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ACQUISITION OF THE AIRBORNE LASER
MINE DETECTION SYSTEM

Report No. D-2001-111

May 02, 2001

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Abstract The Airborne Laser Mine Detection System is a mine countermeasure that is intended to detect, classify, and localize floating or moored sea mines that are near the surface. The Navy will deploy the Airborne Laser Mine Detection System on MH-60S helicopters to provide organic airborne mine defense for Carrier Battle Groups and Amphibious Ready Groups. The Navy will use this capability in littoral zones, confined straits, choke points, and the amphibious objective area. The system is portable and transferable and represents a capability that does not exist in the Navy's mine countermeasures inventory. The program office estimates that the system will cost \$167.2 million for research, development, test and evaluation and \$206.7 million for procurement. The Navy Acquisition Executive is the milestone decision authority for this Acquisition Category II program.		Monitoring Agency Acronym
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Acronyms

ALMDS
CNA

Airborne Laser Mine Detection System
Center for Naval Analyses



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

May 2, 2001

MEMORANDUM FOR NAVAL INSPECTOR GENERAL

SUBJECT: Audit Report on the Acquisition of the Airborne Laser Mine Detection System (Report No. D-2001-111)

We are providing this report for information and use. We considered comments from the Navy when preparing the final report.

Comments on the draft of this report conformed to the requirements of DoD Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are required.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or Mr. Douglas P. Neville at (703) 604-9076 (DSN 664-9076) (dpneville@dodig.osd.mil). See Appendix F for the report distribution. The audit team members are listed inside the back cover.

A handwritten signature in cursive script that reads "Thomas F. Gimble".

Thomas F. Gimble
Acting
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. D-2001-111

(Project No. D2000AE-0242)

May 2, 2001

Acquisition of the Airborne Laser Mine Detection System

Executive Summary

Introduction. The Airborne Laser Mine Detection System is a mine countermeasure that is intended to detect, classify, and localize floating or moored sea mines that are near the surface. The Navy will deploy the Airborne Laser Mine Detection System on MH-60S helicopters to provide organic airborne mine defense for Carrier Battle Groups and Amphibious Ready Groups. The Navy will use this capability in littoral zones, confined straits, choke points, and the amphibious objective area. The system is portable and transferable and represents a capability that does not exist in the Navy's mine countermeasures inventory. The program office estimates that the system will cost \$167.2 million for research, development, test and evaluation and \$206.7 million for procurement. The Navy Acquisition Executive is the milestone decision authority for this Acquisition Category II program.

Objectives. The audit objective was to evaluate the overall management of the Airborne Laser Mine Detection System. Because the program was in the engineering and manufacturing development phase, we determined whether management was cost-effectively developing and readying the system for the full-rate production phase of the acquisition process. In addition, we evaluated the management control program as it related to our audit objective.

Results. Overall, the Airborne Laser Mine Detection System program office was cost-effectively developing and readying the program for the full-rate production phase. However, one area warrants management attention before the program enters full-rate production. The Deputy Chief of Naval Operations (Resources, Warfare Requirements and Assessments) had to use assumptions concerning related acquisition programs to determine the number of Airborne Laser Mine Detection System units needed to satisfy Navy requirements. Until the Navy firms up requirements and tactics for related acquisition programs and assesses the feasibility of transferring Airborne Laser Mine Detection Systems between deployed and nondeployed ships, the Navy will not be able to ensure, through programming and budgeting, that Airborne Laser Mine Detection System production requirements remain fully funded in the Future Years Defense Program. For details of the audit results, see the Finding section of the report. The management controls that we reviewed were effective in that no material management control weakness was identified. See Appendix A for details on the management control program.

Summary of Recommendations. We recommend that the Deputy Chief of Naval Operations (Warfare Requirements and Programs), before the full-rate production decision scheduled for the second quarter, FY 2004, firm up requirements for the Airborne Laser Mine Detection System by:

- Reassessing and validating the assumptions associated with related acquisition programs and other mine countermeasure systems used to determine requirements for the Airborne Laser Mine Detection System.
- Determining the viability and cost-effectiveness of transferring, or cross-decking, Airborne Laser Mine Detection System assets between deployed and nondeployed ships.

Management Comments. We received comments from the Deputy Chief of Naval Operations (Warfare Requirements and Programs). The Deputy Chief partially concurred with the finding and concurred with the intent of the recommendations to review and revalidate requirements for the Airborne Laser Mine Detection System before the full-rate production decision scheduled for the second quarter, FY 2004. As part of the revalidation process, the Deputy Chief stated that the Navy will examine the potential cost-effectiveness of cross-decking the system between deployed and nondeployed ships. A discussion of the management comments is in the Finding section and Appendix E of the report, and the complete text is in the Management Comments section.

