# Audit Report

ACQUISITION OF THE FIREFINDER (AN/TPQ-47) RADAR

Report No. D-2002-012 October 31, 2001

Office of the Inspector General
Department of Defense

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**Acronyms**

| | |
|---|---|
| ACAT | Acquisition Category |
| DOT&E | Director, Operational Test and Evaluation |
| EMD | Engineering and Manufacturing Development |
| IOT&E | Initial Operational Test and Evaluation |
| LRIP | Low-Rate Initial Production |
| NEPA | National Environmental Policy Act |
| $P^3I$ | Pre-Planned Product Improvement |
| PESHE | Programmatic Environmental, Safety, and Occupational Health Evaluation |
| RDT&E | Research, Development, Test, and Evaluation |
| SFFAS | Statement of Federal Financial Accounting Standards |

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
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October 31, 2001

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS
ASSISTANT SECRETARY OF DEFENSE (COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE)
DIRECTOR, OPERATIONAL TEST AND EVALUATION
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on the Acquisition of the Firefinder (AN/TPQ-47) Radar (Report No. D-2002-012)

We are providing this report for information and use. This report discusses the readiness of the Firefinder Radar system to enter full-rate production.

We considered comments from the Offices of the Under Secretary of Defense for Acquisition, Technology, and Logistics; the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence); the Director, Operational Test and Evaluation; and the Army in preparing this final report. The comments on the draft report conformed to the requirements of DoD Directive 7650.3. Therefore, we do not require additional comments.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or Mr. Jack D. Snider at (703) 604-9087 (DSN 664-9087) (jsnider@dodig.osd.mil). See Appendix E for the report distribution. The audit team members are listed inside the back cover.

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Acting
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## Office of the Inspector General, DoD

**Report No. D-2002-012** **October 31, 2001**
(Project No. D2001AE-0047)

# Acquisition of the Firefinder (AN/TPQ-47) Radar

## Executive Summary


**Introduction.** The Firefinder (AN/TPQ-47) Radar (the Q-47), an Army Acquisition Category III program, is intended to improve upon and replace the Firefinder (AN/TPQ-37) Radar (Q-37). The Q-47 will identify incoming projectiles, consisting of mortars, artillery, rockets, and short-range missiles and will determine the launch and impact location of the projectile. The Q-47 will provide greater mobility and range with 50 percent greater target location accuracy than the Q-37. The Army plans to acquire 72 Q-47 systems at an estimated life-cycle cost of $1.4 billion through FY 2027 (FY 1998 dollars) and plans to hold the full-rate production decision in FY 2006.

**Objectives.** The primary audit objective was to evaluate the overall management of the Q-47. Because the program was in the engineering and manufacturing development acquisition phase, the audit determined whether management was cost-effectively readying the program for the production phase of the acquisition process. We also evaluated the management control program as it related to the audit objective.

**Results.** Overall, the Army was effectively managing the Q-47 engineering and manufacturing development phase and readying the Q-47 for the production phase of the acquisition process. However, the following four areas warrant management attention before the program enters the full-rate production phase of the acquisition process.

- The Firefinder Product Office did not update its acquisition plan to incorporate its revised acquisition strategy to acquire the Q-47. Without an up-to-date acquisition plan, the Product Office cannot ensure that the efforts of personnel collectively responsible for the acquisition of the Q-47 are coordinated and integrated to ensure that the Army meets its needs in the most effective, economical, and timely manner (finding A).

- The Director, Operational Test and Evaluation (DOT&E), did not consistently apply its beyond low-rate initial production (LRIP) reporting requirements. As a result, DOT&E cannot ensure that its personnel are effectively applying beyond LRIP reporting requirements to address whether the test and evaluation performed for a program is adequate and whether the results of the test and evaluation confirm that the program is effective and suitable for combat (finding B).

- The Firefinder Product Office did not develop an environmental assessment and a programmatic environmental, safety, and occupational health evaluation (PESHE) for the Q-47 to identify environmental safety issues, occupational health requirements, demilitarization and disposal requirements; establish program environmental responsibilities; and compose a methodology to track progress throughout the remainder of the program life-cycle. Without an environmental assessment and a PESHE, the Product

Office cannot ensure that the Army is aware of the effect of the program on the human environment and the impact of environmental, safety, and occupational health issues on mission and cost, and may also be forgoing opportunities to further reduce environmental life-cycle costs over the life span of the Q-47 (finding C).

- The Firefinder Product Office did not include environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 at the end of its useful life in its life-cycle cost estimate. As a result, the Firefinder Product Office understated the total life-cycle costs for the Q-47 and would not be able to report the liability for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 in the Army financial statements when the Army begins fielding the system (finding D).

The management control program that we reviewed for the Q-47 did not ensure that the Firefinder Product Office periodically reviewed the programmatic environmental, safety, and occupational health evaluation for the programs under its cognizance for currency and compliance (Appendix A).

**Summary of Recommendations**. We recommend that the Product Manager, Firefinder, update its acquisition plan for Q-47 and that the Army Deputy Chief of Staff for Operations and Plans validate the Q-47 requirement for 72 systems. Further, we recommend that DOT&E resolve conflicting DoD beyond LRIP policy to conform with statutory requirements and update its oversight list to show that it intends to prepare and submit a beyond LRIP report for the Q-47. In addition, we recommend that the Product Manager, Firefinder, prepare an environmental assessment and a programmatic environmental, safety, and occupational health evaluation for the Q-47; include a review of the programmatic environmental, safety, and occupational health evaluation in its management control review; develop an environmental cost estimate; and include the environmental cost estimate in its life-cycle cost estimate.

**Management Comments**. We received comments from the Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (the Deputy); the Principal Deputy Director, Office of the Director, Operational Test and Evaluation (the Principal Deputy Director); and the Director, Strategic and Tactical Systems, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (the Director). The Deputy concurred with the findings and concurred or partially concurred with the recommendations directed towards the Army. The Principal Deputy Director concurred with the recommendations to resolve conflicting DoD beyond LRIP policy and to update the DOT&E oversight list. The Director concurred with the recommendation to resolve conflicting DoD beyond LRIP policy. Although not required to comment, the Director also agreed or partially agreed with the remaining recommendations. A discussion of the management comments is in the Finding section of the report, and the complete text is in the Management Comments section.

**Audit Response.** The management comments to the draft report were responsive to the intent of our recommendations. Comments from the Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) were not necessary to prepare the final report. Therefore, no additional comments are required.

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**Firefinder (AN/TPQ-47) Radar**

## Background

The Firefinder (AN/TPQ-47) Radar (the Q-47), an Army Acquisition Category III[1] program, is intended to improve upon and replace the Firefinder (AN/TPQ-37) Radar (Q-37). The Q-47 will identify incoming projectiles, consisting of mortars, artillery, rockets, and short-range missiles, by light, medium, and heavy caliber classifications and will determine the launch and impact location of the projectiles. The Q-47 will provide greater mobility and range with 50 percent greater target location accuracy than the Q-37. Nine soldiers, three less than the Q-37, will operate the Q-47. The Product Manager, Firefinder, is responsible for day-to-day management of the program and is the materiel developer for the Q-47, with overall responsibility for development, test, production, integration, and deployment of the system. The Director for Combat Development, Army Field Artillery School, Fort Sill, Oklahoma, is the user representative and Raytheon Company, Electronics Systems, is the prime contractor for the Q-47. Appendix B provides definitions of technical terms used in this report.

The Q-47 began as a pre-planned product improvement ($P^3I$) to the Q-37. As a $P^3I$, the program proceeded directly to the engineering and manufacturing development (EMD) phase of the acquisition process. On November 13, 1997, the Program Executive Office, Intelligence, Electronic Warfare, and Sensors, approved entry of a $P^3I$ of the Q-37 into EMD and transferred oversight responsibility to the Deputy for System Acquisition, Army Communications and Electronics Command. Subsequently, the Firefinder Product Office changed the name of the program to the Q-47 as it became apparent that the Q-37 would be replaced with a new program instead of being upgraded. On November 21, 2000, the Director, Operational Test and Evaluation (DOT&E), notified the Army of its intent to add the Q-47 to the next update of the Office of the Secretary of Defense Annual Test and Evaluation Oversight List. The Army plans to acquire 72 Q-47 systems at an estimated life-cycle cost of $1.4 billion through FY 2027 (FY 1998 dollars) and plans to hold a low-rate initial production decision in FY 2004 and a full-rate production decision in FY 2006.

## Objectives

The primary audit objective was to evaluate the overall management of the Q-47. Because the program was in the EMD acquisition phase, the audit determined whether management was cost-effectively readying the program for the production phase of the acquisition process. We also evaluated the management control program as it related to the audit objective. See Appendix A for a discussion of the audit scope and methodology, the review of the management control program, and prior coverage related to the audit objectives.

[1]As a result of the audit, the Army changed the Acquisition Category of the Q-47 from III to II.

## Program Generally Well Managed

Overall, the Army was effectively managing the EMD phase and readying the Q-47 for the production phase of the acquisition process. However, four areas warrant management attention before the program enters the full-rate production phase of the acquisition process. A discussion of the associated findings follows.

# A. Updated Acquisition Plan

The Firefinder Product Office did not update its acquisition plan to incorporate its revised acquisition strategy to acquire the Q-47. Since the EMD milestone decision, the Product Office revised the acquisition strategy as a result of changes in hardware requirements, technology, low-rate initial production (LRIP), testing, procurement requirements, full-rate production milestone, program cost and schedule, and acquisition category. Because the Product Office viewed the acquisition plan as an internal document within the Army Communications and Electronics Command, it did not intend to update the plan until the LRIP phase decision in FY 2004. However, without an up-to-date acquisition plan for the Q-47 that reflects the revised acquisition strategy, the Product Office cannot ensure that the efforts of personnel collectively responsible for the acquisition of the Q-47 are coordinated and integrated to ensure that the Army meets its needs in the most effective, economical, and timely manner.

## Acquisition Strategy, Plan, Category, and Requirements Policy

**Acquisition Strategy Policy.** DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001, describes the relationship of the essential elements of a program including: requirements, program structure, acquisition approach, risk, program management, design considerations, and support strategy.

**Acquisition Plan Policy.** Army Federal Acquisition Regulation Supplement, Part 7, "Acquisition Planning," July 25, 1997, requires that acquisition plans be updated when required for milestone approval or when the acquisition strategy changes.

