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Report to the Chairman, Legislation and National Security Subcommittee, Committee on Government Operations, House of Representatives

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TACTICAL AIRCRAFT

F-15 Replacement is Premature as Currently Planned

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United States
General Accounting Office
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National Security and
International Affairs Division

Tactical Aircraft: F-15 Replacement is Premature as Currently Planned

B-253662

March 25, 1994

The Honorable John Conyers, Jr.
Chairman, Legislation and National
Security Subcommittee
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

In December 1993, we issued to the House and Senate Committees on Armed Services and the Subcommittees on Defense, Committees on Appropriations, a classified report on the F-22 as the planned replacement for the F-15. As you subsequently requested, this is an unclassified version of that report. The report presents the results of the first of a series of reviews we plan to conduct on the F-22 program. We currently have underway a review of the program's development progress and a review of the management of F-22 software development.

The development and production of F-22 air superiority fighters is estimated to cost $99.1 billion (then-year dollars). The F-22, with operational capability planned for 2003, is designed to replace the Air Force's F-15 air superiority fighter, which began operations in the mid-1970s. To ascertain why the F-22 was needed to replace the F-15, we have evaluated information provided by the Department of Defense (DOD) describing performance characteristics of foreign weapon systems that may be encountered in air-to-air combat, and compared it with features of the F-15 weapon system. Considering the huge investments required for tactical aviation modernization programs, we also evaluated whether the F-22, as designed, had the potential for joint use among the services and for use in multiple missions, which are being emphasized by the Under Secretary of Defense for Acquisition.[1] Appendix I contains our review's scope and methodology.

Results in Brief

The F-22 program was initiated in 1981 to meet the evolving threat in the mid-1990s. This threat revolved around a fighter threat that had a significant quantitative advantage and was becoming more capable with the introduction of two new high performance fighters.

[1]Statement on Tactical Aviation by the Under Secretary of Defense for Acquisition, to the Defense Subcommittee of the Senate Appropriations Committee, May 12, 1993.

Since the F-22 program entered full-scale development in 1991, the severity of the projected military threat in terms of quantities and capabilities has declined. Instead of confronting thousands of modern Soviet fighters, U.S. air forces are expected to confront potential adversary air forces that include few fighters that have the capability to challenge the F-15—the U.S. front line fighter. Our analysis shows that the F-15 exceeds the most advanced threat system expected to exist. We assumed no improvements will be made to the F-15 but the capability of the "most advanced threat" assumes certain modifications. Further, our analysis indicates that the current inventory of F-15s can be economically maintained in a structurally sound condition until 2015 or later.

Thus, the F-22's initial operational capability can be delayed 7 years and its planned production start date of 1996 can be postponed to a future date deemed appropriate by DOD to meet the new initial operational capability date.

In addition to a declining need for the F-22 to counter threats, the aircraft has not been designed to emphasize multiple missions or joint use among the services, important features for future solutions for tactical aircraft modernization, according to the Under Secretary of Defense for Acquisition. The F-22, as designed, will be a land-based fighter, not capable of operating from Navy aircraft carriers. Further, the F-22 is principally designed to perform one mission—air superiority against opposing fighters.

Background

Air superiority means dominating the air battle to the extent that friendly air and surface forces can conduct operations without prohibitive interference by enemy air forces. During the Persian Gulf War, coalition air forces achieved air superiority during the first few hours. Only 33 air-to-air encounters occurred between U.S. and adversary fighters. F-15s were involved in 31 of these 33 encounters and succeeded in each one.

The F-22 is one of several planned Air Force and Navy aircraft production programs associated with the tactical aircraft modernization program. DOD approved the initiation of F-22 engineering and manufacturing development in 1991 and the start of production is planned for January 1996 with the purchase of long lead production materials. The Air Force plans to take delivery of the first 5 production aircraft in 1999 and an additional 80 by the time the aircraft achieves initial operational capability in 2003.

The Projected Fighter Threat Less Formidable Than Previously Projected

The break up of the Warsaw Pact and the Soviet Union lessened the quantity and the quality of the projected fighter threat. For example, in 1993, DOD identified seven countries that typify the fighter forces that pose a threat to the United States. Except for China, these countries have fighter forces that range from a low of 188 to a high of 460 aircraft. And all seven countries currently have only a few high-performance fighters that come close to matching the F-15's performance capabilities.

