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GAO

Report to the Honorable  
William V. Roth, Jr., U.S. Senate

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August 1994

# NAVAL AVIATION

## F/A-18 E/F Acquisition Strategy



94-31245



National Security and  
International Affairs Division

B-248882

August 18, 1994

The Honorable William V. Roth, Jr.  
United States Senate

Dear Senator Roth:

You asked us to examine the Navy's plans for acquiring tactical aircraft because of concerns that they were duplicative and unaffordable. Since your request, some naval aviation programs were terminated and duplication and costs have been reduced. Your staff subsequently asked us to determine whether the Department of Defense's (DOD) acquisition regulations permitted classification of the F/A-18E/F program as a major modification rather than a new program to avoid the more rigorous review, analysis, and documentation required to justify a new program.

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## Results in Brief

In pursuing these issues, we found that the Under Secretary of Defense for Acquisition, on May 12, 1992, approved the Navy's October 1991 request that the F/A-18E/F development be designated as a major modification of its existing F/A-18C/D, instead of a new program. He decided that acquisition regulations did not require a Cost and Operational Effectiveness Analysis (COEA) for this modification, and he waived certain live fire testing requirements. The Under Secretary based his decisions on (1) Navy analyses that indicated the E/F development was a low to moderate risk and (2) recommendations made by the Conventional Systems Committee of the Defense Acquisition Board (DAB).

Applicable defense acquisition regulations allow management discretion in these matters for the purpose of minimizing development time and reducing costs. By treating this as a modification, some steps normally followed for new acquisitions have been skipped. We are not in a position to conclude whether the decisions made thus far will have a positive or negative effect on the program.

## New Program or Major Modification

The decision to develop the F/A-18E/F was based on the Navy's determination that it needed an upgraded carrier-based, multi-role fighter that could perform both air-to-air and air-to-ground missions. The Navy concluded that this need could most appropriately be met by follow-on development of its only existing multi-role aircraft, the F/A-18C/D.

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The Navy considered the F/A-18E/F development a modification because, in its estimation, the aircraft would be a logical continuation of an upgrade strategy begun in 1982 for the Navy's F/A-18 multi-role strike fighter. In defending its decision, the Navy stated that 90 percent of E/F avionics would be common to those of the C/D; the engine would be derived from the C/D; and the E/F would essentially be a larger, more capable version of the C/D.

The Navy stressed the commonality of the two aircraft, but there are significant differences between the two. The E/F will weigh about 25 percent more and will have a 25-percent larger wing, a 35-percent larger horizontal tail, a 15-percent larger vertical tail, and a 34-inch fuselage extension. Weapon stations will increase from 9 to 11, and there will be new engine inlets. The differences are such that an existing F/A-18C/D cannot be modified to the E/F configuration, and the E/F will require a separate production line. Some senior DOD officials on the Conventional Systems Committee of the F/A-18E/F DAB, after noting the differences between the F/A-18E/F and the F/A-18C/D, expressed the opinion that the F/A-18E/F was a new start. However, these officials did not make an issue of this factor and the consensus of the Board was that the F/A-18E/F was a modification. The DAB Chairman and ultimate decisionmaker, after hearing the arguments presented during the DAB, made the decision to approve the program as a major modification.

The Navy proposed developing the F/A-18E/F as a major modification to its F/A-18 in 1991. The Under Secretary of Defense for Acquisition, the F/A-18E/F milestone decision authority, in his May 12, 1992, Acquisition Decision Memorandum, approved the Navy's request and authorized entry of the E/F into Engineering and Manufacturing Development (EMD), subject to the submission of a fully funded F/A-18E/F program. Approval included

- a waiver of full live-fire testing;
- a waiver of the COEA requirement;
- a provision restricting the issuance of Navy letter contracts for EMD unless the Navy's A-X (later designated the A/FX) COEA, evaluating both the F/A-18E/F and the F/A-18C/D as alternatives, supported the Under Secretary's decision; and
- a requirement to conduct a DAB milestone IIIA review before approval of low rate initial production.