**Acquisition Category Policy.** Army Regulation 70-1, "Research, Development, and Acquisition, Army Acquisition Policy," January 15, 1998, states that the Army Acquisition Executive has discretionary authority to designate a program for intensive centralized management at any point in the program's acquisition life cycle and may redesignate a program to a higher acquisition category level if more dedicated oversight is required.

**Acquisition Requirements Policy.** Army Regulation 70-1 requires the Deputy Chief of Staff for Operations and Plans to validate and integrate the review and evaluation of materiel requirements, critical operational issues, and criteria for all acquisition category programs.

## Current and Updated Acquisition Plan

The Firefinder Product Office revised its original acquisition strategy as a result of changes in its acquisition methodology. Because the Product Office viewed the acquisition plan as an internal document within the Army Communications and Electronics Command, the Product Office did not plan to update it until the LRIP decision in FY 2004.

**Original Acquisition Strategy.** The Product Manager, Firefinder (the Product Manager), included the original acquisition strategy for the Q-47 in Acquisition Plan No. 98-09, February 9, 1998, that describes how the Army would acquire the system. Because the Q-47 program was originally structured as a $P^3I$ to the existing Q-37 radar, the original acquisition strategy developed was for a $P^3I$ rather than a new program. The acquisition strategy, included in the acquisition plan, provided for a competitive EMD contract to design, test, and deliver three production-representative systems that the Army would use to conduct development and initial operational test and evaluation (IOT&E). The original acquisition strategy for production of the Q-47 had the EMD contractor going directly into full-rate production in FY 2002, with the Army awarding a basic contract with yearly options.

**Change in Acquisition Methodology.** Because of schedule increases, which the Army directed, and other technical challenges with the contract, the Firefinder Product Office rebaselined the Q-47 program in December 1999. However, as the contract progressed, the program experienced additional schedule and funding delays. In August 2000, the Product Manager and the contractor determined that the program needed to be rebaselined once again as a result of cost and schedule overruns to the program baseline. Consequently, the contractor submitted a new estimate at completion to the Product Office that extended the schedule 10 months and created a funding shortfall of $3.6 million to complete the EMD phase for the program.

The Product Manager analyzed the situation and determined that he needed to revise the acquisition strategy to reduce program risk and to ensure that the program was executable. As a result, the Product Manager revised the acquisition strategy to incorporate changes in hardware requirements, technology, testing, LRIP, procurement requirements, full-rate production milestone, program cost and schedule, and acquisition category. However, the Product Office did not update its acquisition plan, to document the revised acquisition strategy to acquire the Q-47.

**Hardware Requirements.** The Firefinder Product Office revised the hardware requirement from three production-representative systems to two EMD prototypes in the EMD phase of the acquisition process. This revision allowed the contractor to concentrate its efforts on achieving the technical performance required for the Q-47. As a result of using EMD prototypes instead of production-representative systems, the contractor was allowed to implement hardware and software fixes to any problems identified during EMD testing.

**Technology.** During EMD, the contractor will be allowed to incorporate enhanced technology for a lower-cost antenna module into the second prototype system. The enhanced technology is a re-design of the antenna module that is extremely labor intensive and poses significant producibility issues. Each Q-47 system has 408 antenna modules that account for 27 percent of the manufacturing hardware costs. The re-designed antenna module has promise to result in significant cost savings in the production and operations and support phases of the acquisition process.

**Low-Rate Initial Production.** The revised acquisition strategy added the LRIP of nine Q-47 systems, three systems in FY 2004 and six systems in FY 2005, to the production contract and stated that IOT&E will be performed using the FY 2004 LRIP systems. The contractor is expected to take 2 years to build each Q-47 system. Consequently, the Army will not perform IOT&E until FY 2006. The DOT&E; the Deputy Chief of Staff for Programs; and the Deputy for System Acquisition, the milestone decision authority, gave verbal approval for the 2-year LRIP buy to avoid an FY 2005 production break. The initial acquisition strategy did not include plans for an LRIP decision and buy.

**Testing.** Initially, the Q-47 acquisition strategy stated that the contractor would produce three production-representative systems for use in the dedicated IOT&E before the full-rate production decision planned for FY 2002. With the restructure of the acquisition strategy, the EMD contract was modified to acquire two EMD prototypes, instead of the three production-representative systems, that would be used in an added limited user test. The limited user test will address a limited number of operational issues, and is planned for FY 2004, before the LRIP decision. The dedicated IOT&E is planned for FY 2006 using the three FY 2004 LRIP systems.

**Procurement Requirements.** Because the new acquisition strategy changes the hardware requirement from three production-representative systems to two EMD prototypes, the Q-47 program will have to increase funding for an additional Q-47 system during the production phase to meet its requirement for 72 systems. However, the Deputy Chief of Staff for Operations and Plans has not validated the Army's need for 72 Q-47 systems, which is based on a one-for-one replacement of the Q-37, the predecessor system to the Q-47. Army Regulation 70-1 requires the Deputy Chief of Staff for Operations and Plans to validate and integrate the review and evaluation of materiel requirements, critical operational issues, and criteria for all acquisition category programs. The Deputy Chief of Staff for Programs did not provide documentation showing validation of the Army requirement for 72 Q-47 systems.

**Full-Rate Production Milestone.** The full-rate production decision milestone date for the Q-47 slipped several times because of Army directed schedule increases and contractor cost and schedule overruns to the program baseline. In the original acquisition strategy, the full-rate production milestone decision date was December 2001. However, in the revised acquisition strategy, the full-rate production decision date was slipped to FY 2006, after successful completion of the IOT&E.

**Program Cost and Schedule.** In July 1998, the contractor began work on the EMD contract scheduled to last 43 months and valued at $73.7 million that included a contractor investment of $16.4 million. In May 1999, the Army extended research, development, test, and evaluation (RDT&E) funding for the Q-47 by one year, but delayed the full-rate production decision from FY 2002 to FY 2003. In December 1999, the Firefinder Program Office rebaselined the EMD contract to a 53-month, $96.5 million program, again including the $16.4 million contractor investment, because the contractor was overrunning schedule and costs. In May 2000, the Army again extended the RDT&E funding an additional year and delayed full-rate production from FY 2003 to FY 2004. In August 2000, the Product Manager, Firefinder, and the contractor determined that the program needed to be rebaselined once again because of cost and schedule overruns to the program baseline. As a result, in February 2001, the Product Office rebaselined the EMD contract to an 83-month, $131.8 million program, including a contractor investment of $16.4 million and additional work, valued at $9.5 million.

**Acquisition Category.** In an April 9, 2001, memorandum that was issued as a result of the audit, the Deputy for Systems Acquisition, the milestone decision authority for the Q-47, requested that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) reclassify the Q-47 as an Acquisition Category (ACAT) II program because of increases in RDT&E and procurement funding. At the EMD milestone decision in November 1997, the Q-47 did not meet the threshold requirements for an ACAT II program and was classified as an ACAT III program by the Assistant Secretary of the Army (Research, Development, and Acquisition).[2] However, the FY 2002 through FY 2003 President's Budget for the Q-47 shows RDT&E and procurement expenditures of $165 million and of $767 million, respectively, which exceed the thresholds for an ACAT II program as defined in DoD Instruction 5000.2, "Operation of the Defense Acquisition System," Change 1, January 4, 2001. DoD Instruction 5000.2 defines an ACAT II program as a program that does not meet the criteria for an ACAT I program, but is a major system if it is estimated by the DoD Component Head to require an eventual total expenditure for RDT&E of more than $140 million or for procurement of more than $660 million in FY 2000 constant dollars. On May 16, 2001, the Army Acquisition Executive approved the reclassification of the Q-47 as an ACAT II program.

**Revised Acquisition Strategy Approval.** On July 27, 2000, the Product Manager briefed the Deputy for Systems Acquisition on the revised acquisition strategy and received his approval to revise the acquisition strategy and rebaseline the program pending concurrence by the DOT&E, the Deputy Chief of Staff for Programs, the Army Test and Evaluation Center, and the Director for Combat Development. On April 9, 2001, the Deputy for Systems Acquisition formally approved the new acquisition strategy. However, the Firefinder Product Office did not plan to update the acquisition plan for the Q-47 to incorporate the revised acquisition strategy until the FY 2004 LRIP decision even though the acquisition plan states that it would be updated when

[2]Renamed the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) on February 16, 1999.

required for milestone approval or when the acquisition strategy changes. In addition, the Army Federal Acquisition Regulation Supplement, Part 7, also requires that acquisition plans be updated when required for milestone approval or when the acquisition strategy changes.

## Updated Acquisition Plan Benefits

Without an up-to-date acquisition plan for the Q-47, the Firefinder Product Office cannot ensure that the efforts of personnel collectively responsible for the acquisition of the Q-47 are coordinated and integrated to ensure that the Army meets its needs in the most effective, economical, and timely manner. Acquisition personnel who need up-to-date information on the Q-47 to effectively manage the program include the user representative, the test community, the depot maintenance provider, the milestone decision authority, and the product manager and his staff. With a comprehensive documented strategy within the plan, a roadmap for the program will exist to minimize the time and cost of satisfying the identified, validated need; to document the responsibilities for all those involved; and to guide program execution.

## Recommendations and Management Comments

**A.1. We recommend that the Product Manager, Firefinder, update the acquisition plan for the Firefinder (AN/TPQ-47) Radar to include the latest acquisition strategy and periodically update the plan as significant changes occur to the acquisition strategy.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), concurred, stating that the Product Manager, Firefinder, plans to update the acquisition plan for the Q-47 to support the milestone review and the follow-on contract for the LRIP phase in FY 2004. The Deputy also stated that the Product Manager will update the acquisition plan to include the revised acquisition strategy by the second quarter, FY 2002. In addition, the Deputy restated the comments in the report about the original acquisition plan, the engineering and manufacturing development, and revisions to the program strategy. For the complete text of the Deputy's comments, see the Management Comments section of this report.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration. For the complete text of the Director's comments, see the Management Comments section of this report.

**A.2. We recommend that the Army Deputy Chief of Staff for Operations and Plans validate the Firefinder (AN/TPQ-47) Radar requirement for 72 systems.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration concurred, stating that the Army Deputy Chief of Staff for Operations and Plans has validated the requirement for procurement of 72 Q-47 systems based on a one-for-one replacement of the Q-37, the predecessor system. Further, the Deputy stated that the Army will deploy the 72 systems with newly configured divisions or will preposition the systems. The Deputy also stated that the Army Acquisition Objective for the Q-47 is 72 systems in the Program Objectives Memorandum for FYs 2002 through 2007.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration.

