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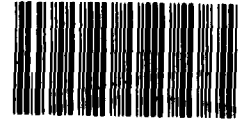
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NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-205800

JANUARY 19, 1984

The Honorable Caspar W. Weinberger
The Secretary of Defense



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Dear Mr. Secretary:

Subject: Concerns About the Air Force Approach to the
Dual Role Fighter Comparison (GAO/NSIAD-84-49)

In the dual role fighter program, the Air Force is evaluating the capabilities of the F-15 and the F-16 derivatives to perform both air-to-air and air-to-ground missions. We understand that the Air Force will very shortly select one of these aircraft as its dual role fighter. We were also informed that following the Air Force announcement, the Defense Systems Acquisition Review Council will review the selection decision and make recommendations to you.

As part of a broad review of efforts to improve the F-16 aircraft, we examined the Air Force approach to the dual role fighter selection. We have some concerns, as discussed in enclosure I, which we believe you should consider in evaluating the Air Force decision. Specifically, we found that the Air Force has not:

- completely defined its operational concepts and requirements for the dual role fighter and
- compared the F-15 and the F-16 derivatives against a uniform set of criteria to determine if each meets a common set of minimum performance specifications.

Consequently, we believe the Air Force may have difficulty determining which derivative would best meet its needs.

The results of our review were provided to the Departments of Defense and the Air Force and their official oral comments are incorporated in the enclosure as appropriate.


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Because of its importance to the Air Force plans to modernize tactical air capabilities, we will continue to monitor the dual role fighter program.

We are sending copies of this report to (1) the Director, Office of Management and Budget, (2) the Secretary of the Air Force, and (3) the Chairmen of interested committees.

Sincerely yours,


for Frank C. Conahan
Director

Enclosure

CONCERNS ABOUT THE AIR FORCE APPROACH
TO THE DUAL ROLE FIGHTER COMPARISON

BACKGROUND

The Air Force is evaluating derivatives of the F-15 and the F-16 tactical fighter aircraft for use as a dual role fighter in the late 1980s and early 1990s. As currently envisioned, the dual role fighter will be a long range, large payload aircraft able to perform both air-to-air and air-to-ground missions.

The Air Force has established a minimum configuration for both the F-15 and the F-16 derivatives (referred to as F-15E and F-16E). Both configurations incorporate ongoing product improvement programs and add a rear cockpit for a second crew member to share the workload, thereby improving mission performance.

The F-16E configuration includes other major changes to the aircraft's structure. The landing gear is strengthened, the fuselage is extended 56 inches, and a cranked-arrow wing (modified delta wing) replaces the current wing and horizontal stabilizers. The new wing is designed to provide additional lift and greater internal fuel capacity, and will permit weapons to be tucked in rows close to the wings to reduce drag.

The F-15E configuration also included structural changes to the landing gear and the wings. However, the changes are not as great as those included in the F-16E configuration.

In 1984, before congressional hearings commence on the fiscal year 1985 budget, the Air Force hopes to select either the F-15E or the F-16E for full-scale development. Delivery of the first production aircraft is targeted for 1987. The Air Force plans to buy 400 aircraft.

OBJECTIVES, SCOPE, AND METHODOLOGY

We reviewed the Air Force approach to selecting the dual role aircraft as part of a broader review of efforts to improve the F-16 aircraft conducted from November 1982 to December 1983. In this overall work, we examined numerous documents including analytical studies, independent cost analyses, program cost estimates, schedules and management plans, available test results, and other documents. We interviewed officials having responsibilities for these programs at various organizations: the Office of the

Secretary of Defense, Washington, D.C.; Air Force Systems Command's Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio; and the Tactical Air Command Headquarters, Langley Air Force Base, Virginia.

Our review was made in accordance with generally accepted government audit standards. In obtaining and analyzing cost estimates, however, we did not assess the appropriateness of the cost estimating procedures or the reliability of the cost estimates.