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DOD Instruction 5000.2 states that if a major modification program is approved, the milestone decision authority will determine which acquisition phase should be entered. This decision will be based on the level of risk, the adequacy of risk management planning, and the amount of resources to be committed.

In granting the live-fire testing waiver, the Under Secretary acknowledged that the Navy was developing a F/A-18E/F live fire-test plan that would be less rigorous than normally required. The Deputy Director, Test and Evaluation, Live-Fire Testing disagreed with the waiver, stating that extrapolating data from previous tests of the F/A-18 and applying it to the E/F, as the Navy plans, is risky. The waiver is allowed under 10 U.S.C. 2366.

In June 1992, the DOD Inspector General criticized the Navy for not preparing a COEA to demonstrate that the F/A-18E/F is the most cost-effective solution to a recognized military need. The Office of the Secretary of Defense countered that the F/A-18E/F would be a major modification of an existing aircraft and that, according to DOD regulations, a COEA is not necessarily required. The Inspector General subsequently reported that the Navy's A/FX aircraft COEA, dated November 19, 1992, comparing the F/A-18E/F to both the F/A-18C/D and the proposed A/FX aircraft, satisfied his earlier concerns. This COEA was prepared by the Center for Naval Analysis.

After the Under Secretary's approval, the Navy did develop a F/A-18E/F live-fire test plan, and the Center for Naval Analysis performed a limited F/A-18E/F COEA (dated December 1992) using information and analysis from the A/FX COEA. The Fiscal Year 1993 National Defense Authorization Act, Public Law 102-484 section 214, dated October 23, 1992, required the Navy to develop prototype aircraft. According to the F/A-18E/F Deputy Program Manager, the Navy will use two EMD aircraft for that purpose.

Navy officials commenting on a draft of this report disagreed with our characterization of the F/A-18E/F COEA as limited. They said all COEAs were limited to some degree. They said a number of fixed-wing aircraft were considered including the A/FX, the F/A-18C/D, the F-22, and the A-6E. We commented on the limited depth of the Navy's analysis in an earlier examination<sup>1</sup> of the decision to develop the F/A-18E/F. At that time, we

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<sup>1</sup>Naval Aviation: Consider All Alternatives Before Proceeding With the F/A-18E/F (GAO/NSIAD-93-144, Aug. 27, 1993).

