byplay?

Mr. WYNNE. Sir, I think we are fairly straightforward on our plan. There were some suggestions that didn't have merit after they were investigated. It's always debatable as to what the forecasted impact would be, the returns on investment. Though we hope that they don't vary over time, some do. And there can be honest debates and disagreements in that area. But we do need the money to in fact conduct the cost reduction projects that we have identified.

Mr. TIERNEY. Well, up until the time that GAO had filed its report, you hadn't used the money in that regard. Right?

Mr. WYNNE. We want to make sure they are high impact. Yes, sir.

Dr. SAMBUR. May I have an opportunity to answer that question?

Mr. TIERNEY. You can. I wasn't asking you because you weren't the one that gave me those conflicting answers. But if you want to get engaged, go ahead.

Dr. SAMBUR. Well, having said it that way, the issue really is when you use money to improve efficiencies you don't really see the outcome of that until you actually start building.

Mr. TIERNEY. The problem was, Dr. Sambur—not to interrupt you, because I'm on limited time—is they hadn't used the money. They promised Congress that this was what they needed the money for and said they were going to put the money into doing that and it was going to show savings down the line. On the review, they had not used the money for that, and then accused GAO of not being able to prove that they would be efficient. It was their plan—we were willing to agree that it might be efficient if implemented, and that was what the money was for. So that was my point. My point was they hadn't used the money and then they made some, I think, bizarre sort of approach that it was GAO's fault for not proving that the plan DOD had proposed would in fact be effective.

Dr. SAMBUR. Are you aware of the fact that in 2003 we will be spending $207 million? In 2002, we did underspend in the plan, but we are——

Mr. TIERNEY. That's what—I'm aware of that, and that's what my question was.

Dr. SAMBUR. Yeah.

Mr. TIERNEY. That up to that point in time that this report was done, you did not spend the money.

Dr. SAMBUR. You are correct.

Mr. TIERNEY. We can all agree that you have the best intentions going forward. If this hearing were just about going forward, you guys would be having a much easier day. The problem is that this is a lot about a huge cost overrun in the past to this date, and I

don't think that we can let it go that you are going to come in here and start fresh and saying that, gee, you know, let's not even just talk about that. I mean, Mr. Wynne, you'd left 16—I think about six pages of 16-page testimony, whatever, and left out everything that dealt with the GAO. I mean, we needed—in the report. We need to know what's going on here.

Let me approach it this way. I got a reply from the Department this week. It says: The Department has approved the procurement budget higher than the congressional cap.

Now, Dr. Sambur, you said the Defense Acquisition Board approved the Air Force plan—the Air Force to plan a program for $43 billion production program. You also said that Secretary Aldridge approved the revised program baseline and directed the Air Force to fully fund the production program accordingly.

So if you set a new baseline, gentlemen, you've approved the new procurement budget and you've planned a program under a higher estimate, tell me how you are not violating the law if Congress set a cap at $36.8 billion.

Mr. WYNNE. Let me first start, sir, by apologizing for the lateness of the letter. We did deliver it on April 8, and I realize that it was due on April 7, and I apologize for that.

Mr. TIERNEY. Thank you.

Mr. WYNNE. We have a budgeting process inside the Pentagon, sir, that is independent of the budgeting process that you consider but does table up Presidential budgets that we did in 2001, 2002, and 2003 that each showed that our intent was to go beyond the cap of the $36.5. When Secretary Aldridge——

Mr. TIERNEY. How does that happen? You have a congressional cap of $36.8 billion, and then you have this whole system where you say, oh, we're going to disregard that. We are going to pull our own deal of $43-something.

Mr. WYNNE. Might I say, sir, with all due respect, we actually have a budgeting process within the Pentagon that tables up Presidential budgets, because all may not feel the same way that you do, sir, with due respect.

Mr. TIERNEY. It's not a question of how I feel, sir; it's a question of how Congress already decided. So if they already decided—they didn't ask me how I felt. Congress as a body said it collectively felt and directed that the budget was going to be $36.8 billion. It's a little disturbing to hear now that you've got this other budget process that says that we don't agree and we think we're going to roll over that.

Mr. WYNNE. We recognize that is a subordinate budget process, sir, to the one that you and your fellow Members of Congress and the Senate agreed to. We do, however, have to plan a future that we think represents the best we can do for the defense of America.

Mr. TIERNEY. Well, excuse me a second. I think your obligation is to provide a plan that comports with the law and what Congress decides, not what you decide you want Congress to do but didn't do for you. I mean, explain to me where it is that you just decide that your opinion circumvents Congress' opinion, and you don't like the $36.8 billion so you're going to decide what's best for everybody and just plan at $43 and assume at some point in time that you

are going to have a convincing argument that's going to win the day.

Mr. WYNNE. Sir, since it is in the outyears, I believe that's planned for fiscal year 2006, and we did notify the Congress shortly after the Defense Acquisition Board as to when we thought we would schedule that and still intend to follow through with that.

Mr. TIERNEY. Well, but what you don't intend to follow through with is with the congressional cap, and I guess that's my point. The existing law is a cap of $36.8 billion. You show no indications at all of even remotely entertaining the idea that you might stay within that cap, that your plans comport with it, everything you've got—it's all in this higher number that I guess the Department of Defense has just decided that's what they want to do.

Mr. WYNNE. Sir, if that's the direction that the Congress in fact continues to impose, then we will comply with the law.

Mr. TIERNEY. Well, I would hope so. But it's taken us an extraordinarily long period of time just to find out that, assuming you comply with the law, how many planes you are going to be able to build. And that's been a long period of time just to get that answer, which leads me and others I think to believe that intention may not be as clear and firm as you indicate.

I think the GAO today had some very good points about a business plan. Originally—can you explain, I think it's worth stating for the record. What was your original business plan for the F–22 when you first put it on the drawing board? Where were you going with it? How many planes did you say you needed? What specifically did you need them for? What characteristics did you need? And how many did you need to fit that?

Mr. WYNNE. I'd have to take that for the record, sir. It's research that I would have to go back and do from 1986, was the original business plan.

[The information referred to follows:]

F/A-22 Business Plan

The ongoing Engineering and Manufacturing Development (EMD) program is developing and fabricating aircraft and engines for the flight test program, which commenced with first flight in Sep 97. Production Representative Test Vehicles (PRTV), PRTV II, and EMD aircraft will be used for dedicated Initial Operational Testing and Evaluation (IOT&E) and to conduct Follow-On Testing and Evaluation (FOT&E). Low-Rate Initial Production (LRIP) aircraft will be procured in five lots and will build the initial training and operational squadrons.

The program team maintains a comprehensive strategy for handling Diminishing Manufacturing Sources (DMS). The strategy is based on executing within the current annual appropriations identified for each production lot. Specifically, based on detailed expenditure and liability profiles for accomplishing known DMS impacts, the plan entails procuring 12-month increments of schedule protection against DMS impacts to future production lots. This schedule protection will enable the program to mitigate the impacts of DMS until multiyear procurement occurs.

Low Rate Initial Production (LRIP)

Low Rate Initial Production is comprised of Lots 1 through 5. These lots emphasize early implementation of producibility improvements to achieve overall program affordability goals. This approach reinforces cost consciousness leading into full rate production and allows the production processes to fully mature, providing a strong foundation for long-term affordability. These aircraft provide for tactics development, initial pilot training, and to meet the Ready Assets Available (RAA) Initial Operational Capability milestones. Initial support capabilities are included as part of the LRIP production contracts. For the air vehicle only, a separate Firm Fixed Price (FFP) Program Support Annual Sustaining contract is used for sustaining labor that cannot be uniquely identified to a particular aircraft or Lot.

The Affordability Incentive Program (AIP) incentivizes the achievement of the Target Price Curve (TPC) and rewards contractor investments through the payment of award fees in production. It provides a mechanism for the Government and the Contractor to share in savings generated as a result of the Contractor's investment in producibility enhancements.

Full Rate Production

The Milestone III, Full Rate Production decision is being planned for approximately three months after the completion of Developmental Initial Operational Test and Evaluation (DIOT&E) Air Combat Simulator (ACS) testing. The planning assumptions used to develop the revised program to cover EMD Estimate at Completion (EAC) increases and increased production costs, changed the full rate production strategy. Lot 6 will be a stand-alone procurement. The multiyear program has shifted one year to Lots 7-11.

The specific multiyear acquisition strategy will be developed using the results of the feasibility study, which will be conducted during CY04. Based on the results of this study, the Air Force (AF) will convene an Acquisition Strategy Panel (ASP). The ASP will review the feasibility study results, including whether the program meets the basic 10 USC 2306b criteria and decide

the appropriate multiyear approach. The System Program Office (SPO) will then prepare the initial multiyear findings package for Secretary of the AF for Acquisition (SAF/AQ) approval.

Contract Types

The contract for air vehicle EMD is Cost-Plus-Award-Fee (CPAF). The contract for Engine EMD is Cost-Plus-Fixed Fee (CPFF). The engine EMD contract was converted from CPAF to CPFF in Mar 99 as part of the engine EMD replan.

FFP contracts with risk mitigation clauses are being used for PRTV and PRTV II for both the air vehicle (including program support) and engine. FFP contracts are used for Lot 1 air vehicle and engines and the remaining LRIP efforts through Lot 5.

The air vehicle Lot 1 production contract includes a separate CPFF line item for material support capability. CPFF was appropriate based on program concurrency and the predictive nature of the data used to prepare for initial field support capability. The air vehicle Lot 2 production contract includes CPAF line items to fully implement the F/A-22 "Support as a Capability" concept. As a result of reduced flying hours and limited budget, the SPO converted the support contract line items to CPFF for Lot 3.

EMD Award Fee

The Air Force Program Executive Officer for Fighter and Bomber Programs (AFPEO/FB) is the Fee Determining Official (FDO) for the air vehicle EMD contract. Award fee periods are 6 months. The award fee plan is under FDO and is subject to unilateral change for future award fee periods. The award fee pool structure was based on a 4% Base Fee and 9% Award Fee. The current award fee plan allows the Government to incentivize contractor performance by focusing on issues most likely to hinder meeting cost, performance, or schedule objectives.

Lockheed Martin Aeronautics Company has earned over $832 million through Period 23. Remaining award fee is less than $20 million. However, with the EMD program extension the award fee plan is being revised to accommodate additional periods.

LRIP Award Fee

Award fee pools, as outlined in the Affordability Incentive Program (AIP) clause, were established on the LRIP contracts to incentivize the contractors to negotiate prices and/or achieve cost performance for those Lots within the Target Price Curve (TPC). During Lot 1 negotiations, the air vehicle contractor agreed to defer payment of the $32.4M incentive owed by the government for the achievement of the TPC requirements on PRTV, PRTV II and Lot 1. This amount, along with $32.4M incentive associated with Lot 2, was paid upon the award of Lot 2. The weapon system contractor did not meet the criteria established for earning LRIP award fee in Lot 3.

The engine contractor earned award fees totaling $22.3M for PRTV/PRTV II, Lot 1, and Lot 2. $15.3M is available for Lot 3.

Partnering Concept

The long-term support concept will evolve into a program encompassing a mix of organic, contractor logistics support, and partnering agreements. Establishing an executable long-term F/A-22 logistics support concept through a realistic and sustainable public-private partnership is the key to ensuring the full capability conceived and delivered during development and production are available to the warfighter for the life of the weapon system. This long-term F/A-22 sustainment partnership will require a clear commitment from all stakeholders to include the System Program Office, the Prime Contractors (and major Subcontractors), and the Air Logistics Centers at Ogden UT, Warner Robins GA, and Oklahoma City OK. Starting CY06, the F/A-22 will begin a transition to a SAF/AQ and Deputy Chief of Staff for Installation Logistics, USAF (AF/IL) approved long-term partnering concept. All primary members of the partnership and Air Force Materiel Command (AFMC) will develop, coordinate, and approve the specifics of the concept. However, certain candidate subsystems will lend themselves to a "fast-tracked" partnering arrangement before the end of CY05. The F119 engine is identified as "fast track" and the SPO intends to implement a partnering capability not later than CY05.

Requirements Plan and Spiral Development Plan

The draft Initial Requirements Document (IRD) provides a broad outline of the desired additional capabilities envisioned for the F/A-22 weapon system in a series of spirals. The Baseline Management Working Group (BMWG), the primary forum for assigning and aligning candidate priorities, has identified a list of potential capabilities, "candidates", for inclusions into the initial spirals. Each candidate or group of candidates will be part of an Initial Capabilities Document (ICD). As part of the evolutionary process, it is recognized that all desired capabilities might not fit into the projected spiral. The application of Cost As Independent Variable principles and evaluation of the technical maturity will be some of the determining factors. Once final selection is made on specific spiral content, program documentation will be changed to reflect the threshold and goal values needed to report development progress.

The change planning strategy for the F/A-22, depicted in the F/A-22 Spiral Development Template, Figure A, will support introduction of improved capabilities on notional two year centers. Each release will be a combination of new capability, correction of deficiencies, and changes resulting from diminishing manufacturing sources. Phase A is system requirements definition and analysis and requirements allocation/verification planning. Periodic reviews, including the System Requirements Review (SRR), Preliminary Design Review (PDR), and Critical Design Review (CDR), during Phases A and B will concentrate on technical feasibility, risk management including identification and reduction, as well as cost and schedule realism. Phase A will develop draft single specification changes and deliver an executable program plan. Phase B will perform detailed design activities, balance technical work content against funding and schedule constraints, and deliver the system verification test plan. By the end of Phase B, the Air Force will have a set of validated Key Performance Parameters (KPPs), contained in a Capability Development Document (CDD). This will be used to modify the APB and integrate reporting of spiral development activities into the existing F/A-22 reporting requirements.

The design is locked down with the initiation of Phase C, product development, integration, and test. In addition to the development activities, Phase C will include a Production Readiness Review (PRR) to ensure a smooth transition into production. Phase D is the operational evaluation to validate and verify the operational suitability and effectiveness. Phase E provides for incorporation of required changes resulting from the Phase D testing and includes the final Operational Flight Program (OFP) build.

To illustrate the process, Figure B presents the preliminary Spiral 2 plan. The complete Spiral 2 development and test plan encompasses approximately four years (FY03-FY06). Requirements analysis, Phase A, was initiated in Mar 03. The analysis portion is expected to last about a year. Design, Phase B, will be initiated after a successful System Requirements Review (SRR) and will also take about a year to perform risk reduction activities and make final adjustments to the candidates for inclusion in Spiral 2. The proposal, developed during the design phase will cover all remaining development, system integration and test activities, Phases C, D, and E. Draft system specification changes will be the technical baseline for the remaining phases. Production and retrofit will be acquired under separate contract actions. Additional spirals to the requirements plan are summarized in Figure C, "F/A-22 Modernization Program," describing the evolution of the spirals and the expected content for modernization.