DUAL ROLE FIGHTER COSTS

The Air Force prepared cost estimates for the F-15E and the F-16E in August 1982 as part of cost analyses for the entire F-15 and F-16 programs. Because of program changes since August 1982, actual cost will probably be higher for whichever aircraft is selected. However, the estimates continue to serve as indications of relative program costs.

Cost estimating methods used

The Air Force cost estimates include both (1) incremental costs (additional cost to add the dual role fighter capability) and (2) the total cost of the dual role fighters.

As shown in the following table, the estimated F-16 development costs and incremental costs are greater than estimated F-15E development and incremental costs. This largely reflects the additional costs of the major airframe changes to the F-16E. However, the estimated total cost of an F-16E is considerably less than the F-15E (approximately \$10 million per aircraft).

Incremental Cost Breakdown--400 Aircraft
(per Air Force independent cost analyses August 1982)
(then year dollars)

	<u>F-15E</u>	<u>F-16E</u>
Research and development	\$ 275 million	\$ 473 million
Incremental production cost	870 million	2,492 million
Incremental acquisition cost	1,145 million	2,965 million
Incremental acquisition cost/unit	2.9 million/ unit	7.4 million/ unit
Incremental recurring flyaway cost/unit	1.6 million/ unit	5.5 million/ unit

Total Cost Breakdown--400 Aircraft
(per Air Force independent cost analyses August 1982)
(then year dollars)

	<u>F-15E</u>	<u>F-16E</u>
Research and development *	\$ 275 million	\$ 473 million
Production costs	14.9 billion	10.9 billion
Total acquisition costs	\$15.2 billion	\$11.4 billion
Total acquisition cost per unit	\$38.0 million/ unit	\$28.5 million/ unit
Average recurring flyaway cost	\$32.6 million/ unit	\$22.4 million/ unit

According to Air Force officials, the dual role capabilities will be built into aircraft that are already planned under the regular F-15 or F-16 acquisition programs. Thus, the Air Force views the dual role fighter cost as essentially incremental cost because the procurement does not involve acquiring additional aircraft. We were told, however, that the Air Force would evaluate the derivatives cost effectiveness using both incremental and total cost comparisons.

We did not determine the appropriateness of using either incremental or total costs in evaluating the alternatives. However, we understand that the Air Force view of the program costs

as essentially incremental is based on Air Force planning assumptions that enough of each aircraft (either F-15 or F-16) will be bought in future years to satisfy the 400 dual role fighter requirement. In this regard, we note that if F-15 production were stabilized at 36 aircraft per year, as intended by the conferees on the 1984 Authorization Act, it would be difficult to select the F-15 as the dual role fighter. If the F-15 were selected, actual numbers procured would have to be considerably greater than 36 to meet the dual role schedule.

OUR CONCERNS ABOUT THE
DUAL ROLE FIGHTER COMPARISON

We are concerned that the Air Force's approach to the dual role fighter selection will hamper its ability to determine which aircraft would better serve in that role. The Air Force has not completed the definition of its operational concepts and requirements for the dual role fighter, and the Air Force has not compared the F-15E and the F-16E against any uniform set of criteria to determine if each meets a common set of minimum performance specifications.

Standard procedures for defining
requirements and selecting sources

An Air Force regulation¹ establishes procedures for defining and documenting operational requirements. The process, which should flow from mission area analyses, calls for the following:

- a Statement of Need which identifies an operational deficiency and states the need for a new or improved capability;
- a System Operational Concept which describes the intended purpose, employment, deployment, and support of a system; and
- quantitative and qualitative levels of system performance for elements such as range and payload which should be established and incorporated before the full-scale engineering development decision is made.

¹Air Force Regulation 57-1, Operations Requirements, Statement of Operational Need.

Another Air Force regulation² establishes procedures for selecting sources for development, production, and modification of major defense systems. The regulation seeks to insure that an equitable and objective selection of the proposal which affords the optimum satisfaction of the Government's stated requirements at reasonable cost. The procedures require that specific evaluation criteria be established as standards for use in measuring the acceptability of the contractor's proposal to fulfill the need. The evaluation criteria should identify areas of major concern to the system's mission, and should be ranked in relative order of importance to the selection decision. The evaluation areas should be further refined to identify factors or characteristics, such as range and payload, which serve as measurable objective standards for evaluating proposals. These standards, which should flow from the process of refining operational requirements, are to be quantitative where practical and serve as the required minimum acceptable performance.