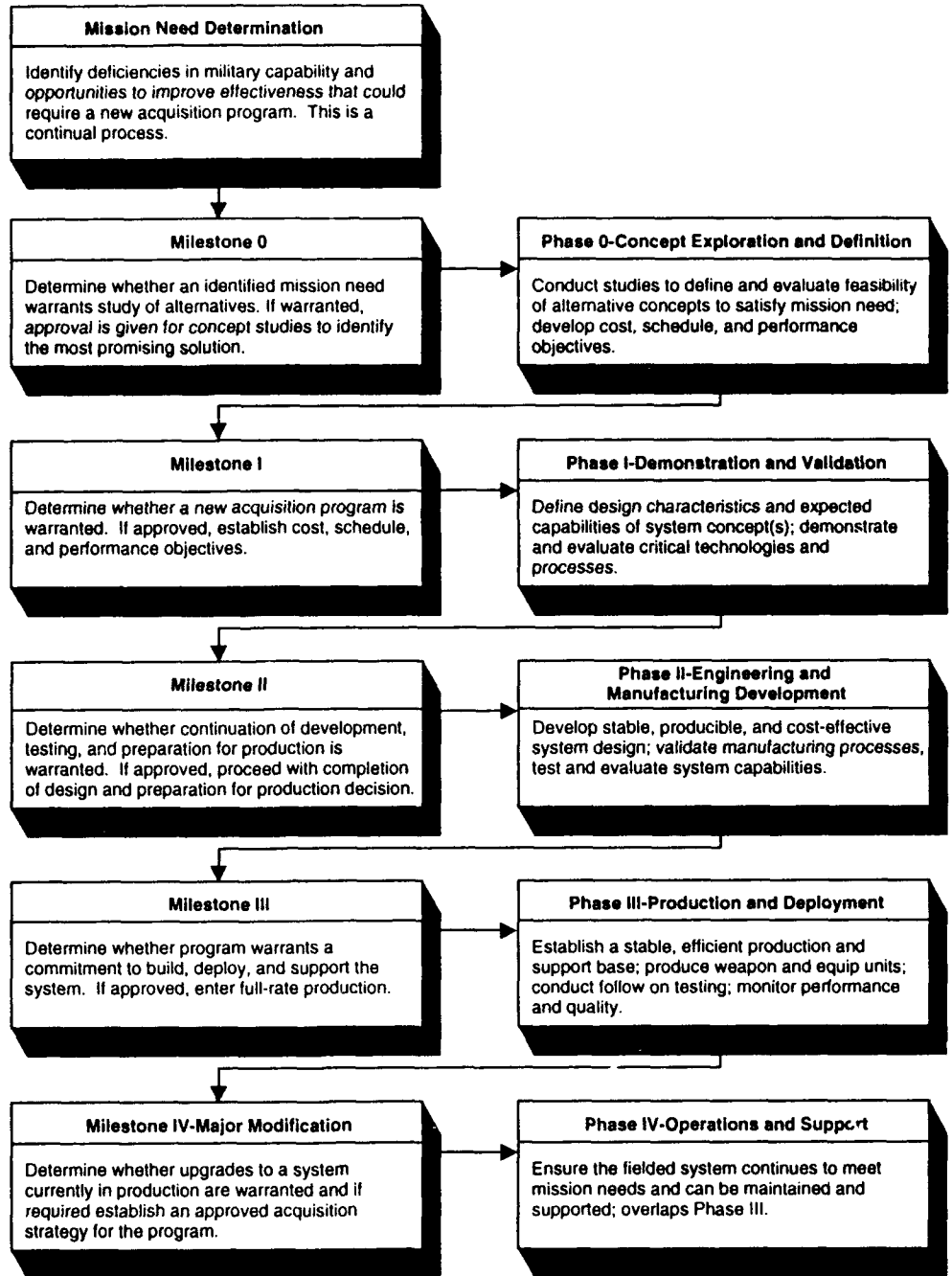
reported that DOD's acquisition regulations required the Navy to consider alternative ways to perform missions before approving a development effort, such as Air Force bombers or missiles. The Navy's analysis did not explore these alternatives. In fact the Center for Naval Analysis officials who prepared the COEA agreed that the E/F COEA was limited.

## Acquisition Regulations Allow Management Discretion

DOD Instruction 5000.2 (Defense Acquisition Management Policies and Procedures) states that a major modification may be brought about by a change in threat or defense planning guidance, an identified operational deficiency, or an opportunity to reduce ownership costs. Neither DOD Directive 5000.1 (Defense Acquisition Management) nor DOD Instruction 5000.2 provide specific criteria for determining whether an acquisition program should be classified as a modification or a new start. The regulations do allow the Under Secretary of Defense for Acquisition to make that determination.

DOD Directive 5000.1 (Defense Acquisition Management) and DOD Instruction 5000.2 (Defense Acquisition Management Policies and Procedures) normally require new programs to be analyzed and reviewed at various decision milestones and receive Department approval before proceeding through each successive step of the acquisition cycle. Figure 1 depicts DOD's System Acquisition Process.

**Figure 1: DOD's System Acquisition Process**



Note: When the Under Secretary approved the F/A-18E/F development as a major modification, he approved entry into phase II of the acquisition cycle or the engineering and manufacturing development phase.