# B. Beyond Low-Rate Initial Production Report

The DOT&E did not consistently apply its beyond LRIP reporting requirements. This condition occurred because the DOT&E oversight list indicated that DOT&E did not intend to prepare a beyond LRIP report for the Q-47 even though it intended to prepare such a report. Additionally, the DoD directive, instruction, and regulation containing the beyond LRIP report requirement provide conflicting guidance. As a result, DOT&E cannot ensure that its personnel are effectively applying beyond LRIP reporting requirements to address whether the test and evaluation performed for a program is adequate and whether the results of the test and evaluation confirm that the program is effective and suitable for combat.

## Beyond Low-Rate Initial Production Report and Major Defense Acquisition Program Policy

The following provides an overview of statutory and DoD policy concerning beyond LRIP reporting before full-rate production decisions and major Defense acquisition programs. Appendix C provides a detailed discussion of the policy.

**Beyond Low-Rate Initial Production Policy.** Statutory and DoD policy provide requirements and guidance concerning beyond LRIP reporting.

**Statutory Policy.** Section 2399, title 10, United States Code, "Operational Test and Evaluation of Defense Acquisition Programs," requires that, at the conclusion of operational test and evaluation conducted for each major Defense acquisition program, DOT&E will prepare and submit a report to the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees. The report will address whether the test and evaluation performed is adequate and whether the results of the test and evaluation confirm that the program is effective and suitable for combat.

**DoD Policy.** The policy in the DoD Directive 5141.2, "Director of Operational Test and Evaluation (DOT&E)," May 25, 2000, and DoD Instruction 5000.2 states that DOT&E will analyze the results of operational test and evaluation conducted on programs under DOT&E test and evaluation oversight and submit a beyond LRIP report that addresses the adequacy of the test and evaluation performed. However, policy in the DoD Regulation 5000.2-R only requires the analysis and report for major Defense acquisition programs.

**Major Defense Acquisition Program Policy.** Statutory and DoD policy provide requirements and guidance on major Defense acquisition programs and state that a major Defense acquisition program is an acquisition program that DoD has determined is not a highly sensitive classified program and has

designated as a major defense acquisition program or has estimated will require an eventual total expenditure for RDT&E and procurement funding that exceeds specified amounts.

## Preparing a Beyond Low-Rate Initial Production Report

The DOT&E did not consistently apply beyond LRIP reporting requirements to its oversight list and to DoD policy containing the beyond LRIP report preparation requirement.

**DOT&E Oversight List.** The DOT&E Test and Evaluation Master Oversight List, May 2001, contains the Q-47 and states that no beyond LRIP report is required because the program is not a major Defense acquisition program as defined by section 139, title 10, United States Code, "Director of Operational Test and Evaluation." However, DOT&E personnel stated that they intend to prepare a beyond LRIP report for the Q-47 at the conclusion of operational test and evaluation and submit the report to the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees. DOT&E personnel indicated that they plan to update the oversight list to be consistent with their beyond LRIP reporting intentions.

**DoD Policy.** The DoD policy documents were not consistent in applying the beyond LRIP report requirement. DoD Directive 5141.2 and DoD Instruction 5000.2 state that the DOT&E should prepare beyond LRIP reports for programs under its oversight. However, DoD Regulation 5000.2-R states that DOT&E will prepare beyond LRIP reports for each major Defense acquisition program, which is not consistent with DoD Directive 5141.2 and DoD Instruction 5000.2. Consequently, the Directive, Instruction, and Regulation provide conflicting guidance concerning beyond LRIP reporting. Furthermore, DoD Directive 5141.2 takes precedence over DoD Instruction 5000.2 and DoD Regulation 5000.2-R.

**Beyond LRIP Report Preparation.** DOT&E personnel stated that the statutory law is clear that all major Defense acquisition programs require a beyond LRIP report. However, for less than major defense acquisition programs, the office of the DOT&E stated that it determines whether a beyond LRIP report will be prepared on a case by case basis. Further, DOT&E personnel stated that preparing a beyond LRIP report is very resource intensive and that DOT&E did not have the time and money to prepare a beyond LRIP report for every program under its oversight. For every program that a beyond LRIP report is not prepared, DOT&E addresses the activity of test and evaluation and an assessment of the test and evaluation in its annual report. Further, if DOT&E is required to prepare a beyond LRIP for every program under its oversight, DOT&E would be forced to reduce the number of programs on its oversight list because of resource constraints.

## Program Operational Effectiveness and Suitability

Without consistently applying beyond LRIP reporting requirements to its oversight list and to DoD policy, DOT&E cannot ensure that its personnel are effectively applying beyond LRIP reporting requirements to address whether the test and evaluation performed for a program is adequate and whether the results of the test and evaluation confirm that the program is effective and suitable for combat.

## Recommendations and Management Comments

**B.1. We recommend that the Director, Operational Test and Evaluation, in coordination with the Under Secretary of Defense for Acquisition, Technology, and Logistics, and the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) initiate action to resolve conflicting policy on beyond low-rate initial production reporting contained in DoD Directive 5141.2, "Director of Operational Test and Evaluation (DOT&E)," May 25, 2000; and DoD Instruction 5000.2, "Operation of the Defense Acquisition System," Change 1, January 4, 2001; DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001, to conform with section 2399, title 10, United States Code, "Operational Test and Evaluation of Defense Acquisition Programs."**

**Director, Operational Test and Evaluation, Comments.** The Principal Deputy Director, Office of the Director, Operational Test and Evaluation, concurred, stating that DOT&E will take action to resolve conflicting policy regarding beyond LRIP reporting requirements. For the complete text of the Principal Deputy Director's comments, see the Management Comments section of this report.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** The Director, Strategic and Tactical Systems, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, concurred, stating that an integrated product team will be convened during the first quarter, FY 2002, to deliberate the conflicting policy on the beyond LRIP reporting. For the complete text of the Director's comments, see the Management Comments section of this report.

**B.2. We recommend that, the Director, Operational Test and Evaluation, update its oversight list to show that it intends to prepare and submit a beyond low-rate initial production report for the Firefinder (AN/TPQ-47) Radar.**

**Director, Operational Test and Evaluation, Comments.** The Principal Deputy Director concurred, stating that DOT&E will prepare a beyond LRIP report on the Q-47 and update its oversight list to show that it intends to prepare the report.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, agreed, stating that, without a beyond LRIP report for the Q-47, the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees will not be informed as to whether:

- the test and evaluation was adequate and
- the results confirm that the items or components tested for the Q-47 are operationally effective and suitable for use in combat before the production decision is made.

# C. Environmental Assessment and Evaluation

The Firefinder Product Office did not develop an environmental assessment and a programmatic environmental, safety, and occupational health evaluation (PESHE) for the Q-47 to identify environmental safety issues, occupational health requirements, demilitarization and disposal requirements; establish program environmental responsibilities; and compose a methodology to track progress throughout the remainder of the program life-cycle. The Product Office did not complete an environmental assessment and a PESHE because:

- the Product Office believed that the environmental assessment for the Q-37 was sufficient because the Q-47 was originally a $P^3I$ for the Q-37; and

- the management control reviews by the Product Office did not include a review for PESHE requirements.

Without an environmental assessment and a PESHE, the Product Office cannot ensure that the Army is aware of the effect of the program on the human environment and the impact of environmental, safety, and occupational health issues on mission and cost and may also be forgoing opportunities to further reduce environmental life-cycle costs over the life span of the Q-47.

## Environmental, Safety, and Occupational Health and Management Control Policy

**DoD Environmental Policy.** DoD Regulation 5000.2-R[3] provides guidance on environmental, safety, and occupational health evaluations and environmental analyses and the National Environmental Policy Act (NEPA).

**Environmental, Safety, and Occupational Health Evaluation.** DoD Regulation 5000.2-R requires that all programs, regardless of acquisition category, conduct environmental, safety, and occupational health analyses to integrate environmental, safety, and occupational health issues into the system engineering process. The analyses must support the development of a PESHE that the program office includes in the acquisition strategy. The program

[3]DoD initially issued DoD Regulation 5000.2-R on March 15, 1996. It included the environmental, safety, and occupational health evaluation policy.

manager must initiate the PESHE at the earliest possible time, usually in support of a program initiation decision, and must update the evaluation throughout the life cycle of the program. Acquisition managers use the PESHE to:

- describe the program manager's strategy for meeting environmental, safety, and occupational health requirements;
- establish program responsibilities; and
- identify how a program manager will track progress.

**National Environmental Policy Act.** DoD Regulation 5000.2-R requires the program manager to complete any analysis required by NEPA before a decision to proceed with a proposed action that may effect the human environment. Further, DoD Regulation 5000.2-R requires the program manager to include an appropriate completion schedule for the NEPA compliance in the acquisition strategy. NEPA documents include a categorical exclusion, an environmental assessment, and an environmental impact statement.

**Management Control Evaluations for Less-Than-Major Defense Acquisition Programs Policy.** Army Regulation 11-2, "Army Programs, Management Control," August 1, 1994, and Army Regulation 70-1 provide Army policy concerning management controls for less-than-major Defense acquisition programs.

**Army Regulation 11-2.** Army Regulation 11-2 requires the program executive office to prepare a written plan for conducting required management control evaluations for acquisition programs under its cognizance, to keep the plan current, and to use the plan to monitor progress to ensure that management control evaluations are conducted as scheduled.

**Army Regulation 70-1.** Army Regulation 70-1 identifies the key management controls for the management control evaluation of less-than-major Defense acquisitions as the milestone decision documentation requirements specified in DoD Regulation 5000.2-R. Further, the Regulation requires the program executive officer to evaluate those key management controls using the milestone decision review process.

## Environmental Assessment and Environmental, Safety, and Occupational Health Evaluation

**Environmental Assessment and PESHE.** The Firefinder Product Office did not develop an environmental assessment and a PESHE for the Q-47. On November 13, 1997, the Program Executive Office, Intelligence, Electronic Warfare, and Sensors, approved entry of a $P^3I$ of the Q-37 into the EMD phase of the acquisition process and transferred oversight responsibility to the Deputy for System Acquisition, Army Communications and Electronics Command. Consequently, the Firefinder Product Office believed that the $P^3I$ of the Q-37 would not require a new environmental assessment because it believed that the

environmental assessment, which it had prepared for the Q-37, was sufficient. Further, the Product Office did not prepare a PESHE for the $P^3I$ of the Q-37 because it was unaware of the requirement. Subsequently, the Firefinder Product Office changed the name of the program to the Q-47, as it became apparent that the Q-37 was not being upgraded but being replaced with a new program. Even after the status of the program changed to become the Q-47, the Product Office did not conduct and complete a new environmental assessment, including a PESHE. In February 2001, the Product Office indicated that it planned to complete the environmental assessment and the PESHE before the full-rate production decision for the Q-47.

