Audit Report

OFFICE OF THE INSPECTOR GENERAL

REVIEW OF THE SENSOR FUZED WEAPON AS A PART OF THE AUDIT OF THE EFFECTIVENESS OF THE DEFENSE ACQUISITION BOARD REVIEW PROCESS – FY 1992

Report Number 92-050

February 18, 1992

Department of Defense

The following acronyms are used in this report.

APB.....Acquisition Program Baseline
COEA.....Cost and Operational Effectiveness Analysis
DAB.....Defense Acquisition Board
GAO.....General Accounting Office
MOE.....Measure of Effectiveness
ORD.....Operational Requirements Document
SFW.....Sensor Fuzed Weapon

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

February 18, 1992

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION
ASSISTANT SECRETARY OF THE AIR FORCE
(FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Report on the Review of the Sensor Fuzed Weapon as a Part of the Audit of the Effectiveness of the Defense Acquisition Board Review Process--FY 1992 (Report No. 92-050)

We are providing this final report for your information and use. On October 24, 1991, a draft of this report was provided to the addressees for comments. As of February 14, 1992, we had not received responses to the draft report. DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. Therefore, all addressees must provide final comments on the unresolved recommendations by April 20, 1992. See the "Status of Recommendations" section at the end of each finding for the unresolved recommendations and the specific requirements for your comments. If appropriate, you may propose alternative methods for accomplishing desired improvements. This report does not claim any monetary benefits. Recommendations are subject to resolution in accordance with DoD Directive 7650.3 in the event of nonconcurrence or failure to comment.

The courtesies extended to the audit staff are appreciated. If you have any questions on this audit, please contact Mr. Russell A. Rau at (703) 693-0186 (DSN 223-0186) or Mr. Michael Welborn at (703) 693-0402 (DSN 223-0402). The planned distribution of this report is listed in Appendix F.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosure

cc:
Deputy Secretary of Defense
Secretary of the Air Force

Office of the Inspector General

AUDIT REPORT NO. 92-050 February 18, 1992
(Project No. 1AE-0036.01)

REVIEW OF THE SENSOR FUZED WEAPON AS A PART OF THE AUDIT OF THE EFFECTIVENESS OF THE DEFENSE ACQUISITION BOARD REVIEW PROCESS--FY 1992

EXECUTIVE SUMMARY

Introduction. The Air Force Sensor Fuzed Weapon was designed to destroy multiple targets during a single aircraft delivery pass. The Sensor Fuzed Weapon must operate against moving or idling vehicles during day or at night and in all weather conditions. The Sensor Fuzed Weapon system is a 1,000-pound class, unpowered, unguided, wide-area munition that consists of a tactical munition dispenser containing 10 submunitions, each with 4 separate infrared sensor projectiles. Delivery aircraft can carry up to four Sensor Fuzed Weapon munitions.

Objectives. Our overall objective was to evaluate the Defense Acquisition Board review process for acquisition of major Defense acquisition programs. In this report, we evaluated the Sensor Fuzed Weapon program's compliance with applicable DoD directives and instructions. We also reviewed applicable internal controls.

Audit Results. The documentation that the Air Force prepared for the Defense Acquisition Board program review in November 1991 generally complied with the requirements in DoD Directive 5000.1 and DoD Instruction 5000.2. However, this review disclosed two reportable conditions. After the draft report was issued, the Defense Acquisition Board review was rescheduled for March 16, 1992.

o Proposed program-specific exit criteria were not established for proceeding with future production decisions in the Defense Acquisition Board documentation. As a result, management did not have an effective means of measuring progress toward, or justifying proceeding with, future production decisions (Finding A).

o Acquisition program baselines did not contain descriptive performance parameters for lethality and launch aircraft survivability. Also, the baseline agreement was not approved by the Under Secretary of Defense for Acquisition. As a result, the

developmental baseline may not provide decisionmakers sufficient insight into achievement of essential system performance characteristics (Finding B).

Internal Controls. The internal controls applicable to the Sensor Fuzed Weapon program were deemed to be effective in that no material deficiencies were disclosed by the audit. A description of the controls assessed is on page 2 of the report.

Potential Benefits of Audit. The report did not identify any quantifiable monetary benefits (Appendix D).

Summary of Recommendations. We recommended the establishment of specific exit criteria for future Sensor Fuzed Weapon production decisions and acquisition program baselines for the number of kills per aircraft pass required in a countermeasures environment and the survivability of launch aircraft employing the Sensor Fuzed Weapon.

Management Comments. No comments were received in response to the draft report. Comments to the final report are requested from the Under Secretary of Defense for Acquisition and the Assistant Secretary of the Air Force (Acquisition) by April 20, 1992.

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This report was prepared by the Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD. Copies of the report can be obtained from the Information Officer, Audit Planning Technical Support Directorate, (703) 693-0340.