F/A-22 Spiral Development Process Reduces Risk

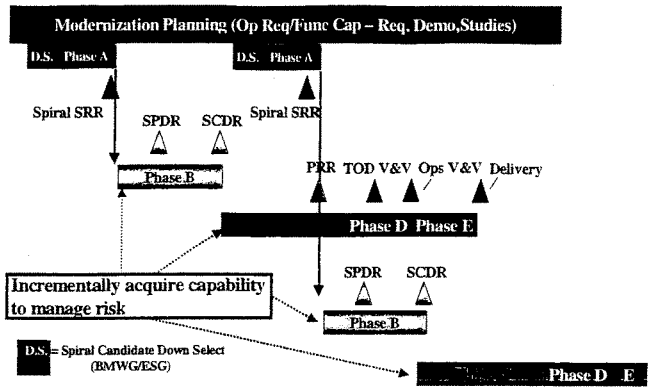
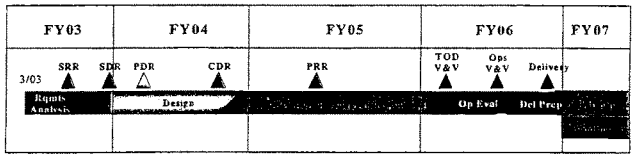


Figure A: Spiral Development Template

Figure B: Preliminary Spiral 2 Plan



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F/A-22 Modernization Program

U.S. AIR FORCE

F/A-22

IOC 4th Gen Array

FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

Lot 3 Lot 4 Lot 5 Lot 6 Lot 7 Lot 8 Lot 9 Lot 10 Lot 11

Battlespace Effects

Warfighting Capabilities

Baseline Multi-role F/A-22

Modernization Candidates

DPG Study Capabilities

- Increased Reach, Lethality

Global Strike Basic

- Improve A/G, update A/A
- Improved Deployability
- Combat Redundancy
- Enhanced Homeland Security

- Enhanced Access
- Exploit, Neutralize, Destroy Enemy High Value Capability

Global Strike Enhanced

- Seek/Destroy Adv SAMs
- Basic IW : anti-Shooter
- Enhanced A/G Weapons, ID
- Worldwide Interoperability
- Machine-Machine Data link

Future Objectives

- Full Spectrum Dominance
- Freedom From/To Attack

Global Strike Full

- Deny Enemy Awareness
- Full Spectrum SEAD/DEAD
- Enhanced Precision, TCT
- Enhanced ISR
- Enhanced NCW

- Battlespace Awareness
- IADS Supremacy

Enhanced ISR

- Strike IW
- Increased Target Set
- Enhanced Lethality
- Enhanced Deep Strike
- Full ISR Integration

Spiral 2

- JDAM Supersonic
- Candidate 38
- PVI Enhancements
  - LZM/G, 3200 PVI
- ECCM Update (Gamma)
- Clear Main Weapon Bay
- 4th Gen Array, AS

Spiral 3A

- A/G Radar (SAR)
- Aided tgt detection
- Emitter Geolocate
- EA (THOR)

Spiral 3B

- Link 16 Transmit
- SDB Integration
- GATM/SAASM
- Mode 5 / S

Objective Capabilities

Spiral 4

- Adv AEA
- A/G Enhancements
  - Precision, Wpns, GMTI
  - A-G HMCS
  - Prec. Emitter Geolocate
- Enhanced Data Recording
- Auto GCAS

Spiral 5

- Adv A/G
- Adv SEAD, AEA
- Full ISR Integration
- Adv Data Recording
- LO Ext Fuel Carriage
- OTH LPI Datalink

Integrity - Service - Excellence

Figure C

Acronym Legend for the F/A-22 Modernization Chart

A/A	Air to Air
A/G, A-G	Air to Ground
AEA	Airborne Electronic Attack
AS	Air to Surface
DEAD	Destruction of Enemy Air Defenses
EA	Electronic Attack
ECCM	Electronic Counter Counter Measures
GATM	Global Air Traffic Management
GCAS	Ground Collision Avoidance System
GMTI	Ground Moving Target Indicator
HMCS	Helmet Mounted Cueing System
ID	Identification
ISR	Information, Surveillance, Reconaissance
IW	Information Warfare
JDAM	Joint Direct Attack Munition
LO	Low Observability
LPI	Low Probability of Intercept
LZIWG	Launch Zone Improvement Working Group
NCW	Network Centric Warfare
PVI	Pilot Vehicle Interface
SAASM	Selected Availability Anti Spoofing Module
SAMs	Surface to Air Missiles
SAR	Synthetic Aperture Radar
SDB	Small Diameter Bomb
SEAD	Supression of Enemy Air Defenses
TCT	Time Critical Targeting

Mr. TIERNEY. You are not aware of what the original business plan was or what the original goal of this particular platform was?

Mr. WYNNE. Sir, I haven't gone back that far to take a look. I encountered this program and have studied it principally to effect my responsibilities going forward.

Mr. TIERNEY. I will yield to chairman for the second.

Mr. SHAYS. Dr. Sambur, wouldn't that show up in your business plan that you have developed now? Because in order to know where we need to go now, wouldn't we know what we needed in the past?

Dr. SAMBUR. The business plan actually looks at all of those factors.

Mr. SHAYS. So we should be able to find some of those answers in your business plan?

Dr. SAMBUR. Yeah, we have that. And as you can recognize, since the early times, the CONOPS, or the concept of operations, for the Air Force has changed. We have now an Air Expeditionary Force quality. And based upon this Air Expeditionary Force new method of operating the Air Force, the number that we need is 381.

Mr. SHAYS. Thank you.

Mr. TIERNEY. Gentlemen, tell us now what your business plan is. What do you identify as the need for the F–22?

Mr. WYNNE. I believe the number that the Air Force has tabled up is 381, which would fill out all of the Air Expeditionary Forces and would allow them some overhead airplanes which, for remaintenance and for in-transit. We have introduced risk into the process, even at the additional funding level of $5.4 billion. We recognize that. We hope we don't get to a high usage, low density construct as we are with the F–117, as it has become so popular that we are wearing out pilots, airplanes, and crews. But we do understand that we have introduced some risk into the process. The Air Force every year, every year, stemming from the QDR down through the national security policy, has to reevaluate their best way to meet the national objectives.

Mr. TIERNEY. When do you project that the JSF will be in production?

Dr. SAMBUR. In around 2012, 2011.

Mr. TIERNEY. And at the rate you are going now, how long do you think it will be before you have 381 F–22s operational?

Dr. SAMBUR. We are not planning on 381. Our plan right now, with the budget constraints that have been given to us by the DOD, is 276. We have a plan on how we would utilize 276 and hopefully, if we can get the additional funds and the budget relief from Congress to go beyond that, the 381.

Mr. TIERNEY. Within your plan for 276, what do you use to fulfill the balance of any need that you originally thought might have required a use of more of the F–22s? You'd use enhanced F–15s and F–16s? Do you use the F–117s?

Dr. SAMBUR. It's a combination of all of those things. And for the record, if some of those aspects are not classified, I will be glad to share it with you.

Mr. TIERNEY. And what did we meet in Iraq that we were unable to meet with any of the air platforms that we already have?

Dr. SAMBUR. Well, I think the greatest picture—I saw a picture on CNN where they had long lines of the Marines ready to go in.

Without air dominance, we could not have achieved that. There was nothing in Iraq that we see right now that would have prevented us. Unfortunately, there are proliferations of these surface-to-air missiles that were mentioned this morning by—I'm not sure if I'll pronounce his name right, but he said Dutch.

Mr. TIERNEY. Nobody else does, but Mr. Ruppersberger.

Dr. SAMBUR. Thank you. He indicated the surface-to-air missiles, the so-called double digit surface-to-air missiles which are proliferating. They are already in China. They're relatively easy to acquire in terms of money. There is no capability other than the F/A–22s that will be able to penetrate and give us air dominance. Without the air dominance, you cannot bring in the forces. In addition, cruise missile defense is a very important attribute of the F/A–22s which is vitally needed. So this takes a step forward. This is—you know, as the chairman mentioned this morning, this is the unfair fight that we want. I mean, the F/A–22 gives us that unfair fight for many, many years.

Mr. TIERNEY. What does the enhanced F–15 and F–16 not do in those regards?

Dr. SAMBUR. It doesn't give you stealth. The stealth is absolutely necessary to penetrate into these surface-to-air missiles, these double digits.

Mr. TIERNEY. And we have no other stealth aircraft that does that?

Dr. SAMBUR. No. Not with the supercruiser, not with the maneuverability of the projected F/A–22. And the important point to recognize, and I think Congressman Schrock said that, we're in the fourth quarter. I mean, we have already demonstrated all of these capabilities. I mean, the only thing that remains right now is avionics stability, and we are going to get there. So we are there. We are demonstrating that a plane meets all of these key performance parameters that will enable this country to basically maintain air dominance, and that's what we need. These surface-to-air missiles, these integrated air defense systems are here right now. They are not on the drawing board.

Mr. TIERNEY. Is there something that the F/A–22 does that the JSF will not do?

Dr. SAMBUR. Yes.

Mr. TIERNEY. What's that?

Dr. SAMBUR. Well, basically the supercruise, the maneuverability. All of these things are not part and parcel of the JSF. They complement each other, but the F/A–22 is a significant enhancement.

Mr. WYNNE. Congressman, just one thing. And that's the F–117 is in fact the airplane we use now to surrogate for the F/A–22 capabilities and the Joint Strike Fighter capabilities in the future. It is, if you will—that's why it's so heavily used; it is our stealthy airplane available to us.

Mr. TIERNEY. I thought it had some stealth capabilities.

Dr. SAMBUR. It doesn't have the maintainability or the stealth characteristics of the F/A–22.

Mr. SHAYS. If I could just interrupt the gentleman, and then we need to get Mr. Schrock into this dialog. But when the F–22 began, it was basically air-to-air?

Dr. SAMBUR. That's correct.

Mr. SHAYS. And we then felt it had some air-to-land mission?

Dr. SAMBUR. Right.

Mr. SHAYS. But in the process of doing that, when we loaded up with certain weapons systems, it's not totally stealth, correct?

Dr. SAMBUR. It is totally stealth.

Mr. SHAYS. Totally stealth.

Dr. SAMBUR. Yes.

Mr. SHAYS. OK. When you add these weapons systems, will it stay stealth then?

Dr. SAMBUR. Yes.

Mr. WYNNE. What you're referring to, sir, is whether it's inboard carriage or outboard carriage. I'm sure that Congressman Schrock could probably fill us all in on the aspect of this. But once I tuck the weaponry inside the airplane, then I am inside the platform and so I can have the same stealth characteristics. When I open the doors—for example, when the B–2 opens its doors to finally drop a bomb, then it becomes very briefly visible, and so also, when an F/A–22 opens its doors to drop a missile. Now, we've tried very hard to minimize its emergence into the light, if you will, but I believe you have to, just like a submarine has to come clean where it is when it fires a torpedo.

Mr. SHAYS. Does the gentleman have another question before we go to Mr. Schrock?

Mr. TIERNEY. I do. Thank you.

Who, if anybody, has any technology even remotely close to the F–117?

Dr. SAMBUR. Well, there are several aircraft that are being developed. France is developing one. I think China is developing that. But more importantly, if you look at our F–16s, if you look at what's being developed in Korea and the UAE, our plane, if we just maintain what we have right now, would probably be the third or fourth most capable fighter plane in the world, and that's a pretty sad situation.

Mr. TIERNEY. Thank you.

Mr. SHAYS. I thank the gentleman.

Mr. Schrock.

Mr. SCHROCK. Thank you, Mr. Chairman.

That is a sad situation. We used to be the leader in all of that, and we are slowly losing that edge, and that is clearly something we have to change.

Let me do a followup on your comments on what Secretary Wynne said, Dr. Sambur. The F–22 is going to replace the air-to-air F–15s, while the Joint Strike Fighter is going to replace the F–16s. I did that for his benefit. He didn't hear it, I guess.

Let me make a few comments on some of the things you have all said. First of all, I think this Defense Department suddenly realizes they have to change the way they do business, and I think that was the primary goal of Secretary Rumsfeld when he took that position. But of course after September 11, 2001, a lot of the focus changed over there. But he is trying to get back to that now. And a lot of what the GAO folks said this morning, I was glad that—I think it was Dr. Sambur that said you agreed wholeheartedly with what the GAO said. And I was pleased to see that, because

clearly some things have to change over there. There is no question about that. And I'm not sure I blame the Air Force and I'm not sure I blame the manufacturers. I think it's just the mindset that is so ingrained over there. It's a cancer in that place that at some point has to get chopped out of there or we're going to operate this way forever.

And I know that mentality of those people who were there forever think well, the secretaries will leave. They think, "I can outwait them, and the guys in uniform will get transferred and I can outwait them," and I think that's half the problem. So we're going to have to change some of that to make sure we don't have to have hearings like that eliminating problems that we are finding here. And I, you know, I have talked to the Air Force a lot about this, and I am convinced that the changes you talked about are being made. I think they realize they have some fundamental problems, and I see the curve going up to make sure that those changes are incorporated, and we will solve some of these problems, and I agree with the chairman too.

We have to establish air dominance. I don't want a fair fight. I want us to be so far superior that nobody will think about coming at us, and I think we saw that the last couple of weeks in Iraq. And your comments about the 22 being stealthy, that is so important. That's going to save a lot of lives so that nobody can hone in on us, and I think that is one of the things that this platform offers that a lot don't. And I, you know, I think, I hope nobody here thinks that the Air Force is the only one going to use the joint strike fighter. The 1,760 airframes they are going to build are going to be used by the Navy, the Air Force and Marine Corps.

So I think that's a good bang for the buck as well. I've got two questions I'm going to ask, one of the secretary and one of Dr. Sambur. You know, you heard me ask the GAO about the cost risk assessment for increasing the production above the 15 aircraft. And I think I read somewhere in a statement, your statement from the Department of Defense, that you performed an analysis. Is that true and if so, what did you find out? What were the conclusions you came to.

Mr. WYNNE. What we really looked at, sir, was whether the risk of retrofit, which is really the dominant thing that would affect the four airplane difference in production, would be. As I mentioned, we have produced thus far seven. This was actually the entering into a 36-month purchase, which gives you some—also some opportunity to, for in line, install if you have a problem. So you look very hard at what is the risk of retrofit which means that, are you going to have these airplanes fully produced and then pull them over to the side and then install whatever the corrective action is.

The risk of retrofit at the time was simply the twin tail flutter. And when we took a look at that and we noted that the Air Force had done quite a bit of testing and simulation on substituting titanium and had gotten themselves into an acceptable risk. We have had twin tail flutter with us, I think since the F–4, the F–111, the F–15, and now the F/A 22. So I'm sorry. F–18 as well.

So it's not an unknown problem for us to solve. It is a question of can we get the right vibration analysis together so that we have an acceptable risk and we can then put the pilots, give them a

flight policy, if you will, that they don't get to pull 10½ or 14 G's to introduce that concept. The only other risk that we saw was the integrated avionics risk. The integrated avionics risk is like your home computer going askew. This is unstable, and I mean, perhaps yours are all very stable. Mine tends to ground on me when I type in strange stuff. This is really debugging, and I will tell you that the aspects of systems engineering are important here because we have to understand how to look into the processors and look into this software development.

Microsoft, bless their hearts. They have a lot of people that debug their software and not just people inside the company, but all of us who are users that get on to their scheme. We actually don't have that kind of capability because we don't let this out to all the universities and all of the public. So we must concentrate on how do you develop efficient tools to do 2 million lines of codes and debug them. When I looked at that I felt, as did my boss, Secretary Aldridge, that the risk there was actually very slight.

But to put it in perspective, we did ask that the director of Defense Research and Engineering to conduct a review for us and give us a feeling as to whether the architecture was stable. If the architecture was not stable, then all bets are off, and now we have to go in and pull that, and that's very expensive and it takes a long time. Their comments back to us in their professional opinion, we would have introduced more problems than we currently have taking that action. I would love to get this system to be modular open systems architecture. We have all but mandated modular open systems architecture for our future weapons systems. This is sort of the last of a generation.

Well, Comanche will probably be the same ilk. That having been said, the cost of retrofit is very inexpensive. For any problems that arise and we would see. It is the cost of duration of fix that we're now worried about. And that's what the review in June is the cost of the duration of fix. As I mentioned, Secretary Sambur has allocated 60 days additional for this problem to be resolved so we can meet our entry criteria. He's very optimistic. I must be skeptical.

Mr. SCHROCK. Your comment about open architecture is important. I'm not sure the word retrofit bothers me that much. I realize it costs money, but when you figure that they first started drawing this thing in 1986, here we are in 2003, people have to understand that architecture and technology and all the fancy things that go into these planes change all the time. As you heard Congressman Duncan say, by the time he gets a brand new computer on his desk, it's old. And that has created a lot of this, I'm sure.

So that's why I think, I wish we could tighten these, get these things designed, approved and built and close that gap. That might eliminate some of this sort of thing. Because I mean as we sit here, there are probably things that are going to change in the next few weeks that are going to want to put on the Raptor that's going to get everybody's ire up again. But the fact is we want the best that we can get.

Mr. WYNNE. Certainly if not in the next 2 weeks, sir, over the next decade.

Mr. SCHROCK. Yes. That's exactly right. Dr. Sambur, the GAO highlighted in their reports a number of issues, especially with re-

gard to the increased costs, and I think that's something that we're all concerned with, and I know I am because we're supposed to be good stewards of the taxpayers' dollars. Based on that, and based on what those reports said, do you really think, does the Navy—I was Navy. You can take the guy out of the Navy. You can't take the Navy out of the guy. Does the Air Force still think this is a bargain? This is a good thing to do based on all of the things that they have heard concerning costs that the GAO has brought up?

Dr. SAMBUR. Well, I think to answer your question, let me just go back to what I said before. About my comment about looking at CNN. Technology, the unfair fight is what makes us secure as a Nation. If we do not understand the emerging threats and build planes that can basically dominate the air in spite of these emerging threats, it's a disservice to this country. We feel that this plane is absolutely needed. We think we have a handle on the cost. We think that once stability occurs in the program, once the vendors feel that this is a program that will go forward, we will see something, I think you said in your opening comments about the C–17 or one of the other Congressman, that program, once it achieved stability, the C–17 costs went down dramatically.