**Management Control Review.** The management control review that the Firefinder Product Office conducted in FY 2000 for the Q-47 did not ensure that a PESHE was prepared, completed, and kept up-to-date. To evaluate management controls for less-than-major Defense acquisition programs, the Product Office conducts management control assessments for programs under its cognizance and provides the results of those assessments to the Deputy for System Acquisition for inclusion in the annual statement of assurance for the Army Communications and Electronics Command. Although the management control review for the Q-47 covered some aspects of the acquisition process, the review did not adequately cover the documentation required in DoD Regulation 5000.2-R for a PESHE. Consequently, the Q-47 was allowed to proceed without a PESHE.

## Environmental Assessment and Environmental, Safety, and Occupational Health Evaluation Benefits

Without an environmental assessment for the Q-47, the Firefinder Product Office cannot ensure that the Army is aware of the effect of the program on the human environment, including the nature and physical environment and the relationship of people with that environment. When the Product Manager performs the analyses for the PESHE for the Q-47, he will gain timely information on the potential environmental, safety, and occupational health effects of developing, fielding, storing, demilitarizing, and disposing of their weapon systems. The information is critical because any unforeseen environmental, safety, or occupational health effects that violate local, state, or Federal law could cause lengthy program delays and affect mission and program cost. Moreover, negative effects may lessen opportunities to further reduce maintenance-process environmental life-cycle costs over the life span of the Q-47, including upgrades to the programs, as appropriate. Therefore, the Product Manager should analyze and document all possible programmatic actions and update the evaluation throughout the program's life cycle.

## Recommendations, Management Comments, and Audit Response

**C. We recommend that the Product Manager, Firefinder:**

**1. Prepare an environmental assessment for the Firefinder (AN/TPQ-47) Radar to determine whether the system has a significant impact on the quality of the human environment, in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), concurred, stating that the Army Communications and Electronics Command will conduct a PESHE for the Q-47 by the third quarter, FY 2002. For the complete text of the Deputy's comments, see the Management Comments section of this report.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, agreed, stating that, the approved acquisition plan for the Q-47 states that:

> The Safety Assessment Report (SAR) will be procured as a contractor-prepared data item. An evaluation of the system's potential impact on the quality of human environment will be conducted and the appropriate environmental documentation will be prepared.

Further, the Director stated that the engineering and manufacturing development contract for the Q-47 includes a contract data item for a safety assessment report for which the initial version was prepared and submitted in January 2000. The Director also stated that the initial safety assessment report, which included a hazard analysis report and an environmental assessment as separate appendixes, was evaluated as part of the critical decision review. Additionally, the Director stated that the next safety assessment report submission will be due 60 days before development testing and the final safety assessment report will be prepared 30 days after receipt of Government comments. For the complete text of the Director's comments, see the Management Comments section of this report.

**2. Prepare and update annually, as appropriate, a programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar to identify environmental safety issues, occupational health requirements, demilitarization and disposal requirements; to establish program environmental responsibilities; and to compose a methodology to track progress throughout the remainder of the program life-cycle, in accordance with DoD Regulation 5000.2-R, "Mandatory**

**Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration concurred, stating that a safety assessment report, which included a hazard analysis report and an environmental assessment, was prepared on the proposed Q-47 components. Further, the Deputy stated that the Directorate for Safety, Army Communications and Electronics Command, has initiated actions on a health hazard assessment and a non-ionizing radiation protection study. The Deputy also stated that a PESHE was not a requirement at the time of the EMD milestone review in November 1997; however, the requirement for a PESHE is in the latest version of DoD Regulation 5000.2-R, June 10, 2001. In conclusion, the Deputy stated that Directorate for Safety will initiate action to complete a PESHE and ensure its review and annual update.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration.

**Audit Response.** The Deputy's comments were responsive; however, the March 15, 1996, version of DoD Regulation 5000.2-R required a PESHE as follows.

> The acquisition strategy shall include a programmatic environmental, safety, and health (ESH) evaluation. The PM shall initiate the ESH evaluation at the earliest possible time in support of a program initiation decision (usually Milestone I) and shall maintain an updated evaluation throughout the life-cycle of the program. The ESH evaluation describes the PM's strategy for meeting ESH requirements (see 4.3.7), establishes responsibilities, and identifies how progress will be tracked.

**3. Conduct a review of the programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar during the management control review for the annual statement of assurance to ensure that the evaluation is up-to-date.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration concurred, stating that the Directorate for Safety, Army Communications and Electronics Command, will initiate action to complete a PESHE and ensure its review and annual update.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration.

# D. Environmental Life-Cycle Costs

The Firefinder Product Office did not include environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 at the end of its useful life in its life-cycle cost estimate. The condition occurred because the Product Office believed that:

- those environmental costs were not significant enough to estimate because disposal revenue would offset disposal costs; and
- historically, this type of radar is fielded longer than its planned life-cycle, which is through FY 2027.

As a result, the Firefinder Product Office understated the total life-cycle costs for the Q-47 and would not be able to report the liability for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 in Army financial statements when the Army begins fielding the system.

## Life-Cycle Estimating and Reporting Policy

The following provides an overview of DoD, Army, and Federal Financial Accounting Standards policy concerning life-cycle estimating and reporting for environmental and disposal liabilities. Appendix D provides a detailed discussion of the policy.

**DoD Policy.** The policy requires that life-cycle cost estimates be comprehensive and identify all costs for the development, production, and operation of a system regardless of the source of funding and that the liability not be based on the availability of funds.

**Army Policy.** The policy states that all life-cycle cost estimates must address environment costs, including activities related to pollution prevention, compliance, remediation, restoration, conservation, litigation, liability, added management or overhead costs, and demilitarization and disposal of the system.

**Federal Financial Accounting Standards Policy.** The policy requires Federal agencies to recognize a liability in agency financial statements for cleanup costs associated with Federal mission property, plant, and equipment, including weapon systems, when the agency places the property, plant, and equipment into service.

## Demilitarization and Disposal Costs

On September 30, 1997, before the EMD decision, the Firefinder Product Office prepared a life-cycle cost estimate for the $P^3I$ of the Q-37, which subsequently became the Q-47. However, the life-cycle cost estimate did not include environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 at the end of its useful life because the Product Office believed that:

- those costs would be offset by disposal revenue from the sale of the system and
- the system would be fielded longer than its planned useful life.

**Disposal Revenue.** The Firefinder Product Office believed that environmental costs for demilitarization, disposal, and associated cleanup for the Q-47 would be offset by disposal revenue and, therefore, would not be significant enough to estimate and include in the life-cycle cost estimate. However, the Product Office had not documented its cost analysis to support that conclusion. Army Pamphlet 70-3, "Army Acquisition Procedures," July 15, 1999, requires the life-cycle cost estimate for a program to include the total environmental, safety, and health costs. The "Department of Army Cost Analysis Manual," May 2001, states that those costs consist of costs related to pollution prevention, compliance, remediation, restoration, conservation, litigation, liability, added management or overhead costs, and demilitarization and disposal of the system.

**Planned Useful Life.** The Firefinder Product Office estimated the useful life of the Q-47 to end in FY 2027. However, the Product Office believed that it could not determine the Q-47 environmental costs because systems similar to the Q-47 have lasted longer than their planned useful life. Therefore, the Product Office neither established a demilitarization and disposal schedule for the Q-47 nor determined the environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 at the end of its useful life. However, the Statement of Federal Financial Accounting Standards (SFFAS) No. 6, "Accounting for Property, Plant, and Equipment," November 10, 1995, requires Federal agencies, beginning in FY 1998, to recognize a liability in agency financial statements for cleanup costs associated with Federal mission property, plant, and equipment, including weapon systems, when the agency places the property, plant, and equipment into service.

## Environmental and Disposal Liability Reporting

The General Accounting Office Testimony No. T-AIMD/NSIAD-00-163 "Department of Defense: Progress in Financial Management Reform," May 9, 2000, states that DoD has taken important steps to implement the Federal

accounting standards requiring recognition and reporting of liabilities in the area of environmental cleanup and disposal; however, DoD still faces significant challenges in that area. Specifically, DoD did not:

- consider all potential liabilities,
- refine estimates to ensure that assumptions and methodologies are consistently applied, and
- adequately support reported estimates.

The Testimony also stated that DoD had focused on those liabilities expected to involve the largest amounts, such as nuclear weapon systems and training ranges. However, going forward, DoD needs to address estimates for other weapon systems and conventional munitions.

## Completeness of Life-Cycle Cost Estimate

By not including the environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the Q-47 at the end of its useful life in the program's life-cycle cost estimate, the Firefinder Product Office understated the total life-cycle costs for the Q-47. Although those costs may not be highly significant in terms of percentage of system life-cycle cost, those costs should not be ignored. Without an accurate life-cycle cost, which includes environmental costs, the Product Office would not be able to accurately report the liability for Q-47 environmental cleanup and disposal costs in future Army financial statements. The Army should begin reporting the environmental cleanup and disposal liability when it begins fielding the Q-47 in FY 2006, in accordance with SFFAS No. 6. Cumulatively, the environmental cleanup and disposal costs for Army weapon systems are likely to represent a material value on future Army and DoD-wide consolidated financial statements.

## Recommendations, Management Comments, and Audit Response

**D. We recommend that the Product Manager, Firefinder:**

**1. Develop an environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), partially concurred, stating that the Q-47 will not contain radioactive materials and did not contain explosives and munitions. Further, the Deputy stated that the Product Manager, Firefinder, believes that the environmental cleanup costs are negligible with a mobile system and, therefore, did not document those costs in the original program

office estimate. The Deputy also stated that the Product Manager will develop an estimate for disposal of the Q-47 program by the first quarter, FY 2002. For the complete text of the Deputy's comments, see the Management Comments section of this report.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, partially agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration. In addition to restating the Deputy's comments, the Director stated that the original program office estimate for the Q-47 did not include the disposal cost of the system because the Army has never disposed of any Firefinder radar systems. For the complete text of the Director's comments, see the Management Comments section of this report.