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Background

Operations Desert Storm and Desert Shield demonstrated the need for minehunting systems as an integral element of deployed forces. As a result, the Navy began developing a suite of five airborne mine countermeasure systems to negate the identified threat. One of the systems, the Airborne Laser Mine Detection System (ALMDS), is a mine countermeasure that is intended to detect, classify, and localize floating and near-surface moored sea mines. The Navy will deploy the ALMDS on MH-60S helicopters to provide organic airborne mine defense for Carrier Battle Groups (Carrier Groups), and Amphibious Ready Groups (Amphibious Groups). The Navy will use this capability in littoral zones, confined straits, choke points, and the amphibious objective area. The ALMDS laser is fired into the water and cameras on the ALMDS pod capture water reflections to create images. Although the depth that the laser can penetrate and provide quality feedback is limited, the ALMDS can detect surface mines that the AN/AQS-20X Sonar is not designed to detect. The ALMDS is portable and transferable and represents a capability that does not exist in the Navy's mine countermeasure inventory. The program office estimates that the system will cost \$167.2 million for research, development, test, and evaluation and \$206.7 million for procurement.

The Navy Acquisition Executive approved the ALMDS for entry into the engineering and manufacturing development phase of the acquisition process on April 18, 2000. At that time, the Navy Acquisition Executive ensured that the ALMDS production quantities were fully funded based on the best information available. The Navy plans to hold the full-rate production decision review for the ALMDS in the second quarter of FY 2004. The ALMDS is an acquisition category II program. Appendix B provides definitions of technical terms used in this report.

Objectives

The audit objective was to evaluate the overall management of the Airborne Laser Mine Detection System. Because the program was in the engineering and manufacturing development phase, we determined whether management was cost-effectively developing and readying the system for the full-rate production phase of the acquisition process. In addition, we 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.

Airborne Laser Mine Detection System Generally Well Managed

Overall, the program office was cost-effectively developing and readying the program for the full-rate production phase. Specifically:

- The program office used integrated product teams to ensure open communication between the contractors and DoD organizations. The integrated product teams, as evidenced in meeting minutes, were effective forums for sharing information and identifying and tracking issues. The integrated product team members included representatives from various DoD organizations as well as contractors and subcontractors. ALMDS issues addressed at these meetings included system integration, system and electronic interfaces, risk management, program accomplishments and plans, operational requirements documents, test plans, schedule delays, and the availability of helicopters for testing.
- The program office established an effective risk management program. An ALMDS working group, which consisted of program office and contractor personnel, identified, analyzed, assessed, and monitored risks associated with the program. The ALMDS working group used a software database to track the resolution of identified risk items. The database included a description of the risk item, risk mitigation plans, status of risk item resolution, risk rating (high, medium, low), and person(s) responsible for managing the resolution of the identified risk item. Meeting quarterly, the ALMDS working group discussed open and closed risk items, identified changes in the ALMDS program and other related programs that might affect the resolution of the risk items, and kept the software database up-to-date.
- The prime contractor provided the program office with real-time access to program documentation and an open forum for discussions through an Internet-based program. The Internet-based program linked the prime contractor to the program office; the Naval Surface Warfare Center, Coastal Systems Station; and the subcontractors. Through the real-time program, the prime contractor tracked system requirements in the ALMDS requirements documents to system design requirements generated by the prime contractor and to contractor test plans to ensure that ALMDS technical and performance requirements were verified through testing.

However, one condition warranted management action before the program enters full-rate production. A discussion of the associated finding follows.

Requirements Generation

The Deputy Chief of Naval Operations (Resources, Warfare Requirements and Assessments)¹ had to use assumptions concerning related acquisition programs to determine the number of ALMDS units needed to satisfy Navy requirements. This condition occurred because the capabilities and deployment tactics of the ALMDS, the deployment platform (MH-60S helicopter), and related mine countermeasure acquisition programs affecting the number of ALMDS units needed, were not yet finalized. Also, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) had not evaluated the feasibility and cost-effectiveness of transferring, or cross-decking, ALMDS units among Navy deployed and nondeployed ships to reduce ALMDS requirements. Until the Navy firms up requirements and tactics for related acquisition programs and assesses the feasibility of transferring Airborne Laser Mine Detection Systems between deployed and nondeployed ships, the Navy will not be able to ensure, through programming and budgeting, that ALMDS production requirements remain fully funded in the Future Years Defense Program.

Full-Funding Policy

DoD Regulation 5000.2-R, “Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs,” Change 4, May 11, 1999,² and Secretary of the Navy Instruction 5000.2B, “Implementation of Mandatory Procedures for Major and Non-Major Defense Acquisition Programs and Major and Non-Major Information Technology Acquisition Programs,” December 6, 1996, define requirements for full funding of acquisition programs at program initiation. The DoD Regulation and Navy Instruction both require the milestone decision authority to assess affordability at each milestone decision point beginning with program initiation. Further, the Regulation and Instruction require that the milestone decision authority not approve an acquisition program to proceed beyond program initiation unless sufficient resources, including staffing, are programmed in the most recently approved Future Years Defense Program, or will be programmed in the next Program Objectives Memorandum, Budget Estimate Submission, or President’s Budget.