PART I - INTRODUCTION

Background

The Sensor Fuzed Weapon (SFW) was designed to destroy multiple targets, such as main battle tanks, armored personnel carriers, self-propelled artillery, trucks, and support equipment, during a single aircraft delivery pass. The SFW is intended to reduce aircraft attrition due to hostile fire during Air Force battlefield interdictions. The SFW is required to operate against moving or idling vehicles during day or night and in all weather conditions.

The SFW, which is primarily intended to attack an armored vehicle's engine area, is a 1,000-pound class, unpowered, unguided, wide-area munition. The SFW consists of a tactical munition dispenser containing 10 submunitions. Each of the submunitions contains 4 separate projectiles, for a total of 40 projectiles in a single SFW munition. The delivery aircraft, including the F-15E and the F-16, can carry up to four SFW munitions. The SFW is launched over the target area, and at a predetermined position, the munition dispenser releases the 10 submunition delivery vehicles. Projectiles, which use infrared sensors to locate targets, are released from the submunition at a preset distance from the ground.

The SFW program evolved from two separate Air Force weapon system development programs: the wide-area antiarmor munition and the extended range antiarmor munition. The feasibility of the SFW concept was demonstrated under extended range antiarmor munition validation contracts with Honeywell, Inc., and Textron Defense Systems (Textron). In 1985, the Air Force selected Textron for the SFW demonstration and validation program as a result of a competitive evaluation of the extended range antiarmor munition contractors. In November 1985, the Air Force awarded a fixed-price-incentive-fee contract for SFW full-scale engineering development to Textron.

Initially, the Air Force retained milestone decision authority for the SFW program because the program did not meet the criteria for Defense Acquisition Board (DAB) cognizance, as defined in the September 1, 1987, versions of DoD Directive 5000.1, "Major and Non-Major Defense Acquisition Programs," and DoD Instruction 5000.2, "Defense Acquisition Program Procedures." Although the SFW qualified as a major Defense acquisition program in 1986, the Under Secretary of Defense for Acquisition did not formally designate SFW as a DAB program until 1988. The SFW program was not scheduled for a formal DAB review until September 1991 (postponed until November 1991 and then rescheduled for March 1992).

The Air Force plans to procure approximately 16,700*/ SFW systems through FY 2002. Total program costs in then-year dollars will be about $200 million for research and development and $3.3 billion for procurement. The acquisition strategy provides for three low-rate initial production buys leading to a DAB Milestone III Production and Deployment decision in September 1994. A dual source competition is projected for the projectile, and potentially the complete munition, in FY 1996 with the second source being selected concurrent with the FY 1992 low-rate initial production buy.

Objective

Our overall objective was to evaluate the DAB review process for acquisition of major Defense acquisition programs. In this report, we evaluate the SFW program's compliance with applicable DoD directives and instructions. Our evaluation of the effectiveness of the DAB process and internal controls will be addressed in our summary report.

Scope

To accomplish our objectives, we reviewed documents that the Air Force prepared and submitted to the Under Secretary of Defense for Acquisition as part of the DAB review process prescribed in DoD Directive 5000.1, "Defense Acquisition," and DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures." We also reviewed data supporting the DAB documentation prepared by the Air Force and the Defense Intelligence Agency from March 1989 to July 1991. Appendix A contains a list of the DAB documentation requested to perform this audit. We performed this audit from July 1 through October 9, 1991. Our audit was made in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were considered necessary. Activities visited or contacted are listed in Appendix E.

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*/ After completion of audit field work, program quantities were reduced with the exact quantity under deliberation at the time of report issuance.

Internal Controls

As part of the SFW program review, we evaluated the internal controls associated with the adequacy of data provided to the DAB and deemed them to be effective in that the review did not disclose any material deficiencies as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38.

Prior Audits and Other Reviews

The DoD Inspector General and the General Accounting Office (GAO) have each issued one report on the SFW program. Both reports are summarized in Appendix B.

Other Matters of Interest

On August 29, 1991, the Deputy Inspector General informed the Under Secretary of Defense for Acquisition of our findings concerning the exit criteria and acquisition program baselines on the SFW program. Subsequently, we discussed the subject of use of exit criteria with numerous officials within the Office of the Under Secretary. The Under Secretary of Defense for Acquisition issued a memorandum for DAB members on September 6, 1991, concerning acquisition program baselines (APB) and exit criteria. The memorandum clarified key concepts regarding APBs and exit criteria. The Under Secretary stated in his memorandum that the APB defines the overall acquisition program for a system as the user expects it to ultimately perform and exit criteria as achievements for a phase that measures progress toward meeting APB thresholds. A copy of the memorandum is in Appendix C.

PART II - FINDINGS AND RECOMMENDATIONS

A. EXIT CRITERIA

The Air Force did not establish adequate proposed program-specific exit criteria for proceeding with future production decisions on the SFW program. Specifically, the Air Force did not include any proposed exit criteria for the FY 1993 and FY 1994 low-rate initial production decisions and only general exit criteria for the FY 1995 DAB Milestone III Production and Deployment decision in the SFW Integrated Program Summary document. Exit criteria were not required at the time of the Milestone II Full-Scale Engineering Development; therefore, exit criteria were not established when the SFW became a designate DAB program. Exit criteria were established to support only the first low-rate initial production decision by the DAB for the February 1992 program review. As a result, DoD and Air Force acquisition management did not have an effective means of measuring progress toward, or justifying proceeding with, future production decisions.

