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

REPORT
NO. 90-088

June 27, 1990

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION
COMPTROLLER OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
ASSISTANT SECRETARY OF THE ARMY (FINANCIAL MANAGEMENT)
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Report on the Survey of Radar Cross-Section Measurement Capabilities (Project No. 0AB-0015)

Introduction

This is our final report on the Survey of Radar Cross-Section (RCS) Measurement Capabilities for your information and use. We made the survey from November 1989 through February 1990. Our objectives were to evaluate DoD plans for additional RCS measurement capabilities, the economies of the options available for meeting requirements, and the effectiveness of applicable internal controls. We also evaluated an OSD study on the requirements for additional RCS capabilities.

Discussion

In 1988 the Inspector General deferred the completion of an audit of RCS capabilities to avoid unnecessary duplication of an OSD study by the Directorate for Special Programs, which had similar objectives. At that time, both the Navy and Air Force planned to build facilities for in-flight RCS measurements, estimated to cost $61 million. In addition, the Navy planned $41 million in improvements to an existing RCS facility for measuring stationary targets. Since that time, the Navy cancelled plans for its in-flight RCS measurement facility, avoiding costs of $31 million. The Navy also delayed about $30 million in RCS range improvements until after fiscal year 2000.

In November 1989, the OSD Directorate for Special Programs provided the Office of the Under Secretary of Defense for Acquisition its study report, "DoD Radar Cross-Section Measurement Improvement Roadmap." That report recommended developing additional RCS measurement capabilities, developing a

DoD capability for characterizing RCS measurement ranges, establishing formal procedures and standards for RCS measurement, and preparing a policy to standardize security practices related to stationary RCS measurements. The Under Secretary of Defense for Acquisition adopted the report recommendations on December 19, 1989.

During our current survey, we evaluated RCS measurement capabilities budgeted for the Naval Weapons Center ($1.5 million), Pacific Missile Test Center ($11.0 million), and Wright Research and Development Center ($7.6 million). We determined that these acquisitions supported unique DoD missions, and that the required capabilities did not exist in DoD. Also, our survey did not disclose any unnecessary acquisitions of RCS measurement capabilities, or differences with the OSD study conclusions. Because of these positive observations, and because there had not been sufficient time to implement the recommendations in the 1989 report, we terminated our current project at the conclusion of the survey.

Scope of Survey

We visited or contacted the Government activities acquiring new RCS measurement capabilities estimated to cost $1 million or more in fiscal years 1988 through 1994. These activities included the Naval Weapons Center, China Lake, California; the Pacific Missile Test Center, Point Mugu, California; and the Wright Research and Development Center, Dayton, Ohio. Other activities visited or contacted are listed in Enclosure 1.

We reviewed documentation and we interviewed personnel to identify planned acquisitions and existing capabilities for RCS measurement. In comparing planned RCS measurement acquisitions with existing capabilities, we evaluated missions, technical capabilities, work load, and management justifications for planned acquisitions. We did not review certain highly classified technical capabilities or range time requirements.

This economy and efficiency survey was made in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were considered necessary.

Internal Controls

We reviewed the implementation of the Federal Managers' Financial Integrity Act at OSD as it related to the scope of our project. OSD did not identify the acquisition of RCS measurement capabilities as a separate assessable unit. However, we determined that two assessable units for the Deputy Director of Defense Research and Engineering, and for the Director,

Operational Test and Evaluation, related to test resource oversight and the impact of test resources on operational testing. The OSD determined these assessable units had a low vulnerability and did not conduct a detailed evaluation of controls.

The internal controls to prevent unwarranted duplication of test resource capabilities include the Defense Acquisition Board Test and Evaluation Committee, the Test Resource Master Plan, and the Multi-Service Test Investment Review Committee. The Defense Management Review is reinforcing these controls through its Test and Evaluation Activity Consolidation Study. The survey showed no significant internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38 at the activities we visited.

Background

Since World War II, radar has been used to locate and target aircraft, ships, and tanks. During the Korean intervention and the Vietnam conflict, the principal means for avoiding enemy radar were tactics, chaff, and countermeasures. In the future, weapon systems will be required to perform their mission in a more hostile radar environment. To accomplish their mission and survive in this environment, weapon systems will become more dependent on low radar signatures to avoid radar detection. A radar signature represents the amount of radar energy returned from a target, and is dependent on the illuminating frequency, angle of approach, target shape and size relative to wavelength, and material absorbency. Reduced radar signatures will allow future weapon systems to avoid radar detection for longer periods of time than the current systems with higher radar signatures.