Once you have stability and vendors feel comfortable, you'll see the cost reductions occurring. So once we get over this hurdle, once there is a feeling this program will be there, I think we'll have many more planes than the 276 that we're forecasting now. That happened with the C–17. The number that were forecasted almost grew by a factor of two, just based upon the stability factor.

Mr. SCHROCK. So the answer is yes, the Air Force——

Dr. SAMBUR. Yes we need it, and yes the cost will come down.

Mr. SCHROCK. And let me reiterate again. I believe every platform, every air frame that has been created for the services in history, has had problems. I mean, it takes a while to stabilize things, and we're just going through that phase of this one right now. When we finally get it to the fleet, I think it is going to serve the same capabilities as, you know, as well as the C–17 is doing right now in Iraq.

Dr. SAMBUR. But in fairness to the committee, the points are good points. You know, the panel here was in terms of controlling costs. As Mr. Walker said, a lot of the things in the F/A 22 are already in concrete and we can't do much about it. But we can learn from our past. We can institute some of these changes in terms of insisting upon systems engineering, insisting upon a spiral development process that basically eats the elephant one bite at a time as opposed to trying to gulp all these requirements in the so called big bang. So I think we can do better.

We're committed to do better. The Air Force recognizes there were problems on this program. There's no attempt to apologize for it. There's only an attempt to try to do better for the future.

Mr. SCHROCK. And I agree with that. And I agree with some of the frustrations that Mr. Tierney has expressed. I think we all feel that way. And you guys are clearly the new guys on the block now pretty much, and you've come in to try to turn this thing around, and I think that's good.

Dr. SAMBUR. I mean, it is extremely disappointing to the Air Force to have a program in which we can only buy, given that we

get relief from the cap of 276. That is not acceptable to us. And that's why the Chief and the Secretary of the Air Force are intimately involved in this program. Plus the CEOs of Lockheed Martin, Vance Kaufman, the CEO of Northrop Grumman, Ron Sugar, they're all involved in this program. I speak on a daily basis to these people to make sure that they are putting their best people, that they recognize how important it is and most importantly, they recognize that we don't have any credibility here.

As the chairman said, you know, there's been a lot of these meetings like this. And I'm sure a lot of people like myself and Secretary Wynne have come up and made statements to you. Our credibility has run out. So we can't come up to this panel again and say don't worry, things are getting better. We have to perform. We have to do better. That message that you're taking to us is well received.

Mr. SCHROCK. I thank you for that. Thank you, Mr. Chairman.

Mr. SHAYS. Thank you. Before calling on Dutch Ruppersberger, I would like to just ask you, what is the cost of going above the cap and doing the 276?

Dr. SAMBUR. It's the $5.2 billion over and above the cap. The number that Mr. Aldridge indicated in his memo. That's where our costs are based on, and that includes all of the issues I talked to you before about, the multi year procurement slippage, the JSF commonality, the inflation factors, all of those additional costs were baked in. There's even conservatism in the development program. We mentioned dedicated IOT&E the testing starting in October. We actually assumed in our estimates that it would occur 4 or 5 months later than that. So there is conservatism baked into the number. I talked to you about the 80/20 percent philosophy that we use in the costing.

Mr. WYNNE. Sir, I think the production number is $42.2 billion, sir.

Mr. SHAYS. OK. Thank you. Dutch Ruppersberger.

Mr. RUPPERSBERGER. That was perfect.

Mr. SHAYS. I got the second one right. Give me credit here. Let me just say to the gentleman from Maryland he's an outstanding member of this committee, and we really enjoyed having him.

Mr. RUPPERSBERGER. Well, first, Dr. Sambur, and excuse me. I had to miss a little time. I don't want to be repetitive. I think your comments in the end are what we all believe, and that is accountability. We all want to do the best. We want to have the best. We need air superiority. We have a great military. We have great expertise in our business community, and the manufacturing community that works with you in partnership to develop this. But I think what the problem is, and I think it is a culture. You lose—and you mentioned this. And the credibility doesn't mean that you're lying. It is just credibility of a project generally, and of an institution, that DOD needs to be more honest about cost and time estimates. And that will—if you can do that.

Now, if you make a mistake, if you feel when you get into the program, that you have underestimated the program, that—and that there has to be a change, then immediately, that's the time when you see with the expertise and the contractors whoever get

the bids, or whoever get the projects, that they will then come back because right now, the credibility isn't there.

Everybody wants to do well. But that doesn't mean that you're going to do well. And there has to be some accountability. And that's what our jobs are about. So let me ask you just a couple of questions. First thing, I know—just about the Raptor itself. Where do you see it going from—and maybe Mr. Wynne too, either one of you. Where do you see the future combat capabilities based on the type of defense we will have in the future, including the issue of terrorism, including, you know, will we have an Iraq. We know where that is right now. And we always have to be ready for that.

Mr. WYNNE. Let me start, Marvin, and I'll be quick. When September 11 happened, no one in America relieved us of being aggressive to the outyear threat. It actually expanded and our requirements for defense of America. Whether it be missile defense, whether it be fighters, we want to have our unfair fight that Marv talked about. And I'll let him take it up there.

Dr. SAMBUR. Yes. You mentioned——

Mr. RUPPERSBERGER. Is that because he's a doctor.

Mr. WYNNE. Yes, sir. I defer often.

Dr. SAMBUR. I'll give him a couple of aspirins after this hearing. What we mentioned previously is the fact that the air defense systems that are coming into vogue, these surface-to-air missiles are the newer ones are called double digit because of their increased capabilities. Right now, Iraq had an SA–3, I believe the single digit surface to air missiles that prevent the air systems from coming in. The newer systems that are under development right now are assets right now, the F–15s, the F–16s would have a very difficult time penetrating those. The F/A 22 will be able to kick the door down, which is the expression that our chief uses, enabling us to get it there and neutralize these air defense systems in a very effective manner.

And being able to have air dominance allows us to do many, many things, which you see on the TV right now. Without that air dominance our Marines, our Army people could never come in with the limited amount of casualties that we're getting right now. You mentioned terrorism. One of the things that we're concerned about is cruise missiles. The F/A 22 because of its super cruise capability has the ability to basically protect us against cruise missiles. So there are many things that the F/A 22 does for us. And that's why we need it. You had missed part of the earlier session, but there was a call this morning for a business plan, a business plan that would look at some of the economics balanced against the needs.

We had to do that because if you recall during the summer period, the Department of Defense took another look at the F/A 22 to really assess whether or not it was needed, just as they've done with a lot of programs, because there's a recognition as most of the people have indicated in this committee that there is other things that they'd like to do. There's opportunity costs. I think this was mentioned this morning. And whether or not the F/A 22 is a legitimate use of precious funds. The Department went through a complete analysis of that and determined that it was.

Mr. RUPPERSBERGER. Let me ask you this. I missed some of the testimony. I assumed you talked about retrofitting. I don't want to do that.

Dr. SAMBUR. Yeah, the issue that came up this morning was there was a vague comment this morning about retrofits have an exponential nature, and I think someone asked them to clarify that and there wasn't a real answer. What we actually did, the Air Force was asked to justify why we should produce 20 as opposed to 16. We did a cost benefit analysis. We actually gave them what the cost of retrofitting some of these programs would be versus the cost of limiting the production from 20 to 16. That limitation caused termination costs. It caused costs associated with the eventual cost of the production because if you ramp slower the cost of the models later become more expensive.

So we gave them a detailed business cost analysis. The cost associated with retrofit versus the benefits of going forward and Pete Aldridge, Secretary Aldridge analyzed that with his people and it was more beneficial on this business case analysis to go forward with producing 20 rather than limiting it to 16. And that's why the DAB gave us that ability.

Mr. RUPPERSBERGER. Are you familiar with the advanced amphibious assault vehicle?

Dr. SAMBUR. No, I am not.

Mr. RUPPERSBERGER. Are you familiar, Mr. Wynne?

Mr. WYNNE. Yes, sir. I have enough to get into trouble.

Mr. RUPPERSBERGER. Well, I think GAO report mentioned that they came in under the projection, the cost projection.

Mr. WYNNE. Yes, sir, they did.

Mr. RUPPERSBERGER. The reason I bring it up is another Army base in my district, Aberdeen is very aggressively pursuing trying to get that to be made there. So that's just a side, but you have to be parochial sometimes.

Mr. WYNNE. Well, they did a great job partnering with the Marine Corps on that job.

Mr. RUPPERSBERGER. Right. Well, anyhow, that is a single systematic approach effect, correct?

Mr. WYNNE. Yes, sir.

Mr. RUPPERSBERGER. Now, what is your opinion, as far as systematic approach for all projects?

Mr. WYNNE. I have been on the hustings talking about systems engineering, and I think an integrated systems engineering approach really pays off. And it will, I think, in the——

Mr. RUPPERSBERGER. Do you want to define that for the panel?

Mr. WYNNE. Well, let me just describe it in the triple AV, which is the amphibious assault vehicle, where they did, in fact, integrate logistic. They integrated tests and they integrated the systems engineering for the entire vehicle, a very holistic design. And I think they ended up balancing weight, as you know, versus capability, and have a terrifically fine vehicle. But it is really systems engineering is addressing the entirety of the system in a holistic way so that one change here can actually be weighed against the benefit to the whole system.

Mr. RUPPERSBERGER. Because different projects take lives of their own.

Mr. WYNNE. Yes, sir, they do.

Mr. RUPPERSBERGER. Should we have one method or approach to developing our weapons systems.

Mr. WYNNE. I will tell you that the world of systems engineering does address that. But the specific aspects of each technical hurdle that you overcome is different. In the world of the triple AV, they had to overcome sea states. As you know, since it's coming in from so far off shore, that was the big technical hurdle. Here on the F/A–22, its integrated mission software and super cruise, that was the technical hurdles that they had to overcome. So there are differences. On the other hand, I think a systematic disciplined approach could be the overarching methodology, and it should be.

Mr. RUPPERSBERGER. Now, this might have been asked before. But I'll ask. If it has, I don't want to be repetitive. I know DOD already said the production cost for the program is $43 billion. Concerns have been raised about overstepping the $36 billion cap or congressional cap. I know DOD has budgeted $43 billion. Now, would that be the total cost? Would it be undercost? Overcost? What is your feeling?

Mr. WYNNE. Right now, we estimate that we can get between 276 and 290. The Air Force is trying to get way over 300. They have great plans for the cost reduction projects that are underway. And I think that Secretary Sambur is right. Once this program stabilizes, I think we are going to see remarkable progress. Right now all of the subcontractors are a little bit nervous as to whether or not they're going to get to produce or not get to produce. And so they're hedging their bets, if you will.

Mr. RUPPERSBERGER. Well, if you have some inconsistency that may scare everyone away, and we don't want to do that either. Let me ask you a final question. Assuming that you get the program under control, cost effectiveness you know where you are going to be, your estimates are correct and again, the cost estimates are just so important for credibility at this point, with the flexibility that you might need depending on what occurs in the future. If, in fact it is, where would you like to see the program go? What would you like to see based on understanding that we're in a very difficult economy right now, we're having historical deficits.

I mean, there's a lot of issues within our economy. It is affecting education, it is affecting other issues on the home front. Based on that consideration, and if you get your program under control, where do you think we should go? How many of these airplanes do you think that we should really, really build for the future?

Mr. WYNNE. Right now from our perspective, sir, we have introduced at that—the budget cap of $43.4, I think you mentioned we've instituted for right now, by the budgets. But it does—which means that we would like to see 276 to 290 approximately. We realize that this introduces some risk on the part of the Air Force. But it has a lot to do.

Mr. RUPPERSBERGER. Why risk on the part of the Air Force?

Mr. WYNNE. Well, because they wanted 381, which fills out their 10 air expeditionary forces. Now, it really does depend, though, on whether JSF, Joint Strike Fighter, stays to its schedule.

Mr. RUPPERSBERGER. All these acronyms. Remember, I just started.

Mr. WYNNE. Yes, sir, I know. The Joints Strike Fighter is the fighter that is coming along and it is doing very well by the way. And we hope to make it—I recognize that this was called the—a model. But we really do have to hope to make the Joint Strike Fighter a model. We have a lot of international people relying on our capability to produce this airplane, not just the Marine Corps and the Navy, but all of our Armed Forces. If it tends to slip and programs are very fragile in this regard, then we may extend the F/A 22 production. If it stays to its schedules, I think there's going to be a real debate.

Mr. RUPPERSBERGER. OK. Thank you.

Mr. SHAYS. I had a question to ask at the end, but Mr. Tierney has a question, and I think Mr. Schrock's all set and then we will get to our next panel.

Mr. TIERNEY. Thank you. We talked about why there is a credibility issue and the gentleman didn't want to talk about the past. But you know recently Air Force Secretary James Roach had this comment to make. "If you use the KA of the cost analysis improvement group divisions you get 270 planes. I don't care what the hell ours is. It's 310. Who cares?" And think it's that kind of dismissiveness that gets every body up here concerned and why you find us making some inquiry on that. But with that said, today we talked about the congressional cap as it exists now, $36.8 billion, and the testimony that you gave me was you think it's somewhere between 225 and 235 aircraft for that amount.

The interesting thing about that is, Mr. Aldridge told me back in 2001, that he could get just 224 airplanes then. If you could have gotten 225, 224 airplanes then, and now you think you get somewhere between 1 and 11 more, the 225 to 235, I don't understand how you get an increase if you stay at the cap of what it was in 2001 the costs haven't decreased in the past 2 years. Labor hasn't become cheaper; schedules haven't been accelerated; all the avionics problems haven't been resolved. In fact, on all those things, just the opposite seems to be occurring. So it would seem to me that means fewer than 224 planes. Fewer than Mr. Aldridge told us in 2001.

Mr. WYNNE. Sir, an estimate is an estimate. I defer, of course, to my superior knowledge of my boss. But an estimate is an estimate. 224 is certainly within the range that I expressed.

Mr. TIERNEY. Well, let me tell you that since the 2001 estimate, $763 million has been taken away from production and put toward development. Right.

Dr. SAMBUR. $876.

Mr. TIERNEY. $876. All right. Thank you. So I guess that would further reduce the number of planes.

Dr. SAMBUR. That's already baked into the numbers that you're seeing now.

Mr. TIERNEY. Not the 224 number though.

Dr. SAMBUR. Well it would be because the 224 is based upon the reduction in the——

Mr. TIERNEY. No, the 224 that Mr. Aldridge gave me in 2001 preceded your taking the $876,000 and putting it over so——

Dr. SAMBUR. Oh, that's correct.

Mr. TIERNEY. So from that number in 2001 it would actually reduce it on that so——

Dr. SAMBUR. You're right.

Mr. TIERNEY. We just keep going around and around. But if that's the case, you're down below 224. And that's at the congressional cap. And so I just make that note on that, that this doesn't seem to be consistent. If you had to stay within the cap, the congressional cap, and you had 224 or somewhat fewer or somewhat more planes, how would you compensate for that. What would the rest of our force look like going forward?

Dr. SAMBUR. You ask a question that is best answered by the people in the XO or operations. They would have to assess what could be done with 225 or more than that. You know, I'm not the right person to ask, so——

Mr. TIERNEY. You didn't draw the plan, the game plan. The business plan? Somebody else did that?

Dr. SAMBUR. There's two aspects of the plan. There is a business plan associated with costs; and then there is a requirements plan, the operations plan; and that's done by the warfighters.

Mr. TIERNEY. Because I think it would be worth knowing whether or not—if the cap were maintained, whether it's worth proceeding, you know, whether or not the 224—unless there's something that does—serves the purpose. I think that's what Mr. Walker was getting at.

What is your mission here? What do you want to do? And if it is not, what do you replace it with? And if it is worth going forward with, then if there is a difference between that 224 and 276 or 381, what do you fill it up with and how is that going to serve us? And does it serve us less expensively and are we able to do other things militarily or homeland security or wherever else with the difference and are we better off in the long run having put our moneys in that regard?

I think we would like an opportunity to see those two plans, or the two aspects of that plan; and I don't know quite how we are going to work that out if some parts of it are classified. But I would like you to get back to me and the committee on that, if you would, as to how we might get a hearing or at least have provided to us that plan and the two aspects of it, the operational aspect and the business aspect of it. Is that something we can do?