DISCUSSION OF DETAILS

Background

DoD Directive 5000.1 requires that successive acquisition phases provide a systematic, structured environment to translate broad mission needs into specific system requirements. One of the primary means of establishing specific program requirements for each acquisition phase is through event driven acquisition strategies that explicitly link major contractual commitments and milestone decisions to demonstrated accomplishments. Acquisition strategies should be tailored to accomplish established program-specific objectives and to control risk. Acquisition strategies must also provide the information essential for milestone decisions.

DoD Instruction 5000.2, part 11, section A 3.e.(2), defines exit criteria as:

> . . . the specific minimum requirements that must be satisfactorily demonstrated before an effort or program can progress further in the current acquisition phase or transition to the next acquisition phase. Failure to meet an exit criterion halts the progress of the system towards the next milestone decision point.

a) Exit criteria are tied to the acquisition phase in which the program is currently engaged and represent a point on the path or growth curve toward the cost, schedule, and performance characteristics of the system defined in the acquisition program baseline for that phase.

b) Exit criteria are not always performance parameters, but may be training events, test events, cost, or contract provisions.

Exit criteria linked to essential program accomplishments provide a means of evaluating a program's progress during the current acquisition phase. Exit criteria can highlight key developmental events and avoid premature commitment to programs. In addition, when exit criteria are properly incorporated into contracts, their use can avoid forcing program decisions solely because of potential loss of contract options that may expire on a certain date and identify contractor responsibility for the cost of program delays covered by events within the contractor's control. DoD 5000.2M requires that the Integrated Program Summary contain proposed exit criteria. Such exit criteria are fundamental to acquisition milestone or program review decisions and proper program oversight by DoD acquisition officials.

Potential Exit Criteria

The March 1992 DAB review of the SFW is being held so that the Under Secretary of Defense for Acquisition can decide whether to approve entering into low-rate initial production of the SFW, formerly a Milestone IIIA decision point. The Air Force's proposed acquisition strategy recommends that production be initiated in FY 1992 with the first low-rate initial production contract for 98 units costing about $95.7 million. In FY 1993, the Air Force plans to select a second source for the SFW projectile and award the second low-rate initial production contract for 560 units estimated at $252.6 million to Textron, the original supplier. The FY 1994 and FY 1995 production contract awards will be priced options on the FY 1993 award to Textron. The FY 1994 option is the third low-rate initial production contract for 1,364 units estimated at $335.6 million. The FY 1995 option will not be exercised until after the Under Secretary of Defense for Acquisition's approval at the DAB Milestone III in late 1994 when the SFW is scheduled to proceed into full-rate production.

Our review of the DAB documentation and supporting data that the SFW project office prepared in support of the upcoming DAB program review indicated a number of potential program, testing, and development events that could be specifically linked to future production decisions and form exit criteria, thus providing management with measures of overall program success in terms of program accomplishments. Exit criteria should also be reflected in future SFW contracts in the form of demonstrated events in order to measure contractor performance, as called for in DoD Instruction 5000.2. Specifically, the Instruction requires that event driven acquisition strategies link program decisions to demonstrated accomplishments in development testing and initial production and contract events support the appropriate exit criteria for the phase or intermediate development events established in the acquisition strategy.

For example, there are contract events cited in the first low-rate initial production request for proposals that were forwarded to Textron on August 5, 1991. These events, which include unit delivery and acceptance testing, are to be tracked by the Government and could be considered for inclusion as exit criteria for future production decisions. Because additional contract events may be needed to adequately reflect exit criteria, it may be necessary to modify the solicitation to ensure DAB approved exit criteria are set forth in contract events, as required.

Potential exit criteria concerning the decision to dual source the SFW and the completion of initial operational test and evaluation should also be considered. For example, our review of the cost-benefit analysis that the project office prepared stated a $73 million savings to the DoD through dual sourcing the SFW program. Another cost-benefit analysis performed by the Director of Cost Analysis, Deputy for Comptroller, Aeronautical Systems Division, Air Force Systems Command, stated that DoD could lose $30 million if the program is dual sourced. The results of both cost-benefit analyses were presented to the OSD Cost Analysis and Improvement Group and are scheduled to be presented by the Group as part of the March 1992 DAB program review. Given the potential loss if the SFW is dual sourced, the continued cost-effectiveness of the dual sourcing based on the results of contract negotiation and program progress should be an exit criteria for the second and third low-rate initial production decisions scheduled for FYs 1993 and 1994, respectively.