**Audit Response.** The Deputy's comments were responsive to the intent of the recommendation.

**2. Include the environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program in its life-cycle cost estimate.**

**Army Comments.** The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), partially concurred, stating that the cost estimate for disposal of the Q-47 systems will be incorporated into the life-cycle cost estimate for the Q-47 by the first quarter, FY 2002.

**Under Secretary of Defense for Acquisition, Technology, and Logistics, Comments.** Although not required to comment, the Director, Strategic and Tactical Systems, partially agreed, restating the comments made by the Deputy for Systems Management and Horizontal Technology Integration.

**Audit Response.** The Deputy's comments were responsive to the intent of the recommendation.

# Appendix A. Audit Process

## Scope and Methodology

We reviewed documentation dated from August 1993 to June 2001. We interviewed and obtained documentation from the staffs of the Army Training and Doctrine Command; the Assistant Secretary of the Army (Acquisition, Logistics, and Technology); the Army Deputy Chief of Staff for Operations and Plans; the Army Communications and Electronics Command; Deputy for System Acquisition, System Management Center; and the Firefinder Product Office. Because the Q-47 Program was in the late phase of EMD, the audit concentrated on whether management was cost-effectively readying the system for the production phase of the acquisition process. Consequently, we focused our review on the areas of requirements generation, acquisition planning, program assessments and decision reviews, and test and evaluation.

**Audit Type, Dates, and Standards.** We performed this program audit from January through July 2001 in accordance with generally accepted Government auditing standards except that we were unable to obtain an opinion on our system of quality control. The most recent external quality control review was withdrawn on March 15, 2001, and we will undergo a new review.

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

**Use of Technical Assistance.** An electronics engineer from the Technical Assessment Division, Office of the Assistant Inspector General for Auditing, DoD, assisted the auditors in determining whether the contractor was effectively transforming operational needs and requirements into an integrated system design for the Q-47.

**Contacts During the Audit.** We visited or contacted individuals and organizations within the DoD and Raytheon Company, Electronics Systems, Los Angeles, California. Further details are available on request.

**General Accounting Office High-Risk Area.** The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the Defense Weapon Systems 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 Regulation 5000.2-R, acquisition managers are to 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 requirements generation, acquisition planning, program assessments, decision reviews, and test and evaluation.

**Adequacy of Management Controls.** We identified a material management control weakness concerning the programmatic environmental, safety, and occupational health evaluation (PESHE) for the Q-47 as defined in DoD Instruction 5010.40. The management controls for program documentation were not adequate to ensure that the Firefinder Product Office periodically reviewed the PESHE for currency and compliance. Recommendation C.3., if implemented, will ensure that the Q-47 will have a PESHE that is up-to-date and in compliance with DoD guidance. We will provide a copy of this report to the senior official responsible for management controls in the Office of the Assistant Secretary of the Army (Financial Management and Comptroller).

**Adequacy of Management's Self-Evaluation.** To evaluate management controls for less-than-major Defense acquisition programs, the Firefinder Product Office conducts management control assessments for programs under its cognizance and provides the results of those assessments to the Deputy for System Acquisition for inclusion in the annual statement of assurance for the Army Communications and Electronics Command. For FY 2000, the Firefinder Product Office conducted a management control review of the Q-47. However, in its review, the Product Office did not identify the specific material management control weakness identified by the audit because the review by the Product Office did not include PESHE requirements.

## Management Comments on Management Control Program Review and Audit Response

**Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments.** The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), provided comments concerning the "Management Control Program Review." He stated that the audit identified the lack of a PESHE as a material management control weakness. In addition, he stated that the Directorate for Safety, Army Communications and Electronics Command, will complete a PESHE for the Q-47 and ensure that it is reviewed and updated annually. Further, he stated that the Product Manager, Firefinder, has conducted adequate environmental assessments on the proposed Q-47 components and that, in the Army's opinion, no material weakness is present. For the complete text of the Deputy's comments, see the Management Comments section of this report.

**Audit Response.** The actions of the Army will ensure that the Q-47 has a PESHE that is up-to-date and in compliance with DoD guidance. However, the lack of a PESHE for the Q-47 is a material management control weakness in accordance with DoD Instruction 5010.40. Specifically, the weakness resulted

from management controls by the Firefinder Program Office that did not ensure compliance with PESHE requirements for the Q-47 as well as other Firefinder programs under its cognizance, such as the AN/TPQ-37 and AN/TPQ-36 Firefinder Radar Programs. Without up-to-date PESHEs that are in compliance with DoD guidance, the Firefinder Program Office would not be able to ensure that the Firefinder programs under its cognizance:

- describe the program manager's strategy for meeting environmental, safety, and occupational health requirements;
- determine the individual responsible for ensuring that Firefinder programs and any future upgrades to those programs meet environmental, safety, and health requirements;
- track and document whether Firefinder programs are meeting environmental, safety, and health requirements;
- determine whether the Firefinder programs are experiencing any unforeseen environmental, safety, or health effects that violate local, state, or Federal law before the programs could cause lengthy program delays and affect mission and program cost; and
- proactively identify opportunities to reduce environmental life-cycle costs over the life span of the systems.

Further, PESHEs that include program environmental responsibilities and a methodology to track and document the completion of the environmental strategy will help prevent environmental pollution. It is easier and cheaper to prevent environmental pollution than it is to cleanup and dispose of pollution after it occurs.

## Prior Coverage

During the last 5 years, the General Accounting Agency; the Inspector General, DoD; and the Military Department audit agencies have not issued reports specifically addressing whether management was cost-effectively readying the Q-47 for production.

# Appendix B. Definitions of Technical Terms

**Acquisition Category.** An acquisition category is an attribute of an acquisition program that determines the level of review, decision authority, and applicable procedures for the program. The acquisition categories consist of I, major Defense acquisition programs; IA, major automated information systems; II, major systems; and III, all other acquisition programs. Acquisition Category I programs have two sub-categories: ID and IC. Acquisition IA programs also have two sub-categories: IAM and IAC.

**Acquisition Plan.** An acquisition plan is a formal written document showing the specific actions necessary to implement the approach established in the approved acquisition strategy.

**Acquisition Program Baseline.** The acquisition program baseline embodies the cost, schedule, and performance objectives for the program.

**Acquisition Strategy.** An acquisition strategy is a business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. It provides a master schedule for research, development, test, production, fielding, modification, postproduction management, and other activities essential for program success. The acquisition strategy is the basis for formulating functional plans and strategies.

**Beyond Low-Rate Initial Production Report.** A beyond low-rate initial production report states whether an initial operational test and evaluation performed was adequate and whether the results of such test and evaluation confirm that the items or components actually tested are effective and suitable for combat.

**Categorical Exclusion.** A categorical exclusion is a NEPA document that certifies that neither an environmental assessment nor an environmental impact statement is required.

**Critical Operational Issue.** A critical operational issue is an issue of operational effectiveness and operational suitability (not parameters, objectives, or thresholds) that must be examined in operational test and evaluation to determine the capability of the system to perform its mission. A critical operational issue is normally phrased as a question that must be answered to properly evaluate operational effectiveness or operational suitability.

**Environmental Assessment.** An environmental assessment is a concise public document that provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

**Environmental Impact Statement.** An environmental impact statement is a public document prepared for actions that may have a significant impact on the quality of the human environment. An environmental impact statement is

prepared in draft, filed with the Environmental Protection Agency, and distributed to Government, organizations, and individuals for review and comment. A final environmental impact statement includes pertinent comments and information from the review process and is filed with the Environmental Protection Agency and distributed to recipients of the draft environmental impact statement. The environmental impact statement process is completed by the publication in the Federal Register of a record of decision.

**Estimate at Completion.** An estimate at completion is actual direct and applied indirect costs to date plus the estimate of cost for authorized work remaining.

**Finding of No Significant Impact.** A finding of no significant impact is a document that presents the reasons why an action not otherwise categorically excluded will not have a significant effect on the human environment, and for which an environmental impact statement will not be prepared.

**Initial Operational Test and Evaluation.** Initial operational test and evaluation is operational test and evaluation conducted on production or production-representative articles, to support the decision to proceed beyond low-rate initial production. Further, initial operational test and evaluation is conducted to provide a valid estimate of expected system operational effectiveness and operational suitability.

**Life-Cycle Cost.** Life-cycle cost is the total cost to the Government of acquisition and ownership of that system over its useful life. In includes the cost of development, acquisition, operating, support, and, where applicable, disposal.

**Limited User Test.** A limited user test is any type of research, development, test and evaluation funded operational test conducted between the engineering and manufacturing design and the full-rate production phases other than the dedicated initial operational test.

**Materiel Developer.** A materiel developer is a command or agency responsible for research and development and production validation of an item.

**Operating and Support Costs.** Operating and support costs consist of those resources required to operate and support a system, subsystem, or a major component during its useful life in the operational inventory.

**Pre-Planned Product Improvement.** A pre-planned product improvement includes improvements planned for ongoing systems that go beyond the current performance envelope to achieve a needed operational capability.

**Production-Representative System.** A production-representative system is a system that can be used for initial operational test and evaluation during the engineering and manufacturing development phase of the acquisition process. A production-representative system can also be a mature engineering development model or a low-rate initial production system in its final configuration that conforms to production specifications and drawings.

**Program.** A program is an acquisition effort funded by research, development, test and evaluation or procurement appropriations, or both, with the express objective of providing a new or improved capability in response to a stated mission need or deficiency.

**Prototype.** A prototype is an original or model on which a later system or item is formed or based.

**Rebaseline.** Rebaseline is a process whereby the program office redefines the program cost, schedule, and performance parameters that are the starting point for subsequent efforts and progress measurement.

**Record of Decision.** A record of decision is a concise statement of the decision made concerning the environmental impact statement.

**Weapon System.** A weapon system is an item or set of items that can be used directly by warfighters to carry out combat or combat support missions to include tactical communication systems.

# Appendix C. Beyond Low-Rate Initial Production Report and Major Defense Acquisition Program Policy

The following discusses relevant policy concerning statutory and DoD policy on beyond low-rate initial production (LRIP) reporting and major Defense acquisition program classification.