Dr. SAMBUR. I'm not sure with respect—the Air Force has never looked at the 224 number. The Air Force has looked at the 381, the 339 and the 276 number for a business plan.

Mr. TIERNEY. And that's regardless of the fact that Congress set a cap at the other number.

Dr. SAMBUR. Well, you have to understand two aspects—and I'm not apologizing because, you know, I understand the point that you're making here. I was not here when the DAB led by Secretary Aldridge told the Air Force to plan for an increased budget. We're not anticipating exceeding that budget until 2006, so we haven't exceeded the budget. We've been planning, based upon our guidance from the acquisitions czar, and that's how we've been planning.

Mr. TIERNEY. Well, if you would exceed the cap by $5.2 billion just getting to the 276, are you able to tell us now how much would you exceed that cap if you went to 381?

Dr. SAMBUR. I don't have the number. No. No, we would—you know, obviously, what we are hoping for—you know, your previous question talked about why do you see—what improvements would happen.

Now one of the things that we used in our estimate right now is a certain learning curve—and I think you're familiar with the learning curve—which tells you as you build more how does your experience help you. Lockheed Martin, when they made the estimate, we asked them to be very conservative because we wanted to maintain credibility. We didn't want to go back to the well again. Lockheed has been arguing with us—basically, arguing is the wrong choice of words—but trying to give us evidence that as this program progresses that learning curve should improve significantly.

In addition, the producability costs that we've been spending on this program, that investment, we assumed that our relationship—that we would get a 5.6 return on our investment. Some of the earlier projects have been achieving 18 to 1 or better. We took the more conservative view. Some—a lot of people in the group have forecasted significantly higher returns on the investment. But we've come back and given a lower number, again, because we want to maintain credibility and not go to the well again, so to speak, in terms of our estimates. So we're challenging everybody to do better, and we're putting processes in place to do better.

But, you know, you've asked very fair questions.

Mr. TIERNEY. Thank you.

Earlier, you said that there—two of our allies, the European Union and South Korea, have airplanes or technology that may make us even third in terms of capability for fighters.

Dr. SAMBUR. Actually, there's a program called Block 60 which is being produced in the UAE with the F–16 plane.

Mr. TIERNEY. The UAE.

Dr. SAMBUR. UAE—United Arab Emirates.

Mr. TIERNEY. OK. Another ally of ours, generally. I mean, we sell them military equipment day in and day out. I hope they're considered an ally or a friend.

Dr. SAMBUR. I hope so, too.

Mr. TIERNEY. And they're doing that partially with the technology, and some aspects of that come from us.

Dr. SAMBUR. They're doing it with all of our technology. We gave them the ability.

Mr. TIERNEY. So we have the UAE, European Union and South Korea all building new fighters that now make us believe that we have the capability that exceeds that so we will end up being further down the line here.

Dr. SAMBUR. Well, the question, if I may turn it around a little bit, is not the issue of a fighter capability. The question is the air defense systems. When you come in and you basically try to establish air dominance, there's two things that you're worried about. First, you're worried about their integrated air defense systems, their radar and their surface to air missiles that basically recognize you and then send out missiles to kill you; and then you're also worried about the fighters that they have that can basically take you on as you defeat them.

Mr. TIERNEY. Addressing that part of it, I think what you are saying is that those three countries at least, using our technology, may have——

Dr. SAMBUR. But I am also telling you that in the integrated air defense systems, the surface to air missiles, the double digits will be proliferating to other countries that can—for example, if Iraq——

Mr. TIERNEY. And how will they be proliferating to other countries?

Dr. SAMBUR. Because they're being sold by Russia. China makes it. Russia is making it. They will sell these things to other countries, and the countries will buy that.

Mr. TIERNEY. Is any of that technology ours at all?

Dr. SAMBUR. No.

Dr. SAMBUR. Congressman, I would say, not to debate the cataloging, but the real concerns are the Russians' so-called 31, if you want to get the airframes, and that's also being exported to China. Russia cannot produce in quantity, I agree, but they are selling their advanced engineering products to India, Pakistan, China and others.

Mr. TIERNEY. Thank you.

Who do we expect that the United States is going to export its technology on the F–22 to?

Mr. WYNNE. There are no plans to export the F–22.

Mr. TIERNEY. Are we putting a prohibition on it or are we just saying there's currently no plans?

Mr. WYNNE. There is no plan right now.

Mr. TIERNEY. What about the JSF?

Mr. WYNNE. Joint Strike Fighter, I think there are currently eight international partners starting with the U.K., Australia. I'm not sure I can go down the list, but it ends with——

Mr. TIERNEY. So, just following some of our logic, does that mean that, by virtue of that, the minute we get the JSF done and we start selling it all around the block that now we have to come up with something else because of that proliferation and where that might go from there?

Mr. WYNNE. I think we really do look at the so-called 31, rather than looking at confronting any of our allies. We do carefully analyze who we intend to partner with and when they get this airplane. But we do hope that our technology progress continues. We are an advanced engineering country and we will, I think, continue to push the envelope lest there be somebody out there.

Mr. TIERNEY. Well, I guess my point is—and I think you have it—is that it might be one thing to be concerned about other people's technology, it's another thing to be giving them ours and have to be concerned that they have it.

Mr. WYNNE. Right.

Mr. TIERNEY. Thank you.

One last statement if I could. The Producability Improvement Projects, the so-called PIPs, I really just want to get a clear stand on where we are there. They were identified, Dr. Sambur, by you as investments to improve manufacturing processes or to incorporate new technologies to reduce costs.

Dr. SAMBUR. Yes.

Mr. TIERNEY. At one point, there was an indication that those were going to be used to save us costs. But another point, as I mentioned earlier, the GAO is accused of failing to provide credible evidence that these investments in PIPS would reduce costs. Could I ask both of you to tell me now, do we believe that the investments in PIPS do reduce costs or not and will they be used on this project or not?

Dr. SAMBUR. The answer is yes, we are.

Mr. TIERNEY. Do you agree, Mr. Wynne.

Mr. WYNNE. I certainly have seen great evidence of that, sir.

Mr. TIERNEY. OK. Thank you.

Mr. SHAYS. Before letting you go, Mr. Wynne, we'll get you out with the 10 minutes you wanted; and, hopefully, we can get you out with the 15 minutes that I wanted.

Mr. Tierney had raised some questions, and I want to just nail this down on two areas: first, that the argument is we don't want to it be a fair fight. I do want to respond and say that part of the argument, as I heard it, was, with the F–16 in particular, that our allies are—the European market, European Union, South Korea and others—are going to be developing this same technology and surpassing us. But with the Joint Strike Fighter we clearly are going to be taking a much improved plane; and our allies, some of whom you have mentioned, you know, the European Union will have a good look at that plane as well. Obviously, we're building it with the Brits.

What we've asked GAO to do is a tech transferability study on the implications of that. Because it does concern us and because we don't have that unfair fight in the sense of that technology is out there, and that becomes almost an absurdity. We'll keep making the argument our allies have it and others have it because we shared it with them.

Dr. SAMBUR. If I may just interject for a second, Mr. Chairman. What we're saying is that these air defense systems—again, these double-digit surface to air missiles—so-called double-digit SAMS are there now. They're basically proliferating. They're being made in China. They're proliferating throughout the Third World countries. For a limited investment these people can basically stymie a great deal of our capabilities in terms of air dominance.

The F/A–22 is here right now, as Congressman Schrock so eloquently put it. We're in the fourth quarter right now. The F/A–22 is something real that will come out.

The JSF is not going to be here——

Mr. SHAYS. We're beyond the point of arguing whether we're going to have the plane. But the issue is understanding the logic, though, of what we're doing with the JSF in particular. You get the point. OK.

But let me just ask you this other—because I really have trouble with these numbers. And you both have been, I think, very candid with us. I would have liked to have seen the business plan before the hearing, but you have been very candid with us, and I appreciate that. It is a good way to have a relationship, and we are all in same team. That is for sure.

Dr. SAMBUR. That is for sure.

Mr. SHAYS. But what I'm wrestling with now is that, in an attempt to help me, Mr. Wynne, you said to stay within the cap we could build 225 to 235 planes. If I take the higher number, the 235, that means to do the 276, which is your intention, that's 41 additional planes. When I subtract out the $36.8 billion from the $42.2 billion—in other words, the additional $5.4 billion—you're saying that we can do 41 planes for $5.2 billion, and if we use the lower number, 225, you're saying we can do 51 planes. I have a big disconnect, and I think you can understand why.

Mr. WYNNE. Sir, I haven't said that we can do those kind of—when you do large variances on small numbers or small variances on large numbers, estimating is fun to debate. But what I said was at the $43.4 I thought they could get between 276 and 290 if things go well. Down at the lower end number, my estimate was 225 to 235. I make no insinuation as to whether that——

Mr. SHAYS. I'm going to take the most conservative.

Mr. WYNNE. But, sir, an estimate is an estimate. I have no quarrel if you take a different estimate.

Mr. SHAYS. No. Hold on a second.

Mr. WYNNE. Yes, sir.

Mr. SHAYS. I appreciate estimates, and I understand what they are, but I'm talking—you gave me a range, and I am taking the lower of both. In other words, I'm taking—saying you're going to have 235 as the cost of the cap, and I'm saying not the 290 number. I am taking the 276, and that is 41 planes. You're basically saying that you, for $5.4 billion, in that marginal cost, are going to do 41 planes; and that strikes me as going to be difficult.

Dr. SAMBUR. Mr. Chairman, may I just try to attempt to answer that? We've been talking about learning curves; and what learning curves tell you, basically, is that the first units cost significantly more than the latter units. The last bunch of planes are significantly less expensive than the first bunch.

Mr. SHAYS. I agree with that.

Dr. SAMBUR. And that's why you can get—basically, for that $5.4 billion, you can get significantly more planes.

Mr. SHAYS. I'm just wanting to put it on the record that we're saying we can get, at the minimum, 41 planes with those estimates. And we could potentially—you're saying 51 or even, if I go to the 290 figure, my gosh, we could get, you know, in the 260's—excuse me—we could get in the 60's.

It's leaving me a little uncertain here because it seems to me quite a drop in marginal costs. But if you're comfortable with it——

Dr. SAMBUR. Yes, we are.

Mr. WYNNE. I'm not comfortable, sir, with any estimate. I am only trying to answer the question as best I could.

Mr. SHAYS. No. No. You're trying to answer the question as best you could. But, with all due respect, you're a professional here; and we've gotten to the point where we can start—because we are in the fourth quarter, make some meaningful estimates. I didn't pin you down to, you know, from 225 to 227. We gave you a range of 10. I'm just using the lower number, OK?

Dr. SAMBUR. From the Air Force's point of view.

Mr. SHAYS. We're not playing tricks here. We're just trying to understand.

Dr. SAMBUR. I appreciate your understanding of the issue is very clear. From the Air Force's point of view, our point here is that there is a lot of leverage to be gained at the end of the programs when you add money there because the marginal costs at the end is much lower than at the beginning and there's a lot more clout. So you can get more planes. We feel comfortable that for that extra investment we can get that additional number of planes.

Mr. SHAYS. I'll tell you, as a Member of Congress, I'm going to be asking to get more planes at those marginal cost differences.

Dr. SAMBUR. And this is legitimate. That's why as you add more quantities you get more value. The unit costs go down, and the latter part of that run is always significantly less expensive than the beginning part.

Mr. SHAYS. OK. Here's what we'd like from you gentlemen. We'd like the cost of the program, we'd like the cost per plane, and we want to know how many planes you need. So that will be something we'd like from you in the interim.

In regard to the business plan, I didn't want to make a big deal out of it. But we are Members of Congress, and we do have access to, obviously, classified information. This committee has never in the time that I've certainly chaired it, any problem with classified material; and we have been told many things that would have been interesting for people to know about. So whatever you send us, if you send it to us in the classified way, it will be secure.

But we want to know the cost of the program, the total cost of the program, the cost per plane and how many planes you need.

Dr. SAMBUR. Well, we can give you those answers right now. The cost of the program, it will live within the caps. I mean, if we cannot get relief from the congressional cap, that'll be the cost of the program. If the cost—if the cap is relieved, the cost will be the $42 billion number. We're estimating that, with the relief of the cap, there will be 276 planes; and there are a number of—you know, in our various——

Mr. WYNNE. Congressman, in the interest of time, could I please take that for the record and get with your staff and get you an answer?

Mr. SHAYS. You have been patient. You told us up front. You both have been very fine witnesses; and I appreciate, Dr. Sambur, you putting that on the record. We'll nail it down a little better. You have 10 minutes to get to your next meeting, and I hope you have a chance to stop along the way.

Mr. WYNNE. Thank you very much and thank you very much for holding this conference, this meeting. Thank you.

Mr. SHAYS. Thank you both. We appreciate your being here and appreciate your service to our country, both of you.

Our third panel is Mr. Eric Miller, senior defense investigator, Project on Government Oversight; Mr. Christopher Hellman, senior analyst, Center for Defense Information, and Mr. Steven Ellis, vice president of programs, Taxpayers for Common Sense.

Gentlemen, if you would come up, stay standing; and we'll swear you in.

[Witnesses sworn.]

Mr. SHAYS. Thank you. Note for the record our three witnesses have responded in the affirmative.

I think we will do it as I called you, and I think you're in that order: Miller, Hellman and Ellis. We will go in that order. I thank all three of you.

Mr. Miller.

STATEMENTS OF ERIC MILLER, SENIOR DEFENSE INVESTIGATOR, PROJECT ON GOVERNMENT OVERSIGHT; CHRISTOPHER HELLMAN, SENIOR ANALYST, CENTER FOR DEFENSE INFORMATION; AND STEVEN ELLIS, VICE PRESIDENT OF PROGRAMS, TAXPAYERS FOR COMMON SENSE

Mr. MILLER. Good afternoon, Mr. Chairman and members of the committee. Thank you for this opportunity to comment on controlling costs in tactical aircraft programs.

Founded in 1981, the Project on Government Oversight is a nonpartisan, nonprofit watchdog that strives to promote a government that is accountable to the citizenry.

I was very impressed with the candid testimony of Mr. Walker today——

Mr. SHAYS. Mr. Miller, I'm just going to interrupt you because I want to make sure that it's clear for the record that we are asking the business plan from the Department of Defense and the Air Force; and we'll just make sure that is part of the record. I think it's clear, but I want to make sure. Thank you.

Mr. Miller, I am going to have you start all over again; and we are going start that clock all over again. I apologize.

Mr. MILLER. Mr. Chairman and members of the committee, thank you for this opportunity to comment on controlling costs in tactical aviation. Founded in 1981, the Project on Government Oversight is a nonpartisan, nonprofit watchdog that strives to promote a government that is accountable to the citizenry.

I was very impressed with the candid testimony of Mr. Walker this morning, and we would tend to agree with many of his conclusions. We would, however, have to respectfully disagree with Mr. Walker on his testimony that the F/A–22 will be the best aircraft ever built. From our vantage point, the facts show we don't really yet know how the tactical fighter will perform, particularly in the area of avionics. After all, it has not been operationally tested yet.

Your instincts to closely scrutinize the financial aspects of the F/A–22 program are right on target. As you have seen, probably observed, the Air Force has a public face. But the people that we talk with inside the acquisition system share your concern. In places where these people let their hair down and feel free to talk candidly, they question whether the F/A–22 has a role, if it is worth the cost and if it really will work.

Just like all of you, we continue to read troubling public accounts detailing out-of-control cost escalation in the F/A–22 program and reports of seemingly insurmountable technological challenges. We also understand from our context and sources that critical problems within the program have been the subject of some rather heated internal debate at the Pentagon. We wish the debate would become more public.

My organization typically focuses on holding weapon systems accountable, and we rarely call for the outright cancellation of a major weapons system. However, in light of the September 11 trag-

edy, we are now more than ever convinced that an F/A–22 buy is not consistent with the Pentagon's goals of transforming the military. In fact, Defense Secretary Donald Rumsfeld has publicly stated that, although he has to pick his battles on canceling systems, killing the F/A–22 is a battle he's considering taking on.

The F/A–22 essentially has become an aircraft without a practical mission, not unlike the B–2 bombers that have, for the most part, been sitting on runways even during recent conflicts. Why purchase one $257 million aircraft like the F/A–22 when you can buy several F–16 Falcons or F–15 Eagles for roughly the same price? It doesn't make sense to us. The F/A–22 is a solution to a problem that no longer exists.