Causes for Lack of Exit Criteria

The DAB documentation did not contain exit criteria because the February 1992 DAB program review is the first review of SFW as a DAB acquisition program under the February 23, 1991, 5000 series of DoD acquisition directives. Exit criteria were not established for the SFW program at the FY 1986 Milestone II Full-Scale Engineering Development (now Engineering and Manufacturing Development in DoD Instruction 5000.2) review because the acquisition regulations in effect at that time did not require exit criteria. Subsequently, exit criteria were not adequately established when the SFW was designated a DAB program.

The Air Force did not require, or previously establish, exit criteria in the program except to support entering low-rate initial production. The Air Force Program Director for the SFW informed us that in his view, exit criteria are not required at subsequent low-rate initial production decision points, only at entry into low-rate initial production. When the exit criteria are required will be decided at the upcoming DAB program review. The Program Director also stated that program-specific exit criteria would be presented to the DAB for the Milestone III decision at the upcoming program review. However, the program-specific exit criteria were not contained in the DAB documentation, which stated only three general exit criteria.

Effect of Not Having Established Exit Criteria

The absence of specific exit criteria geared to the subsequent production decisions may impede OSD's and the Air Force's ability to make subsequent second and third low-rate initial production decisions because there are no objective means of evaluating program progress against the event based acquisition strategy. The 5000 series of directives identifies a number of requirements for a Milestone III decision, such as completion of a Beyond Low-Rate Initial Production Report by the Director, Operational Test and Evaluation, which essentially are exit criteria. However, additional program-specific exit criteria are required based on the unique aspects of each program, including the SFW.

DoD Instruction 5000.2, part 11, section C, attachment 1, requires that the Under Secretary of Defense for Acquisition approve the exit criteria to be used in the next phase of a major Defense acquisition program in the Acquisition Decision Memorandum. The exit criteria are then intended to be used to ensure specific minimum requirements are satisfactorily demonstrated before the program progresses in the current acquisition phase or transitions to another phase. As a result, the exit criteria should minimize OSD program oversight during

particular acquisition phases. Additionally, successfully completed exit criteria provide an objective and prompt means of evaluating program progress, while failure to meet exit criteria is an indication of a need for additional management attention.

RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Assistant Secretary of the Air Force (Acquisition):

a. Direct the development of proposed exit criteria for each subsequent production decision in the Sensor Fuzed Weapon program, including all low-rate initial production and Milestone III Production and Deployment decisions.

b. Incorporate, as appropriate, the exit criteria approved by the Under Secretary of Defense for Acquisition as contract events into all Sensor Fuzed Weapon production contracts.

2. We recommend that the Under Secretary of Defense for Acquisition establish program-specific exit criteria for future Sensor Fuzed Weapon production decisions, including low-rate initial production and Milestone III Production and Deployment decisions.

MANAGEMENT COMMENTS

We requested that comments on the draft report be provided to us by December 23, 1991. As of February 14, 1992, we had not received responses to the draft report. Therefore, we request that the Assistant Secretary of the Air Force (Acquisition) and the Under Secretary of Defense for Acquisition provide comments to the final report.

STATUS OF RECOMMENDATIONS

		Response Should Cover:		
Number	Addressee	Concur/ Nonconcur	Proposed Action	Completion Date
1.a.	SAF/AQ	X	X	X
1.b.	SAF/AQ	X	X	X
2.	USD(A)	X	X	X

B. ADEQUACY OF ACQUISITION PROGRAM BASELINES

The APB for the SFW program, while generally complete, did not include descriptive performance parameters for SFW lethality in a countermeasures environment or for launch aircraft survivability. Also, the Air Force had not submitted the APB agreement to the Under Secretary of Defense for Acquisition and the Joint Requirements Oversight Council for review since April 1990 because the Air Force had not, in its opinion, initiated revisions to the baselines that warranted further approval until the DAB Milestone III Production and Deployment decision. The Air Force included a lethality baseline in a noncountermeasures environment that was considered sufficient although it did not reflect the SFW's operational environment. Also, the Air Force considered launch aircraft survivability to be implied in the SFW mission and not required as a separate program baseline. As a result, the baselines by which the SFW are being developed and tested to determine operational effectiveness may not provide decisionmakers sufficient insight into achievement of essential system performance characteristics for the SFW program.

DISCUSSION OF DETAILS

Background

To effectively control the SFW program, decisionmakers in the acquisition chain must be kept informed of emerging problems. DoD Instruction 5000.2, part 11, section A, requires that the Development Baseline include thresholds for the key performance parameters using the minimum acceptable operational requirements identified in the Operational Requirements Document (ORD) for those parameters. Before DAB reviews, the Joint Requirements Oversight Council is responsible for validating these performance goals and baselines. Specifically, the Council validates performance objectives and thresholds proposed for acquisition program baselines of acquisition category I programs coming to the DAB commencing at Milestone I. Additionally, the Joint Requirements Oversight Council reviews programs scheduled for milestone review to ensure that performance objectives and thresholds proposed for the programs include a capability that satisfies operational requirements.