**Beyond Low-Rate Initial Production Policy.** Section 2399, title 10, United States Code, "Operational Test and Evaluation of Defense Acquisition Programs;" DoD Directive 5141.2, "Director of Operational Test and Evaluation (DOT&E)," May 25, 2000; and DoD Instruction 5000.2, "Operation of the Defense Acquisition System," Change 1, January 4, 2001; DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001, provide policy concerning beyond LRIP reports.

**Section 2399.** Section 2399 requires that, at the conclusion of operational test and evaluation conducted for each major Defense acquisition program, DOT&E will prepare a report stating its opinion as to whether the test and evaluation performed was adequate and whether the results of the test and evaluation confirm that the items or components actually tested are effective and suitable for combat. The section also requires DOT&E to submit the report to the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees. Further, the section adds that DoD may not proceed with a major Defense acquisition program beyond LRIP until the DOT&E has submitted the beyond LRIP report to the Secretary of Defense and the congressional Defense committees have received the report.

**DoD Directive.** DoD Directive 5141.2 states that DOT&E will analyze the results of operational test and evaluation conducted on programs under DOT&E test and evaluation oversight and submit a report for operational test and evaluation to the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees before DoD makes a decision to proceed beyond LRIP. The report addresses the adequacy of the test and evaluation performed and whether the results confirm the operational effectiveness, operational suitability, lethality, and survivability of the items or components actually tested.

**DoD Instruction.** DoD Instruction 5000.2 states that, for DOT&E oversight programs, a system cannot be produced at full-rate until a beyond LRIP report has been completed and sent to Congress; the Secretary of Defense; and the Under Secretary of Defense for Acquisition, Technology, and Logistics.

**DoD Regulation.** DoD Regulation 5000.2-R states that DOT&E will analyze the results of the initial operational test and evaluation conducted for each major Defense acquisition program. At the conclusion of the initial operational test and evaluation, DOT&E will prepare a report stating its opinion as to whether the test and evaluation performed were adequate, and whether the results of such test and evaluation confirm that the items or components actually tested are effective and suitable for combat. Further, DoD Regulation 5000.2-R requires DOT&E to submit the beyond LRIP reports to the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology, and Logistics; and the congressional Defense committees.

**Major Defense Acquisition Program Policy.** Title 10, United States Code and DoD Instruction 5000.2 provide classification policy for a major Defense acquisition program.

**Statutory Requirements.** Section 139, title 10, United States Code, "Director of Operational Test and Evaluation;" section 2399; and section 2430, title 10, United States Code, "Major Defense Acquisition Program Defined;" establish statutory requirements for a major Defense acquisition program.

**Section 139.** Section 139(a)(2)(B) states that a major Defense acquisition program is a DoD acquisition program that is a major Defense acquisition program as defined by section 2430.

**Section 2399.** Section 2399 states that a major Defense acquisition program has the meaning of that term in section 139(a)(2)(B).

**Section 2430.** Section 2430 states that a major Defense acquisition program is a DoD acquisition program that the Secretary of Defense has determined is not a highly sensitive classified program and has designated as a major defense acquisition program; or that the Secretary of Defense has estimated will require an eventual total expenditure for research, development, test, and evaluation of more than $300 million (FY 1990 constant dollars) or an eventual total expenditure for procurement of more than $1.8 billion (FY 1990 constant dollars).

**DoD Instruction.** DoD Instruction 5000.2 states that a major Defense acquisition program is a acquisition program that the Secretary of Defense has determined is not a highly sensitive classified program and that the Under Secretary of Defense for Acquisition, Technology, and Logistics has designated as a major defense acquisition program or has estimated will require an eventual total expenditure for research, development, test, and evaluation of more than $365 million (FY 2000 constant dollars) or an eventual total expenditure for procurement of more than $2.19 billion (FY 2000 constant dollars). DoD Instruction 5000.2 also states that Acquisition Category I programs are those programs that are major Defense acquisition programs or that the milestone decision authority designates as an Acquisition Category I because of special interest.

# Appendix D. Life-Cycle Cost Estimating and Reporting Policy

The following discusses relevant policy concerning DoD, Army, and Federal Financial Accounting Standards policy on life-cycle cost estimating and reporting for environmental and disposal liabilities.

**DoD Policy.** DoD Regulation 5000.2-R;* DoD Regulation 7000.14-R, "DoD Financial Management Regulation," Volume 4, October 1999; DoD Manual 5000.4-M, "Department of Defense Cost Analysis Guidance and Procedures," December 11, 1992; and the Defense Acquisition Deskbook provide life-cycle cost estimating and reporting guidance, including the reporting of environmental and disposal liabilities.

**DoD Regulation 5000.2-R.** DoD Regulation 5000.2-R requires that life-cycle cost estimates be comprehensive and identify all costs for the development, production, and operation of a system regardless of the source of funding.

**DoD Regulation 7000.14-R.** DoD Regulation 7000.14-R prescribes the accounting policy and principles for estimating and reporting in DoD financial statements the liabilities associated with the disposition of property, structures, equipment, munitions, and weapons, and the liabilities associated with the containment, treatment, or removal of contamination that could pose a threat to public health and the environment. Further, DoD Regulation 7000.14-R states that liability recognition will not be based on the availability of funds.

**DoD Manual.** DoD Manual 5000.4-M requires that program offices identify the cost of any hazardous, toxic, or radiological materials that may be encountered or generated during system development, manufacture, transportation, storage, operation, and disposal. Furthermore, the guidance states that program offices should include the costs of demilitarization, detoxification, or long-term waste storage in the cost estimates.

**Defense Acquisition Deskbook.** The Defense Acquisition Deskbook addresses life-cycle estimates in its "Scope of Life-Cycle Cost Estimates" and the "Cost Estimate Documentation Guidelines" sections. Specifically, the Deskbook states that life-cycle cost estimates should:

- cover the entire planned life of a program and include all cost categories (concept exploration, if applicable; demonstration and validation; engineering and manufacturing, development, production, and deployment; operations and support; and demilitarization and disposal) and all appropriation accounts; and

*DoD initially issued DoD Regulation 5000.2-R on March 15, 1996. It included the requirement to prepare a comprehensive life-cycle cost estimate.

- address environmental costs, such as pollution prevention, hazardous waste management, demilitarization and disposal of equipment, and cleanup of real estate.

**Army Policy.** Army Pamphlet 70-3, "Army Acquisition Procedures," July 15, 1999, and the "Department of Army Cost Analysis Manual," May 2001 (the Cost Manual), Chapter 6, "Environmental Quality Costing," provide Army policy on estimating and accounting for environmental life-cycle costs.

**Army Pamphlet 70-3.** Army Pamphlet 70-3 states that the life-cycle cost estimate for a program includes the total environmental, safety, and health costs.

**Cost Manual.** The Cost Manual states that the total ownership costs of Army weapon systems must address and identify the environmental quality costs associated with their development, production, operations, maintenance, support, and disposal. Those costs also include the environmental quality costs at installations that host the system operations, overhaul, and disposal, which can be directly linked to the weapon system. Environmental quality costs for any weapon system are those costs that specifically relate to activities in pollution prevention, compliance, restoration, and conservation. Program managers are to ensure that all environmental quality life-cycle costs are included in the program estimate and to provide appropriate visibility to the environmental quality life-cycle costs such that they support acquisition decisions. The program estimate must include costs for environmental quality related activities, products, and services and encompass all significant environmental quality costs. Such costs may arise in any or all of the major segments of the estimate and stem from activities for pollution prevention, compliance, remediation, restoration, conservation, litigation, liability, added management or overhead costs, and operation, maintenance, demilitarization, and disposal of the system.

**Federal Financial Accounting Standards Policy.** The Statement of Federal Financial Accounting Standards (SFFAS) No. 6, "Accounting for Property, Plant, and Equipment," requires that Federal agencies, beginning in FY 1998, recognize a liability in agency financial statements for cleanup costs associated with Federal mission property, plant, and equipment, including weapon systems, when the agency places the property, plant, and equipment into service. SFFAS No. 6 defines cleanup costs as those costs to remove, contain, or dispose, or any combination of the three, of hazardous waste from material or property that is permanently or temporarily shut down. In addition, cleanup costs include decontamination, decommissioning, site restoration, site monitoring, closure, and post closure costs.

# Appendix E. Report Distribution

## Office of the Secretary of Defense

Under Secretary of Defense for Acquisition, Technology, and Logistics
  Deputy Under Secretary of Defense (Acquisition Initiatives)
Under Secretary of Defense (Comptroller)
  Deputy Chief Financial Officer
  Deputy Comptroller (Program/Budget)
Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)
Director, Operational Test and Evaluation

## Department of the Army

Commander, Army Materiel Command
  Commander, Army Communications and Electronics Command
    Deputy for System Acquisition
      Product Manager, Firefinder
Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
  Program Executive Office, Intelligence, Electronic Warfare, and Sensors
Assistant Secretary of the Army (Financial Management and Comptroller)
Commander, Army Training and Doctrine Command
  Commandant, Army Field Artillery School
Deputy Chief of Staff for Operations and Plans
Auditor General, Department of the Army

## Department of the Navy

Naval Inspector General
Auditor General, Department of the Navy

## Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force

## Other Defense Organization

Director, Defense Contract Management Agency
  Commander, Defense Contract Management Command West

## Non-Defense Federal Organization

Office of Management and Budget

## Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
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

# Under Secretary of Defense for Acquisition, Technology, and Logistics Comments

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

03 OCT 2001

MEMORANDUM FOR DEPUTY DIRECTOR, ACQUSITION MANAGEMENT DIRECTORATE, INSPECTOR GENERAL

THROUGH: DIRECTOR, ACQUISITION RESOURCES AND ANALYSIS NS 10/3/01

SUBJECT: Draft Report -- Acquisition of the Firefinder (AN/TPQ-47) Radar, Project D2001AE-0047, July 25, 2001

I am forwarding the proposed Department of Defense response to the DoD Inspection General's draft report, Acquisition of the Firefinder (AN/TPQ-47) Radar, Project D2001AE-0047, July 25, 2001.

The DoD appreciates the opportunity to comment on the draft report.

for George R. Schneiter
Director
Strategic and Tactical Systems

Department of Defense Reply to
Draft Report
Acquisition of the Firefinder (AN/TPQ-47) Radar
(Project No. D2001AE-0047, dated July 25, 2001)

**Recommendation A.1.** We recommend that the Product Manager, Firefinder, update the acquisition plan for the Firefinder (AN/TPQ-47) Radar to include the latest acquisition strategy and periodically update the plan as significant changes occur to the acquisition strategy.