RCS measurement capabilities are required for measuring extremely low radar signatures and for diagnosing causes for radar returns. Measurements are required across the entire spectrum of radar frequencies expected to be encountered in the threat environment. RCS data identify potential vulnerabilities, and are essential for devising tactics that enhance mission effectiveness and survivability.

Prior Oversight Coverage

The House Appropriations Committee Surveys and Investigations Staff issued a report, "Management of the Major Range and Test Facility Base of the Department of Defense," June 9, 1987. That report stated that the Naval Weapons Center planned to spend $72 million to upgrade its RCS facility while at the same time another facility was severely underutilized. No recommendations were made in that report.

No audits in the last 5 years covered the specific issues discussed in this report.

Report Staffing

We provided a draft of this report to the addressees on April 9, 1990. Because there were no recommendations, no comments were required of management and none were received. No comments are required to this final report. The final report distribution is in Enclosure 3.

We appreciate the cooperation and courtesies extended to the staff during the survey. The audit team members are listed in Enclosure 2. If you have any questions concerning this report, please contact Mr. Raymond A. Spencer, Program Director, at (202) 694-3995 (AUTOVON 224-3995), or Mr. Robert E. Benefiel, Project Manager, at (202) 693-0356 (AUTOVON 223-0356).

Edward R. Jones
Deputy Assistant Inspector General
for Auditing

Enclosures

cc:
Secretary of the Army
Secretary of the Navy
Secretary of the Air Force

ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Office of the Under Secretary of Defense for Acquisition, Washington, DC
Office of the Comptroller of the Department of Defense, Washington, DC
Director, Defense Research and Engineering, Washington, DC
Directorate for Special Programs, Washington, DC
Director, Operational Test and Evaluation, Washington, DC

Department of the Army

Test and Evaluation Management Agency, Washington, DC

Department of the Navy

Office of the Chief of Naval Research, Arlington, VA
Directorate of Research and Development Requirements, Test and Evaluation, Washington, DC
Director, Low Observable Technology and Special Programs Division, Washington, DC
Naval Air Systems Command, Washington, DC
Director of Navy Laboratories, Washington, DC
David Taylor Research Center, Bethesda, MD
Naval Weapons Center, China Lake, CA
Pacific Missile Test Center, Point Mugu, CA

Department of the Air Force

Directorate of Special Programs, Washington, DC
Deputy for Security and Investigative Programs, Washington, DC
Air Force Systems Command, Andrews Air Force Base, MD
Wright Research and Development Center, Dayton, OH
6585th Test Group, Holloman Air Force Base, NM

Non-DoD Activities

House Appropriations Committee, Chief of Surveys and Investigations Staff, Washington, DC

Non-Government Activities

Hughes Corporation, Los Angeles, CA
Institute for Defense Analysis, Alexandria, VA
Lincoln Laboratory, Lincoln, MA
Lockheed Corporation, Rye Canyon, CA
Mitre Corporation, McLean, VA
Northrop Corporation, Los Angeles, CA
Ohio State University, Columbus, OH
Scientific Atlanta Corporation, Norcross, GA

AUDIT TEAM MEMBERS

David A. Brinkman, Director, Acquisition Management Directorate
Raymond A. Spencer, Program Director
Robert E. Benefiel, Project Manager
Wanda A. Hopkins, Team Leader
Jerel B. Silver, Team Leader
Ursula Cleary, Auditor
Olga I. Velazquez, Auditor
Gary B. Dutton, Auditor

FINAL REPORT DISTRIBUTION

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition
Comptroller of the Department of Defense
Director, Defense Research and Engineering
Directorate for Special Programs
Director, Operational Test and Evaluation

Department of the Army

Secretary of the Army
Assistant Secretary of the Army (Financial Management)
Test and Evaluation Management Agency

Department of the Navy

Secretary of the Navy
Assistant Secretary of the Navy (Financial Management)
Office of the Chief of Naval Research
Director of Research and Development Requirements, Test and Evaluation
Director, Low Observable Technology and Special Programs Division
Naval Air Systems Command
Naval Weapons Center
Pacific Missile Test Center

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Directorate of Special Programs
Deputy for Security and Investigative Programs
Air Force Systems Command
Wright Research and Development Center
6585th Test Group

FINAL REPORT DISTRIBUTION (Continued)

Non-DoD Activities

Office of Management and Budget
U.S. General Accounting Office
NSIAD, Technical Information Center

Congressional Committees:

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