Program Baseline for the SFW

Lethality of SFW. The July 1991 APB agreement did not address the lethality required for the SFW in an operational environment with defensive countermeasures. Neither the June 1990 System Operational Requirements Document nor the

June 1991 Test and Evaluation Master Plan addressed lethality for the SFW in countermeasures and noncountermeasures environments. In our opinion, the baseline agreement should include the minimum acceptable lethality thresholds and objectives stated in kills per aircraft pass in both operational environments, as specified in requirements documents and as required in DoD Instruction 5000.2, part 11, section A. Specifically, SFW lethality as measured by the number of target kills per aircraft pass was stated only in an operational environment with no defensive countermeasures present. However, the System Threat Assessment Report states that countermeasures are both likely and serious threats to the SFW and therefore we consider the countermeasures environment to be a meaningful, and perhaps more realistic, basis for an acquisition program baseline. It should be noted that preliminary operational test and evaluation reports indicated that the SFW was exceeding performance parameters for lethality in both required environments.

Survivability thresholds for launch aircraft. The Tactical Air Command did not establish a launch aircraft survivability threshold. In our opinion, this decision resulted in a significant deficiency in the program baseline because the purpose of the SFW requirement is for multiple kills per aircraft pass and to enhance aircraft survivability. Survivability of launch aircraft, which is a key factor in delivery of ordnance, should be considered in establishing thresholds for performance parameters. If launch aircraft deliver the SFW to designated armored battlefield targets using tactics at altitudes in which the SFW is considered most effective, the risk of launch aircraft attrition may be greatly increased.

According to the SFW program office, the SFW will be most effective when the launch aircraft attacks designated battlefield vehicle columns head-on and delivers the weapon at low altitudes over those targets. However, this tactic increases the risk of launch aircraft attrition because the head-on attack also increases launch aircraft vulnerability to counterattack.

During the March 7, 1991, SFW Conventional Systems Committee planning meeting, the Office of the Assistant Secretary of Defense (Program Analysis and Evaluation) requested that the Tactical Air Command provide an analysis of the SFW's effectiveness in a case of "no-attrition" of launch aircraft. This analysis was to be incorporated as part of the SFW Cost and Operational Effectiveness Analysis (COEA). The SFW COEA, dated June 28, 1991, stated that five measures of system effectiveness were used to assess the SFW; however, the Measure of Effectiveness (MOE) cost per kill included all of the four MOEs and was the only one that actually compared cost and operational

effectiveness. The four MOEs that made up the cost per kill MOE, kills per pass, sorties per kill, munitions per kill, and aircraft attrition per kill were all products of the operational effectiveness analysis. In turn, we found that the COEA concluded that cost per kill was most sensitive to, and driven by, aircraft attrition. While the COEA also concluded that the cost benefit of SFW increased with higher aircraft attrition, we believe that an APB that incorporates aircraft attrition and the other measures of effectiveness (for example, cost per kill) is required.

Currently, kills per pass is an established, APB parameter and is the primary operational effectiveness MOE. While kills per pass directly influenced all other MOEs in the COEA including aircraft attrition per kill, aircraft attrition does not influence kills per pass. Therefore, we do not consider aircraft attrition to be a part of any of the existing acquisition program baselines. Use of kills per pass as the sole APB performance parameter associated with operational effectiveness does not provide for consideration of aircraft attrition.

DoD Instruction 5000.2 states that baselines should include the key cost, schedule, and performance parameters established in the ORD. DoD Instruction 5000.2 defines key parameters as those that if the threshold established is not met, the milestone decision authority would require a reevaluation of alternative concepts or design approaches. The SFW ORD does not specify a performance parameter that includes aircraft attrition, although the ORD emphasizes attack aircraft survivability and the ability of the SFW to permit low attrition delivery profiles and multiple kills per pass. Specified performance parameters are related to employment tactics that would affect launch aircraft survivability, although the relationship between these tactics and aircraft survivability is not established in the performance parameters. We believe that this relationship should be established, and can be accomplished, through use of the existing performance parameters and one or more additional parameters that specifically include aircraft attrition in some form.

Under Secretary of Defense for Acquisition approval. The revised SFW APB agreement, July 14, 1991, has not been submitted to the Under Secretary of Defense for Acquisition for approval even though the SFW is designated an Acquisition Category ID program. The Air Force has indicated that there is no requirement for the Under Secretary of Defense for Acquisition, who is the milestone decision authority for the SFW, to approve this document until the Milestone III Production and Deployment decision because of the SFW program's transition from an Air Force to an OSD milestone decision authority after the

Milestone II decision point. The Air Force's position is based on the Under Secretary's approval of the development baseline on April 17, 1990, and the Air Force's determination that no changes had occurred to these approved baselines. However, we noted that while the Air Force's conclusion concerning the baselines was correct, there were several program changes highlighted in the SFW baseline agreement signed by the Assistant Secretary of the Air Force (Acquisition) on July 14, 1991, that are significant and should be reviewed by the Under Secretary of Defense for Acquisition. For example, the President's FY 1992 budget reduced procurement funds for the total program by $367.9 million (then-year dollars) and did not support a previously approved Multi-Staged Improvement Program. The Multi-Staged Improvement Program was intended to improve overall operational effectiveness by increasing the number of target engagements. Also, the April 1990 baselines did not incorporate additional baselines for the SFW in a countermeasures environment and launch aircraft survivability.

RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Assistant Secretary of the Air Force (Acquisition):

a. Direct the development of proposed performance parameters in the acquisition program baselines agreement for the number of kills per aircraft pass required in a countermeasures environment and launch aircraft survivability.

b. Submit the Sensor Fuzed Weapon acquisition program baseline agreement, including Air Force recommended baselines, to the Under Secretary of Defense for Acquisition and Joint Requirements Oversight Council for review.

2. We recommend that the Under Secretary of Defense for Acquisition establish acquisition program baselines for the Sensor Fuzed Weapon program, including performance parameters for lethality in a countermeasures environment and launch aircraft survivability, after the Joint Requirements Oversight Council has concurred with the performance parameters.

MANAGEMENT COMMENTS

We requested that comments on the draft report be provided to us by December 23, 1991. As of February 14, 1992, we had not received responses to the draft report. Therefore, we request that the Assistant Secretary of the Air Force (Acquisition) and the Under Secretary of Defense for Acquisition provide comments to the final report.

STATUS OF RECOMMENDATIONS

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Number	Addressee	Concur/ Nonconcur	Proposed Action	Completion Date
1.a.	AF/AQ	X	X	X
1.b.	SAF/AQ	X	X	X
2.	USD(A)	X	X	X

PART III - ADDITIONAL INFORMATION

Appendix A - Documents Reviewed
Appendix B - Prior Audits and Other Reviews
Appendix C - Acquisition Program Baselines and Exit Criteria
Appendix D - Summary of Potential Benefits Resulting from Audit
Appendix E - Activities Visited or Contacted
Appendix F - Report Distribution

APPENDIX A: DOCUMENTS REVIEWED

System Threat Assessment Report
Integrated Program Summary
Development Test and Evaluation Report
System Operational Requirements Document
Program Life Cycle Cost Estimate
Independent Cost Estimate
Acquisition Program Baseline Agreement
Test and Evaluation Master Plan
Human Systems Integrated Plan
Configuration Plan
System Engineering Management Plan*
Functional Configuration Audit
Program Readiness Reviews
Production Transition Program
Results from Documentation Review by OSD
Program Cost Estimation
Initial Operational Test and Evaluation Report
Manpower Estimate Report
Cost and Operational Effectiveness Analysis
Acquisition Plan
Integrated Logistics Support Plan
Manufacturing Plan
Planning Meeting Minutes
Cost Analysis Improvement Group Report
Defense Acquisition Executive Summary Reports
Joint Requirements Oversight Council Assessment
Defense Intelligence Agency Report
Cost-Performance Reports
Contract Funds Status Report

* The SFW system Program Office did not prepare a System Engineering Management Plan because it is not a requirement in the full-scale development contract. Further, the system Program Office stated that the information provided in the System Engineering Management Plan is in other documents, and therefore a System Engineering Management Plan would have been redundant and unnecessary.

APPENDIX B: PRIOR AUDITS AND OTHER REVIEWS

General Accounting Office Report No. NSIAD-91-235 (OSD Case No. 8718), "Munitions Procurement: Resolve Questions Before Proceeding With Sensor Fuzed Weapon Production," August 16, 1991, concluded that although the SFW's test results indicate that technical problems have been overcome, the SFW's cost and operational effectiveness in its primary mission is unknown, and threat changes could affect the need for the SFW. GAO recommended that the Secretary of Defense direct the Secretary of the Air Force to assess the SFW's cost and operational effectiveness in comparison to the full range of interdiction weapons using an approved interdiction criterion and not approve the SFW for production until the Air Force conclusively demonstrates that the weapon is cost-effective in its primary mission. DoD disagreed with GAO's interpretation of the requirements for the SFW, which DoD said led to erroneous conclusions about the criterion being used to measure the effectiveness of the SFW for the cost and operational effectiveness analysis.

Department of Defense, Inspector General, Report No. 90-072, "Acquisition of the Sensor Fuzed Weapon," May 23, 1990, concluded that the SFW may not satisfy the mission requirement of the Tactical Air Forces because design limitations and planned testing of the SFW will not adequately assess required system performance in the postulated Soviet threat. Additionally, program documentation and reports essential to effective monitoring of the SFW full-scale development program were missing or incomplete. The report recommended that the Under Secretary of Defense for Acquisition direct that an independent Cost and Operational Effectiveness Analysis be made to determine if the SFW is the most cost-effective weapon system to meet the interdiction mission requirements; the Under Secretary of Defense for Acquisition convene the DAB to decide on the direction of the SFW; the Air Force provide additional research and development funds to improve the SFW; OSD revise DoD Directive 5000.1 and DoD Instruction 5000.2 to include guidance on transition from minor to major program status; and the Air Force Systems Command submit deviation reports to the Under Secretary of Defense for Acquisition on baseline breaches. Management's response incorporated the known design problems associated with SFW development, and the Under Secretary of Defense for Acquisition directed that the Air Force report to the Conventional Systems Committee on the status of the program. As a result, the Air Force restructured the program, and the program review was moved

to September 1991 (now postponed until February 1992). Because of the restructure, additional research and development funds were required and a Cost and Operational Effectiveness Analysis was to be conducted before the program review decision. The Cost and Operational Effectiveness Analysis was to compare the SFW's performance with competing antiarmor weapons in meeting the interdiction mission requirements of the Tactical Air Command.