¹ Effective October 1, 2000, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) office was divided into the offices of the Deputy Chief of Naval Operations (Warfare Requirements and Programs) and the Deputy Chief of Naval Operations (Resources, Requirements, and Assessments)

² Interim DoD Regulation 5000.2-R, issued January 1, 2001, contains the same full-funding requirements for acquisition programs.

Requirement for ALMDS

During Operations Desert Shield and Desert Storm, the Navy relied upon dedicated mine countermeasure assets to detect, classify, and localize sea mines. The time required for the arrival of these dedicated assets, however, demonstrated the need for the Carrier and Amphibious Groups to have an organic mine countermeasure capability. Subsequently, the Navy addressed the need in a mission need statement and an operational requirements document for the ALMDS.

Mission Need Statement. In October 1993, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) approved a mission need statement for mine countermeasures that laid the foundation for the ALMDS program. The mission need statement presented several alternatives to address the need for mine countermeasures. As a result, the Navy is developing the ALMDS as one of a suite of five airborne mine countermeasure systems. The remaining four systems, the AN/AQS-20X Sonar, the Organic Airborne and Surface Influence Sweep, the Airborne Mine Neutralization System, and the Rapid Airborne Mine Clearance System, are in the program definition and risk reduction phase of the acquisition process. A brief description of the four systems is included at Appendix C.

The suite of systems will provide organic mine identification and neutralization for specific threats based on the depth of the mine, the density of the minefield, and the conditions of the surrounding water. Specifically, ALMDS and the AN/AQS-20/X Sonar are both mine identification systems. ALMDS will be used at near-surface depths where the AN/AQS-20/X Sonar is not designed to detect mines. Working together, these two systems will identify moored and bottom mines. The Organic Airborne and Surface Influence Sweep will be used where environmental limitations would make mine hunting difficult. For mine neutralization purposes, the Rapid Airborne Mine Clearance System will be used to neutralize near-surface mines detected by ALMDS. The Airborne Mine Neutralization System will be used to neutralize mines below the surface and outside the range of the Rapid Airborne Mine Clearance System.

Operational Requirements Document. In July 1998, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) approved the operational requirements document for the ALMDS. The ALMDS is intended to fulfill the stated need for the rapid detection, laser image classification, and localization of drifting, floating, and near-surface moored mine threats for avoidance by the Carrier and Amphibious Groups and other strategic vessels in transit. As of February 2001, the Navy supported 12 aircraft carriers and 11 large deck amphibious ships. Appendix D discusses the composition and availability of the Carrier and Amphibious Groups that will use the ALMDS.

ALMDS Requirements Determination

Requirements Study. At the request of the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments), the Center for Naval Analysis (CNA), a federally funded research and development organization, performed a mine countermeasure study to ensure that programming plans and strategies for evolving organic mine countermeasure systems were quantitatively balanced against future warfighting requirements. In June 1999, CNA published its study, “MCM [Mine Countermeasures] Force-21 Study Final Results.” The study stated that the Navy and Marine Corps needed 42 ALMDS units to fulfill the requirements stated in Table 1.

Table 1. ALMDS Requirements

Carrier and Amphibious Groups	28
Carrier and Amphibious Group Surge ³ Capability	6
Shore Rotation	2
Fleet Readiness Squadron	2
Supply Pipeline	<u>4</u>
Total	42

Study Assumptions. The CNA provided extensive support and explanations for its ALMDS requirement calculations. However, CNA had to base its requirement calculations, in part, on assumptions about the capabilities of related mine countermeasure systems in development, MH-60S helicopter deployment tactics, worst-case warfighting scenarios, and use of ALMDS on Amphibious Groups.

Capabilities of Related Mine Countermeasure Systems. The number of ALMDS units needed by the Navy is based, in part, on the capabilities of related systems, such as the AN/AQS-20/X Sonar, the Organic Airborne and Surface Influence Sweep, the Airborne Mine Neutralization System, and the Rapid Airborne Mine Clearance System. The number of ALMDS that are needed vary depending on how well the other mine countermeasure systems in this suite satisfy their stated operational requirements. For example, if one or more of the other countermeasure systems cannot meet the minimum operational requirements that the Navy has established, the Navy may need additional ALMDS units to mitigate the impact of that performance degradation on Carrier or Amphibious Group operations support.

³Surge is the ability to deploy a concentrated quantity of follow-on assets in a relatively short time.

As defined in DoD Regulation 5000.2-R, a threshold value represents a system's minimum acceptable performance requirements. An assumption used by CNA to determine the number of ALMDS units needed was that the four related countermeasure systems under development, as well as the MH-60S helicopter, would meet their threshold performance requirements. That assumption is understandable because the systems are in development. Accordingly, ALMDS requirement quantities will need to be reassessed as the related mine countermeasure systems mature, their designs stabilize, their deployment tactics are determined, and decisions are made to produce the related systems. For example, if the Organic Airborne and Surface Influence Sweep program does not meet its threshold performance requirements, the number of ALMDS and AN/AQS-20/X Sonar units required may increase because of the additional time that would be required to detect and identify mines where environmental limitations make mine hunting difficult.