As shown in figure 1, milestone 0 requires a determination that an identified mission need warrants study of alternatives. Approval is obtained to conduct studies that define and evaluate the feasibility of alternative concepts to satisfy mission needs and to develop cost, schedule, and performance objectives. Milestone I requires a determination that a new acquisition is warranted. If approved, program cost, schedule, and performance objectives are established; design characteristics and expected system concepts are explored; and critical technologies and processes are evaluated. Milestone II requires a determination that continuation of development, testing, and preparation for production is warranted. If approved, the program enters EMD, to develop a stable, producible, and cost-effective design; validate manufacturing processes; and test and evaluate system capabilities. Milestone III requires a determination that the program warrants a commitment to build, deploy, and support the system. If approved, the program enters production. A stable, efficient production and support base is established; weapons and equipment are produced; follow-on testing is conducted; and performance and quality are monitored.

The cumulative amount of review, analysis, and documentation for any acquisition program increases as the program progresses through acquisition decision milestones. When the Under Secretary approved E/F development as a major modification, he approved entry into phase II of the acquisition cycle or the EMD phase. By doing this, he authorized bypassing acquisition phases 0 and I. If the E/F had been treated as a new start with development starting at milestone 0, there would have been additional documentation requirements and milestone reviews. For instance, milestone 0 approval would have required a new Mission Needs Statement identifying a mission need that cannot be met by existing systems. The statement must be supported by a validated threat assessment. The Navy did not prepare a Mission Needs Statement for the E/F. It relied upon the assessment that justified the original F/A-18 in the mid-1970s. Milestone I approval would have required either provisions for competitive prototyping or an exception obtained.

Before a system can enter phase III and be deployed, certain additional analyses may be required. The system should include the following:

- A System Threat Assessment Report that documents the military department's threat assessment justifying the system.

- A Test and Evaluation Master Plan that lists the critical development and operational test objectives and outlines the testing and evaluation approach and methodology.
- A COEA, that compares the cost-effectiveness of alternatives. At milestone III, Production Approval, the analysis may be only an update of a previous analysis.

## Development Contract Awarded to McDonnell Douglas Aircraft Company

On July 20, 1992, the Navy awarded the McDonnell Douglas Aircraft Company a sole-source contract to develop the F/A-18E/F. We determined that the Navy complied with requirements of the Competition in Contracting Act (CICA). CICA generally requires agencies to use full and open competition for procurements. However, it recognizes an exception to this requirement when an agency reasonably determines that only one type of property or service is available to satisfy its needs from only one responsible source. This decision involves the determination that the expected cost to develop another source could not be recovered through competition or that an unacceptable delay in fulfilling agency needs would occur.

With regard to the costs needed to develop another source for the aircraft, the Navy's justification and approval (J&A) document, required by CICA to support the sole-source award, states that McDonnell has been the sole designer, developer, weapon system integrator, and producer of the F/A-18 for over 15 years. As a result, McDonnell owns much of the technical data needed to develop any F/A-18 derivative. The J&A document stated that McDonnell has an established supplier base and composite material and manufacturing processes that are not expected to change substantially for the E/F. On this basis, the J&A document concluded that the additional cost to develop another source to the level necessary to provide an upgrade of the F/A-18 aircraft would be prohibitive and could not be recovered through competition.

The Navy's J&A document also concluded that the time needed to develop a second source would result in an undue delay in meeting established milestones. At the time the determination was made, the aircraft the F/A-18E/F was intended to replace were expected to start reaching the end of their fatigue lives in the mid-1990s. The J&A document states that it would be time-consuming to acquire the full F/A-18 technical disclosure package and estimates that the time needed to develop a second source would result in an unacceptable delay of at least 2 years.



Our review was conducted in accordance with generally accepted government auditing standards. We did not obtain written agency comments, but we did obtain oral comments on a draft of this report from Defense and Navy officials. Their views were incorporated where appropriate.

We are sending copies of this report to the Secretaries of Defense and the Navy. We will also make copies available to other interested parties upon request.

If you or your staff have any questions concerning this report, please contact me at (202) 512-3504. Major contributors to this report were Jess T. Ford, William C. Meredith, Jerry W. Clark, and Anthony J. DeFrank.

Sincerely yours,

A handwritten signature in cursive script that reads "Richard Davis".

Richard Davis  
Director, National Security  
Analysis