APPENDIX C: ACQUISITION PROGRAM BASELINES AND EXIT CRITERIA

THE UNDER SECRETARY OF DEFENSE
WASHINGTON, DC 20301

ACQUISITION

6 SEP 1991

MEMORANDUM FOR DEFENSE ACQUISITION BOARD MEMBERS

SUBJECT: Acquisition Program Baselines and Exit Criteria

During the review of the ATF, it became apparent to me that there is a great deal of confusion over what is contained in an Acquisition Program Baseline (APB), what exit criteria are and how exit criteria should be used, and the relationship between the two. The purpose of this memorandum is to clarify in a short space some of the key concepts regarding APBs and exit criteria by integrating the guidance given in Sections 2, 4-B, and 11-A of DoD Instruction 5000.2.

Attached is a discussion of APBs and exit criteria which reflects the way these concepts are defined and used in DoD Instruction 5000.2. The attachment represents how I intend to use APBs and exit criteria in overseeing acquisition programs.

Don Yockey

Attachment

ACQUISITION PROGRAM BASELINES AND EXIT CRITERIA

Each Acquisition Program Baseline (APB) contains objectives and minimum acceptable requirements -- known as thresholds -- for key cost, schedule, and performance parameters. While the level of detail of the APB evolves as the program progresses, DoDI 5000.2, Section 11-A states that "values for APB parameters reflect the cost and performance characteristics of the system as it is expected to be produced and/or fielded..." (emphasis added). Exit criteria, unlike the APB, are tailored to the phase and are described in both Part 2 and Section 11-A of DoDI 5000.2 as "program-specific results to be required in the ... phase." Exit criteria are gates that must be passed for significant events to occur during a phase, as well as criteria which must be satisfied at the end of a phase before passing to the next phase.

ACQUISITION PROGRAM BASELINES -- PURPOSE, CONTENT, AND EVOLUTION

Section 11-A defines key parameters for baselines as "those that if the thresholds are not met the milestone decision authority (MDA) would require a reevaluation of alternative concepts or design approaches." This means the MDA may revisit the Milestone I or II decision unless there is a compelling reason to relax the threshold. Thresholds and objectives in the APB should be determined, by and large, by the interrelated work done in the previous phase -- requirements evolution, cost estimates, acquisition strategy determination, and cost and operational effectiveness analyses.

The identification of APB parameters is done by both the requirements validation authority and the MDA. The requirements validation authority -- the JROC for ACAT ID programs -- identifies the key operational performance (and schedule, if appropriate) parameters in the Operational Requirements Document (ORD), and these parameters should be included in the APB. The MDA may include in the APB other key performance parameters identified by technical risk assessment, cost and operational effectiveness analysis, etc.

Likewise, the specification of values for the APB parameters is done by both the requirements validation authority and the MDA. The values of thresholds for operational performance, and occasionally for operational capability schedules, are derived from the ORD as described in Section 4-B of DoDI 5000.2, and ORD values should be influenced by analyses as well as military judgment. APB objectives for operational performance may be derived from the ORD but as noted in Paragraph 2c(3) of Section 4-B, they may be influenced by other considerations such as cost and operational effectiveness analyses. Values for both thresholds and objectives for non-operational key parameters are specified by the MDA based on assessments and analyses. Objectives may be the same as the threshold values, or they may represent a meaningful increment beyond the threshold level.

DIFFERENT PURPOSES, DIFFERENT FUNCTIONS

The APB defines the overall acquisition program (cost, schedule, performance) for a system as the user expects it to ultimately perform and the Department expects it to cost. Program status is measured and reported relative to the APB. Exit criteria define program specific achievements for a phase of the acquisition program that are measures of progress (risk reduction), during and/or at the end of a phase, toward meeting APB thresholds. Additional program activities or program reviews are triggered by failure to meet exit criteria.

The initial APB at Milestone I, the Concept Baseline, contains a few key cost, schedule, and performance parameters. Subsequent baselines (Development at Milestone II and Production at Milestone III) include additional, more specific, key parameters representing the results of tradeoffs during the previous phase. Demonstration of these key parameters -- and other parameters in the ORD -- provide the test data to assess if the system is operationally effective and suitable and meets the mission need. The higher order parameters in the previous baseline -- possibly refined as a result of tradeoffs and analyses in the previous phase -- should be retained in the new baseline unless no longer judged to be key.