MH-60S Helicopter Deployment Tactics. The MH-60S helicopter is currently in development. The MH-60S program office has scheduled a full-rate production decision review in October 2001, with an initial operational capability in December 2001. As the planned platform for ALMDS and the other four airborne mine countermeasure systems, the MH-60S helicopter will be deployed on specific ships within Carrier and Amphibious Groups to meet the organic mine countermeasure requirement. The CNA assumed a specific number of MH-60S helicopters would be assigned to each Carrier and Amphibious Group; however, the deployment tactics of the MH-60S helicopters are still in development. The Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) described three scenarios for the use of ALMDS-equipped helicopters, including a single helicopter covering an entire area, two helicopters covering separate areas, or two helicopters covering an area in a grid-like pattern. The decision on the deployment of the MH-60S helicopters will impact the number of helicopters used for mine countermeasure missions and the number of ALMDS units needed. Also, there are competing missions for the MH-60S helicopter, including vertical replenishment and search and rescue. Consequently, the number of ALMDS units needed to support the requirements of Carrier and Amphibious Group Commanders cannot be accurately calculated until decisions are made on MH-60S helicopter deployment tactics and mission priorities.

Worst-Case Warfighting Scenarios. When given a variety of possible options for interpreting a warfighting situation, CNA assumed the worst-case scenario to provide the best protection for the fleet. For example, CNA made an assumption about the number of mines laid in a strategic port. Three scenarios ranging from the absence of mines to mining the entire port were considered. The CNA assumed that the entire port would be mined because it provided the best protection for the fleet. Also, although the allied and coalition forces were recognized as being able to supply mine countermeasure assistance, the study assumed that allied and coalition force assistance would be limited and that the Navy would have to perform mine countermeasure operations alone. Although this conservative approach is valid for individual scenarios, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) would have been better served had the probability of the worst-case scenarios occurring simultaneously been provided for his consideration in making decisions concerning ALMDS requirements. With this

information, the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) would have had more realistic information on which to decide ALMDS requirements.

Use of ALMDS on Amphibious Groups. The CNA assumed that the Marine Corps would support the use of ALMDS assets on Amphibious Group vessels. However, the Marine Corps had not committed to support ALMDS assets.

Deployment Options

The Navy will deploy ALMDS aboard ship and mount it to specially configured MH-60S helicopters, as needed, to provide Group Commanders with organic airborne mine defense. The Office of the Deputy Chief of Naval Operations (Plans, Policy, and Operation) stated that, in a process known as cross-decking, the Navy routinely transfers limited assets between deployed and nondeployed platforms to conserve resources.

The Air Force uses the cross-decking concept for aircraft mounted sensors that are assigned to air wings, just as the ALMDS will be used on helicopters and assigned to MH-60S squadrons. Specifically, the Low Altitude and Targeting Infrared for Night program used cross-decking as an option in the early stages of production when the number of assets was limited. As the number of assets grew, the Air Force no longer needed to physically remove assets from one platform to another. However, the Air Force still removes assets from nondeployed platforms to create a pool of assets for use on deployed platforms. In addition, the Air Force still cross-decks the support equipment for those assets because it is very costly to outfit every platform with support equipment. Similarly, the Air Force, for the Tactical Airborne Reconnaissance Pod System, cross-decks assets from nondeployed to deployed platforms. Cross-decking assets does not have a negative impact on the readiness of the Air Force to perform its mission.

Although CNA considered cross-decking in its study to transfer ALMDS assets within Carrier and Amphibious Groups, CNA did not consider transferring ALMDS assets between deployed and nondeployed ships.

Peacetime Deployment and Wartime Contingencies. During peacetime, three Carrier Groups are routinely deployed. One Carrier Group is permanently stationed in Japan, and the other two are deployed from the East and West coasts of the United States. The Carrier Groups are deployed in a three-Carrier-Group rotation, with 6 months deployed, 6 months in maintenance and resupply, and 6 months in preparation for the next deployment. The Amphibious Groups follow the same deployment rotation as the Carrier Groups during peacetime. The peacetime deployment schedule is shown in Table 2.

Table 2. Peacetime Deployment Schedule

	<u>Carrier Groups</u>	<u>Amphibious Groups</u>
Forward Deployed–Japan	1	1
East Coast		
Forward Deployed	1	1
Maintenance and Resupply	1	1
Preparation for Deployment	1	1
West Coast		
Forward Deployed	1	1
Maintenance and Resupply	1	1
Preparation for Deployment	<u>1</u>	<u>1</u>
Total	7	7

In the event of two, near simultaneous major theater wars, the Navy plans to deploy all available Carrier and Amphibious Groups. However, when those assets are mobilized, the Navy may not need all Carrier and Amphibious Groups to have organic mine countermeasure capabilities. After forward-deployed ships have cleared an initial path through a mined area, other dedicated mine countermeasure ships, such as the *USS Gladiator*, the *USS Guardian*, or the *USS Cardinal*, will arrive to take over the specialized mission. Because of the limited peacetime deployment of Carrier and Amphibious Groups and the use of dedicated mine countermeasure ships, the Navy needs to determine the feasibility and cost-effectiveness of cross-decking ALMDS assets to enable the Navy to use available resources for other higher priority requirements capabilities.