Of course, anyone who studies the history of the Pentagon's acquisition system would be hard pressed to claim that rising costs, the dumbing down of testing and the shrinking number of buys are unique to the F/A–22.

It looks to us that what you, as Members of Congress, are now facing is a repeat of the procurement of the B–2 bomber. At first, the Air Force told us that $40 billion would buy from 135 to 150 B–12s. In the end, you might recall, you only got 21 B–2s for that same price, each costing roughly $2 billion.

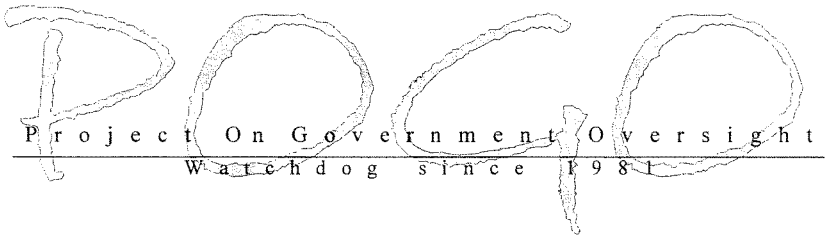
To us, the only reasonable answer is to terminate the program. It doesn't take a clairvoyant to see that the F/A–22 is shaping up to be a part of the problem, rather than a solution to the Air Forces' shrinking tactical fighter fleet. It may be a sleek-looking aircraft and fly a little bit faster and longer than other U.S. fighters and it may be somewhat harder to detect on a radar screen in darkness, but it's a budget buster. Its structural soundness is suspect, and its avionics package is still little more than a dream.

The Air Force wants that aircraft so bad that it's willing to mortgage the future. We fear that unless you, as Members of Congress, will have the will to hold the military and defense contractors accountable, the F/A–22 will become another sorry chapter in the history of Pentagon acquisition boondoggles.

Thank you for inviting me to testify before the subcommittee. I'm happy to answer any questions.

Mr. SHAYS. Thank you, Mr. Miller.

[The prepared statement of Mr. Miller follows:]



Testimony of
Eric Miller, Senior Defense Investigator
Project On Government Oversight
on
F/A-22 Cost Control
Before the
House Government Reform Subcommittee on
National Security, Veterans' Affairs, and International Relations
April 11, 2003

Mr. Chairman and Members of the Committee, thank you for this opportunity to comment on controlling costs in tactical aircraft programs.

The Project On Government Oversight (POGO) investigates, exposes, and seeks to remedy systemic abuses of power, mismanagement, and subservience by the federal government to powerful special interests. Founded in 1981, POGO is a politically-independent, nonprofit watchdog that strives to promote a government that is accountable to the citizenry.

Just like all of you, we continue to read troubling public accounts detailing out-of-control cost escalation in the F/A-22 program, and reports of seemingly insurmountable technological challenges. We also understand from our contacts and sources that critical problems within the program have been the subject of some rather heated internal debate at the Pentagon. Certainly debate is fruitful, but we'd like a better public explanation of why program costs are spinning out of control, and why stubborn technical challenges can't seem to be met.

POGO typically focuses on holding weapons systems accountable, and we rarely call for the outright cancellation of a major weapons system. However, in light of the 9/11 tragedy, we are now more than ever convinced that an F/A-22 buy is not consistent with the Pentagon's goal of "transforming" the military. In fact, Defense Secretary Donald Rumsfeld has publicly stated that although he has to pick his battles on canceling systems, killing the F/A-22 is a battle he's considering taking on.

The F/A-22 essentially has become an aircraft without a mission, not unlike the B-2 Bombers that have for the most part been sitting on runways even during recent conflicts. Why purchase one $200 million aircraft like the F/A-22 when you can buy several F-18 Super Hornets, F-16 Falcons, or F-15 Eagles for roughly the same price? It doesn't make much sense to us. There is no Soviet Air Force to destroy, and there wasn't even a single enemy aircraft flying

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during the conflicts in Afghanistan and Iraq. "The F/A-22 has no role," one Pentagon insider recently told us. "What air force are we fighting? The Soviet Union? China? Iran?"

The already checkered story of F/A-22 development has only gotten worse in recent months. First, we heard of a house-cleaning within the program which resulted in the replacement of several top program managers. Then last month, the General Accounting Office reported that the Air Force is not implementing cost-saving measures as promised, and is even hiding program cost overruns from Congress. The GAO study also pointed out that the F/A-22 program is experiencing several technical problems, including violent movement or "buffeting" of the aircraft's vertical fins, overheating in some areas of the aircraft, and a weakening of materials in the horizontal tail. Although the Air Force is pressing to begin operational testing by late summer, the F/A-22 has yet to be tested at altitudes below 10,000 feet, a critical requirement in its new found mission as an attack plane.

It's no secret that the aircraft's most troubling and potentially costly problem is the instability of its avionics software. Imagine yourself as an F/A-22 pilot in a dogfight with an enemy aircraft and suddenly, without warning, your entire display panel goes blank. It's a little like a soldier going into battle blind and deaf. Our sources tell us this is precisely what has repeatedly happened during F/A-22 testing in recent weeks. These several-minute-long computer shutdowns have occurred when pilots attempted to use the aircraft's radar, communication, navigation, identification, and electronic warfare systems at the same time, the GAO says. Despite this critical problem, the number of hours scheduled for testing the aircraft's avionics has been shortened.

Of course, anyone who studies the history of the Pentagon's acquisition system would be hard-pressed to claim that rising costs, the dumbing down of testing, and the shrinking number of buys are unique to the F/A-22. It's like when the sports moguls tell us that they will build us a Cadillac baseball or football stadium which will only cost the taxpayers $250 million but they actually end up building us a Ford for $350 million. Low-balling, I believe it's called.

What you as Members of Congress are facing right now is a repeat of the procurement of the B-2 Bomber. At first, the Air Force told us that $40 billion would buy from 135 to 150 B-2s. In the end, you might recall, you only got 20 B-2s for that same price tag, each costing about $2 billion.

The F/A-22 is on the same path. In the beginning, we were told that the Air Force would buy 800 aircraft for $40 billion, an estimate that was soon reduced to 750 aircraft for an increased $64.2 billion price tag. In 1991, the number of aircraft that amount would purchase declined to 680; in 1997, 339; and last year, only 303. Last month, the GAO reduced the estimated number of buys to only 276. One wonders what the future numbers will be as program costs continue to rise.

Much like the B-1 and B-2 bombers, fighter aircraft like the F/A-22 are "exploding in cost and imploding in sheer numbers," according to an August 2001 paper written for POGO by Colonel

Everest E. Riccioni, a member of the so-called "Fighter Mafia" and one of the men behind the development of the F-16.

Here's the pattern, according to Colonel Riccioni: Fighters are getting more complex and expensive and fewer are being bought by the military. In the decade following World War II, the U.S. was able to purchase about 17,000 fighters. But now, with more costly fighters being built, the result is a dangerous decline in fleet strength and we are headed for a troubling state of affairs Colonel Riccioni calls "unilateral disarmament."

To quote Colonel Riccioni, "The F-22 was conceived on my watch at the Flight Dynamics Laboratory. It was intended to be able to fly deep into the heart of the former Soviet Union at supersonic speeds and without being detected so as to intercept and destroy Russian bombers well before they could carry and drop nuclear bombs on the United States or our allies. The success of the F-22 was to be guaranteed by 70,000 pounds of thrust driving a 50,000 pound aircraft. It was to have 'magical' avionics, providing its pilot great battle awareness. And it was projected to fulfill its mission at a bargain basement cost per unit of about $50 million or about the same price as the F-15C, the aircraft it was meant to replace."

Those visions of the F/A-22 have long since evaporated, and Colonel Riccioni is predicting that the Air Force will ultimately only be able to afford 100 to 175 F/A-22s. "This means the cost of the F-22 could escalate to insane levels – beyond $350 million per aircraft," Colonel Riccioni wrote. "Meanwhile the size of our Air Force's fleet of fighters would be reduced to such a small number that we would, in effect, be rendering it impotent. The idea of replacing the current air superiority potential of 1600 F-15s and F-16s which are admittedly wearing out, with that of 175 F-22s is manifestly absurd."

It doesn't take a clairvoyant to see that the F/A-22 is shaping up to be a part of the problem rather than a solution to the Air Force's shrinking tactical fighter fleet. It may be sleek-looking and fly a little bit faster and longer than other U.S. fighters, and it may be somewhat harder to detect on a radar screen in darkness, but it's a budget buster, its structural soundness is suspect, and its avionics package is still little more than a dream. The Air Force wants this aircraft so bad that it's willing to mortgage the future. While there seems to be a lot of talk about pulling the plug on the program, no one at the Pentagon, including so far Defense Secretary Rumsfeld, seems willing to do the deed. We fear that unless you as Members of Congress have the will to hold the military and defense contractors accountable, the F/A-22 will become another sorry chapter in the history of Pentagon acquisition boondoggles.

Thank you for inviting me to testify before the Subcommittee. I am happy to answer any questions.

# # #

Mr. SHAYS. Mr. Hellman.

Mr. HELLMAN. Thank you, Mr. Chairman and members of the committee and also to Mr. Tierney, for bringing attention to this issue and also for his able representation in my home State.

Like many analysts, I believe that cost growth in successive generations of weapons systems is inevitable. Over time, the threat will increase. Capabilities of systems that supercede the past generation have to be improved correspondingly, and new technologies are usually more costly than those of the current technologies.

It's also a truism that costs of developing a new weapons system will rise over original estimates, as one of the previous panelists pointed out. Historically, that expectation is roughly in the range of 30 percent; and that's due to a lot of factors. But if one agrees with the precept that cost growth in weapons systems is, to a certain extent, inevitable, then I think an important question is what extent of cost growth is acceptable and how does one determine what is reasonable and what is unacceptable.

Further, in attempting to answer that question, it's critical to discuss whether strategies that might limit this growth are applicable and, if so, whether they've been adopted.

With that in mind, I'd reference statements earlier by Mr. Tierney where he was discussing the PIP programs that GAO identified and the service's use of some of those funds not to leverage additional savings in the future but actually to pay for existing cost overruns.

The second thing that I think is important to point out is the impact that cost increases have in programs like this. As GAO has pointed out, this is going to have an impact on efforts to modernize the tactical Air Force—the tactical aircraft fleet.

The first impact is going to be there's going to be a slower replacement schedule of existing aircraft. What that will do is drive up the costs of operations and maintenance of the existing aircraft as they age. These costs always inevitably go up; and if you replace them more slowly, estimates about growth and O&M costs are skewed.

The second thing to point out is that the number of aircraft ultimately will diminish, and I think that has been discussed at length here. We talked about the original 648 down to, at this point, a possible number as low as 224. This also has an impact, particularly on the overall age and cost of maintaining the TACAIR fleet.

Earlier, the gentleman from GAO alluded to a study that they had done—actually, that GAO had done back in 2001 that looked at the average age of the TACAIR fleet and the effect that the current modernization program would have on that age. What they discovered and what some of your questions have highlighted is the fact that the current plan—and at that point they were talking about a buy of 329 F–22s, not the 225 that were being discussed under the current cost cap—was that the actual age of the Air Force fleet would grow over the current—and well above the target age of about 11 years of age for aircraft in that inventory.

So in effect what happens is that if you stick with the F–22 program and look at it as a solution to your modernization of the TACAIR fleet, not only is it not the solution, it actually increases the problem.

Then I want to return to something that Mr. Walker spoke to this morning which I hadn't heard quite so well defined before, but the plug and hope approach to determining number of aircraft that would be purchased in the F–22 program. I think that when you look at this, that number, the 225 or the 276 or wherever it is, you have to recognize that number really doesn't do a lot in terms of one-for-one replacement of the existing fleet.

This is something that I believe you, Mr. Shays, brought up earlier, which is, what are these aircraft attempting to replace? Even at the 381 mark, which is the most optimistic number I heard discussed today in terms of aircraft that would be required, you're talking about a one-for-two replacement over the current fleet of F–15s.

While technologically the aircraft could be twice as good as the program it's designed to replace, at some point numbers do make a difference in terms not just of our ability to project force on a given battlefield but just the aircraft that are available to do the things that they do, when they are not fighting, training, maintenance, those types of things.

You can only substitute technology to a certain point; and my concern is that when you get numbers this low you're not going to be able to fill out the roles of all the things that you're asking our air expeditionary forces to do in the future.

And the question that was raised but not answered—and I did hear some very good answers today. But one of the questions that was raised and not answered is, if you look at the lower numbers, the 224s or the 276s, what other types of aircraft are you going to look at in order to fill out the numbers across the tac air fleet, so that you can do all the things that the Air Force is going to be required to do in the future? And I would be interested, at some point, in hearing that information revealed to us.

And with that, I would like to say once again, thank you. And I look forward to your questions.

Mr. SHAYS. Thank you, Mr. Hellman.

[The prepared statement of Mr. Hellman follows:]

Prepared Testimony

Of

Christopher Hellman
Senior Analyst
Center for Defense Information

For the House Government Reform Committee
Subcommittee on National Security, Emerging Threats and International Relations

Hearing on

"Controlling Costs in Tactical Aircraft Programs"

April 11, 2003

Mr. Chairman and Members of the Subcommittee:

It is an honor to be here today, and to have the opportunity to contribute to the debate over the Air Force's F/A-22 aircraft program.

Today's discussion focuses on recent reports by the General Accounting Office (GAO) about cost growth and technical challenges in the F/A-22 program.

As the GAO reports point out, the F/A-22 program has experienced repeated delays and cost-overruns throughout its history. The most recent reports show that the F/A-22 development program failed to meet specified performance goals in fiscal year 2002, and still faces may technological challenges, including "instability of the avionics software, violent movement, or 'buffeting,' of vertical fins, overheating in portions of the aircraft, weakening of materials in the horizontal tail, and the inability to meet airlift support and maintenance requirements."[1]

I, like many analysts, believe that cost growth in successive generations of weapons systems is inevitable. Over time, threats increase, and capabilities must be improved correspondingly. New technologies are usually more costly than current technologies. Norman Augustine, former head of Lockheed Martin, warned, only somewhat facetiously, that eventually the entire defense budget would be needed to fund a single aircraft, which would be shared by the Air Force, Navy, and Marines. Professor David Kirkpatrick, of the Defense Engineering Group of University College in London, has said that during the Cold War per unit costs of weapons grew at between 5 percent and 10 percent annually, with the costs of tactical aircraft growing at 10 percent.[2]

It is also a truism in Washington that the costs of developing new weapons will rise above original estimates. Estimating costs of as yet non-existent technologies is an imprecise science. Some less generous, or more suspicious, analysts have asserted that defense firms intentionally underestimate costs in order to improve their odds of securing a new contract, knowing that cost growth for Pentagon programs is, by and large, an accepted norm. Either way, program cost increases for DoD weapons routinely reach between 15 percent and 30 percent over the development and production of a given system.

If one agrees with the precept that cost growth in weapons systems – either from one generation to the next, or within a given program, or both - is inevitable, then it seems

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[1] ("Tactical Aircraft, DoD Should Reconsider Decision to Increase F/A-22 Production Rates While Development Risks Continue," GAO-03-431, March 14, 2003, pg. 4

[2] "Trends in the Cost of Weapons of Weapon Systems, And the Consequences," a paper by Professor David Kirkpatrick, Defense Engineering Group of University College, London, presented at the conference "Budgets and Expenditure Choices in the Post Cold War," sponsored by the George C. Marshall European Center for Security Studies and NATO Economics Directorate, September 15-18, 2002.

that the question becomes: how does one determine what is reasonable growth, and what is unacceptable? Further, in attempting to answer this question, it critical to discuss whether strategies that might limit cost growth are applicable, and if so, whether they have been adopted?

In 1997, the Pentagon announced that the F-22 (which was redesignated the F/A-22 in September 2002 to highlight the aircraft's ground attack capability) had experienced $13.1 billion in cost overruns. In a 2001 analysis, the Defense Department identified a further $5.4 billion in cost growth. According to the GAO, in addition to the newly identified $1.3 billion increase, further overruns are likely. One factor driving further increases, according to the GAO report, are continuing delays in developmental testing of the aircraft.

A second, and more important, likely source of cost growth results from the Air Force's failure to fund what are known as "production improvement programs" (PIPs). PIPs are initiatives where additional expenditures result in future net savings. Some examples of PIPs identified by GAO as previously implemented by the Air Force in the F/A-22 program include improvements in the manufacturing process for the aircraft's avionics and in the fabrication and assembly processes for its airframe. The GAO also noted that the earlier such changes are made in the production process, the greater the net savings.