**DoD Response.** Concur. The revised acquisition strategy was outlined during an In-Process Review to the Milestone Decision Authority (MDA) and approved by an Acquisition Decision Memorandum (ADM) dated April 9, 2001. The PM has planned to update the Acquisition Plan to support the Milestone review and the follow-on contract for the LRIP phase in FY 2004.

**Recommendation A.2**. We recommend that the Deputy Chief of Staff for Operations and Plans (DCSOPS) validate the Firefinder (AN/TPQ-47) Radar requirements for 72 systems.

**DoD Position**. Concur. DCSOPS has already validated the requirement for procurement of 72 systems consistent with Army Regulation 70-1. As correctly stated in the draft report, the need for 72 AN/TPQ-47 systems is based on a one-for-one replacement of the AN/TPQ-37, the predecessor system to the AN/TPQ-47. While the Army has reduced force structure, the 72 systems will be deployed with newly configured divisions or prepositioned.

**Recommendation B.1**. We recommend that the Director, Operational Test and Evaluation, in coordination with the Under Secretary of Defense for Acquisition, Technology and Logistics, and the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) initiate action to resolve conflicting policy on beyond low-rate initial production reporting contained in DoD Directive 5141.2, "Director of Operational Test and Evaluation (DOT&E)," May 25, 2000; and DoD Instruction 5000.2, "Operation of the Defense Acquisition System," Change 1, January 4, 2001; DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001, to conform with section 2399, title 10, United States Code, "Operational Test and Evaluation of Defense Acquisition Programs."

**DoD Position**. Concur. An Integrated Product Team (IPT) will be convened and will deliberate the conflicting policy on the beyond-low-rate initial production reporting contained in the various governing documents. The IPT will be convened during first quarter FY 2002.

**Recommendation B.2**. We recommend that, the Director, Operational Test and Evaluation, update its oversight list to show that it intends to prepare and submit a beyond low-rate initial production report for the Firefinder (AN/TPQ-47) Radar.

**DoD Position**. Concur. Without a beyond-LRIP report for the AN/TPQ-47, the Secretary of Defense, the Under Secretary of Defense for Acquisition, Technology and Logistics, and the congressional defense committees will not be informed as to whether the test and evaluation was adequate and whether the results confirm that the items or components tested for the AN/TPQ-47 are operationally effective and suitable for use in combat before the production decision is made.

**Recommendation C.1**. Prepare an environmental assessment for the Firefinder (AN/TPQ-47) Radar to determine whether the system has a significant impact on the quality of the human environment, in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June10, 2001.

**DoD Position**. Concur. The approved Acquisition Plan for the AN/TPQ-47 states: "The Safety Assessment Report (SAR) will be procured as a contractor-prepared data item. An evaluation of the system's potential impact on the quality of human environment will be conducted and the appropriate environmental documentation will be prepared." The AN/TPQ-47 EMD contract includes a contract data item for a Safety Assessment Report (SAR). The initial SAR, prepared and submitted in January 2000, includes a Hazard Analysis Report and an Environmental Assessment as separate appendices. The SAR was evaluated as part of the Critical Design Review (CDR). The next SAR submission is due 60 days prior to the initiation of Development Testing (DT) with a final SAR prepared 30 days after receipt of Government comments.

**Recommendation C.2**. Prepare and update annually, as appropriate, a programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar to identify environmental safety issues, occupational health requirements, demilitarization and disposal requirements; to establish program environmental responsibilities; and to compose a methodology to track progress throughout the remainder of the program life-cycle, in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001.

**DoD Position**. Concur. As stated in DoD Response C.1 above, a Safety Assessment Report including a Hazard Analysis and an Environmental Assessment was prepared on the proposed AN/TPQ-47 components. The CECOM Directorate for Safety has also initiated actions on a Health Hazard Assessment and a Non-ionizing Radiation Protection Study with the U.S. Army Center for Health Promotion and Preventative Medicine. The Programmatic Environmental Safety and Occupational Health Evaluation (PESHE) was not a requirement at the time of the milestone review in Nov 97. However, the requirement for a separate PESHE is outlined in the latest DoD 5000.2R dated June 10,

2001. The CECOM Directorate for Safety will initiate action to complete a PESHE and ensure its review and update annually.

**Recommendation C.3**. Conduct a review of the programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar during the management control review for the annual statement of assurance to ensure that the evaluation is up-to-date.

**DoD Position**. Concur. The CECOM Directorate for Safety will initiate action to complete a PESHE and ensure its review and update annually.

**Recommendation D.1**. Develop an environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program.

**DoD Position**. Partly concur. As documented in the Safety and Health Data Sheet approved by the Director, Safety Risk Management, the AN/TPQ-47 was not expected to contain radioactive materials, does not contain explosives, and does not contain munitions. The PM believed environmental cleanup costs to be negligible, and therefore, they were not documented in the original Program Office Estimate (POE). This is still the PM position.

The original POE, based on a twenty-year life cycle, estimated the cost of leaving each system in the field for twenty years from its fielding date. However, the POE did not include the cost to dispose of the systems. It was estimated this way because the Army has never disposed of any Firefinder radar. The original Firefinder systems procured in the 1970s and 1980s are still fielded today. However, based on this recommendation, the PM will develop an estimate for disposal costs relating to the AN/TPQ-47 program. Estimated completion date for this estimate is 1QFY02.

**Recommendation D.2**. Include the environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program in its life cycle cost estimate.

**DoD Position**. Partly concur. The cost estimate for disposal of the AN/TPQ-47 systems will be incorporated into the AN/TPQ-47 life cycle cost estimate. Estimated completion date for this effort is 1QFY02.

# Director, Operational Test and Evaluation, Comments

OPERATIONAL TEST AND EVALUATION

OFFICE OF THE SECRETARY OF DEFENSE
1700 DEFENSE PENTAGON
WASHINGTON, DC 20301-1700

1 OCT 2001

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Response to Draft of the Proposed Audit Report on the Acquisition of the AN/TPQ-47 Firefinder Radar (Project No. D2001AE-0047)

Thank you for the opportunity to comment on your draft audit report which addresses two important issues concerning DOT&E:

a. Whether to write a Beyond Low Rate Initial Production (BLRIP) report on the AN/TPQ-47 Firefinder radar.

b. The larger issue of the inconsistency between DoD policies, directives, and Title 10, US Code, regarding BLRIP reporting requirements.

I concur with your recommendation to write a BLRIP on the AN/TPQ-47 Firefinder radar. The next iteration of the OSD oversight list will reflect that change. I also concur with your recommendation to initiate action to resolve conflicting policy regarding BLRIP reporting requirements.

L.H. Franc
Principal Deputy Director

# Department of the Army Comments

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

REPLY TO
ATTENTION OF

09 OCT 2001

SAAL-SA

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Audit Report of the Acquisition of the Firefinder (AN/TPQ-47) Radar (Project No. D2001AE-0047)

The Army appreciates the opportunity to review and comment on the draft audit report on the Firefinder (AN/TPQ-47) Radar. Enclosed are management comments as requested. The Army concurs with Findings A, B, & C (a. Updated Acquisition Plan, b. Beyond Low-Rate Initial Production Report, and c. Environmental Assessment & Evaluation). The Deputy Chief of Staff for Operations (DCSOPS) validates the Army Acquisition Objective (AAO) for the Q-47 to be 72 Systems in response to recommendation A-2. We fully concur with Recommendations C-1 (Prepare Environmental Assessment Report), C-2 (Safety & Occupational Health Evaluation), and C-3 (Annual Programmatic Reviews).

We partly concur with Recommendations D-1 (Environmental Cost Estimate), and D-2 (Pollution Prevention, Demilitarization & Disposal Cost Estimates). The Q-47 will not contain explosives, radioactive materials or munitions that will generate environmental cleanup costs associated with its disposal.

The Communications-Electronic Command (CECOM) initial reply of "non-concur" to recommendation C-1 (Prepare an environmental assessment to determine whether the system has a significant impact on the quality of the human environment) is now changed to "concur." CECOM will conduct a Programmatic Environmental, Safety and Occupational Health Evaluation with an estimated completion date of the 3rd Quarter, 2002.

The Army POC is Mr. DeWitt Player at (703) 604-7042 (DSN 664); e-mail: playerdt@saalt.army.mil.

ROBERT E. ARMBRUSTER, JR.
Major General, USA
Deputy for Systems Management
and Horizontal Technology Integration

Enclosure

Army Comments on the Draft Audit Report of the Acquisition of the Firefinder (AN/TPQ-47) Radar (Project No. D2001AE-0047)

1. **Recommendation A-2** (page 7), "We recommend that the Deputy Chief of Staff for Operations and Plans validate the Firefinder (AN/TPQ-47) Radar requirement for 72 systems."
   **Army Position.** Concur. DCSOPS validated the requirement for the procurement of 72 systems consistent with Army Regulation 70-1, "Army Acquisition Policy & Procedures." The need for 72 AN/TPQ-47 Firefinder's is based on a one-for-one replacement of its predecessor system--the AN/TPQ-37. While the Army has reduced Force Structure, the 72 systems will be deployed with newly configured Divisions or be pre-positioned. Currently, in the FY02 - 07 POM, the Army Acquisition Objective (AAO) for the Firefinder Q-47 is 72 systems.

2. **Recommendation D-1** (page 17), "Develop an environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program."
   **Army Position.** Partly Concur. As documented in the Safety and Health Data Sheet approved by the CECOM Director, Safety Risk Management, the Q-47 will not contain radioactive materials, does not contain explosives, and does not contain munitions. The PM's position is that environmental cleanup costs will be negligible with a mobile system, and was consequently not documented in the original Program Office Estimate (POE). The PM will develop as estimate for disposal costs relating to the Q-47 by end of 1st Qtr., FY02.

3. **Recommendation D-2** (page 17), "Include the Environmental Cost Estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program in its life-cycle cost estimate.
   **Army Position.** Partly Concur. The cost estimate for disposal of the Q-47 systems will be incorporated into its Life-Cycle Cost Estimate. Projected completion date for this effort is 1QFY02.

The Army position is consistent with command comments submitted by HQ AMC (enclosure 2) unless otherwise noted in the above recommendations.

