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### **Acronyms**

AIMO	Aircraft Integrated Maintenance Operations
ALMDS	Airborne Laser Mine Detection System
AMNS	Airborne Mine Neutralization System
AN/AQS-20X	Sonar Mine Detecting Set
CJCS	Chairman of the Joint Chiefs of Staff
COMOPTEVFOR	Commander, Operational Test and Evaluation Force
CPD	Capability Production Document
DCMA	Defense Contract Management Agency
GAO	Government Accountability Office
LRIP	Low-Rate Initial Production
MCM	Mine Countermeasures
MOA	Memorandum of Agreement
MW	Mine Warfare
NBC	Nuclear, Biological, and Chemical
NSWC-PC	Naval Surface Warfare Center, Panama City
OASIS	Organic Airborne and Surface Influence Sweep
RAMICS	Rapid Airborne Mine Clearance System
RMK	Rapid Airborne Mine Clearance System Mission Kit
SDP	Software Development Plan



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

April 11, 2007

MEMORANDUM FOR DIRECTOR, DEFENSE CONTRACT MANAGEMENT AGENCY  
NAVAL INSPECTOR GENERAL

SUBJECT: Report on the Acquisition of the Navy Rapid Airborne Mine Clearance System  
(Report No. D-2007-084)

We are providing this report for information and use. In preparing the final report, we considered comments on the draft report from the Deputy Assistant Secretary of the Navy for Integrated Warfare Systems and the Acting Director of the Defense Contract Management Agency.

Comments on the draft of this report conformed to the requirements of DoD Directive 7650.3. Although we revised Recommendation B.3. in response to comments on the draft report, no issues are unresolved. Therefore, no additional comments are required.

We appreciate the courtesies extended to the staff. Questions should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) or Mr. Harold C. James at (703) 604-9088 (DSN 664-9088). See Appendix F for report distribution. The team members are listed inside the back cover.

By direction of the Deputy Inspector General for Auditing:

A handwritten signature in black ink, reading "Richard B. Jolliffe", is positioned above the printed name.

Richard B. Jolliffe  
Assistant Inspector General  
Acquisition and Contract Management

## Department of Defense Office of Inspector General

Report No. D-2007-084

April 11, 2007

(Project No. D2006-D000AE-0153.000)

### Acquisition of the Navy Rapid Airborne Mine Clearance System

#### Executive Summary

**Why You Should Read This Report.** This report discusses management issues associated with defining capability requirements, planning and executing tests, and defining responsibilities of the Defense Contract Management Agency in support of the low-rate initial production decision for the Navy Rapid Airborne Mine Clearance System (RAMICS).

**Background.** RAMICS is a non-towed airborne mine neutralization system. The system will operate from an MH-60S Organic Airborne Mine Countermeasures Helicopter Group deployed from the Littoral Combat Ship in the Carrier Strike and Expeditionary Strike Groups. When fielded, RAMICS will provide the Navy with rapid-response, surface and near-surface mine reacquisition and neutralization capabilities. The Program Manager, Mine Warfare is developing RAMICS in preparation for the low-rate initial production decision that is planned for August 2008. The Naval Surface Warfare Center, Panama City, Florida, is providing technical direction support to the Program Manager, Mine Warfare by developing capability requirements for RAMICS and monitoring the work of several subcontractors developing the system. The milestone decision authority for the program is the Navy Acquisition Executive. As of December 2006, the program's funding to develop and procure the system totaled \$327.0 million, with \$127.3 million in research, development, test, and evaluation funds and \$199.7 million in procurement funds.

**Results.** The Program Manager, Mine Warfare plans to hold the low-rate initial production decision review with the milestone decision authority in August 2008 before completing needed testing and program documentation. Specifically, the Program Manager, Mine Warfare will not have completed developmental testing to demonstrate the ability to integrate RAMICS with the MH-60S helicopter, conducted an operational assessment to gauge the system's operational effectiveness and suitability, or completed key program planning documents. Until the Program Manager, Mine Warfare completes and obtains this needed testing and program documentation, the Navy is at risk of acquiring four low-rate initial production units of unknown operational performance at an estimated cost of \$15 million. These units may not satisfy warfighter requirements and could require costly retrofits (finding A).

The Naval Surface Weapons Center staff did not fully define significant system capability requirements, the required number of RAMICS, and the expected life-cycle costs in the draft capability production document prepared to support the low-rate initial production decision planned for August 2008. Until the Naval Surface Warfare Center staff updates the draft capability production document to fully define required system capabilities,

quantities, and life-cycle costs, the Navy will be unable to effectively plan and budget for the system and verify through testing that RAMICS will satisfy essential warfighter capability requirements (finding B).

The Commander, Defense Contract Management Agency, Aircraft Integrated Maintenance Operations, Melbourne, Florida, and the Program Manager, Mine Warfare established a memorandum of agreement that did not adequately define required Defense Contract Management Agency support to the RAMICS program office. Additionally, the Commander had not formulated a surveillance plan to implement the program support defined in the memorandum of agreement. With limited staff resources, the Commander cannot fully support the Program Manager, Mine Warfare until the Commander and the Program Manager update the memorandum of agreement to better define required program support and the Commander formulates a surveillance plan (finding C).

The problems described in our findings resulted from material control weaknesses in the management of RAMICS. The Background section discusses these material control weaknesses.

During the audit, we also noted another item of interest concerning the management of contractor incentive fees. Appendix E discusses how the program office for RAMICS did not effectively link incentive fee criteria to the desired program outcomes on the development contract with Northrop Grumman. Appendix E also discusses recent DoD initiatives to ensure that DoD Components better manage incentive fees.

**Management Comments and Audit Response.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems responded for the Assistant Secretary of the Navy (Research, Development, and Acquisition); the Deputy Chief of Naval Operations for Resources, Requirements, and Assessment; the Commander, Naval Surface Warfare Center, Panama City; and the Program Manager, Mine Warfare. The Deputy Assistant Secretary concurred with, or proposed actions meeting the intent of, recommendations for demonstrating that RAMICS is capable of reacquiring and neutralizing mines while in flight and functioning with the MH-60S helicopter, updating the test and evaluation master plan to include an operational assessment of RAMICS, and updating and approving the draft systems engineering and software development plans before the low-rate initial production decision review. The Deputy Assistant Secretary also concurred with updating the draft capabilities production document to define computer memory and processing margins in measurable and testable terms; to define relevant architecture product descriptions; and to identify the number of RAMICS required for operations, training, and maintenance, as well as the projected system life-cycle cost. Further, the Deputy Assistant Secretary concurred with modifying the development contract to ensure that the contractor designs RAMICS to meet the revised capability requirements. In response to the Deputy Assistant Secretary's comments, we revised Recommendation B.3. to avoid requiring the Program Manager, Mine Warfare to contract for nuclear, biological, and chemical capability requirements that the Navy no longer considered valid for the RAMICS program. The Acting Director, Defense Contract Management Agency and the Deputy Assistant Secretary concurred with, or proposed actions meeting the intent of, recommendations for updating the memorandum of agreement between their organizations to better define Defense Contract Management Agency support to the Program Manager, Mine Warfare and to clearly delineate responsibilities between the Defense Contract Management Agency and Navy technical support representatives. Further, the Acting Director agreed to establish a surveillance plan to describe oversight activities planned to support the RAMICS program. See the Findings section of the report for a discussion of management comments and the Management Comments section of the report for a complete text of the comments.

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## Background

The Navy Rapid Airborne Mine Clearance System (RAMICS) is a major system that is in the system development and demonstration phase of the acquisition process. The Program Manager, Mine Warfare (MW) was developing RAMICS in preparation for the low-rate initial production (LRIP) decision planned for August 2008.