In contrast, the U.S. Air Force has about 900 F-15s. Because the foreign high-performance fighter aircraft are expensive, DOD believes that few purchases of these aircraft will be made in the future.

U.S. Aircraft Characteristics Exceed the Projected Threat

Our analysis shows the existing F-15C was superior in four out of five major performance categories against the most likely advanced fighter threat. Further, our analysis assumes no improvements will be made to the F-15s but the capability of the most advanced threat assumes certain modifications. Our detailed analysis has been classified by DOD.

In addition to having superior aircraft, the U.S. Air Force has other capabilities that enhance its air superiority mission that potential adversaries lack. The E-3 Airborne Warning and Control System is considered by DOD to be the most advanced command and control system in the world, assisting tactical aircraft in locating, identifying, tracking, and attacking enemy aircraft at great distances. DOD officials also consider U.S. pilot training methods to be far more advanced than any foreign country. U.S. pilots are often trained in advanced combat tactics that are not taught anywhere else.

F-15s Are Expected to Have Service Life Until 2015

DOD cited, as a factor in its 1981 decision to replace the F-15, projected limits on the F-15's structural service life. However, a 1990 DOD evaluation indicated that the F-15s might have a service life longer than originally expected. Since then, testing has demonstrated that the Air Force can further extend the F-15's service life. Based on this recent testing, our analysis shows that none of the 918 F-15s that were in the inventory in July 1992 will begin to exceed their expected economic service lives until 2014.

F-22 as Designed Offers Little Versatility for Navy Roles or Surface Attack Missions

As currently designed, the F-22 will be a highly specialized aircraft to be used by one service—the Air Force—to perform one mission—air superiority. The F-22 program does not appear to meet all the tactical modernization goals set forth by the Under Secretary of Defense for Acquisition. The Under Secretary testified in May 1993 that DOD intended to take full advantage of commonality and jointness in tactical modernization programs, emphasizing both multimission or multirole platforms and commonality among the services.

During the air war in the Persian Gulf, there was not a need for large numbers of fighters having only the capability to perform air superiority missions. Of the 215 Iraqi aircraft destroyed or captured, 182 were destroyed on the ground by bombs or were captured by ground troops. Only 33 aircraft, or 15 percent, were destroyed in air-to-air combat. DOD's report to Congress, Conduct of the Persian Gulf War, indicated that few Iraqi aircraft left the ground, in large measure, because U.S. forces quickly destroyed the Iraqi air defense command and control network.

The F-22 is currently designed to operate from land bases only. It cannot operate from Navy carriers or readily be converted for such operations. Although the F-22, like other fighters, has some inherent air-to-ground capability, the F-22 program is not funded to develop that capability. DOD said plans are now being made to initiate development of an air-to-ground capability for the F-22.

The Defense Science Board, in a report on the modernization of tactical aviation forces, stated that in the future, the greater economic constraints and lower rates and quantities of combat aircraft to be acquired will tend to make the use of common aircraft and/or components more attractive than it has been in the past. They recognized that this may require some compromise in mission capabilities. For example, Air Force applications of a common aircraft for land and aircraft carrier use may be heavier than they would be if designed only for land-based operations. We agree with the Board and also believe that the less formidable military threat could make certain compromises acceptable that would not have been acceptable prior to the changes in the projections of the future threat.

The theme that the services need to cooperate was sounded again by a special task force sponsored by the Board to evaluate the fiscal implications of DOD's proposed future years defense plans. The task force noted the need for the services to cooperate in the development of future systems because of future funding shortfalls. It concluded that the aircraft

programs now under development will not all be affordable at the funding levels projected for the rest of this decade.

Recommendations

Because F-15s, by most measures, are more capable than the most likely threat related to the air superiority mission and because F-15s are expected to have service lives extending until 2014, we recommend that the Secretary of Defense defer the initial operational capability of the F-22 7 years and adjust the currently planned production start date accordingly. In addition, because the F-22, as designed, does not incorporate the features of multiservice use and multimission capability being articulated by the Under Secretary of Defense for Acquisition, we also recommend that the Secretary reconsider whether it is appropriate to continue the development of the F-22 as a single-service aircraft designed principally to perform only the air superiority mission.

Agency Comments and Our Evaluation

In commenting on a draft of the classified report, DOD disagreed with our recommendations and stated that although there had been substantial changes to the world order, DOD is convinced its direction on the F-22 program is correct. Further, DOD did not concur with our characterizations of (1) the threat, (2) current U.S. capability, (3) F-22 capabilities, and (4) its objectives for aircraft modernization.