At earlier milestones, risk management, as described in Part 2, paragraph 3 of DoDI 5000.2, and the achievement of any exit criteria, as described below, establish confidence in our ability to achieve program thresholds. Performance thresholds should be demonstrated prior to commitment to full rate production (Milestone III) unless the particular parameter (e.g., reliability) requires more test data than can reasonably be expected at Milestone III. In this case, a value on a growth curve should be demonstrated.

EXIT CRITERIA -- PURPOSE, NATURE, AND USE

During a phase, exit criteria may serve as "gates" that, when successfully passed (or exited), allow the program office to expand its activities or commitments within that phase (e.g., long-lead procurement or low-rate initial production), with or without a formal program review. At the end of a phase, exit criteria are any program-specific accomplishments required in addition to the minimum required accomplishments for the phase (listed in Part 3 of DoDI 5000.2) and any other ADM direction. In either case, exit criteria may be related to performance, technology (e.g., demonstrate a new manufacturing process), or events (e.g., CDR, first flight, final assembly). Exit criteria may be established for a performance parameter in the APB if the demonstration of that performance parameter to some value -- not necessarily the threshold -- is critical to risk reduction for the particular phase of the program. This usage is most likely for the Dem/Val phase.

Exit criteria should be carefully and selectively applied. They are intended to be beneficial to both the MDA and the PM. For the MDA, exit criteria offer flexibility to set execution boundaries for each phase of the program and to regulate the amount of oversight to be applied during the phase. For the PM, exit criteria offer the freedom to execute key events during the phase without the formality of MDA and staff reviews except at Milestone decisions. However, if exit criteria are not met, they may delay progress or trigger a program review. To be effective, exit criteria must be specific and quantitative. They are not intended to repeat or usurp the minimum required accomplishments for each phase contained in DoDI 5000.2, or the APB objectives and thresholds.

APPENDIX D: SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT

Recommendation Reference	Description of Benefit	Type of Benefit
A.1.a.	Compliance with Regulation. Development of proposed exit criteria for each subsequent production decision in the SFW program, including all low-rate initial production and Milestone III Production and Deployment decisions.	Nonmonetary.
A.1.b.	Compliance with Regulation. Incorporate approved exit criteria as contract events into all SFW production contracts.	Nonmonetary.
A.2.	Compliance with Regulation. Establish exit criteria for future SFW production decisions, including low-rate initial production and Milestone III Production and Deployment decision.	Nonmonetary.
B.1.a.	Compliance with Regulation. Development of proposed performance parameters in the APB agreement for the number of kills per aircraft pass required in a countermeasures environment, and launch aircraft survivability.	Nonmonetary.

APPENDIX D: SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT (cont'd)

Recommendation Reference	Description of Benefit	Type of Benefit
B.1.b.	Compliance with Regulation. Submit the SFW APB to the Under Secretary of Defense for Acquisition and the Joint Requirements Oversight Council for review.	Nonmonetary.
B.2.	Compliance with Regulation. After the Joint Requirements Oversight Council has concurred with the performance parameters for the SFW, the Under Secretary of Defense for Acquisition should establish acquisition program baselines for the SFW program, including performance parameters for lethality in a countermeasures environment and launch aircraft survivability.	Nonmonetary.

APPENDIX E: ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Office of the Under Secretary of Defense for Acquisition, Washington, DC
Office of the Assistant Secretary of Defense (Program Analysis and Evaluation), Washington, DC
Office of the Director, Defense Research and Engineering (Tactical Warfare Programs), Washington, DC
Office of the Director, Acquisition Policy and Program Integration, Washington, DC

Department of the Air Force

Office of the Assistant Secretary of the Air Force (Acquisition), Washington, DC
Office of the Assistant Secretary of the Air Force (Financial Management and Comptroller), Washington, DC
Aeronautical Systems Division, Sensor Fuzed Weapon and Airfield Attack System Program Office, Eglin AFB, FL
Commander, Air Force Operational Test and Evaluation Center, Eglin AFB, FL

Defense Agency

Defense Intelligence Agency, Washington, DC

APPENDIX F: REPORT DISTRIBUTION

Office of the Secretary of Defense

Deputy Secretary of Defense
Under Secretary of Defense for Acquisition
Director, Defense Research and Engineering
Assistant Secretary of Defense (Production and Logistics)
Assistant Secretary of Defense (Program Analysis and Evaluation)
Comptroller of the Department of Defense
Director, Operational Test and Evaluation
Director, Joint Staff

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Acquisition)
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Commander, Aeronautical Systems Division
Program Director, Sensor Fuzed Weapon and Airfield Attack System Program Office

Defense Agency

Director, Defense Intelligence Agency

Non-DoD Activities

Office of Management and Budget

U.S. General Accounting Office,
NSIAD Technical Information Center

Congressional Committees:
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
Ranking Minority Member, Senate Committee on Armed Services
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
Ranking Minority Member, House Committee on Appropriations
House Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security, Committee on Government Operations

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