**Mission and System Description.** RAMICS is a non-towed airborne mine neutralization system. RAMICS will operate from a MH-60S Organic Airborne Mine Countermeasures helicopter deployed from the littoral combat ship in the Carrier Strike and Expeditionary Strike Groups. When fielded, RAMICS will provide the Navy with rapid-response, surface and near-surface mine reacquisition and neutralization capabilities. The RAMICS hardware and software will be integrated into the MH-60S helicopter through the installation of a RAMICS mission kit (RMK). Appendix B provides additional information on RAMICS, including an illustration of the RMK components integrated on the MH-60S helicopter.

**Related Organic Airborne Mine Countermeasures Systems.** The Navy plans to develop and install four other related Organic Airborne Mine Countermeasures Systems separately on the MH-60S helicopter. The systems are the:

- Sonar Mine Detecting Set,
- Airborne Mine Neutralization System,
- Airborne Laser Mine Detection System, and
- Organic Airborne and Surface Influence Sweep.

The four systems will work with RAMICS to perform the Navy's mine detection and neutralization mission. Appendix B provides information on the missions of the four systems, including an illustration of the systems working with RAMICS to perform the mine neutralization mission.

**Program Management.** The Program Manager, MW was developing RAMICS for the Naval Sea Systems Command. The Program Manager, Multi-Mission Helicopters, who reports to the Naval Air Systems Command, has responsibility for integrating the RMK with the MH-60S helicopter. The Navy Acquisition Executive is the milestone decision authority for the RAMICS LRIP decision.

**Navy Technical Direction and Testing Support.** The Naval Surface Warfare Center, Panama City (NSWC-PC) assigned engineers with responsibility to provide technical direction to the Program Manager, MW to develop capability requirements for RAMICS and monitor the work of several RAMICS subcontractors. NSWC-PC is the recognized world leader in mine warfare expertise and facilities.

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**Funding and Contract Data.** As of December 2006, the program's funding to develop and procure the system totaled \$327.0 million, with \$127.3 million in research, development, test, and evaluation funds, \$189.2 million in procurement funds for hardware, and \$10.5 million in procurement funds for ammunition. The Navy awarded a contract to Northrop Grumman on August 23, 2002, for \$36.9 million to develop RAMICS. On December 14, 2005, the Navy increased the contract value to \$54.4 million through a contract modification.

## Objectives

The audit objective was to evaluate the overall management of the Navy RAMICS program. Because the program was in the system development and demonstration phase of the acquisition process, we determined whether management was cost-effectively developing and readying the program for the LRIP phase of the acquisition process. We also evaluated the managers' internal controls as they related to the audit objective. See Appendix A for a discussion of the audit scope and methodology and prior coverage. See Appendix E for an other matter of interest related to program office use of contract incentive fees.

## Review of Internal Controls

We determined that material internal control weaknesses existed in the management of RAMICS, as defined by DoD Instruction 5010.40, "Managers' Internal Control (MIC) Program Procedures," January 4, 2006. The DoD 5000 series of guidance requires the Program Manager, MW to exercise discretion and prudent business judgment in structuring a tailored, responsive, and innovative program. Although the Navy's original planning for RAMICS involved fully developing and testing the system before the LRIP decision, the Navy Acquisition Executive approved the Program Manager, MW proposed exit criteria for the LRIP decision. Those exit criteria did not require the Program Manager, MW to demonstrate that RAMICS could be integrated with the MH-60S helicopter. According to the Program Manager, MW staff, the Navy Acquisition Executive decided to reduce funding on the RAMICS program to fund higher priority mine warfare countermeasures programs. Planning the progression of RAMICS from development into LRIP without fully defining system capability requirements, fully demonstrating required system capabilities, completing key program planning documents, and efficiently and effectively using the program surveillance resources of the Defense Contract Management Agency (DCMA) is not prudent business practice. Implementing our recommendations will improve internal controls by ensuring that the Navy more effectively and efficiently readies RAMICS for LRIP. We will provide a copy of this report to the senior Navy official responsible for internal controls in the Department of the Navy.



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## **A. Testing Planned to Support the Low-Rate Initial Production Decision**

The Program Manager, MW plans to hold the LRIP decision review with the milestone decision authority in August 2008, before completing needed developmental testing to demonstrate the ability to integrate the RMK with the MH-60S helicopter and an operational assessment to gauge the operational effectiveness and suitability of RAMICS. Also, the Program Manager, MW has not completed and obtained key program planning documents that testers need to support the RAMICS test program. These conditions occurred because:

- the Navy Acquisition Executive approved the Program Manager, MW proposed exit criteria, which did not require the Program Manager, MW to demonstrate that RAMICS could be integrated with the MH-60S helicopter before the LRIP decision;
- the Program Manager, MW did not reach an agreement with the Navy Commander, Operational Test and Evaluation Force (COMOPTEVFOR) on the program achievements necessary to support achieving a meaningful operational assessment; and
- the Program Manager, MW did not fully implement program documentation requirements in the DOD 5000 series of guidance.

As a result, the Navy could commit to acquiring four LRIP units of RAMICS of unknown operational performance at an estimated cost of \$15 million. Those units may not satisfy warfighter requirements and could require costly retrofits.

## **DoD Policy for Low-Rate Initial Production**

DOD Instruction 5000.2, "Operation of the Defense Acquisition System," May 12, 2003, states that the two purposes of LRIP are to demonstrate adequate and efficient manufacturing capability at the completion of manufacturing development and to produce the minimum quantity necessary to provide production-representative articles for initial operational test and evaluation. The Instruction states that before acquisition programs enter LRIP, they must demonstrate acceptable performance in the development, test and evaluation, and operational assessment phases of the acquisition process. Furthermore, the Instruction requires that DoD Components perform an independent operational assessment before releasing each successive increment to the user because it

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provides the warfighter and acquisition decision makers with a prediction of the operational effectiveness and suitability of a weapon system before an investment is made in production units for operational testing.

## **Tests to Demonstrate the Ability to Integrate the Rapid Airborne Mine Clearance System Mission Kit**

Since February 2003, the Program Manager, MW reduced the number of tests planned to show that the RMK could be integrated with the MH-60S helicopter before the planned LRIP decision in August 2008. The reduction in planned integration testing is evident through a comparison of the following RAMICS test documents:

- Test and Evaluation Master Plan Number 1644, which the DoD Director, Operational Test and Evaluation approved on February 6, 2003;
- Test and Evaluation Master Plan Number 1644, Draft Revision A, dated August 30, 2005; and
- Test planning since August 30, 2005.

**Test and Evaluation Master Plan Number 1644.** Test and Evaluation Master Plan Number 1644 designated DT-IIC the third and final developmental test phase before the LRIP decision. The DT-IIC test phase was to test the RMK while it was fully integrated with the MH-60S helicopter. The objectives of the DT-IIC test phase were to verify that the RAMICS components were properly integrated with each other and that the RMK was properly integrated with the helicopter. DT-IIC was to include ground and flight testing that focused on proper operation of the RMK when integrated with the MH-60S helicopter. Flight testing was to include firing RAMICS at small, medium, and large inert targets placed at water depths defined in the “Operational Requirements Document for the Rapid Airborne Mine Clearance System (RAMICS) Acquisition Category II Prepared for Milestone B Decision,” December 11, 2001. The DT-IIC test phase was to be completed during the second quarter of 2005 and the LRIP decision was planned to occur during the third quarter of 2005.