Summary

When the Navy Acquisition Executive made the decision for the ALMDS to enter the engineering and manufacturing phase of the acquisition process in April 2000, he used the best available information concerning the number of ALMDS units required in determining whether the ALMDS program was fully funded in the Future Years Defense Program. However, until requirements and tactics for related mine countermeasure acquisition programs are firmed up and the feasibility of transferring ALMDS units between deployed and nondeployed ships is assessed, the Navy will not be able to ensure, through programming and budgeting, that ALMDS production requirements remain fully funded in the Future Years Defense Program.

Management Comments on the Finding and Audit Response

A summary of management comments on the finding and our responses are in Appendix E.

Recommendations and Management Comments

We recommend that the Deputy Chief of Naval Operations (Warfare Requirements and Programs), before the full-rate production decision scheduled for the second quarter of FY 2004, firm up requirements for the Airborne Laser Mine Detection System by:

1. Reassessing and validating the assumptions associated with related acquisition programs and other mine countermeasure systems used to determine requirements for the Airborne Laser Mine Detection System.

2. Determining the viability and cost-effectiveness of transferring, or cross-decking, Airborne Laser Mine Detection System assets between deployed and nondeployed ships.

Management Comments. The Deputy Chief of Naval Operations (Warfare Requirements and Programs) concurred with the intent of the recommendations, stating that the Navy intends to review and revalidate the ALMDS Operational Requirements Document, including procurement quantities, in the normal course of preparations for the planned FY 2004 Milestone III decision. As part of the revalidation process, the Navy will examine the potential cost-effectiveness of initially transferring or cross-decking ALMDS between deployed and nondeployed ships.

Appendix A. Audit Process

Scope

We conducted this audit from July 2000 through February 2001, and reviewed documentation dated from April 1992 through February 2001. We used criteria in DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," Change 4, May 11, 1999, to perform the audit. To accomplish the audit objectives, we took the following steps:

- determined whether the users had adequately defined the system requirements;
- determined whether the program office had developed and implemented an acquisition plan, a risk management plan, a logistics plan, and a test and evaluation plan;
- evaluated Defense Contract Management Command involvement in monitoring the contractor's earned value management process;
- evaluated the program office's management of the prime contract for the program;
- determined whether the program office had a fully developed, programmatic, environmental, safety, and health evaluation;
- assessed the program office's implementation of the DoD environmental management process;
- determined whether the program office had prepared a life-cycle cost estimate for the program;
- evaluated program office use of integrated product teams; and
- reviewed management controls related to the audit objective.

DoD-Wide Corporate Level Government Performance and Results Act Coverage. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate level goals, and subordinate performance goals. This report pertains to achievement of the following goal and subordinate performance goal.

- **FY 2001 DoD Corporate Level Goal 2:** Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. **(01-DoD-02)**

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- **FY 2001 Subordinate Performance Goal 2.4:** Meet combat forces' needs smarter and faster, with products and services that work better and cost less, by improving the efficiency of DoD's acquisition process. (01-DoD-2.4)

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 Weapons System Acquisition high-risk area.

Methodology

We conducted this program audit in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and included such tests of management controls as we deemed necessary. We did not use computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within the DoD and contractor locations. Further details are available upon request.

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 Interim DoD Regulation 5000.2-R, January 1, 2001, 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 those elements of the ALMDS program. Because we did not identify a material weakness, we did not assess management's self-evaluation.

Adequacy of Management Controls. The Program Executive Office for Mine Warfare's management controls were adequate in that we identified no material management control weakness.

Prior Coverage

During the last 5 years, no reports have been issued related to the Airborne Laser Mine Detection System.

Appendix B. Definitions of Technical Terms

Acquisition Category. An acquisition category is an attribute of an acquisition program that determines the program's level of review, decision authority, and applicable procedures. Weapon system acquisition categories consist of I, major Defense acquisition programs; II, major systems; and III, all other acquisition programs. Acquisition category I programs include two subcategories: acquisition category ID programs where the milestone decision authority is the Under Secretary Defense for Acquisition, Technology, and Logistics, and acquisition category IC programs where the milestone decision authority is the Component acquisition executive. The Component acquisition executive is the milestone decision authority for all acquisition category II programs.

Acquisition Phase. An acquisition phase represents all the tasks and activities needed to bring a program to the next major milestone. Phases provide a logical means of progressively translating broadly stated mission needs into well-defined, system-specific requirements and, ultimately, into operationally effective, suitable, and survivable systems.