According to the GAO report, the Air Force has been using money allocated by Congress for investment in additional changes in future production to cover cost overruns that occurred earlier. As a result, projected future cost savings will not occur, resulting in further overruns.

When preparing its reports, GAO allows the federal agency in question to view a draft in order to identify inaccuracies and to have the opportunity to dissent or concur with any recommendations presented in the report. These responses are included in the final version. In responding to the GAO's concerns regarding the reallocation of funds intended for PIPs, the Defense Department wrote that GAO "failed to provide credible evidence that investments in [PIPs] reduce costs,"[3] and that therefore they would not allocate the funds as directed. Yet the GAO reports show that while implemented cost offsets in certain years have not equaled planned offsets for those years, over the period FY'99-FY'02, total implemented offsets have slightly exceeded plans.[4]

As GAO has pointed out, continued delays in the F/A-22 program impacts the Defense Department's efforts to modernize it aging tactical aircraft fleet. If the F/A-22 program had met its original schedule, the Air Force would have begun replacing its fleet of F-15s by 1997. Now it will not begin replacing these aircraft until late 2005, at the earliest. And it will do so at a slower rate than previously planned. As a result, the Air Force will

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[3] "Tactical Aircraft: DoD Needs to Better Inform Congress about Implications of Continuing F/A-223 Cost Growth," GAO-03-280, February 28, 2003, pg. 18.

[4] "Tactical Aircraft: DoD Needs to Better Inform Congress about Implications of Continuing F/A-223 Cost Growth," GAO-03-280, February 28, 2003, pg. 6.

be forced to use ageing tactical aircraft, thus driving up overall operations and maintenance (O&M) costs.

In addition to driving up program and O&M costs further, continued delays in the F/A-22 program will exacerbate current problems in the Air Force's efforts to modernize its fleet of tactical aircraft. As GAO pointed out in a February 2001 report,[5] the average age of the Air Force's tactical aircraft fleet will actually grow over the life of the modernization program.

According to the 2001 report, while the services do not have specific targets for the average age of their tactical aircraft fleets or retirement dates, historically the average age of the Air Force fleet is 11 years and the retirement age is 22 years. At the time of its release, the GAO report indicated that the average age of the current Air Force fleet was 13 years. Given the fact that only a very limited number of new replacement aircraft have entered the fleet since the report was issued, the average age is now certainly higher.

GAO found that the Air Force's modernization plans will not improve this situation, let alone get the average age of the fighter fleets back to the historical average. In fact, age of the fleets will actually increase during the modernization program. In 2011, the half-way point of the modernization program, the average age of the Air Force's fleet will increase to 21 years. By 2025, at roughly the end of the modernization program, the Air Force fleet's average age will be 16 years, or three years above the average at the time of the report's release. And given that the number of F/A-22s that the Air Force will purchase has been reduced from 339 to 276 since that report was released, the average age will likely be slightly higher.

Further, as a result of these rising costs, the number of aircraft that the Pentagon estimates it can purchase without violating a congressionally mandated cap on the total cost of the program set in 1997 is diminishing. The Defense Department estimated in 1997 that it could afford to purchase 438 aircraft. That number sank to 333 in 2001. And in a letter last October to Rep. John Tierney, D-Mass., a member of this subcommittee, the Pentagon reported that only 224 aircraft could be purchased with the expected funding. This assessment does not reflect the further reductions that might result from the $2 billion in recently identified cost growth, nor the impact of any further overruns.

Members of the subcommittee unfortunately much of what you've heard here today is not new news. It is, rather, just the latest chapter in what is already the long, sad tale of the F/A-22. Yet some supporters of the F/A-22 will argue that prudence dictates that, given the substantial investments already made in the program, it must continue to completion, lest these funds be wasted. I, for one, however, have never believed that future mistakes will redeem us for past mistakes. And there are viable alternatives to fully funding the F/A-22 program.

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[5] "Tactical Aircraft: Modernization Plans Will Not Reduce Average Age of Aircraft," GAO-01-163, February 9, 2001.

Last year I co-authored a paper that looked at various weapons programs and recommended alternatives to current Pentagon development plans. As part of that paper I recommended that the Air Force limit production of the F-22 fleet to a "silver-bullet" force of a maximum 120 aircraft. While there are substantial costs ($400 million-$600 million) involved in canceling existing contracts, immediate termination of the F-22 nonetheless would result in more savings than a partial buy. However, the money already spent on research and development, as well as the 51 aircraft currently authorized for deployment (representing roughly $35 billion in investments) would effectively be wasted, since the number of aircraft obtained would be insufficient to train pilots and provide a viable operational capability.

Instead, a "silver bullet" buy will permit the Air Force to field one air wing (with training and attrition replacement). A force of this size would allow the Air Force to learn about producing such technically complex aircraft, permit the development of suitable operational tactics, and provide a sufficient force to perform any future missions that require the F-22s stealth characteristics and other improved performance capabilities. The Congressional Budget Office (CBO) estimates that limiting the F-22 program to such a force while replacing the remaining proposed F-22s with new F-15s would save $10 billion over 10 years.[6]

Mr. Chairman, once again, thank you for the opportunity to appear here today. I look forward your questions.

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[6] "Budget Options for National Defense," the Congressional Budget Office, March 2000.

Mr. SHAYS. Mr. Ellis.

Mr. ELLIS. Good afternoon, Chairman Shays, Congressman Tierney, Congressman Schrock.

Thank you for calling this hearing and inviting me to testify. It's been very informative and helpful. It has caused me to—as evidenced by my testimony, which I've scribbled all over to try to revise it and improve it so that I could provide some assistance.

I'm Steve Ellis, vice president of programs at Taxpayers for Common Sense, a national, nonpartisan budget watchdog group.

In the 6 years my organization has been watching the F/A–22 Raptor program, we have found it to be a veritable poster child for some of the problems of putting the weapons production cart in front of the development and testing horse. The unprecedented cost increases of this program coupled with several other factors, including a reduction in the number of F/A–22s procured, the development of the F–35 Joint Strike Fighter, and the overwhelming air superiority the United States already enjoys, raise the fundamental question: Do we need to continue to pursue the acquisition of the F/A–22, or is it unnecessary and redundant?

We cannot stop asking questions just at improving the acquisition process. TCS strongly agrees with the Comptroller General that the Bush administration, the Department of Defense, and Congress need to seriously evaluate what are our needs and whether the F/A–22 is still an essential part of our force mix, or if the billions planned for this program are better spent elsewhere.

The discipline acquisition procedures embodied by "fly before you buy," basically, conduct Operational Testing and Evaluation before moving into full-scale production, have been abandoned in the case of the F/A–22. Until that approach is rectified, cost overruns, system failures, and a lack of performance can be assured. The simple mantra of the carpenter: Measure twice, cut once, also applies to aircraft acquisition, but the Air Force's aggressive production plan for the F/A–22 seems to be: Cut first and measure later.

In an admirable but failing effort to control cost overruns—although we hope not in the end failing—Congress mandated that the F/A–22 production cost not exceed $36.8 billion. However, current DOD estimates put costs at $42.2 billion, $5.4 billion over the cap.

Additionally, the Air Force "buy to budget" strategy reduces contractor incentives to control costs and essentially guarantees that taxpayers will get fewer aircraft for the money. Or, worse, contractors and the Air Force hope to use an old salesman trick to force taxpayers to buy more to meet the real need—purportedly 381—after the production run is over. This is the "plug and hope" approach Comptroller General Walker discussed.

Rather than slowing down or potentially pausing F/A–22 production levels to stabilize cost overruns, DOD has done the opposite, increasing 2003 production levels to 20, arguing, unconvincingly, that the increased costs of terminating some contracts, inflation, and reduced manufacturing efficiencies outweigh the high risk of expensive retrofitting and repair of aircraft and more costly delays.

The problems revealed so far in the F/A–22 testing impair safety and performance.

The Air Force posture seems to be little more than a policy of "get as many planes as you can, as fast as you can," despite the long-term risks. This is more of the "buy before you fly" approach that got us in the vicious cycle of cost overruns and project delays in the first place.

The delays in aircraft delivery have forced DOD to slip schedules; but instead of shifting the full testing and production schedule, DOD plans to slip just the testing, while leaving the timing of the full-scale production decision unchanged. The new schedule removes a 3-month lag between the two, and requires the production decision to be 4 months before the completion of OT&E. Common sense, as well as recent experience with the F/A–22 and other weapons systems, has revealed that significant changes and improvements generally result from OT&E. But under this plan, 25 to 30 percent of the production aircraft will be completed and will have to be retrofitted at possibly significant cost.

An additional cost risk factor is that by—is that only $14 billion of the $27.3 billion of the announced Program Cost Reduction Plans are implemented. One cost reduction tool, the Production Improvement Plan [PIPs], require an initial government investment to improve production processes, but are predicted to reduce long-term cost growth by $3.7 billion.

However, in fiscal year 2001, 2002, the Air Force had used $87 million in planning PIP funding to offset cost growth in the first two production lots as previously discussed. By failing to invest in these improved processes, we are guaranteeing that some of the planned savings in future years will not occur.

The Air Force has led taxpayers down the primrose path on the cost of the F/A–22. Original plans called for 750 aircraft at $68 million per plane. We just heard the DOD could purchase 225 to 235 planes for the congressionally mandated production cap. That's more than $250 million per F/A–22, roughly six times the cost of an F–15. The acquisition and procurement problems serve to highlight that this program needs further scrutiny. The fundamental question of whether we need to pursue acquisition of the F/A–22 remains, and taxpayers need it to be answered.

Thank you, again, for inviting me to testify. I will be happy to answer any questions you might have.

[The prepared statement of Mr. Ellis follows:]

Testimony of Stephen Ellis
Vice President of Programs at Taxpayers for Common Sense
before the
Subcommittee on National Security, Veterans Affairs and International Relations,
Committee on Government Reform
April 11, 2003

Good morning, and thank you Chairman Shays and Congressman Kucinich for inviting me to testify about "Controlling the Costs in Tactical Aircraft Programs," specifically regarding how the divergence of acquisition policy and practice can result in significantly higher costs and project delays. As this Subcommittee and others have noted, the F/A-22 Raptor acquisition is particularly suited for this discussion, a veritable poster child for some of the problems of putting the weapons production cart ahead of the development and testing horse.

I'm Steve Ellis, Vice President of Programs at Taxpayers for Common Sense(TCS), a national non-partisan budget watchdog group. In the six years my organization has been watching this program, the F/A-22 acquisition has experienced $17.7 billion in production cost growth[1] with an overall development and production cost of $58.7 billion[2], if the Pentagon adheres to congressionally mandated limits. The current cost of an F/A-22 is more than $260 million per aircraft.[3]

The F/A-22 was first conceived in the 1980s to be a replacement for the F-15, with some air-to-ground capabilities added later. The unprecedented cost increases of this program, coupled with several other factors, including: a reduction in the number of F/A-22s procured; the development of the F-35 Joint Strike Fighter; and the overwhelming air superiority the United States already enjoys; raise a fundamental question: Do we need to continue to pursue acquisition of the F/A-22, or is it unnecessary and redundant?

Although outside the scope of this hearing, this fundamental question is one that must be addressed. The F/A-22 cost overruns are a direct result of a failure to adhere to "fly before you buy" principle, a hallmark of defense acquisition since the Fitzhugh Commission in 1970. The principle was also championed by the Packard Commission in the late 1980s - conduct Operational Testing and Evaluation (OT&E) before moving into full scale production.[4] The Bush administration, the Department of Defense, and Congress need to seriously evaluate whether the F/A-22 is still an essential part of our force mix, or if the billions planned for this program will be better spent elsewhere.

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[1] General Accounting Office. "Tactical Aircraft: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth" (GAO-03-280). February 28, 2003. p5.
[2] General Accounting Office. "Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production Rates While Development Risks Continue" (GAO-03-431). March 14, 2003. p3.
[3] The cost per aircraft is calculated using the a total of 224 F/A-22s that could be procured under Congressionally mandated caps. The 224 figure came from a Under Secretary of Defense Aldridge letter to Rep. John Tierney on Oct. 3, 2001.
[4] Ethan McKinney, Eugene Gholz, and Harvey M. Sapolsky. "Acquisition Reform – Lean 94-03." Lean Aircraft Initiative – Massachusetts Institute of Technology. May 24, 1994.

The Subcommittee asked me to discuss several points regarding why F/A-22 program costs continue to escalate, how cost overruns can be stabilized, what impacts the schedule delays in developmental testing will have on cost control, and risk factors that may increase future production costs.

Why Do F/A-22 Program Costs Continue To Escalate?

Despite significant congressional oversight reviewing the F/A-22 procurement, and a series of excellent General Accounting Office reports addressing the testing and development failures of the program, the disciplined acquisition procedures embodied by "fly before you buy" have been abandoned in the case of the F/A-22. Until that approach is rectified, cost overruns, system failures, and a lack of performance can be assumed. But, the F/A-22 is not the only example of the impacts of failing to properly test weapons systems, but just the most recent. Other examples of costly Pentagon acquisition and development nightmares include the V-22 and the B-1.[5]

The "fly before you buy" concept was largely initiated in the 1970s, but as the speed of technological advancements have increased, there has been a commensurate and understandable increase in the desire to streamline and accelerate acquisition processes. While streamlining makes sense in some cases, particularly software and C4I (Command, Control, Communications, Computers and Intelligence) systems, the simple fact is that with highly complex assets like the F/A-22, we must take the time to do it right or the program costs will skyrocket.[6] The simple mantra of the carpenter: measure twice, cut once, also applies to aircraft acquisition. But the Air Force's aggressive production plan for the F/A-22 seems to be cut first and measure later.

In an admirable, but failing, effort to control cost overruns, Congress mandated that F/A-22 production costs not exceed $36.8 billion. However, current DOD estimates put costs at $42.2 billion, $5.4 billion over the cap. Development costs, currently estimated at $21.9 billion, were also initially capped, but that cap was later removed.[7] While the overall caps have helped limit the damage to the taxpayer's pocketbook, they have not stemmed the tide of program cost overruns. The Air Force pursuit of a "buy to budget" strategy reduces contractor incentives to control costs, and essentially guarantees that the taxpayer will get fewer aircraft for the money.[8]

DOD has announced $27.3 billion in program cost reduction plans (PCRP), however, only $14 billion of these have been implemented to date. A key tool to reducing cost in later production lots are production improvement plans (PIPs), which require an initial government investment to improve production processes, but are predicted to reduce

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[5] Project on Government Oversight. "Will We Ever Fly Before We Buy? F-22 Doesn't Meet Basic Testing Criteria". January 2, 2001.
[5] RADM John J. Zerr, USN and LT Mike Oldenburg, USN. "Is 'Fly Before You Buy' Obsolete? The Need for Rapid but Disciplined Acquisition." Program Manager. January-February. 1995.
[7] P.L. 107-107, Section 213. December 28, 2001.
[8] Glenn F. Lamartin, Director, Defense Systems Office of the Under Secretary of Defense. Letter to Mr. Allen Li, U.S. General Accounting Office. February 27, 2003.

long-term cost growth by $3.7 billion. However, in FY 2001-02, the Air Force had used $87 million in planned funding for PIPs to offset cost growth in the first two production lots.[9] Like many investments, the earlier the PIP is put in place the greater the return on the investment. By delaying or failing to invest in this improved process, we are guaranteeing that some of the planned savings in future years will not occur.

How Can Program Cost Overruns Be Stabilized?

TCS is concerned that without significantly slowing down and scaling back proposed F/A-22 production levels, stabilizing cost overruns will be impossible. If we are to control F/A-22 costs, we have to step back and potentially pause production. Then we must ensure that adequate development testing is completed, and problems revealed during testing are resolved. This will save money in the long-term. The DOD response to concerns about accelerating low-rate production despite the continuing development testing problems and cost overruns with the F/A-22 has been wholly inadequate.

To acquire more than 16 aircraft, previous legislation required that DOD submit a formal risk assessment that characterizes the cost, technical, and schedule risks prior to completion of OT&E and certify that increasing production was a lower cost risk than remaining at the limit. In December 2002, DOD announced that they will increase the number of F/A-22s acquired in 2003 to 20 and submitted a risk assessment and certification to Congress.[10]

DOD has argued against scaling back 2003 F/A-22 production levels to the 16 envisioned by Congress, stating that the increased costs of terminating some contracts, inflation, and reduced manufacturing efficiencies outweigh the risks of expensive retrofitting and repair of aircraft and more costly delays.[11] The recent experience of the F/A-22 development and production process indicates that we are much more likely to see increased costs, continued development problems, and significant delays. The Air Force posture seems to be little more than a policy of 'get as many planes as you can, as fast as you can,' despite the long-term cost risks. This is more of the "buy before you fly" approach that got us into the vicious cycle of cost overruns and project delays in the first place.