**Draft Revision A of Test and Evaluation Master Plan Number 1644.** Draft Revision A, which the Program Manager, MW formulated in August 2005 after the Navy Acquisition Executive approved a rebaseline of the RAMICS program in April 2005, significantly reduced the level of developmental testing planned before the LRIP decision review. Instead of three developmental test phases before the LRIP decision review, Draft Revision A specified that the DT-IIA test phase would be the only developmental test phase conducted before the LRIP decision. Unlike the DT-IIC test phase in the original Test and Evaluation Master Plan 1644, the DT-IIA test phase involved operating RAMICS independently and the RMK would not be fully integrated with the MH-60S helicopter. Draft Revision A stated that the DT-IIA test phase would serve as the initial flight test period for the RMK and that testers may need additional time for demonstrating

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basic system functionality and for verifying system performance. Draft Revision A further stated that the focus of the DT-IIA test phase was the RAMICS targeting sensor subsystem and would include the fire control subsystem and the gun subsystem, if available. Draft Revision A did not specify a planned completion date for the DT-IIA test phase. Program office staff stated that Draft Revision A did not progress beyond internal program office review.

**Test Planning Since August 2005.** Since August 2005, the Program Manager, MW had not revised developmental test plans to include flight testing before the LRIP decision that focused on proper operation and functioning of the RMK when integrated with the MH-60S helicopter. Additionally, the Program Manager, MW revised test plans were still mostly in the conceptual stage, with the test leader for the Program Manager, MW having developed a draft timeline showing revised test schedule leading up to the LRIP decision review. Five of the 16 conceptually planned tests included testing various levels of RMK integration with the MH-60S helicopter. The Program Manager, MW stated that testing staff would fire the gun to determine the blast pressure that would be exerted on a helicopter platform. Also, subject to funding availability and resolution of contractual issues, the Program Manager, MW hoped to demonstrate firing the gun in flight from an alternative (non-MH-60S) helicopter. Appendix C provides descriptions of the five conceptually planned tests to evaluate RMK integration with the MH-60S helicopter.

**Completing Integration Testing to Include Firing the Rapid Airborne Mine Countermeasures System.** Under the conceptual test planning, the test phase called Weapon Systems Integration Team Contractor Test would still be ongoing at the time of the LRIP decision review in August 2008. The Weapon Systems Integration Team Contractor Test was planned for March through December 2008. The test leader for the Program Manager, MW stated that the Weapon Systems Integration Team Contractor Test would culminate with the RMK integrated with the MH-60S helicopter and firing on mine targets. The Weapon Systems Integration Team Contractor Test would also be used to verify that RAMICS cockpit changes, safety controls, and mechanical interfaces did not adversely affect aircraft performance. The test would also allow the contractor to collect RAMICS reliability and maintainability data. Because the LRIP decision review is planned to occur 3 months before the Weapon Systems Integration Team Contractor Test phase ends, the milestone decision authority will not have complete developmental test results providing an analysis of RAMICS performance when integrated with and firing from the MH-60S helicopter.

**Contracting for Planned Contractor Tests.** The RAMICS program office had placed on contract with Northrop Grumman 6 of the 16 planned tests to occur before the LRIP decision review. Of the remaining 10 planned tests, 4 involved integration of RAMICS with the MH-60S helicopter, while the other 6 involved testing RAMICS in a stand-alone mode. The descriptions of the four planned tests involving integration of RAMICS are provided in Appendix C and were based on statements from the test leader for the Program Manager, MW since no formal, written test descriptions existed.

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## Exit Criteria for Low-Rate Initial Production Decision

Testing staffs from the offices of the Program Manager, MW and the Program Manager, Multi-Mission Helicopters did not believe that integration testing had to be completed before the LRIP decision review because the approved exit criteria for the review allowed for a lesser level of program accomplishment. On April 26, 2005, the Navy Acquisition Executive approved exit criteria for the LRIP decision review that included requirements to:

- meet the operational requirement document thresholds for target reacquisition and neutralization, and
- define all MH-60S helicopter interfaces, as defined by the Program Manager, Multi-Mission Helicopters.

Those exit criteria did not require the Program Manager, MW to demonstrate that RAMICS could be successfully integrated with and deployed from the MH-60S helicopter before the LRIP decision review. Specifically, the exit criteria for target reacquisition and neutralization did not specify operating the RAMICS system in flight. Also, the exit criteria for defining interfaces with the MH-60S helicopter did not specify successfully demonstrating actual RAMICS interfaces with the MH-60S helicopter.

The Navy Acquisition Executive approved the above exit criteria as part of a restructure of the RAMICS program. The Navy Acquisition Executive allowed the program restructure because he had to reduce funding on the RAMICS program to fund higher priority airborne mine countermeasure programs. Further, at the time the Navy Acquisition Executive approved the exit criteria, a MH-60S helicopter was not identified as an available test resource to support demonstrating integration of the RMK.

## Operational Assessment

As of June 2006, the Program Manager, MW had not reached agreement with COMOPTEVFOR for conducting an operational assessment before the LRIP decision review as required by DoD Instruction 5000.2. Staff from COMOPTEVFOR stated that an agreement could not be reached for COMOPTEVFOR to accomplish an operational assessment before the LRIP decision review because the RAMICS program office had not agreed to:

- obtain an MH-60S helicopter to support an operational assessment;
- allow time for the Naval Air Systems Command Flight Clearance Office to grant clearance for firing RAMICS from the MH-60S helicopter; and

- 
- allow RAMICS maturity and accomplishment to progress far enough to support a meaningful operational assessment, to include gathering sufficiently representative reliability, maintainability, and supportability data.

As documented in the latest conceptual test planning for RAMICS, COMOPTEVFOR will conduct only one operational test period for RAMICS, which is planned for January 2010, in support of the RAMICS full-rate production decision review.

The COMOPTEVFOR staff stated that they had expressed concern regarding performing an operational assessment without firing the gun while it was integrated with the MH-60S helicopter. The staff further stated that the Director, Operational Test and Evaluation would likely not sign a test plan for an operational assessment that was not preceded by firing RAMICS from the MH-60S helicopter, especially if the Program Manager, MW wanted to attach an LRIP buy (the purchase of four RAMICS) to the operational assessment. The Program Manager, MW staff agreed that firing RAMICS from the MH-60S is the ultimate goal but stated that availability of an MH-60S test asset that was cleared to fire the gun was a key issue for achieving the firing. The Program Manager, MW and COMOPTEVFOR had not yet agreed to the testing strategy to support the LRIP decision. We agree with the COMOPTEVFOR staff's stated concerns and believe that firing RAMICS from the MH-60S helicopter during developmental testing would demonstrate that RAMICS is mature and ready for a meaningful operational assessment.

As of December 2006, the Program Manager, MW; the Program Manager, Multi-Mission Helicopters; and staff at COMOPTEVFOR had made some progress towards scheduling and planning a test strategy to include an operational assessment to be performed before the LRIP decision review. Specifically, the Program Manager, MW requested and received funding to support having an operational assessment in FY 2008 before the LRIP decision. Also, officials at the Multi-Mission Helicopters Program Office stated that they identified an MH-60S helicopter that could be used to support an operational assessment. Further, staff at COMOPTEVFOR stated that they were drafting a memorandum of understanding that they and the Program Manager, MW could use to define the agreed terms for the operational assessment.

## **Planning Documents Needed to Support the Rapid Airborne Mine Clearance System Test Program**

In addition to the test and evaluation master plan discussed previously, the Program Manager, MW had not updated two other key documents needed to support the RAMICS test program: the systems engineering plan and the software development plan (SDP).

**Systems Engineering Plan.** Under Secretary of Defense for Acquisition, Technology, and Logistics memorandum, "Policy for Systems Engineering in DoD," February 20, 2004, requires that program managers for all acquisition

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programs develop a systems engineering plan for milestone decision authority approval in conjunction with each milestone review, and integrated with the acquisition strategy. Additionally, the Under Secretary of Defense for Acquisition, Technology, and Logistics issued another memorandum, “Implementing Systems Engineering Plans in DoD - Interim Guidance,” March 30, 2004, that stated that program managers should establish the systems engineering plan early in the program’s life cycle to guide all technical aspects of an acquisition program. The systems engineering plan provides significant input to the program manager for successfully planning the test and evaluation of a system. Specifically, the Defense Acquisition Guidebook states that the test and evaluation master plan should be consistent with and complimentary to the systems engineering plan.