Engineering and Manufacturing Development. Engineering and manufacturing development is the third phase of the acquisition process where the program office and its contractors fully develop, engineer, design, fabricate, test, and evaluate the systems and the principal items necessary for its support.

Full-Rate Production. Full-rate production is contracting for economic production quantities following stabilization of the system design and validation of the production process.

Milestone. A milestone is the point where the milestone decision authority decides whether to start or continue an acquisition program in the acquisition process.

Milestone Decision Authority. A milestone decision authority is the individual designated in accordance with criteria established by the Under Secretary of Defense for Acquisition, Technology, and Logistics to approve entry of an acquisition program into the next phase.

Mine Countermeasure. A device or tactic designed to negate or offset a mine.

Appendix C. Airborne Mine Countermeasure Systems

The Navy is developing the ALMDS, as one of a suite of five airborne mine countermeasure systems, to negate mine threats based on the depth of the mine, the density of the minefield, and the conditions of the surrounding water. Following is a brief description of the other four airborne mine countermeasure systems in that suite.

AN/AQS-20/X Sonar. The AN/AQS-20/X Sonar is a helicopter-towed, single-pass, minehunting detection, classification, and identification sonar. The sonar identifies mine-like objects under the water, but is not designed to identify near-surface mines.

Organic Airborne and Surface Influence Sweep. The Organic Airborne and Surface Influence Sweep is a magnetic and acoustic influence minesweeping system. The sweep system is used where environmental limitations inhibit mine hunting.

Airborne Mine Neutralization System. The Airborne Mine Neutralization System is a helicopter deployed, expendable, remotely operated, mine neutralization system that reacquires previously identified mines or locates mine-like objects. Military personnel navigate the system using on-board propulsion and cameras. The operator locates the mines or mine-like objects and uses the Airborne Mine Neutralization System to detonate or otherwise destroy them. However, the associated ordnance is also destroyed when the mine or mine-like object is neutralized.

Rapid Airborne Mine Clearance System. For ALMDS-detected, near-surface, mines, the Rapid Airborne Mine Clearance System provides neutralization capabilities by firing a supercavitating projectile at the objects from a helicopter. Like the Airborne Mine Neutralization System, the Rapid Airborne Mine Clearance System is used to neutralize previously identified mines. However, the Rapid Airborne Mine Clearance system can only be used at limited depths because of water penetration constraints.

Appendix D. Carrier Groups and Amphibious Groups

Carrier Groups

Composition of a Carrier Group. A Carrier Group is a highly balanced mix of ships and aircraft capable of conducting a variety of missions including strike operations, humanitarian assistance, sea control, and power projection. A Carrier Group generally consists of an aircraft carrier, two cruisers, three destroyers, two frigates, two submarines, and a supply ship.

Availability. The Navy has 12 aircraft carriers that serve as the focal point of a Carrier Group. The maintenance schedule for the 12 aircraft carriers showed that, through FY 2008, 9 carriers, on average, are available for deployment at any given time. The remaining three aircraft carriers are out of service for refueling or incremental maintenance. Although two of the remaining three carriers can be deployed on short notice, this condition would only occur in an emergency scenario.

Amphibious Groups

Composition of an Amphibious Group. An Amphibious Group is a Naval expeditionary force consisting of an amphibious squadron normally composed of three ships with an embarked Marine Expeditionary Unit.* Amphibious Groups possess the ability to rapidly project forces ashore by land or sea. Forward-deployed Amphibious Groups provide the Commanders in Chief with a wide array of capabilities to include sustained maritime presence, rapid crisis response, humanitarian relief, peace support, and amphibious forcible entry.

Availability. The Navy has 11 large deck amphibious ships each serving as the focal point of an Amphibious Group. The deployment schedule of the 11 Amphibious Groups showed that for 2000 and 2001, only 3 Amphibious Groups, on average, were scheduled for deployment or were in transit at any given time. The other eight Amphibious Groups were used in training or out-of-service for maintenance. Unlike the carriers, none of the Amphibious Group lead ships were scheduled for long maintenance cycles, therefore, all were available for deployment on short notice.

*A Marine Expeditionary Unit is an intervention force with the ability to move quickly on short notice to wherever it is needed to accomplish conventional or special operations.

Appendix E. Audit Response to Navy Comments Concerning the Report

Our detailed responses to the comments of the Deputy Chief of Naval Operations (Warfare Requirements and Programs) on statements in the draft report follow. The complete text of those comments is in the Management Comments section of this report.

Management Comments on the Overall Report and Audit Response

Management Comments. The Deputy Chief of Naval Operations (Warfare Requirements and Programs) stated that the Navy's CH-60S helicopter was redesignated as the MH-60S multi-mission helicopter effective February 6, 2001.

Audit Response. We revised the report to reflect the new helicopter designation.

