January 31, 2003

Acquisition

Acquisition of the Synthetic Aperture Radar/Moving Target Indicator
(D-2003-052)

Department of Defense
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Acronyms

C4I	Command, Control, Communications, Computers, and Intelligence
CECOM	Communications and Electronics Command
SAR/MTI	Synthetic Aperture Radar/Moving Target Indicator
TUAV	Tactical Unmanned Aerial Vehicle

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202–4704

January 31, 2003

MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Report on the Acquisition of the Synthetic Aperture Radar/Moving Target Indicator (Report No. D-2003-052)

We are providing this report for your information and use. No written response to this report was required, and none was received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the staff. Questions should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) or Ms. Susan J. Lippolis at (703) 604-9081 (DSN 664-9081). See Appendix B for the report distribution. The team members are listed inside the back cover.

for David K. Steensma
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General of the Department of Defense

Report No. D-2003-052 **January 31, 2003**
Project No. D2002AE-0164

Acquisition of the Synthetic Aperture Radar/Moving Target Indicator

Executive Summary

Who Should Read This Report and Why? Those who are specifically involved in the management, support, and oversight of the Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) should read this report because it discusses why the SAR/MTI program was halted and pending program actions.

Background. The SAR/MTI is an Army acquisition category III program. SAR/MTI, when installed on the Tactical Unmanned Aerial Vehicle (TUAV), is to provide imaging of stationary targets and detection of moving targets, resulting in the tactical commander having increased situational awareness during periods of adverse weather and through battlefield obscurants. The Army estimates that total life-cycle costs would exceed $100 million for acquiring, operating, and maintaining 86 SAR/MTI systems.

Results. Overall, the program office was cost-effectively developing and readying the SAR/MTI for full-rate production on the TUAV. Because the Army has decided not to install the SAR/MTI on the TUAV but on the Extended Range/Multi-Purpose air vehicle and other as yet undefined air vehicles, the Program Executive Officer for Intelligence, Electronic Warfare and Sensors halted contractual actions until the Army clarifies SAR/MTI requirements in operational requirements documents being prepared for the new platforms. As a result, existing program documentation such as the acquisition strategy; the command, control, communications, computers, and intelligence support plan; the operational requirements document; the test and evaluation master plan; the program protection plan; the life-cycle cost estimate; and the risk management plan will need to be revised once the operational requirements documents for the new platforms are approved. We reviewed the management control program as it related to the SAR/MTI. Management controls that the Program Executive Office for Intelligence, Electronic Warfare, and Sensors implemented were adequate in that we identified no material management control weakness. (See the Finding section for details.)

Management Comments. We provided a draft of this report on December 23, 2002. No written response to this report was required, and none was received. Therefore, we are publishing this report in final form.

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Background

The Synthetic Aperture Radar/Moving Target Indicator (SAR/MTI) is an Army acquisition category III program. When installed on the Tactical Unmanned Aerial Vehicle (TUAV), the SAR/MTI has the capability of imaging stationary targets and detecting moving targets. SAR/MTI can also increase the tactical commander's situational awareness during periods of adverse weather and through battlefield obscurants.

In April 1998, the Army Communications and Electronics Command (CECOM) awarded a 3-year, cost-plus-incentive fee, advanced technology demonstration contract to Northrop Grumman, Linthicum, Maryland, with a government target cost of $7.3 million. The contract challenge was to reduce the size and weight of the SAR/MTI to facilitate its use on the Army's TUAV. Northrop Grumman was tasked to design, fabricate, integrate, test, and deliver two SAR/MTI payloads, two sets of radar display units, and one set of spares. In July 2001, Northrop Grumman successfully demonstrated the operational performance of the SAR/MTI on the Hunter unmanned aerial vehicle.

The Army estimates that the SAR/MTI total life-cycle costs, using the TUAV, would exceed $100 million for acquiring, operating, and maintaining 86 systems.

Objectives

The audit objective was to evaluate the overall management of the SAR/MTI program. Because the program was in the system development and demonstration phase, we determined whether management was cost-effectively readying the program for the production phase of the acquisition process. We also reviewed the adequacy of the management control program as it related to our audit objective. See Appendix A for a discussion of the scope and methodology, our review of the management control program, and prior coverage related to the audit objective.