As of December 2006, the Program Manager, MW had not directed the contractor to update the draft “Rapid Airborne Mine Clearance System (RAMICS) Systems Development and Demonstration (SD&D) Systems Engineering Management Plan (SEMP), Draft Revision B,” April 2004, to meet systems engineering plan requirements, as directed in the Under Secretary of Defense guidance. Accordingly, the contractor did not plan to update the systems engineering management plan to meet systems engineering plan requirements until after RAMICS was ready for integration with the MH-60S helicopter.

The Program Manager, MW needs to direct the contractor to update the systems engineering management plan because it does not include key information that is required to be included in the systems engineering plan. Specifically, Under Secretary of Defense for Acquisition, Technology, and Logistics memorandum, “Policy Addendum for Systems Engineering,” October 22, 2004, requires that technical reviews of program progress be event-driven (rather than schedule-driven) and conducted when the system under development meets the review entrance criteria documented in the systems engineering plan. The systems engineering management plan did not include entrance criteria for holding technical reviews. It stated that the contractor will hold formal reviews at locations and dates the contractor proposes and the Program Management Integrated Product Team approves. Additionally, the October 2004 policy memorandum required that technical reviews “...include participation by subject matter experts who are independent of the program ([that is], peer review) unless specifically waived by the SEP [systems engineering plan] approval authority....” Although the Systems Engineering Management Plan did require peer reviews “...both internal and external to an IPT [integrated product team],” it did not specify that subject matter experts who were independent of the program would participate in the technical reviews.

**Software Development Plan.** The contract statement of work required the contractor to develop an SDP and RAMICS software in accordance with the processes and requirements of the Software Engineering Institute “Key Practices of the Capability Maturity Model, Version 1.1,” February 1993 (the Capability Maturity Model). The Capability Maturity Model requires the contractor to use the SDP to:

- track software activities, communicate status, and revise plans; and

- 
- determine progress by comparing actual software size, effort, cost, and schedule with the SDP when software products are completed and milestones are accomplished.

Additionally, the Capability Maturity Model states that contractors may revise the SDP to reflect actual accomplishments, replan remaining work, or support action to improve performance. Further, the SDP provides significant input to the Program Manager, MW for successfully planning the software test and evaluation for a system. Specifically, paragraph 1.3 of the draft “Software Development Plan (SDP) for the Rapid Airborne Mine Clearance System (RAMICS) program, Revision Draft A,” August 4, 2003, states that it covers aspects of conducting software development activities including testing. It further states that updates to the SDP must be coordinated through the Systems Engineering Integration and Test Team.

As of December 2006, the Program Manager, MW had not directed the contractor to update the draft SDP to reflect program accomplishments and to replan remaining work. The contractor needed to update the draft SDP because in June 2005, the Navy Acquisition Executive approved RAMICS Acquisition Program Baseline Change 2 to lengthen the program acquisition schedule and increase the program cost for completing the system development and demonstration phase. Thus, the contractor needed to update the SDP to enable Navy and contractor management to more effectively use the SDP for tracking software activities, tracking progress, and planning remaining work.

## **Conclusion**

If the Program Manager, MW does not complete required developmental and operational testing before the LRIP decision review, the milestone decision authority will not have test results to show that RAMICS can be successfully integrated with the MH-60S helicopter. Without having an operational assessment from COMOPTEVFOR, the milestone decision authority will not have an independent assessment of risk factors to gauge whether RAMICS will be operationally effective and suitable. Early approval to allow RAMICS to enter into LRIP without an operational assessment could also lead to unplanned retrofit expenses, production line breaks, delivery of equipment that will not meet the user’s needs, and LRIP units that will not pass the operational evaluation that is needed to support a positive full-rate production decision. To remedy this situation, testers need updated and completed program documentation to accomplish required developmental and operational testing before the LRIP decision review. If required developmental and operational testing is not conducted, the Navy risks premature commitment to LRIP of four RAMICS units estimated to cost up to \$15 million.

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## Recommendations, Management Comments, and Audit Response

**A.1. We recommend that the Assistant Secretary of the Navy (Research, Development, and Acquisition):**

**a. Revise the Rapid Airborne Mine Clearance System exit criteria for the low-rate initial production decision review to require the Program Manager, Mine Warfare to obtain developmental test results and an operational assessment that:**

**(1) Demonstrate the capability of the Rapid Airborne Mine Clearance System to reacquire and neutralize mines while in flight on the MH-60S helicopter.**

**(2) Demonstrate Rapid Airborne Mine Clearance System can operate and function with the MH-60S helicopter.**

**Management Comments.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems, responding for the Assistant Secretary of the Navy (Research, Development, and Acquisition), partially concurred. She stated that although she considers the existing exit criteria adequate, the program manager will conduct developmental testing and have an operational assessment performed that will provide the recommended test results to the milestone decision authority to support the LRIP decision.

The program manager plans to use an alternative helicopter, the H-3, in addition to the MH-60S, to conduct developmental testing and for use in performing the operational assessment for RAMICS. The Deputy Assistant Secretary stated that the H-3 helicopter's planned RAMICS installation and gross weight made it a suitable alternative to the MH-60S helicopter. The program manager will use the H-3 helicopter in developmental testing to validate RAMICS sensor performance and to demonstrate the RAMICS capability to reacquire and neutralize mines while in flight, in support of the operational assessment.

The Deputy Assistant Secretary stated that the program manager will use the MH-60S helicopter in Weapon System Integration Team Contractor Testing to demonstrate the operation of RAMICS as integrated with the helicopter. She explained that the contractor will conduct this testing in several phases. The first test phase will consist of verifying the communication paths between RAMICS and the MH-60S. The second phase will continue verifying the operation of RAMICS on the ground, as integrated on a production representative MH-60S airframe. The second phase will also include captive carriage and jettison tests to establish the flight envelope for the MH-60S when carrying RAMICS. The primary focus of subsequent test phases will determine if firing the gun has any adverse effects on the performance of the MH-60S airframe. The Deputy Assistant Secretary stated that through the contractor tests of RAMICS, the program manager will be able to determine the firing and lifetime firing limits of RAMICS on the MH-60S and whether there is any degradation in the weapon system's performance.



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**Audit Response.** The Deputy Assistant Secretary's comments met the intent of the recommendation. Specifically, we believe that the Navy's commitment through the program manager to perform additional developmental testing and have an operational assessment performed will provide necessary support for the LRIP decision review. This testing will provide the milestone decision authority with needed information on the capability of RAMICS to reacquire and neutralize mines while in flight and whether it can operate and function with the MH-60S helicopter. In our discussions with staff of COMOPTEVFOR, the staff stated that the program manager's revised test plans should provide them with valid test data to prepare a meaningful operational assessment before the LRIP decision. Staff from the Office of the Director, Operational Test and Evaluation also agreed that the Navy's revised test plans should support the preparation of a meaningful operational assessment. The program manager's staff also advised that the third phase of the Weapon System Integration Team Contractor Test would be completed before the LRIP decision review and would include RAMICS firing the gun from the MH-60S helicopter. Because the Navy plans to have a meaningful operational assessment accomplished before the LRIP decision, revising the exit criteria is no longer necessary.

**b. Delay the low-rate initial production decision review, as necessary, to enable the Program Manager, Mine Warfare to meet the revised exit criteria identified in Recommendation A.1.a.**

**Management Comments.** The Deputy Assistant Secretary nonconcurred, stating that the Navy considers the existing RAMICS exit criteria to be adequate for the LRIP decision.