The primary Department of Defense directive³ on major systems acquisition requires that essential operational requirements be established to validate or demonstrate the performance of a candidate system before it is selected for full-scale development.

Dual role fighter requirement
is not completely defined

The Air Force outlined in general terms its dual role fighter requirement for the Congress in March 1982 in a briefing to the House Armed Services Committee, Research and Development Subcommittee.⁴ According to that briefing, a new dual role fighter is needed in the late 1980s and early 1990s to assist the F-111 in the deep interdiction role, to assist the F-15 in the air superiority role, and to partially replace the aging F-4, which is the only dual role fighter in the Air Force inventory. The dual role fighter should be capable of a broad range of air-to-air and air-to-ground missions. The requirement includes

²Air Force Regulation 70-15, Source Selection Policy and Procedures.

³Department of Defense Directive 5000.1, Major System Acquisitions.

⁴TACAIR Dual Role Fighter Requirement Briefing for the House Armed Services Committee Research and Development Subcommittee, U.S. Air Force Tactical Air Command, March 24, 1982.

- long-range, large payload, day/night low altitude terrain following capability, and a rear cockpit for air-to-ground missions and
- long-range/endurance and a rear cockpit for air-to-air missions.

However, since March 1982, the Air Force has progressed slowly in refining the dual role fighter requirement. The Tactical Air Command drafted a "Statement of Operational Need" document including performance thresholds and goals for the dual role fighter and a "Systems Operational Concept" document for the F-15E and the F-16E candidates. In July 1983 the Command submitted a revised statement of operational need to Headquarters, Air Force, but in December 1983, we were told it had not yet been approved. At the same time, we were advised that the F-15E and the F-16E System Operational Concepts were still being coordinated at Tactical Air Command. Significantly, the performance thresholds and goals incorporated in the earlier draft of the requirement document have been withdrawn as inappropriate, because they might influence or predetermine selection of one aircraft over the other.

Dual role fighter candidates
will not be compared to specific
performance standards

The Air Force prefers to consider the F-15E and the F-16E as separately proposed aircraft, each to be judged individually on its own possible contribution to satisfying the Air Force's need for a dual role fighter. Air Force officials plan to determine whether the F-15E or the F-16E is the more cost-effective, using such measures as targets killed per sortie or targets killed per cost. They will compare the F-16E and F-15E in evaluation areas based on the general dual role fighter requirement, as outlined by the Tactical Air Command in their requirement briefing and their draft "Dual Role Fighter Statement of Operational Need". Air Force officials do not intend to rank the evaluation areas in order of their importance to the comparison and they do not plan to establish specific dual role fighter criteria which would serve as the minimum acceptable performance for characteristics such as range and payload. As stated previously, the Tactical Air Command dual role fighter thresholds and goals, which could have served as evaluation criteria, have been withdrawn.

According to Air Force officials, the standard source selection procedures relating to establishing specific performance criteria as set forth in Air Force Regulation 70-15 do not apply to

the dual role fighter comparison. Usually, source selection would start with a common request for proposals. In this case, however, separate proposal instructions, respectively tailored to the F-15 and the F-16, were used to accommodate inherent differences in those aircraft. Air Force officials also said that ranking the evaluation criteria and further refining and quantifying them might predetermine results or the comparison and defeat their objective of determining the most cost-effective enhancement.

In our opinion, established acquisition procedures were appropriate for this program. Air Force Regulation 70-15 clearly states that source selection policies and procedures apply to "any modification, maintenance, services, or other program/project estimated to require \$300 million or more." The dual role fighter program meets this criteria--even on an incremental cost basis the program is expected to require a minimum of \$1,145 million.

In summary, the Air Force has not followed its established procedures for defining requirements and selecting a source for the dual role fighter. As a consequence, the Air Force may have difficulty determining which derivative would best meet its needs.