Program Status in Preparation for the Full-Rate Production Decision Review

The SAR/MTI program office was cost-effectively developing and readying the SAR/MTI for full-rate production on the TUAV. Because the Army decided not to install the SAR/MTI on the TUAV but on the Extended Range/Multi-Purpose air vehicle and other as yet undefined air vehicles, the Program Executive Officer for Intelligence, Electronic Warfare and Sensors halted contractual actions until the Army clarifies SAR/MTI requirements in operational requirements documents being prepared for the new platforms. As a result, existing program documentation such as the acquisition strategy; the command, control, communications, computers, and intelligence support plan; the operational requirements document; the test and evaluation master plan; the program protection plan; the life-cycle cost estimate; and the risk management plan will need to be revised once the operational requirements documents for the new platforms are approved.

Change in Platform

The Program Executive Officer for Intelligence, Electronic Warfare and Sensors (the Milestone Decision Authority) approved the SAR/MTI to enter the system development and demonstration phase in an October 2001, acquisition decision memorandum, with the assumption that SAR/MTI would be used on the TUAV. Subsequently, on September 30, 2002, the Milestone Decision Authority halted contractual actions for SAR/MTI, pending a briefing to identify platform system requirements. The Milestone Decision Authority halted contractual actions because the Army decided not to install SAR/MTI on the TUAV but on the Extended Range/Multi-Purpose air vehicle and other as yet undefined air vehicles to be used in the Army's Future Combat System vision.

Since January 2002, the Army Training and Doctrine Command has been reviewing the draft operational requirements document for the Extended Range/Multi-Purpose air vehicle. Further, the Army is still in the process of defining its air vehicle to be used in its Future Combat System vision. Without defined requirements for the new platforms, the performance requirements for the SAR/MTI cannot be clearly defined.

Program Documentation Review

Overall the Army properly developed and updated program documentation needed to manage the SAR/MTI program and make informed management decisions. Program documents generally met regulatory requirements and contained up-to-date information on programmatic decisions until the program was halted.

Acquisition Strategy. The program office prepared the "Draft Acquisition Strategy Report for SAR/MTI Payload," version 4, in April 2002. The stated goal in the acquisition strategy was to minimize the time and cost of satisfying the SAR/MTI operational requirements consistent with common sense and sound business practices. Essential elements of the acquisition strategy included use of an open systems approach, risk management, cost as an independent variable, the acquisition approach, the management approach, environmental considerations, sources of support, and reliability and total ownership cost reduction activities. Acquisition reform initiatives identified in the acquisition strategy included multi-year funding, component breakout, and contracting methods used to reduce program costs. The program manager had incorporated cost as an independent variable cost objective in the acquisition strategy so that the program would be managed in line with out-year resources and planned-process improvements.

Analysis of Alternatives. The Army did not prepare an analysis of alternatives for the SAR/MTI program because it considered SAR/MTI as a component of the TUAV program. The Studies and Analysis Division of the Marine Corps Combat Development Command completed an analysis of alternatives for the TUAV program, "Support for the Close Range Unmanned Aerial Vehicle Cost and Operational Effectiveness Analysis," dated December 15, 1994. The Studies and Analysis Division highlighted the need for better intelligence gathering devices and recommended the use of a close range unmanned aerial vehicle, like the TUAV, as the best way to meet the mission need.

Acquisition Program Baseline. The Program Executive Officer for Intelligence, Electronic Warfare and Sensors approved the SAR/MTI acquisition program baseline on November 4, 2001. The acquisition program baseline identified key performance, schedule, cost, and supportability parameters, but did not include an interoperability performance parameter. The acquisition program baseline for the host platform, the TUAV, included the interoperability performance parameter for the TUAV as integrated with SAR/MTI.

Command, Control, Communications, Computers, and Intelligence (C4I) Support Plan. The SAR/MTI program office did not develop a separate C4I support plan. The C4I Support Plan, Draft Version 2.2, dated February 21, 2002, for the TUAV program cited C4I support for the SAR/MTI payload system as second in priority after the Electro-Optic/Infrared capability. The C4I support plan identified the various systems in which TUAV interfaces to accomplish its mission. Additionally, the TUAV operational requirements document identified C4I interfaces as a key performance parameter.

Operational Requirements Document. SAR/MTI objectives, thresholds, and requirements were included in the "Tactical Unmanned Aerial Vehicle Operational Requirements Document," Appendix B, approved March 11, 1999, and updated June 20, 2001.

Test and Evaluation Master Plan. The program office prepared a draft test and evaluation master plan, dated August 7, 2002, which was premised on operating the SAR/MTI on the TUAV platform. The plan identified specific measures of effectiveness and suitability and outlined testing responsibilities, resources, and timelines.