**Audit Response.** Although we still consider the existing exit criteria inadequate, as discussed in the finding, the Navy's commitment to perform the additional testing described in its response to Recommendation A.1.a. meets the intent of our recommendation.

**A.2. We recommend that the Program Manager, Mine Warfare:**

**a. Coordinate with the Commander, Operational Test and Evaluation Force to update the test and evaluation master plan to require an operational assessment before the low-rate initial production decision review.**

**Management Comments.** The Deputy Assistant Secretary concurred, stating that the RAMICS program office is working with COMOPTEVFOR to generate a compliant test strategy in the test and evaluation master plan. The Deputy Assistant Secretary estimated that the test and evaluation master plan would be updated and completed by December 31, 2007.

**Audit Response.** The Deputy Assistant Secretary's comments were responsive to the recommendation.

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**b. Update and obtain all required approvals for the following program draft planning documents:**

(1) test evaluation master plan, including test event descriptions,

(2) systems engineering plan, and

(3) software development plan

**before the low-rate initial production decision planned for August 2008, in accordance with DoD Instruction 5000.2, “Operation of the Defense Acquisition System,” May 12, 2003; Under Secretary of Defense for Acquisition, Technology, and Logistics memorandum, “Policy for Systems Engineering in DoD,” February 20, 2004; and Software Engineering Institute, “Key Practices of the Capability Maturity Model, Version 1.1,” February 1993.**

**Management Comments.** The Deputy Assistant Secretary concurred, stating that the RAMICS program office estimated that the systems engineering plan and the software development plan would be updated and completed by June 30, 2007, and March 31, 2007, respectively. In her response to Recommendation A.2.a., the Deputy Assistant Secretary estimated that the test and evaluation master plan would be updated and completed by December 31, 2007.

**Audit Response.** The Deputy Assistant Secretary’s comments were responsive to the recommendation.

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## B. Defining Requirements in the Capability Production Document

The Commander, NSWC-PC did not fully define significant system capability requirements in the draft capability production document (CPD) prepared to support the LRIP decision planned for August 2008. Specifically, the draft CPD did not fully define:

- memory and processing capacities for computer hardware;
- nuclear, biological, and chemical (NBC) survivability requirements; and
- required architecture product descriptions to define system characteristics and performance for information exchange.

Additionally, the draft CPD did not define the required number of RAMICS and the expected system life-cycle cost. This occurred because the NSWC-PC staff did not always follow established Chairman of the Joint Chiefs of Staff policy and guidance for defining system capability requirements in a manner verifiable through test and evaluation. Additionally, the Commander, NSWC-PC was unable to finalize the number of RAMICS required because of uncertainties regarding the planned number of littoral combat ships that will deploy MH-60S helicopters carrying RAMICS. As a result, Navy testers will not be able to verify through testing that the RAMICS will satisfy essential warfighter capability requirements before the LRIP decision. Moreover, until the Navy is able to define the number of required systems and the related life-cycle operational and support costs in the CPD, the Navy will not be able to effectively plan and budget for RAMICS.

### Policies, Guidance, and Procedures for Defining Capability Requirements

The DoD and the Navy have established policies, guidance, and procedures for defining capability requirements.

**DoD.** Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3170.01E, “Joint Capabilities Integration and Development System,” May 11, 2005, and CJCS Instruction 6212.01D, “Interoperability and Supportability of Information Technology and National Security Systems,” March 8, 2006, provide the primary DoD policies and procedures for defining system capability requirements through the Joint Capabilities Integration and Development System. CJCS Manual 3170.01B, “Operation of the Joint Capabilities Integration and Development System,” May 11, 2005, provides procedures for implementing the Joint Capabilities Integration and Development System. DoD Design Criteria Standard

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Military Standard 1472F, “Human Engineering,” August 23, 1999, provides guidance for implementing general human engineering design criteria for military systems, subsystems, equipment, and facilities.

**Navy.** The publication “Multi-Service Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection,” June 2003, designated as Navy Tactics, Techniques, and Procedures 3-11.27 within the Navy, contains information for planning and executing operations in an NBC environment. Navy sponsors use the publication to help define capability requirements for systems operating in a NBC environment.

The Deputy Chief of Naval Operations for Resources, Requirements, and Assessments (the Navy’s requirements gatekeeper) coordinates staffing, validation, and approval of the CPDs for all Navy acquisition programs within the Joint Capabilities Integration and Development System process. Staff from the Office of the Deputy Chief of Naval Operations advised that the NSWC-PC staff was drafting the RAMICS CPD for the Navy’s requirements gatekeeper. The gatekeeper will review and coordinate the draft CPD with other DoD Components with potential interest in participating in the acquisition program. After completing the coordination process, the gatekeeper will forward the draft CPD to the Vice Chief of Naval Operations for validation and approval.

## Defining Capability Requirements

The Commander, NSWC-PC did not adequately define significant system requirements in the draft CPD to support the LRIP decision planned for August 2008. Specifically, the draft CPD did not adequately define:

- computer memory and processing margins for computer hardware,
- NBC survivability requirements, and
- required architecture product descriptions to define system characteristics and performance for information exchanges.

**Computer Memory and Processing Capacities.** CJCS Instruction 3170.01E requires that the CPD define projected system capabilities with sufficient accuracy to begin production. Additionally, CJCS Manual 3170.01B states that CPDs should present system performance attributes in output-oriented, measurable, and testable terms. The March 23, 2006, version of the draft CPD did not define computer memory and processing capacities in a manner to support production and testing. Instead of stating output-oriented measurable and testable terms, the draft CPD stated that “computer hardware resource use would be measured and adhere to the requirements mandated by the contract.” This condition occurred because the NSWC-PC staff did not adhere to policy and guidance provided in CJCS Instruction 3170.01B and CJCS Manual 3170.01B respectively, in drafting the CPD. After discussion with the audit staff, the NSWC-PC staff revised the May 18, 2006, version of the draft CPD to define computer memory and processing margins. The revised draft CPD referenced

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computer memory and processing capacities in the RAMICS performance specification document. The performance specification document requires that the contractor design RAMICS so that computer memory and processing capacity will provide a 50 percent reserve to allow the system to operate efficiently and to expand in the future.

**Nuclear, Biological, and Chemical Survivability Requirements.** The March and May 2006 versions of the draft CPD did not define NBC survivability requirements for all NBC environments in which RAMICS will operate. Those requirements must be defined for a tester to perform developmental and operational tests. Specifically, the draft CPDs state:

The system will be operable by crew wearing NBCC [nuclear, biological, and chemical contamination] protective equipment. The system will be configured for post mission decontamination so that it can be safely maintained by unprotected personnel. Munitions and system modules used in this system will be designed to resist threats, but the system is not expected to survive conventional or initial nuclear weapons effects.

The draft CPDs did not fully define the required capabilities for operating and decontaminating the system as discussed in the following sections.

**Operating the System.** Navy Tactics, Techniques, and Procedures 3-11.27 defines five levels (0 through 4) of mission-oriented protective posture equipment for personnel working in an NBC environment. As written, the draft CPDs only requires that the RAMICS be operable by crew wearing NBC contamination protective equipment. Navy Tactics, Techniques, and Procedures 3-11.27 states that the amount of protective equipment the crew would wear would vary depending on the mission-oriented protective posture level at which they were operating. For example, Mission-Oriented Protective Posture Level 1 (used when an attack in theater is possible) involves personnel wearing protective over-garments and field gear, while carrying footwear covers, masks and gloves. Mission-Oriented Protective Posture Level 4 (used when the highest degree of protection is required or if chemical or biological agents are present) involves personnel wearing masks, hoods, footwear covers, and gloves, in addition to the over-garments and field gear worn at Mission-Oriented Protective Posture Level 1.