**DEPARTMENT OF THE ARMY**
**HEADQUARTERS, U.S. ARMY MATERIEL COMMAND**
**5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333 - 0001**

REPLY TO
ATTENTION OF

AMCIR-A (36-2a) 1 October 2001

MEMORANDUM FOR MR. DONALD C. CRESS, PROGRAM MANAGER, STRATEGIC ENGAGEMENT OFFICE, U.S. ARMY AUDIT AGENCY, 3101 PARK CENTER DRIVE, ALEXANDRIA, VA 22302-1596

SUBJECT: DODIG Draft Report, Acquisition of the Firefinder (AN/TPQ-47) Radar, Project 1AE-0047 (AMC No. D0113)

1. We are enclosing our position on subject report IAW AR 36-2.

2. Reference is made to the Communications-Electronics Command (CECOM) reply to Recommendation C-1. The "non-concur" should be changed to "concur." CECOM will conduct a Programmatic Environmental, Safety and Occupational Health Evaluation with an estimated completion date of the 3rd quarter 2002. We concur with the actions taken or proposed by CECOM.

3. Point of contact for this action is Mr. Robert Kurzer, (703) 617-9025, e-mail - bkurzer@hqamc.army.mil.

4. AMC -- Army READINESS Command . . . Supporting Every Soldier Every Day.

FOR THE COMMANDER:

Encl
as

RICHARD A. HACK
Major General, USA
Chief of Staff

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND
AND FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY 07703 - 5000

REPLY TO
ATTENTION OF

AMSEL-IR (36-2)

29 AUG 2001

MEMORANDUM FOR Commander, U.S Army Materiel Command, ATTN: AMCIR-A, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

SUBJECT: DODIG Draft Report, Acquisition of the Firefinder (AN/TPQ-47) Radar, Project 1AE-0047 (AMC No. D0113)

1. Reference, Memorandum, HQAMC, AMCIR-A, 2 Aug 01, SAB.

2. In accordance with reference 1, the command comments on the subject report are enclosed.

3. Point of contact for the reply is Mr. John Riley, AMSEL-IR, DSN 987-4537, Email: John.Riley@mail1.monmouth.army.mil.

4. CECOM Bottom Line: THE SOLDIER.

Encl

ROBERT E. JOHNSON
Colonel, GS
Chief of Staff

**CECOM Reply to**
**Draft Report**
**Acquisition of the Firefinder (AN/TPQ-47) Radar**
**(Project No. D2001AE-0047)**

**FINDING SUMMARY A: Updated Acquisition Plan.** The PM did not update the Acquisition Plan to incorporate a revised acquisition strategy and the Army DSCOPS has not fully validated the quantity of systems required

**ADDITIONAL FACTS:** None.

**RECOMMENDATION AND COMMAND COMMENTS**

**Recommendation A-1.** We recommend that the Product Manager, Firefinder, update the acquisition plan for the Firefinder (AN/TPQ-47) Radar to include the latest acquisition strategy and periodically update the plan as significant changes occur to the acquisition strategy.

**Command Comments: Concur.** The CECOM Principal Assistant Responsible for Contracting approved Acquisition Plan No. 98-09 for the AN/TPQ-47 on 9 Feb 98 prior to the solicitation and award of the Engineering and Manufacturing Development (EMD) contract. The acquisition plan outlined a strategy for a competitive EMD contract to design, test, and deliver three production-representative systems that the Army would use to conduct an Initial Operational Test and Evaluation (IOT&E). The competitive EMD contract was awarded 19 May 98 to Raytheon Systems Company for the program outlined in the plan. However, because of schedule stretch-outs directed by the Army, as well as technical challenges and cost increases, in Aug 00, the PM determined that revising the program strategy was the best way to ensure that the program was executable. The EMD program was revised to reduce the quantity from three to two systems that would be used for Development Test and a Limited User Test. The acquisition strategy was revised to add a Low Rate Initial Production (LRIP) phase to the program to procure systems for IOT&E prior to full production.

The revised acquisition strategy was outlined in an In-Process Review to the Milestone Decision Authority (MDA) and approved by an Acquisition Decision Memorandum (ADM) dated 9 Apr 01. The PM planned to update the Acquisition Plan to support the Milestone review and the follow-on contract for the LRIP phase in FY04. However, the PM acknowledges that AFARS—Part 7 Acquisition

ENCL 1

Planning, dated 25 Jul 97, states "Update acquisition plans when required for milestone approval or when there is a change in the acquisition strategy." Based on the AFARS, it appears that the change to the strategy should be documented in a formal revision to the Acquisition Plan. The PM will initiate the update to the Acquisition Plan with an anticipated completion date of 2QFY02.

**FINDING SUMMARY C. Environmental Assessment and Evaluation.** The PM did not develop an environmental assessment and a Programmatic Environmental, Safety, and occupational Health Evaluation (PESHE).

**ADDITIONAL FACTS.** None.

**RECOMMENDATIONS AND COMMAND COMMENTS**

**Recommendation C-1.** Prepare an environmental assessment for the Firefinder (AN/TPQ-47) Radar to determine whether the system has a significant impact on the quality of the human environment, in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001.

**Command Comments: Non-concur.** A Safety and Health Data Sheet was prepared and approved by the CECOM Director, Safety Risk Management prior to the Milestone II Decision. The Safety and Health Data Sheet stated that "no uncontrolled safety hazards are expected to be identified" for the program. The recommendation was that the program should proceed into the EMD phase. The Safety and Health Data Sheet requested that a Safety Assessment Report be prepared and a Health Hazard Assessment be requested from the Army Center for Health Promotion and Preventive Medicine. It further stated that the Directorate of Safety Risk Management would perform an Environmental evaluation and prepare the Record of Environmental Consideration prior to Material Release.

The approved Acquisition Plan for the AN/TPQ-47 states "The Safety Assessment Report (SAR) will be procured as a contractor prepared data item. An evaluation of the system's potential impact on the quality of human environment will be conducted and the appropriate environmental documentation will be prepared." The AN/TPQ-47 EMD contract includes a contract data item for a Safety Assessment Report (SAR). The initial SAR, prepared and submitted in Jan 00, includes a Hazard Analysis Report and an

Environmental Assessment as separate appendices. The SAR was evaluated as part of the Critical Design Review (CDR). The next SAR submission is due 60 days prior to Development Testing (DT) with a final SAR prepared 30 days after receipt of Government comments.

The CECOM Directorate for Safety has requested a Health Hazard Assessment and a Non-ionizing Radiation Protection Study from the US Army Center for Health Promotion and Preventative Medicine. Both studies are ongoing, and the projected completion date for the Health Hazard Assessment is 1QFY02. In accordance with the requirements of the National Environmental Policy Act, the AN/TPQ-47 will be evaluated for its potential impact on the quality of the human environment. Environmental concerns will be minimized to the maximum extent practicable, and appropriate environmental documentation will be completed prior to fielding. The evaluation will be conducted using the Record of Environmental Consideration and CECOM's Environmental Impact Analysis Worksheet. The item will be evaluated for hazardous materials such as reactive or flammable chemicals, toxins, carcinogens and ozone depleting substances. System components will be evaluated as to their requirement for special handing or disposal. The potential for the release of hazardous substances into the soil or a body of water will be evaluated as well as the effect of excessive noise levels on humans or wild life.

**Recommendation C-2**. Prepare and update annually, as appropriate, a programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar to identify environmental safety issues, occupational health requirements, demilitarization and disposal requirements; to establish program environmental responsibilities; and to compose a methodology to track progress throughout the remainder of the program life-cycle, in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," June 10, 2001.

**Command Comments**: **Partly concur.** As stated in C-1 above, a Safety Assessment Report including a Hazard Analysis and an Environmental assessment was prepared on the proposed AN/TPQ-47 components. The CECOM Directorate for Safety has also initiated actions on a Health Hazard Assessment and a Non-ionizing Radiation Protection Study with the US Army Center for Health Promotion and Preventative Medicine. The Programmatic Environmental Safety and occupational Health Evaluation (PESHE)

was not a requirement at the time of the program Milestone Review in Nov 97. However, the requirement for a separate PESHE is outlined in the latest DoD 5000.2R dated June 10, 2001. The CECOM Directorate for Safety will initiate action to complete a PESHE and ensure its review and update annually.

**Recommendation C-3**. Conduct a review of the programmatic environmental, safety, and occupational health evaluation for the Firefinder (AN/TPQ-47) Radar during the management control review for the annual statement of assurance to ensure that the evaluation is up-to-date.

**Command Comments**: **Concur**. The CECOM Directorate for Safety will initiate action to complete a PESHE and ensure its review and update annually.

**FINDING SUMMARY D**. **Environmental Life-Cycle Costs**. The PM did not include environmental costs for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup for the AN/TPQ-47 at the end of its useful life in the life cycle cost estimate.

**ADDITIIONAL FACTS**. None.

**RECOMMENDATIONS AND COMMAND COMMENTS**

**Recommendation D-1**. Develop an environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program.

**Command Comments**: **Partly Concur**. As documented in the Safety and Health Data Sheet approved by the Director, Safety Risk Management, the AN/TPQ-47 was not expected to contain radioactive materials, does not contain explosives, and does not contain munitions. The PM believed environmental cleanup costs to be negligible, and therefore, they were not documented in the original Program Office Estimate (POE). This is still the PM position.

The original POE, based on a twenty-year life cycle, estimated the cost of leaving each system in the field for twenty years from its fielding date. However, the POE did not include the cost to dispose of the systems. It was estimated this way because we have never disposed of any Firefinder radar. The original Firefinder systems procured in the 1970s and 1980s are

still fielded today. However, based on this finding, the PM will develop an estimate for disposal costs relating to the AN/TPQ-47 program. Estimated completion date for this estimate is 1QFY02.

**Recommendation D-2.** Include the environmental cost estimate for pollution prevention, hazardous waste management, demilitarization, disposal, and associated cleanup of the Firefinder (AN/TPQ-47) Radar Program in its life cycle cost estimate.

**Command Comments: Partly Concur.** The cost estimate for disposal of the AN/TPQ-47 systems will be incorporated into the AN/TPQ-47 life cycle cost estimate. Estimated completion date for this effort is 1QFY02.

**Appendix A. Management Control Program Review.** The audit identified the lack of a PESHE as a material management control weakness. As addressed in C-2 and C-3 above, the CECOM Directorate for Safety will initiate action to complete a PESHE and ensure its review and update annually. Also, as addressed above, the PM has conducted adequate environmental assessments on the proposed AN/TPQ-47 components. It is our position that no material weakness is present.

# Audit Team Members

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