Programmatic Environmental Safety and Health Plan. The SAR/MTI program office drafted the Programmatic Environmental, Safety, and Health Evaluation Plan for SAR/MTI in August 2001. The plan established procedures to manage, identify, document, track, and categorize environmental, safety, and health risks associated with SAR/MTI. The plan also states that the program office established system safety requirements for the life-cycle of the SAR/MTI program. In addition, the program office stated that it planned to require the contractor to prepare a safety assessment report and that safety risks identified in the report would be evaluated and resolved before beginning operational tests of the system.

Program Protection Plan. The TUAV project manager determined that the TUAV program, including SAR/MTI, did not contain any critical program information requiring protection.

Life-Cycle Cost Estimate. The SAR/MTI program office developed a detailed program office estimate, dated August 2, 2001. The program office estimate identified research and development, procurement, and operation and maintenance costs for the SAR/MTI payload from FY 2001 through FY 2020, in FY 2002 constant dollars.

Risk Management Plan. The program office identified technical, schedule, and cost risks in the acquisition strategy. The acquisition strategy identified the risk areas as low to moderate and established methods for tracking and mitigating identified program risks.

Conclusion

We agree with the Milestone Decision Authority decision to halt the contractual actions for the procurement of SAR/MTI until the Army Training and Doctrine Command makes decisions concerning future applications of the SAR/MTI technology. When decisions are made, the SAR/MTI program office will need to restructure the program and update appropriate program documentation with specific SAR/MTI requirements.

Appendix A. Scope and Methodology

We reviewed documentation dated from April 1998 through September 2002. We used criteria and references cited in Memorandum of the Secretary of Defense, "The Defense Acquisition System," October 30, 2002; Memorandum of the Secretary of Defense, "Operation of the Defense Acquisition System," October 30, 2002; Army Regulation 70-1, "Army Acquisition Policy," December 15, 1997; and the Defense Federal Acquisition Regulation Supplement 242.75, "Contractor Accounting Systems and Related Controls," November 9, 1999, to perform the audit.

To accomplish the audit objectives, we took the following steps:

- We reviewed "Tactical Unmanned Aerial Vehicle Operational Requirements Document," March 11, 1999, and its revision, dated June 20, 2001, to determine whether the users had adequately defined the system requirements, key performance parameters, and interoperability considerations.

- We reviewed "Acquisition Strategy Report," DRAFT, April 29, 2002; and "Test and Evaluation Master Plan for Unmanned Aerial Vehicle Payloads," DRAFT, August 7, 2002, to determine whether the program office had developed and implemented an acquisition strategy, a risk management plan, and a test and evaluation master plan.

- We met with Defense Contract Management Agency personnel to identify their involvement in monitoring the contractor's earned value management process. Additionally we reviewed the memorandum of agreement, May 1999, between the Defense Contract Management Agency and CECOM.

- We reviewed advanced technology demonstration contract number DAABO7-98-C-J016, awarded April 30, 1998, and contract modifications through March 18, 2002, to evaluate the management of the contract. Additionally we reviewed cost and schedule status reports from March 2001 through May 2001.

- We reviewed "Programmatic Environmental, Safety, and Health Evaluation for SAR/MTI," August 2001, to determine whether the program office had developed a programmatic, environmental, safety, and health evaluation plan.

- We met with program office personnel to determine whether they had prepared a program protection plan to identify critical program information or technology and used integrated product teams.

- We reviewed "Program Office Estimate," August 3, 2001, to determine whether the program office had prepared a life-cycle cost estimate.

We performed this audit from July 2002 through December 2002 in accordance with generally accepted government auditing standards.

Use of Computer-Processed Data. We did not use computer-processed data to perform this audit.

Use of Technical Assistance. We did not use technical assistance to perform this audit.

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in DoD. This report provides coverage of the DoD Weapon System Acquisition high-risk area.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. In accordance with DoD policy, acquisition managers use program cost, schedule, and performance parameters as control objectives to implement the requirements of DoD Directive 5010.38. Accordingly, we limited our review to management controls directly related to program cost, schedule, and performance. Because we did not identify a material weakness, we did not assess management's self-evaluation.

Adequacy of Management Controls. Management controls that the Program Executive Office for Intelligence, Electronic Warfare, and Sensors implemented were adequate in that we identified no material management control weakness.

Prior Coverage

During the last five years, the General Accounting Office, the Inspector General of the Department of Defense, and the Army Audit Agency have not issued reports specifically addressing the SAR/MTI.

Appendix B. Report Distribution

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Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
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    Product Manager, Robotics and Unmanned Sensors
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  Commander, Army Communications and Electronics Command
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House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Team Members

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