DOD concerns about increased costs from contract terminations and inflation pales in comparison to the financial risks of retrofitting aircraft to fix problems revealed in testing, if the problems can even be fixed retroactively. The problems revealed so far in F/A-22 testing are not insignificant; they impair performance and safety. Failure of the avionics dramatically reduces the F/A-22's capability; buffeting of the vertical tail fins has limited operation under 10,000 feet; heat buildup in rear portions of the aircraft has effectively eliminated supercruise capabilities, forcing the jet to fly only 500 miles per

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[9] General Accounting Office. "Tactical Aircraft: DOD Needs to Better Inform Congress about Implications of Continuing F/A-22 Cost Growth" (GAO-03-280). February 28, 2003. p 7-8.
[10] General Accounting Office. "Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production rates While Development Risks Continue" (GAO-03-431). March 14, 2003. p. 4.
[11] Glenn F. Lamartin, Director, Defense Systems Office of the Under Secretary of Defense. Letter to Mr. Allen Li, U.S. General Accounting Office. February 27, 2003.

hour.[12] The cost of fixing these and other problems as they arise through testing will likely be significant, but accelerating production schedules will only add to the already high risk that taxpayers will have to bear a heavy burden of costs to retrofit these aircraft.

What Impacts Will The Schedule Delays In Developmental Testing Have On Cost Control?

Simply put, schedule delays will increase costs. But, the Air Force is adding additional cost risk by increasing production levels before development and operation testing are complete. Delays in aircraft delivery have forced DOD to slip testing schedules. The logical response would be to allow the full testing and production schedule to slip and proceed in the logical order of development testing, leading into operational testing, followed by full scale production. Instead, DOD plans to slip the testing schedule and increase the overlap of development and operational testing, while leaving the timing of the full scale production decision unchanged. The earlier schedule incorporated a three month lag between completion of OT&E and the full scale production decision. The revised DOD schedule places the production decision four months prior to the completion of OT&E.[13] Moving the full scale production process ahead, when operational testing is only half complete, further increases the risks of ever larger cost overruns.

Under the revised schedule, 25 to 30% of the production run of the F/A-22 will be completed prior to the completion of OT&E.

What Are The Risk Factors That May Increase Future Production Costs?

Accelerating production levels before OT&E is complete represents the biggest risk factor for increased production cost. Common sense, as well as recent experience with the F/A-22 and other new weapon systems, has revealed that significant changes and improvements generally result from OT&E. The F/A-22 has not been immune to needed modifications. Development and early production aircraft have generally received more than 50 modifications to improve performance.[14]

An additional factor that will certainly increase production costs is the failure to document all of the production cost growth. The GAO documented nearly $1.3 billion in F/A-22 production cost growth that DOD did not include in their most recent congressional cost estimates. More than half of this cost increase was incurred because of delays in the F/A-22's production.

While on the one hand, DOD has shifted funding from Production Improvement Plans, on the other hand, Pentagon officials are counting on cost savings from programs like these to keep the F/A-22 acquisition costs below the congressionally mandated level.

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[12] General Accounting Office. "Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production rates While Development Risks Continue" (GAO-03-431). March 14, 2003. p. 3-6.
[13] General Accounting Office. "Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production rates While Development Risks Continue" (GAO-03-431). March 14, 2003. p. 8-9.
[14] General Accounting Office. "Tactical Aircraft: DOD Should Reconsider Decision to Increase F/A-22 Production rates While Development Risks Continue" (GAO-03-431). March 14, 2003. p. 7.

Additionally, some of the cost reductions seem largely speculative, such as reducing the estimated support costs by $1.8 billion. DOD's lackadaisical attitude toward future F/A-22 cost increases is troublesome and fiscally irresponsible.

Conclusion

The cost overruns and failures of the F/A-22 acquisition process reinforce the need to rigidly adhere to "fly before you buy" principles regarding development, testing and production.

Additionally, the concurrent engineering and manufacturing development approach employed with the F/A-22 and other weapons systems, merely perpetuates a system where money and power dictates support for a concept or plan before we can evaluate its cost effectiveness and whether it is a necessary taxpayer investment. The F/A-22, with sub-contractors in virtually all 50 states, is a perfect example of political support for a weapons system that simply hasn't yet proven it's worth.

The Air Force has led taxpayers down the primrose path on the cost of the F/A-22. Original plans called for 750 aircraft at a per unit cost of $68 million per plane. Even with the congressionally mandated production cap, the total development and production cost of the F/A-22 is $58.7 billion. Recently, DOD predicted they could purchase 224 planes for that amount.[15] That's a per unit cost of more than $260 million, roughly six times the cost of an F-15, which is still the most capable fighter on the planet and will continue to be until the F/A-22 replaces it.

Clearly, the F/A-22 needs further scrutiny because the fundamental question of whether we need to pursue acquisition of the F/A-22 remains, and taxpayers need it to be answered.

Thank you again for inviting me to testify, and I would be happy to answer any questions you might have.

[15] E.C. Aldridge, Under Secretary of Defense for Acquisition, Technology and Logistics. Letter to Rep. John F. Tierney, U.S. Congress. October 3, 2001.

Mr. SHAYS. Thank you, Mr. Ellis and Mr. Hellman, again, and Mr. Miller.

We will start with Mr. Schrock.

Mr. SCHROCK. Thank you, Mr. Chairman.

Mr. Chair, let me say before I question, first of all, welcome to all of you. I don't usually say this about hearings that I attend all day, but this has probably been one of the best ones I've been to since I've been in Congress. This has really been good. And I'm telling you, I have learned a lot of things from people I didn't think I was going to agree with that I do agree with. And I think when that situation happens, I think a lot of good things happen. And I appreciate everything I've heard and what you all say, too.

Let me just make a couple comments. Mr. Miller, I think you're right, no one is questioning that there have been some real problems with this platform, and they certainly need to be corrected. I think they are. And it has cost a lot of money to do that. So you are dead right on that.

You mentioned that you felt the F–16 could probably do what the F/A–22 does, with the exception, I believe, that the F–22 has the stealth capability that I think is going to be so important for our war fighter in future years, because our adversaries out there are creating all sorts of nasty things they want to lob at us. And if we can get a pilot in and out real quick and do the job, I think that's going to save lives, and I really think that has to be one of our main goals.

And I don't think I heard you correctly. You weren't suggesting the B–1 isn't doing what it's supposed to do. It did a beautiful job. I think it's done a beautiful job in the last 3 weeks. I hope I didn't hear you——

Mr. MILLER. No, sir. I was talking about the B–2.

Mr. SCHROCK. Oh, the B–2.

Mr. MILLER. A more sophisticated stealthy bomber.

Mr. SCHROCK. OK. Great.

I have one question and a comment for Mr. Miller and then one for Mr. Ellis. Somebody gave me an article when they knew I was coming here to read from the Fighting With Failure series. I think you are familiar with that. And the stated purpose for the series, of course, was to document weapons that don't work but waste taxpayers' money and aren't suitable for combat. And they particularly focused on the C–17, which clearly had its problems initially. But I'm wondering if you all still believe that the C–17 doesn't work, and it's not suitable for combat. Because I think it's done a yeoman's job.

Mr. MILLER. Oh, no. We don't believe it doesn't work. It's had some problems and it has some very—if you read the most GAO report, it has some astounding maintenance cost problems. It's a very costly aircraft to operate and maintain. It has not qualified in some areas, for example, of dropping a brigade of troops and such. Some of its aspects have not been realized fully yet, but I think we were more critical of the actual process of the development process.

Mr. SCHROCK. Just the development process. Let me make a comment on that, and it's a statement, and it follows on from what I said this morning about the C–17. And I raise it because I think it's relevant to this discussion.

You know, the C–17 went through the same turbulence that the F–22 is going through now, and many people question its value when, in fact, we reduced the numbers for what was planned, I think, to be 220 down to about 40, to as low as 40, and we were ringing our hands about the development issues, and now, we are back up to 180 with, potentially, even more being built. And it really has proven almost everything I think we've anticipated. And I can't imagine not having that platform, not having that air frame in this particular war that we have just gone through and continue to go through. But, guess what? All that hand wringing and doubt caused the plane to cost more because we were producing fewer. And I think the F–22 is going through the same thing, it's no different.

So we need to really get—and I think that's what you are all saying. We need to get stability into these programs so that we can get the cost down. And at some point in the Pentagon, they have simply got to do that.

As I said before, I don't really blame the Air Force or the manufacturers. It's all within that mindset at the five-sided puzzle palace across the river, where I worked for several years. So I understand the problems they have over there. But I think there is no doubt in my mind that this is going to be—we need this aircraft, and it's going to be a good one.

And Mr. Ellis you are from the Taxpayers for Common Sense. That's a great title, I love it, because I think we all—as taxpayers, we all need to have common sense.

But I have an opportunity on almost a weekly basis to talk with the men and women in uniform. I represent the Hampton Roads area, which is Virginia Beach, Norfolk, and represent more military than 385 members, combined. And one of the things—when you ask them what they are most concerned about, you swear it's going to be pay and benefits. But what they want is equipment that works, they want spare parts, and they've been sorely lacking in that for a long time. And that's one of the key things I hear from them. And, of course, the cost of maintaining a lot of this equipment, a lot of the air frames is skyrocketing. And I find myself increasingly concerned that, if we don't modernize, we are going to find ourselves no longer able to provide the war fighter with the air dominance that we have all talked about here today, and especially as we have seen demonstrated in the last few week weeks in Iraq.

How does your organization propose to deal with these issues? And as a taxpayer myself, modernizing, and modernizing with the incredible capabilities of a platform like the F–22, just seems to make common sense. How would you do it differently?

Mr. ELLIS. Well, first let me say that——

Mr. SCHROCK. Your credibility is already pre-established, being a Coasty, because part of the sea service, that really——

Mr. ELLIS. Right. And not only a Coasty, but a son of a career Naval officer and nephew of another one. So I've had a lot of time in the Hampton Roads area.

Mr. SCHROCK. You've just gone up two more rungs on the ladder.

Mr. ELLIS. Well, I dropped one when I went to the Coast Guard Academy instead of Annapolis.

Mr. SCHROCK. Not at all.

Mr. ELLIS. But, and actually, the other thing on reliability and understanding that is, is the ship—first ship I was on in the Coast Guard was the Coast Guard Cutter Sorrel, which I happened to be on board for the 50th anniversary of its commissioning. So the Coast Guard is clearly aware of age infrastructure. As a matter of fact, from the gentlemen from the other chamber—or used to be in the other chamber, now the Governor of Alaska, Senator Murkowski, served on the Sorrel as a seaman. So, the same ship I was on.

Mr. SCHROCK. He's an old-timer.

Mr. ELLIS. Yeah. So, but—no. I think that actually coming to grips with the critical issues of modernization and really spending our money wisely and putting it in the most appropriate places is what's going to make our service members the most happy.

And that we need to—we need to really target our funding, our acquisition dollars. And I realize there is different accounts, and you can't just change acquisition money into money for spare parts or—etc. But that the key thing for us is to making sure that we are acquiring new assets that are maintainable and easily maintainable, that are cost effective; that we are not trying to keep alive incredibly old assets, like a 50-year-old buoy tender, and that you know we look at, we really—the key thing, and I saw in the business plan, the discussion there, it seemed to me the Air Force when they were discussing that, the F–22 was always—F/A–22. Excuse me. I haven't quite gotten used to that—was always part of the mix. That, you know, instead of really stepping back and looking at the need and looking at the universe and what do we actually need, and then figuring out, OK, what are the various factors? Does the F/A–22 fix and actually fit into that mix? They instead seem to have the F/A–22 already there, and then, what part of it does it fit into?

And that's not really a way of doing a business plan, and that's not really going to get us to have the most cost-effective approach into dealing with these issues.

Mr. SCHROCK. Appreciate that.

Thank you, Mr. Chairman.

Mr. SHAYS. Thank you, Mr. Schrock.

Mr. Tierney.

Mr. TIERNEY. Thank you.

Mr. Schrock, just to add on. I have to say that I don't think I've had an occasion to be in a lengthy hearing with you, but I appreciate your perspective on these issues. And I think you have added a lot of value to the hearing, and certainly, we learned a lot from your questioning and some of your comments.

And just to ingratiate myself with you, my father and brother were both in the Navy, so you won't be slinging anything over here. Just cover yourself at all times, Mr. Chairman, is what I say.

Let me cut to the quick on one thing. When I tried to ask the Air Force and the Department of Defense what the need was for the F/A–22 going forward, whatever the answer I seemed to get—and you can correct me if I've misstated it—was that there is a particular aircraft that the Soviet Union is supposedly creating and maybe sharing with China and others. And Mr. Chairman or Mr. Schrock may remember what it was, the 31 Sorrel, or the Russian

aircraft that the Department of Defense and the Air Force indicated that they were concerned with that the F/A–22 was going to combat. And they also were talking about double surface-to-air missiles and those things.

Talk to me, if you would, the three of you, in turn, is the F/A–22 going to address those issues? Is it the only platform that can address those issues? And, how do we address those issues if they are real threats and we don't have the F/A–22?

Mr. HELLMAN. I'm going to go first just by default. I think part of the answer—because I'm not an expert in threat assessment, but I think part of the answer has been answered already, which is, we are already going to buy the F/A–22, and that, therefore, the question becomes one of how many and at what cost?

One of the things that I've looked at is trying to—and this is something that Mr. Kucinich brought up earlier, was what's the mix going—what's the force mix of tac air going to look like? Clearly, it's going to have a component of F–22. The question then becomes: How much of the mix is going to be F–22, and how much of it is going to be something else?

We haven't heard what the other options are that are out there. I would argue that you could do it with an upgraded F–15, maybe it's an upgraded F–16. But the point is that there has to be some discussion of that. Because I believe from a purely budgetary standpoint that you can't do the full replacement with F/A–22s, nor do I think that's necessarily a good idea. Because I think one of the things that you have to recognize about programs like the F/A–22—and this is not unique to the Air Force, it's true of a lot of the Capital Improvement Programs in other services, which is why I think this discussion is particularly relevant—is that it's going to bleed funding away from other priorities.

The Air Force is not just a fighter—a school for fighter aircraft. They have other functions. And one of the things that they are struggling with right now is how they are going to upgrade their mid-air refueling capability. They have to revamp so they can stop calling on the Navy; they have to resuscitate their airborne jamming capability. These are all things that are going to place demands on the Air Force budget. And my belief and my fear is that the F–22 is going to place a disproportionate burden on that, and that, therefore, you have to look at alternatives, so that you can achieve the balance within the Air Force budget and within the DOD budget, so that you can get all the things that you need to do done.

Mr. TIERNEY. Do the other gentlemen feel compelled to add something? Or are you going to let that go?

Mr. Miller.

Mr. MILLER. I think it is also a matter of how much you want to spend. Accountability. Are you getting for the taxpayers what you tell them you are going to get them? And I don't think that's happening with the F/A–22. So far we haven't seen demonstrable evidence.

And I think—while I'm not made privy to classified information, I haven't seen a lot of evidence yet supplied by the Air Force that there are better aircraft out on the drawing board, better than the F–15, and I've not seen evidence that any other countries would be

willing to spend the kind of money to develop those types of fighters that are so costly. But, again, I've not had access to any classified information, so maybe—perhaps the Air Force has.

Mr. TIERNEY. Thank you.

Mr. Ellis, either I stole a phrase from you or you stole it from me at one point. I think I may have heard it, but I was using the expression you used for developing—"put the development cart in front of the testing horse." I think I used it in terms of National Missile Defense, but I think one of the problems—and Mr. Schrock mentioned it earlier, too. I think one of the problems we have in all these systems is this apparent desire to race forward and develop something before you have tested it appropriately, and then end up spending a lot of money retrofitting it or whatever expression you want to use, at a much higher cost and less efficient result on the long run on that.

But I don't want to stop you from answering any other question; I want to make that point, that I quite agree with you on that, that one of the issues we're looking at here today is, if you get over the threshold, and you can't go back, and they are already in production of some of these F/A–22s, then the question is, how do we not make that mistake of putting the development cart in front of the testing horse in the future or with respect to the rest of what we have to do with the F/A–22?