Because of the variability in the amount of protective equipment the crew could wear, the CPD should specify the required Mission-Oriented Protective Posture Levels at which the crew will operate RAMICS. Additionally, CJCS Manual 3170.01B advises that, when addressing system survival capabilities in adverse environments, the CPD should define capabilities in terms of full or percent degraded when operating a system in an adverse environment. The CPD did not specify whether RAMICS will operate at full or at some percentage degraded capability when operating in an NBC environment. This condition occurred because the NSWC-PC staff did not consider NBC criteria in Navy Tactics, Techniques, and Procedures 3-11.27 and CJCS Manual 3170.01B when defining NBC survivability requirements in the draft CPDs.

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**Decontaminating the System.** Military Standard 1472F states that the design of the equipment will be compatible with NBC protection requirements and permit performance of mission-essential operations, communications, maintenance, resupply, and decontamination tasks by suitably clothed, trained, and acclimatized personnel for the survival periods and NBC environments required of the system. Further, it states that the design will facilitate NBC hardness surveillance and lessen the likelihood that NBC hardness will be reduced. Hardness is the ability of a system to withstand a hostile environment. The draft CPDs did require that RAMICS be configured for post-mission decontamination so that it can be effectively maintained by unprotected personnel. However, the CPDs did not address system resistance to hardness reductions through exposure to NBC environments or through the decontamination process after exposure has occurred. This condition occurred because the NSWC-PC staff did not realize that system hardening against NBC must be defined in measurable and testable terms in the CPDs.

**Descriptions of Architecture Products.** CJCS Instruction 6212.01D lists 16 descriptions of architecture products that the CPD must include. The Instruction states that the descriptions of architecture products are an element of the net-ready key performance parameter. Sponsors use this key performance parameter to define the system characteristics and performance metrics required for the timely, accurate, and complete exchange of information. The March 23, 2006, version of the draft CPD did not include 11 of the 16 required descriptions of architecture products. After discussion with audit staff during May 2006, the NSWC-PC staff included 13 of the 16 required descriptions in the May 18, 2006, version of the draft CPD. The NSWC-PC staff also included the statement that RAMICS information exchange would be limited to information sent through a dedicated fiber optic cable to the common console in the MH-60S helicopter. Further, the updated draft CPD states that testers can verify the satisfaction of net-ready requirements only through the MH-60S helicopter. However, the NSWC-PC staff did not modify the draft CPD to explain that because of its limited requirements to exchange information with the MH-60S helicopter, the three excluded architecture product descriptions were not applicable to RAMICS. Appendix D lists the 16 descriptions of architecture products defined in CJCS Instruction 6212.01D and shows which of the descriptions were included in the March and May 2006 draft CPDs for RAMICS.

The incomplete documentation of product descriptions for RAMICS occurred because NSWC-PC staff did not follow guidance in CJCS Instruction 6212.01D regarding documenting reasons for omitting descriptions of architecture products. Specifically, CJCS Instruction 6212.01D states that the Joint Staff can waive the requirement for certain descriptions as necessary based on the presence or absence of a net-ready key performance parameter.

## **Defining System Quantities and Cost**

CJCS Instruction 3170.01E requires that the CPD define the production quantities specific to an increment of an acquisition program. CJCS Manual 3170.01B states that the CPD should define the assets required to obtain full operational

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capability, to include asset quantities needed for operations, maintenance, and training. The March 23, 2006, draft CPD specified fielding a total of 58 RMKs. In addition to not separately breaking out the number of RMKs required for operations, maintenance, and training as discussed in CJCS Manual 3170.01B, the requirement for 58 RMKs was no longer current.

This condition occurred because the Navy changed its plans for operating the MH-60S helicopter. In 2004, the Navy decided to operate the MH-60S helicopter (with RAMICS and the four related mine countermeasure systems) from the developmental littoral combat ship rather than from aircraft carriers, as originally planned. With carrier basing, the Navy planned to have 2 RMKs for each MH-60S helicopter, which was the basis for requiring 58 RMKs. Because the littoral combat ship will have less storage space than the carrier, the Navy plans to require one RMK for each littoral combat ship that has the mine countermeasure mission. Additionally, the Navy has not decided how many littoral combat ships it will buy, or how many multiple-mission littoral combat ships it will equip for the mine countermeasures mission. Because the NSWC-PC staff did not know how many RAMICS the Navy would require, they could not accurately estimate the systems life-cycle cost in the CPD as specified in CJCS Manual 3170.01B. Within the Navy, the Deputy Chief of Naval Operations for Resources, Requirements, and Assessment has responsibility for defining the total number of Rapid Airborne Mine Clearance Systems required for operations, training, and maintenance.

## Conclusion

Without a CPD that fully defines all essential and mandatory capability requirements, the Navy will not be able to verify through testing that RAMICS will provide the capabilities the warfighter needs. Further, until the Navy is able to define the number of system mission kits required and the related life-cycle cost of operating and supporting those systems, the Navy will not be able to effectively plan and budget for RAMICS.

## Recommendations, Management Comments, and Audit Response

**Revised Recommendation.** As a result of Navy comments, we revised Recommendation B.3. The recommendation no longer requires the Navy to modify the contract to require RAMICS to operate in nuclear, biological, and chemical environments. The Commander, Naval Surface Warfare Center, Panama City determined that nuclear, biological, and chemical requirements were no longer valid for the RAMICS program; therefore, the contract does not need to include that requirement.

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**B.1. We recommend that the Commander, Naval Surface Warfare Center, Panama City, Florida, update the draft capability production document for the Rapid Airborne Mine Clearance System in accordance with:**

**a. Chairman of the Joint Chiefs of Staff Instruction 3170.01E, “Joint Capabilities Integration and Development System,” May 11, 2005, to define in measurable terms and verifiable through test and evaluation, computer memory and processing margins to support systems capability growth.**

**Management Comments.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems, responding for the Commander, Naval Surface Warfare Center, Panama City, concurred. She stated that the Commander would update the draft CPD to state:

Computer hardware resource utilization such as processor capacity, memory capacity, input/output device capacity, auxiliary storage capacity, and communications/network equipment capacity will be measured and adhere to the requirements. The system shall be designed so that processing and memory utilization will allow for a 50% reserve capacity to provide for efficiency of operation and expandability.

The Deputy Assistant Secretary stated that the updated memory and processing requirements would align with requirements stated in the RAMICS performance specification. The Deputy Assistant Secretary expected the Commander to complete the CPD by March 31, 2007.

**Audit Response.** The Deputy Assistant Secretary’s comments were responsive to the recommendation.

**b. Chairman of the Joint Chiefs of Staff Manual 3170.01B, “Operation of the Joint Capabilities Integration and Development System,” May 11, 2005, to define in measurable terms and verifiable through test and evaluation, nuclear, biological, and chemical requirements to protect equipment from system degradation.**

**Management Comments.** The Deputy Assistant Secretary concurred in principle. She stated that although our recommendation to define requirements in measurable terms was valid, the Airborne Mine Counter Measures Specification did not include a requirement for RAMICS to operate in nuclear, biological, and chemical environments. Therefore, the Deputy Assistant Secretary stated that the Commander, Naval Surface Warfare Center, Panama City deleted the nuclear, biological, and chemical requirements from the draft CPD.

**Audit Response.** The Deputy Assistant Secretary’s comments were responsive to the recommendation. The Airborne Mine Counter Measures Specification defines performance specifications for the MH-60S helicopter, which will carry RAMICS. Because the performance specification did not require the MH-60S to operate in nuclear, biological, and chemical environments, logically the CPD for RAMICS does not need to include a requirement for RAMICS to operate in these environments.