Management Comments on the Finding and Audit Response

Management Comments. The Deputy Chief of Naval Operations (Warfare Requirements and Programs) partially concurred with the finding, stating that although the final ALMDS procurement levels would be revalidated prior to the planned FY04 Milestone III production decision, the Navy's current Future Years Defense Program fully funds required ALMDS quantities. The Deputy Chief stated that the requirement was based on recommendations contained in the CNA "MCM [Mine Countermeasures] Force-21 Study Final Results," which provides an initial quantitative assessment of future Mine Countermeasure warfighting requirements. He continued by stating that only after the Navy's annual Integrated Warfare Architecture review process, completion of the Operational Test and Evaluation, and initial fleet introduction, could the Navy properly develop the comprehensive number of ALMDS units required to meet warfighting requirements. The Navy remains confident that the current estimate of 42 ALMDS will meet future Mine Countermeasure requirements.

Audit Response. The comments of the Deputy Chief of Naval Operations (Warfare Requirements and Programs) were responsive; however, the statement that the required ALMDS quantities are fully funded in the Future Years Defense Program depends on a requirements calculation that is based on unvalidated assumptions. Although the Office of the Deputy Chief of Naval Operations (Warfare Requirements and Programs) used the CNA study as a basis, the assumptions used in the study need to be reassessed and validated. Additionally, the CNA study did not consider transferring ALMDS assets among deployed and nondeployed ships.

Management Comments Addressing the Main Body of the Report and Audit Response

Management Comments. The Deputy Chief of Naval Operations (Warfare Requirements and Programs) did not concur that additional ALMDS would be required should the Organic Airborne and Surface Influence Sweep Program fail to meet its threshold performance requirements. The Deputy Chief explained that the Organic Airborne and Surface Influence Sweep addresses bottom-influence-activated mines that are positioned on the sea floor while ALMDS addresses near-surface influence and contact-moored or buoyant sea mines. He stated that because each system operates in a distinct operational environment against different sea threats, the failure of one does not correlate into a requirement to procure more of the other.

Audit Response. Information provided by Deputy Chief of Naval Operations (Warfare Requirements and Programs) personnel described the Organic Airborne and Surface Influence Sweep Program as a magnetic and acoustic minesweeping system to be used in shallow water. Until the Organic Airborne and Surface Influence Sweep is developed and tested, its effect on influence-activated mines within the ALMDS range is unknown. It is possible that the Organic Airborne and Surface Influence Sweep could detonate influence-activated mines close to the surface and would reduce the need for additional ALMDS missions. Conversely, if the sweep does not meet its requirements in very shallow water, additional ALMDS missions requiring additional ALMDS units may be needed.

Management Comments. The Deputy Chief of Naval Operations (Warfare Requirements and Programs) disagreed that, in the event of two, near simultaneous major theater wars, the Navy may not need all Carrier and Amphibious Groups to have organic mine countermeasure capabilities. The Deputy Chief stated that guidance from the Secretary of Defense and the Chief of Naval Operations mandates that mine warfare become a core competency within the Carrier Battle Group force structure, which would require each Carrier Battle Group to effectively counter the potential threat posed by sea mines. Additionally, the Deputy Chief stated that dedicated mine countermeasure forces will not be available to support the Carrier Battle Groups because they will likely be assigned responsibilities independent of dedicated assets in other littoral areas hundreds of nautical miles away.

Audit Response. Mandating mine warfare as a core competency for Carrier Battle Groups does not automatically establish a requirement for ALMDS or a specific number of ALMDS units per Battle Group, nor does it establish a requirement to equip Amphibious Groups with the mine warfare capabilities. Additionally, when asked about the need for dedicated forces once the organic forces were integrated into the fleet, the Deputy Chief of Naval Operations (Warfare Requirements and Programs) personnel stated that the dedicated forces would be used to clear mine fields after the organic forces had cleared an initial path for the Carrier or Amphibious Groups. Therefore, to say that the dedicated forces will not be available to support Carrier Battle Group operations and may

be operating in littoral areas hundreds of nautical miles away, contradicts the Navy's rationale for keeping dedicated forces after the organic forces have been integrated.

Appendix F. Report Distribution

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Deputy Chief of Naval Operations (Warfare Requirements and Programs) Comments



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

13484
Ser N7/1U637116
23 Apr 01

MEMORANDUM FOR THE DEPARTMENT OF DEFENSE ASSISTANT INSPECTOR
GENERAL FOR AUDITING

Subj: AUDIT REPORT ON THE ACQUISITION OF THE AIRBORNE LASER
MINE DETECTION SYSTEM (PROJECT NO. D2000AE-0242)

Ref: (a) DoD-IG memo of 13 Feb 2001

Encl: (1) Navy comments on DOD-IG Memo

1. In response to reference (a), our comments are provided in enclosure (1). The Navy has reviewed the report and partially concurs with the findings and recommendations. Specific comments regarding information contained in the report are contained in the enclosure.

2. The Navy appreciates the opportunity to comment on the draft report.

A handwritten signature in black ink, appearing to read "D. V. McGinn".