Mr. ELLIS. Well, yeah. Before I go to what you asked previously, absolutely, the getting the development—or the cart before the horse in this case actually worked. I mean, we've all pretty much conceded that we are going to be building some F/A–22s. And so the Air Force, in some measure, has gotten what they wanted. I mean, they have gotten a series of these aircraft and where people are conceded, basically anywhere between, you know, somewhere in the hundreds to 225.

Mr. TIERNEY. I guess the question would be, if we had done this properly, might that not have been the case, and might we have had other and better choices as we went around if we found out we were going to have this kind of cost overrun and this kind of technical problems with avionics and everything else, might we have shifted gears, gone to a better platform, or—if it were the case, and upgraded the others more efficiently than now saying, well, they were persistent enough, and they kept jamming it in; it has all these problems, still way over cost, but here we are.

Mr. ELLIS. Right. Sort of abandoned the economic theory of sunken costs and go ahead and sink more in to it.

No. I think that those are critical issues, and I think that some of the discussions about spiral planning and some of the discussions about, you know, really having—if they are going to do a real business plan, I mean, a really ground-up sort of business plan of what do we need and what do we think is going to happen. And obviously there are going to be new threats developing over time. I mean, that's understandable. And we are going to have to evolve and hopefully we do a design—we design a planning process that will answer that. I don't have the perfect idea in my head. I don't think anybody does.

I think that just a little point that I would add on the potential opponents, competitors for the F/A–22 air dominance, the key

things that—air frames are not the only thing that have made our country have the greatest air superiority. Some of it has been training and has been equipment and has been maintenance. And those are all things that other countries are going to be far behind us on and have been previously. And I think that is something that I'm sure that Congressman Schrock would agree with, that we have the best trained and the best outfitted pilots and aviation personnel in the world. And so that's one area that always will assist us in air superiority.

And then the other is, that I'm a bit jaded by a lot of the things that happened in the cold war, where we heard a lot about the Soviet military threat and how big it was and how bad it was. And I'm not saying that there wasn't a threat there by any stretch of the imagination, and I remember those Soviet threat books that we used to get when I was at the Coast Guard Academy in the 1980's. And, lo and behold, when the Iron Curtain fell, we found out that they were not nearly as capable as we thought they were.

And I'm not saying that people are drumming up or are more concerned than is necessary, but I am also somewhat concerned about that, just as Mr. Miller mentioned, that I haven't quite heard about this new capability out there that is going to outperform our F–15s and F–16s. And so that's the other thing that I—I'm not going to say that it isn't out there, but I don't know to the level of the threat. And again, it does come down to the cost benefit analysis across the spectrum of the Department of Defense spending that Mr. Hellman mentioned.

Mr. TIERNEY. Thank you. Thank you all for your testimony here today. It's been enormously helpful.

Anything that any of you want to add?

Mr. MILLER. I think, with respect to the F/A–22, I think we shouldn't forget that the F–16 and the F–15 are getting some incredible upgrades to their systems, to their avionics. So they are not the same aircraft that they were when they were first built. And so the answer some of the threats—might be able to answer some of the threats with the upgrades.

Mr. TIERNEY. We actually had a hearing on that some time back, the chairman will remember, and the people testified what the upgrades were from the Air Force and from the Department of Defense. My memory of that hearing is that essentially with the upgrades there was very, very little that they couldn't do with the enhanced existing capabilities, as opposed to what they were proposing on this.

Now, I don't know how much they now seem to think that they've gone beyond that or whatever; it was only a couple years ago. But I think they were at least, at one point in time with a different group of people that testified and today, were willing to admit that with upgrades, the others did essentially all of the tasks that we would be asking an F/A–22 to do. So that is interesting to note.

Mr. Chairman, I will yield back the balance of the time. Thank you.

Mr. SHAYS. Thank you. Appreciate that.

Gentlemen, what was your reaction when you learned about the business plan that they have? What was your reaction to that?

Were you—was your reaction, well, that makes sense; they should have it? Were you surprised they had it? Were you surprised they haven't made it public?

Mr. ELLIS. I was not aware of it. I'm not surprised—and I'm curious, at least the part that I can see, to know what exactly is it comprised of.

You know, as I mentioned earlier, I am concerned that it seemed that there were a lot of preconceived notions that went into the business plan rather than actually a real identification of need and then finding how to match that need or meet that need.

Mr. SHAYS. Anyone else?

Mr. MILLER. That was the first I'd heard of the business plan. I mean, I'm not sure I even understand it or that it was very well explained.

Mr. SHAYS. OK. In terms of the issue of marginal cost, if, in fact—this is what we have a pretty good idea of: They are saying that they can build 276 planes for $42.2 million, which is $5.4—excuse me 276 planes for $42.2 billion. They are saying for the cap level of $36.8 billion, they estimate—but even this 276 is an estimate. They estimate for the $36.8 billion, they can build 225 to 235. Were you surprised that the marginal cost of the last 41 planes to 60 would be in the realm of $5.4 billion?

And, do you think that's realistic?

Mr. ELLIS. I was quickly doing my long division on my pad when those numbers were coming through, and I came out to $131.5 million per copy for that last 41. You know, for that—basically for that $5.4 billion number, Mr. Chairman. And, yeah, I think that it's a pretty significant cost savings. I would be curious to see—obviously, it's, you know, a pretty widely accepted fact and widely known fact that the more copies you produce, generally, that the reduction in prices is greater.

So I'm not surprised that's occurring. But the scale to deviate from the average, from which the average is somewhere around $250 million per copy, it's a pretty significant cost savings over $100 million there, almost 50 percent savings over the life of the program. I think that pretty large.

Mr. SHAYS. In your experience of looking at other programs, would that be a consistent drop?

Mr. ELLIS. Well——

Mr. SHAYS. If you don't know——

Mr. ELLIS. We could try to answer that for the record.

Mr. SHAYS. See, what I'm going to be very interested in is, if we do decide—given the reality that in 1991 we went from 750 to 248, in 1993 to 438, and in 1997 to 337, and then 1999 to 333, 2002 to 276, down to potentially 225 to 235, I am—I'm wondering if we aren't going to get caught in this trap of then saying, let's build 276 at that additional cost, or let's build—if the marginal cost is so much less, you know, it appears to me maybe—and the requirement is there, let's build 330 of them or 380 of them, if we aren't going to then find that once we committed, that then we are going to find the cost is going to go up.

Is there any way that you would know to nail down this number in any work that you have done with other projects?

Mr. HELLMAN. The short answer to that one is, no. And I think, in part, it may be because this program is somewhat unique in a lot of ways. But I think that—first off, I thought the number was pretty optimistic. But, again, that's intuitive, and it's based on what we have seen about cost projections not so much in other programs but in this program, which has been notoriously bad.

So while I recognize that to a certain extent, it's new day here and that, you know, the past is not necessarily a precursor to the future, and taking into the account the fact that you will see obviously improvement in cost as you get further into the program on the per unit costs, it seems that given the track record in this program in making those types of projections, it's reasonable to ask how they came up with that number. And it goes back to what Mr. Walker was saying about the "plug and hope" approach to this.

It also leads me to a question about how—because it seems that your question is, how do we avoid a situation where we agree to do something and then find ourselves with a fait accompli, where the money that we agreed to spend on it is not there and, yet, we have already gone so much further down the road, that we have to make up the difference.

Mr. SHAYS. Given that, all of you have pointed out that in the late 1980's and early 1990's, this didn't seem like a bad deal if you could get 700-plus planes.

Mr. HELLMAN. Right.

Mr. SHAYS. But if you had told us in 1990 that in 2004, 2005 and 2006, we might end up with 224 planes at approximately that cost, we might have said, I'm not sure we are going to do it.

Mr. HELLMAN. And I think that Mr. Miller's point on the B–2 in that regard is well taken, because that was a situation where Congress, despite receiving repeated assurances from the Air Force about what they were going to get for the investment, found that it didn't—actually didn't never come to pass, and, ultimately in their wisdom, they decided to end the program. Ultimately, you have that recourse. But it would seem to me that, from what I heard today, they still have to do a little bit about making that case, at least just on a numbers perspective.

Mr. SHAYS. Let me just ask two more questions, and then I think we will be done here. Should the statutory—let me ask you this first. What—and if you don't have an answer to it—if you are not feeling confident to answer it, then I don't want an answer. But what actions does the Department need to take to stabilize program costs? Any of the three of you want to take a stab at that?

Mr. HELLMAN. In just this program?

Mr. SHAYS. Yes. Let me ask this question. Should the statutory production cap be eliminated? And the question is, why or why not? Mr. Ellis.

Mr. ELLIS. Mr. Chairman, we would be very concerned about removing the statutory cap. I think that although people can talk about how it may have hurt the program or the fact that now it's much cheaper per copy, that was part of the reason why.

I mean, that the cap actually helped force the Air Force to look very hard and come up with different things to try to reduce costs in out years, and it made them really make hard decisions about what they need. Or maybe not as hard as I would have liked, but

still harder than they wanted to make on this. And it wasn't free money. And I think that the cap has served us well and that we can evaluate in the future, if there is a need for additional copies in some discreet amount to go at. And I think that's something that is lost, is something of the benefits that we have already achieved from the wisdom of Congress in establishing that in the past.

Mr. SHAYS. Let me react to it, though. When I look at the charts that we see, whether they've gone up $19.8 billion or close to that, we are certain that the drop in the number of planes is there. If the cap simply means we are going to spend the same amount of money and get one-third the planes.

I'm not—I don't know if the cap has done all that much. If you, on the other hand, are saying to me that the costs would have gone up even more than $20 billion, then I guess I'd agree.

Mr. ELLIS. That would be my impression. Yes, and, no, absolutely, that's one of the things that I raised in my testimony is, is that—I mean, the sad thing is, is that we are still spending the same amount of money. I mean the taxpayer is on the hook for the $40 billion plus. Whether we get 100 planes or we get 300 planes, we are still paying the same amount of money. And the sad thing is, is that, in this case, as per unit cost goes up, we are getting less bang for the exact same buck. And that is the conundrum about the cap.

Mr. SHAYS. We basically are existing with 400, therefore, less planes that we anticipated, and we are getting them much later than we anticipated, and so on.

Anyone else want to respond before we close up? I see Mr. Tierney——

Mr. MILLER. I would say, we would probably want you to stay with the cap. But I suppose it would also be a judgment call on your part as to how bad you as a Member of Congress want this aircraft and feel that the fighting men and women really need it. It might set a bad precedent.

Mr. SHAYS. You started, Mr. Miller, making the point that, rather than what was beginning to develop as a consensus, that we are probably going to see some of these planes. The question is how much. Your view is that you are not convinced that we should see any of these planes.

Mr. MILLER. No, we are not.

Mr. SHAYS. Mr. Hellman. Your view is?

Mr. HELLMAN. Well, the fact is we have already authorized 51 of the aircraft and the funding. Therefore, and it's already in limited production, so we're going to see some. So then the question is, how many and at what cost. I mean, there have been plenty of programs that have been overseen by Congress that did not have a cost cap. So I think that function can be performed without the rigor of a cap, if that's what you so decide.

But I think it's important to remember that first the initial cap was based on Air Force figures that were supplied to Congress, and it was adopted by Congress because their efforts to regulate costs in this program prior to that had been unsuccessful. And it was, I think, in part, to actually set a hard limit but also, in part, to put these people on record.

Has that been effectively done? It seems so. Is it the only way to achieve that? I'm not sure. But given the track record on costs, this is a program and the projections that GAO has made about some of the changes or some of the problems that they see in the future in both schedule and technology, there is likely to be further cost growth in this. And I'm not sure how one keeps that under control without a cap.

Mr. SHAYS. Which one of you was making the claim that there is a real maintenance issue on this plane? Did one of you say that there was a challenge on maintenance? Was that you, Mr. Miller?

Mr. MILLER. No, I didn't say that. But—I think that was in the new GAO report; that in effect their goal with the F/A–22 was to get 3 hours of flying time between maintenance actions, and I think it comes down to about 17 minutes between every average maintenance. It's point 29 or something like that hours.

Mr. SHAYS. Well, that will be something I should take a good look at, because I didn't catch that. But thank you.

I have no further questions to ask. Mr. Tierney, do you want to?

Mr. TIERNEY. If I could, just a couple.

First of all, it seems to me that the reason that the cap was set, was for all the reasons you stated, about kind of to control costs. But I heard on a number of occasions here, people keep saying, whether it was the Air Force or the Department of Defense, they need stability in this program.

That was what the cap was all about. Wasn't it? Am I wrong? The idea was to set, this is a cap, this is all you can spend. It's about as stable as you can get. Congress is telling you, that's it. And it wasn't even cold, and then all of a sudden it's like, well, the hell; we're not going to worry about that. We got a call here from the Secretary, they said earlier that, the hell, our number is different and we're just going forward. So they've had stability. They've had it at least since the time they had the cap. And that, clearly, has not done the trick.

So I hope, Mr. Chairman, that we will be mindful of that, that all these assertions that we need funding stability, really doesn't mean that. What it means is, they need an unlimited pocketbook, so they can go do whatever the heck they want to do. Because when they had stability, it didn't quite work out that way, instead of restraining them.

Mr. SHAYS. I might comment that what seemed to have replaced the cap is the number 276. In other words, locked into the 276 rather than the $36.8. That's what it appears.

Mr. TIERNEY. No, I think what happened is that they are now going to spend up at $43-something, and decided that what they can do for the $43-something is 276. But I think it's going the other way; I think it's plugging, just like Mr. Walker said it was.

Mr. SHAYS. To be continued.

Mr. TIERNEY. But I think that's—so I made a great point on that. It's like, whatever we get, we'll just figure out what we can make it at that point in time and keep on rolling here. And now they figure if they get another $5.2 billion we'll do 276. Because, otherwise, I heard no logic of why 276. I heard that they wanted 381, and they seemed to have some logic for that although I'm not sure what

it is, but there was no logic for 276 other than that's the amount we think we can squeeze out.

I think it's imperative, and I hope the chairman and maybe others in this committee might join me in a letter to the Department of Defense and the Air Force asking them for that business plan. I think that's critical to see that. And to then, if we need to, follow-up on it with a hearing, to do that. Because we have to see that information so Congress can establish an opinion of the amount of these aircraft that are needed, if any.

Mr. SHAYS. Then it will be a request with your signature on it from the committee and the other the chairman and myself and others.

Mr. TIERNEY. Because I mean, I think that's really where the crux really comes in. We see what they say their business plan is, we see whether or not the enhanced F–16, F–15 can serve some of the functions or all of the functions there. We will know whether we don't need the F–22 at all, and that to go forward is just going to be such maintenance cost and such continued overruns or whatever, that we should fill this need otherwise. We will know whether or not we should just take the 51 or whatever that's authorized now and stop there, and fill the remaining need for tactical aircraft with other things or just what we need to do and how we can better spend the money. So I look forward to seeing that report.

Again, Mr. Chairman, I thank the witnesses for all of their help today, as well as, again, thank you for an excellent hearing as usual.

Mr. SHAYS. Thank you very much. Appreciate all your participation and work on this.

Is there anything that any of the three of you would like to put on the record before we close? Anything that you might have been prepared to answer that we should have asked that you want on the record?

Mr. MILLER. I don't know if you—if the committee would—if it will be proper for the committee to do this. But I notice the Air Force said that they now agreed with the Cost Analysis Impact Groups' assessment of what the costs would be. And those documents haven't been public since 1997, I believe, when they were made public by appropriation legislation, I think. It would be nice for those to be public to see there is actually—if they are on the same page, because they were $9 billion off the last time we heard.

Mr. SHAYS. I can't imagine why they wouldn't be public, and so we will work on that.

Mr. MILLER. Thank you.

Mr. SHAYS. That's one thing that I've tried to emphasize with this administration, and that is—on a whole host of areas. But if the administration wants more authority, more power, then there has to be more congressional oversight and there has to be, frankly, more transparency. Clearly it's been a tradition, as long as I can remember, that when we talk about costs, Congress has obviously not just a right to know, a responsibility to find out, and the public has a right to know. So—because we also appreciate the input of organizations like your own, and we want to make sure you can take a look at that and respond to it and help us figure out what's going on. This is how democracies work.

Thank you all very, very much. Appreciate it. And we will adjourn this hearing.

[Whereupon, at 3:45 p.m., the subcommittee was adjourned.]

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