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**c. Chairman of the Joint Chiefs of Staff Instruction 6212.01D, “Interoperability and Supportability of Information Technology and National Security Systems,” March 8, 2006, to define architecture product descriptions that are relevant to the Rapid Airborne Mine Clearance System.**

**Management Comments.** The Deputy Assistant Secretary concurred. She stated that the Commander, Naval Surface Warfare Center, Panama City would update the draft CPD. The update would clarify that architectural products descriptions for AV-1 (Overview and Summary), OV-3 (Operational Exchange Matrix), and TV-2 (Technical Standards Forecast) would not be included in the draft CPD because of the limited requirements for RAMICS to exchange information with the MH-60S helicopter.

**Audit Response.** The Deputy Assistant Secretary’s comments were responsive to the recommendation.

**B.2. We recommend that the Deputy Chief of Naval Operations for Resources, Requirements, and Assessment define the total number of Rapid Airborne Mine Clearance Systems required for operations, training, and maintenance, and the projected life-cycle cost for the Rapid Airborne Mine Clearance System in accordance with Chairman of the Joint Chiefs of Staff Manual 3170.01B, “Operation of the Joint Capabilities Integration and Development System,” May 11, 2005.**

**Management Comments.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems, responding for the Deputy Chief of Naval Operations for Resources, Requirements, and Assessment, concurred. She stated that staff of the Deputy Chief of Naval Operations preliminarily planned to procure 48 RAMICS, including 24 to support operational requirements, 2 for spares, and 22 to support training requirements. She stated that the operational and training requirements could change as a result of two ongoing studies that the staff of the Deputy Chief of Naval Operations were conducting in support of the FY 2010 program objective memorandum. Following completion of the two studies and any resulting adjustments to the planned overall RAMICS buy, the staff of the Deputy Chief of Naval Operations will update the draft CPD and finalize the life-cycle cost estimate during the first quarter of FY 2008, in support of the LRIP decision.

**Audit Response.** The Deputy Assistant Secretary’s comments were responsive to the recommendation.

**B.3. We recommend that the Program Manager, Mine Warfare modify contract N00024-02-C-6324 with Northrop Grumman Corporation, as required, to ensure that the contractor designs the Rapid Airborne Mine Clearance System to meet the revised capability requirements in the draft capability production document resulting from implementing Recommendations B.1.a. and B.1.c.**

**Management Comments.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems, responding for the Program Manager, Mine Warfare, concurred. She stated that NSWC-PC was in the process of writing the statement of

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work for the FY 2008 RAMICS contract with Northrop Grumman. She stated that the program manager would provide the updated draft CPD to Northrop Grumman. The Deputy Assistant Secretary stated that corrective action would be completed by July 30, 2007.

**Audit Response.** The Deputy Assistant Secretary's comments were responsive to the recommendation.

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## **C. Establishing Defense Contract Management Agency Support Responsibilities**

The approved memorandum of agreement (MOA) between the Commander, DCMA Aircraft Integrated Maintenance Operations (AIMO), Melbourne, Florida, (the Commander) and the Program Manager, MW, which the Commander had begun reviewing in June 2006, did not adequately define required DCMA AIMO support to the RAMICS program office. Specifically, the MOA:

- was not tailored to focus DCMA AIMO support on priorities and risk areas associated with the RAMICS program,
- did not clearly define the role of DCMA AIMO in monitoring the contractor's efforts in engineering and integrated logistics support, and
- did not delineate responsibilities between DCMA AIMO staff and the Program Manager, MW technical representatives for monitoring subcontractors.

Also, the Commander did not formulate a surveillance plan to implement the program support that was defined in the MOA. The MOA and surveillance plan conditions occurred because the Commander did not follow provisions in the DCMA Guidebook for preparing those documents. Specifically, the DCMA Guidebook states that MOAs should focus on program risks and clearly state the support that DCMA will provide. Additionally, the DCMA Guidebook states that after establishing the MOA, DCMA staff should prepare a surveillance plan to implement the MOA program support requirements. Also, the Program Manager, MW determined the need for Navy technical representatives at NSWC-PC to monitor subcontractors after the approval of the MOA. Therefore, the responsibilities for DCMA AIMO and NSWC-PC staffs to monitor the subcontractors were not included in the MOA. As a result, DCMA AIMO was not able to focus its limited staffing resources on providing the Program Manager, MW with timely and meaningful insights and recommendations regarding those aspects of contractor performance that were most critical to successfully developing RAMICS.

## **Regulations and Guidance for Defense Contract Management Agency Support**

Federal and DoD regulations and guidance define the Commander's role in supporting the Program Manager, MW as he develops the RAMICS.

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**Federal Acquisition Regulation.** Federal Acquisition Regulation 42.302, “Contract Administration Functions,” specifies the contract administration functions that Federal organizations normally delegate to contract administration offices. Those contract administration functions include program status reporting; assessing contractor compliance with contract terms; surveilling contractor engineering efforts and management systems; and reviewing and evaluating the contractor’s logistics support, maintenance, and modification programs.

**DoD Regulation and Guidance.** The Defense Federal Acquisition Regulation Supplement and the DCMA Guidebook provide policy and guidance within the DoD.

**Defense Federal Acquisition Regulation Supplement.** The Defense Federal Acquisition Regulation Supplement Subpart 242.74, “Technical Representation at Contractor Facilities,” November 9, 2005, requires the Program Manager, MW to issue a letter of intent to the contract administration office commander listing the assignment location, starting and ending assignment dates, technical duties assigned, authority delegated, and support required when program managers conclude that they need technical representation in contractor facilities.

**Defense Contract Management Agency Guidebook.** The DCMA Guidebook provides DCMA staff with on-line access to information for performing outcome-based program management support for DoD acquisition programs. This support includes:

- establishing MOAs with program managers that focus on desired program outcomes;
- establishing surveillance plans detailing the tasks necessary to meet the provisions of the MOA; and
- establishing and managing program support teams led by program integrators to carry out the tasks documented in the surveillance plan.

DCMA uses outcome-based program support because of its commitment to performance-based management. Specifically, the DCMA Guidebook states that each program is burdened with a unique blend of risk elements, some of which DCMA can help manage and others that are beyond DCMA’s ability to influence. Therefore, in designing outcome based MOAs, DCMA should focus on those risk elements for which it can provide meaningful assistance to the program manager.

## **Establishing the Memorandum of Agreement**

On November 16, 2005, the Commander and the Program Manager, MW approved the “Memorandum of Agreement and Customer Service Agreement Between the Mine Warfare Program Office Program Executive Office Littoral Mine Warfare, Washington Navy Yard (RAMICS) and DCMA Aircraft Integrated Maintenance Operations, Melbourne, Florida (DCMA AIMO).” On

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June 2, 2006, our audit staff sent an e-mail to the DCMA AIMO program integrator for RAMICS. The e-mail stated that we planned to review the MOA and other DCMA AIMO documentation relating to supporting the Program Manager, MW in developing RAMICS. On June 5, 2006, the Commander requested that the program integration team assigned to RAMICS review the MOA. We discussed the MOA with DCMA AIMO staff from June 19 through June 23, 2006. The MOA, as approved, did not conform to the DCMA Guidebook requirements. Specifically, the MOA:

- was not tailored to focus DCMA AIMO support on program priorities and risk areas;
- did not clearly define DCMA AIMO role in monitoring the contractor's efforts in engineering and integrated logistics support; and
- did not delineate responsibilities between DCMA AIMO and NSWC-PC for monitoring subcontractors.