D. V. MCGINN
Vice Admiral, U.S. Navy
Deputy Chief of Naval Operations
(Warfare Requirements and
Programs (N7))

Copy to:
NAVINGEN (42)
ASN RDA (MUW)
CNO (N8)
CNO (N75)

NAVY COMMENTS

DoD-IG Draft Report, "Acquisition of the Airborne Laser Mine Detection System," dated March February 13, 2001 (Project No. D2000AE-0242)

FINDING:

Overall, the Airborne Laser Mine Detection System program office was cost-effectively developing and readying the program for the full-rate production phase. However, one area warrants management attention before the program enters full-rate production. The Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments) had to use assumptions concerning related acquisition programs to determine the number of Airborne Laser Mine Detection System units needed to satisfy Navy requirements. Until the Navy firms up requirements and tactics for related acquisition programs, and assesses the feasibility of transferring Airborne Laser Mine Detection Systems between deployed and non-deployed ships, the Navy will not be able to ensure, through programming and budgeting, that Airborne Laser Mine Detection System production requirements remain fully funded in the Future Years Defense Program.

Navy Response:

Partially concur. Requirements validation is an iterative process. While it is true that final Airborne Laser Mine Detection System procurement levels will have to be revalidated prior to the planned FY 04 Milestone III production decision, the Navy's current Future Years Defense Program fully funds required Airborne Laser Mine Detection System quantities. This is based upon recommendations contained in The Center for Naval Analyses (CNA) "MCM {Mine Countermeasures} Force-21 Study Final Results" which provides an initial quantitative assessment of future Mine Countermeasure warfighting requirements.

The ultimate size and composition of Airborne Laser Mine Detection System procurement quantities will be determined based upon continuing evaluation including the Navy's annual Integrated Warfare Architecture (IWAR) review process, completion of Operational Test and Evaluation, and initial fleet introduction. Only then can the Navy properly develop the comprehensive number of units required to meet warfighting requirements. The Navy remains confident that the current estimate of 42 Airborne Laser Mine Detection System will meet future fleet MCM requirements.

Navy Specific Comments:

General. The Navy's CH-60S helicopter has been re-designated MH-60S multi-mission helicopter effective 6 February, 2001.

Page 6, paragraph 1, Capabilities of Related Mine Countermeasures Systems. We do not concur that additional Airborne Laser Mine Detection Systems will be required should the Organic Airborne and Surface Influence Sweep (OASIS) program fail to meet its threshold performance requirements. OASIS performance requirements address bottom influence activated mines positioned on the sea floor. The Airborne Laser Mine Detection System performance requirements address near surface influence and contact moored or buoyant sea mines. Since each system operates in a distinct operational environment against different sea-mine threats, failure of one does not correlate into a requirement to procure more of the other.

Page 8, paragraph 1 Peacetime Deployment and Wartime Contingencies (cont). We do not concur that in the event of two, near simultaneous major theater wars, the Navy may not need all Carrier and Amphibious Groups to have organic mine countermeasure capabilities. SECDEF and CNO guidance mandates that Mine Warfare become a Navy core competency within the Carrier Battle Group (CVBG) force structure. As such, each CVBG must be capable of effectively countering the potential threat posed by sea mines. Also, MCM requirements to prosecute two near simultaneous major theater wars will require all available dedicated and organic MCM assets. Dedicated MCM assets such as *USS Gladiator* and *USS Guardian* will likely be assigned responsibilities independent of the CVBG, such as mine clearance of strategic ports of debarkation/embarkation. These dedicated assets will not be available to support the CVBGs, which may be operating in other littoral areas hundreds of nautical miles at sea.

RECOMMENDATION:

We recommend that the Deputy Chief of Naval Operations (Resources, Warfare Requirements and Assessments), before the full-rate production decision scheduled for second quarter, FY2004, firm up requirements for the Airborne Laser Mine Detection System by:

1. Reassessing and validating the assumptions associated with related acquisition programs and other mine countermeasure systems used to determine requirements for the Airborne Laser Mine Detection System.
2. Determining the viability and cost-effectiveness of transferring, or cross-decking, Airborne Laser Mine Detection System assets between deployed and non-deployed ships.

Navy Comments:

Concur with the intent of the recommendation. In accordance with SECNAV INST 5000.2B, we intend to review and revalidate the Airborne Laser Mine Detection System Operational Requirement Document, including procurement quantities, in the normal course of preparation for the planned FY04 Milestone III decision. As part of the revalidation process, we will examine potential cost-effectiveness of initially transferring, or cross-decking Airborne Laser Mine Detection Systems between deployed and non-deployed ships. In assessing the benefits of cross-decking Airborne Laser Mine Detection Systems, the Navy must balance against ensuring an adequate number of systems are available to meet both Navy and Joint warfighting needs, and Carrier Battle Group Inter-deployment Training Cycle (IDTC) requirements in support of the National Security Strategy.

Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

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