Our threat information comes from DOD intelligence agencies and we believe it is accurately characterized. Concerning the capabilities of the F-15, DOD merely argues that the F-22 would do a better job than the F-15. We do not necessarily disagree with this, but suggest that a more realistic view would be that the United States does not need the extra air superiority by 2003 as planned, considering the costs involved and the unlikely increase in the threat. Our report is based on a methodology used by DOD for comparative evaluations of the characteristics of fighters, and on discussions with responsible DOD officials. Aircraft characteristics were obtained from defense intelligence organizations and Air Force weapon system program offices. Therefore, we believe the concerns set forth in the DOD comments concerning the characterization of the threat and current U.S. capabilities are unfounded.

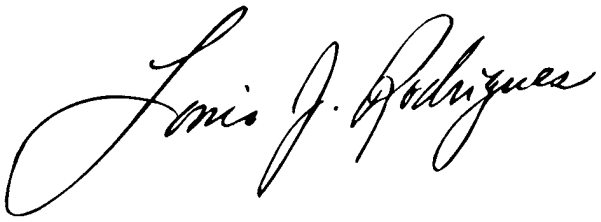
We have modified the report to recognize that the F-22 has some inherent air-to-ground capability (like most other fighter aircraft) and that DOD has initiated plans to develop that capability.

The agency comments also indicate that DOD has no policy that requires aircraft to be designed for multiservice use or that requires the same aircraft be used to meet the common needs of the services. However, these comments appear to be at odds with the May 1993 congressional testimony of the Under Secretary of Defense for Acquisition.

The full text of the DOD comments and our evaluation of them are contained in the classified version of this report.

We are sending copies of this report to the Secretary of Defense, the Director of the Office of Management and Budget, the original four congressional requesters, and other interested parties. Major contributors to this report are listed in appendix II. Please contact me on (202) 512-4841 if you or your staff have any questions concerning this report.

Sincerely yours,



Louis J. Rodrigues
Director, Systems Development
and Production Issues

Scope and Methodology

In conducting our work, we visited the Defense Intelligence Agency; the Foreign Aerospace Science and Technology Center; the F-22, F-16, and F-15 System Program Offices; and the Development Planning Directorate at the Air Force's Aeronautical Systems Center (Air Force Materiel Command).

In making aircraft performance comparisons, we examined documents regarding the capabilities of threat aircraft, including the Multicommand Manual 3-1, Threat Reference Guide and Countertactics. Using performance categories and scenarios from this document, which Air Force officials agreed provided pertinent categories for comparison, we requested consistent foreign and U.S. aircraft performance data from the applicable Defense organizations. We received foreign aircraft information from the Air Force's Foreign Aerospace Science and Technology Center (Air Force Intelligence Command), and U.S. aircraft information from the F-14, F-15, F-16, F-18, and F-22 System Program Offices. We compared the F-15C to the most severe threat aircraft projected to be available in substantial quantities to illustrate the capabilities of U.S. fighter aircraft. We did not evaluate the F-15C's capabilities against ground-based threats, such as surface-to-air missiles because the primary need for the F-22, as stated in Selected Acquisition Reports, was to counter the emergence of large numbers of advanced Soviet fighters, and because a number of other weapon systems exist for the primary purpose of neutralizing those threats. Similarly, we did not evaluate the capabilities of threat fighter aircraft against U.S. surface-to-air missile systems.

We used this data to perform aircraft capability comparisons involving 5 categories and 32 characteristics identified as most pertinent to the air superiority mission by Air Combat Command. The 32 characteristics are distributed throughout the 5 categories as follows: flight performance (11), radar (3), long-range missiles (8), short-range missiles (8), and combat mission radius (2).

To conclude that one aircraft was better than another in one of the five categories, the aircraft was required to have superior statistics in a majority of the compared characteristics. If two aircraft had equal characteristics, they were determined to be even in that category.

We performed our work from December 1992 through August 1993 in accordance with generally accepted government auditing standards.

Major Contributors to This Report

National Security and International Affairs Division, Washington, D.C.	Robert D. Murphy, Assistant Director
Cincinnati Regional Office	Richard L. Strittmatter, Evaluator-in-Charge Edward R. Browning, Site Senior Don M. Springman, Evaluator