**Tailoring the Memorandum of Agreement.** The DCMA Guidebook states that the focus of program support activities revolves around mitigating program risk. Accordingly, the Guidebook states that the Program Manager, MW should identify those program risk areas that DCMA has the ability to influence and for which the Program Manager, MW requires DCMA assistance. For RAMICS, a major system, the Commander's assigned program integrator had not established an MOA that focused on specific program risk areas. Instead, the program integrator used an MOA for a major Defense acquisition program as the template for establishing the MOA. Because the program integrator used that template, he did not focus and prioritize DCMA support in the MOA to the RAMICS program. As a result, DCMA agreed to perform more responsibilities than the program support team could actually accomplish. Because of higher program oversight responsibilities, the program integrator estimated that he spent 25 percent of his available time on RAMICS, while members of the program support team devoted a lesser percentage of their available time to accomplishing RAMICS management support responsibilities.

**Defining Role for Monitoring Systems Engineering and Integrated Logistics Support.** The MOA needed to more clearly define the DCMA role for monitoring the contractor's efforts in systems engineering and integrated logistics support.

**Engineering Support for the Systems Engineering Plan.** The systems engineering annex to the MOA, which identifies general engineering support requirements, did not require the DCMA program support team to review and monitor the contractors accomplishments against the systems engineering management plan in the same manner as required for the SDP, the software configuration management plan, the software quality plan, and the software test plan. The draft systems engineering management plan was dated December 15, 2003. As discussed in finding A, the program office needs to update the draft systems engineering management plan into a systems engineering plan to better plan for RAMICS. The systems engineering plan is important because it addresses how systems engineering will support the translation of system

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capability needs into an effective, suitable product that is sustainable at an affordable cost. The systems engineering plan should also address the integration of the technical aspects of the program with the overall program planning, systems engineering activities, and execution tracking.

**Integrated Logistics Support.** The MOA contained conflicting information regarding the DCMA role in surveilling the contractor's efforts in developing the integrated logistics support capability for RAMICS. In Annex A, "Customer Desired Outcomes," the MOA stated that a desired outcome was the "successful integration of maintainability, reliability, and logistical supportability into the system design process." The measured success for this desired outcome was the accomplishment of the reliability, maintainability, and availability requirements outlined in the RAMICS performance specification. Further, Annex A stated that DCMA AIMO would ensure that the contractor had adequate documented procedures in key logistical areas and was adhering to those procedures. Annex A also stated that DCMA AIMO would ensure that the contractor considered reliability, availability, and maintainability factors when developing an integrated logistics support capability. Conversely, Annex F, "Integrated Logistics Support," stated that, "[s]ince the bulk of the effort for integrated logistics support is being subcontracted to other suppliers, the DCMA, AIMO logistics staff will perform very limited [integrated logistics support] surveillance, on a by-requested case-by-case basis." The surveillance limitations in Annex F were not consistent with the desired customer outcome. Annex F actually precluded DCMA from performing work necessary to achieve the desired customer outcome.

**Delineating Responsibilities of Technical Representatives.** The Defense Acquisition Guidebook encourages program managers to maximize the use of DCMA personnel rather than assigning technical representatives to a contractor facility. When a program manager determines that a program needs to use technical representatives at a contractor facility, Defense Federal Acquisition Regulation Supplement 242.7400 requires the program manager to issue a letter of intent to the DCMA contract administration office responsible for monitoring the contractor facility listing the technical duties and delegated authority of the technical agents. Subpart 242.7400 also states that the program manager and the commander of the DCMA contract administration office will negotiate a memorandum of agreement delineating their functional administrative interrelationships. It further states that the assigned technical agents must keep the contract administration office fully informed of matters they discuss with the contractor. The Defense Acquisition Guidebook also states that the MOA should identify the duties of the technical representatives and should establish how the technical representatives and the DCMA program integrator will coordinate and communicate.

The Program Manager, MW determined that Navy technical representatives from NSW-PC were needed to monitor RAMICS subcontractors because the NSW-PC premier research and development capabilities allowed it to provide the optimum level of technical oversight. DCMA AIMO agreed with the Program

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Manager, MW decision to use NSWC-PC to monitor subcontractors because the NSWC-PC level of expertise was unequalled and because DCMA AIMO did not have on-site staff available at the subcontractors' offices.

Defense Federal Acquisition Regulation Supplement 242.74 allows program managers to assign technical representatives to perform non-contract-administration service technical duties and to provide liaison, guidance, and assistance on systems and programs. However, the existing MOA did not delineate responsibilities between DCMA AIMO and Navy technical representatives or establish how they would coordinate and communicate as required. DCMA AIMO staff stated that this condition occurred because the Program Manager, MW did not assign the technical representatives with the responsibility of monitoring the subcontractors until after approval of the MOA. Specifically, in December 2005, 1 month after the Commander and the Program Manager, MW approved the MOA, the Program Manager, MW requested that the technical representatives begin work at subcontractor locations.

**Progress in Revising the Memorandum of Agreement.** Because DCMA AIMO began reviewing the MOA in June 2006, just before the audit staff visit, the audit staff helped the DCMA AIMO staff identify needed MOA revisions. As of December 2006, the program integrator had developed the initial draft version of a revised MOA that focused DCMA AIMO support on desired program outcomes and clarified the role of DCMA AIMO in surveilling the contractor's effort in engineering and integrated logistics support.

## **Formulating a Surveillance Plan**

The DCMA Guidebook specifies that the surveillance plan should be an attachment or appendix to the MOA and should prioritize details on what the DCMA will do in support of an acquisition program, along with when, where, and how these support activities will occur. The Commander had not yet developed a surveillance plan to implement the program support for RAMICS as defined in the MOA. This condition occurred because the Commander had not taken the time to establish a formal surveillance plan. The surveillance plan is to provide a roadmap for the DCMA AIMO program support to follow in performing required support functions.

After discussions with the audit staff in June 2006, DCMA AIMO began working to establish a surveillance plan to implement the program support defined in the MOA. As of December 2006, the program integrator had developed the initial draft version of a surveillance plan for supporting the RAMICS program. Because the surveillance plan was based on the MOA, DCMA AIMO could not finalize the plan until the program manager agreed to the updated MOA discussed previously.

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## Conclusion

Without a focused and complete MOA, supported with a surveillance plan, DCMA AIMO with its limited resources was not in a position to provide the Program Manager, MW with timely and meaningful insights and recommendations regarding the cost, schedule, and performance aspects of the contractor's performance most critical to successfully developing the RAMICS. Without this focused input from DCMA AIMO, the Program Manager, MW cannot make the most informed decisions concerning RAMICS program. Additionally, it is possible that DCMA AIMO and NSWC-PC technical representatives will perform duplicative surveillance work if the MOA does not clearly delineate the responsibilities and functions of each group.

## Recommendations, Management Comments, and Audit Response

**C.1. We recommend that the Program Manager, Mine Warfare and the Director, Defense Contract Management Agency coordinate to revise the memorandum of agreement for the Rapid Airborne Mine Clearance System to:**

**a. Focus the limited Defense Contract Management Agency support resources on the Program Manager, Mine Warfare's identified priorities and risk areas.**

**Navy Comments.** The Deputy Assistant Secretary of the Navy for Integrated Warfare Systems, responding for the Program Manager, Mine Warfare, concurred. She stated that the program office was working with DCMA to revise the MOA for the RAMICS program to concentrate on the program office's priorities and risk areas.

**Defense Contract Management Agency Comments.** The Acting Director, DCMA concurred. He stated that DCMA had revised the draft MOA into an outcome-based format that focused on the program manager's identified priorities and risk areas. He stated that the MOA was in the review process and would be implemented by June 30, 2007.

**Audit Response.** The Navy and DCMA comments were responsive to the recommendation.

**b. Reference the Rapid Airborne Mine Clearance System systems engineering plan as the focus for Defense Contract Management Agency systems engineering support.**

**Navy Comments.** The Deputy Assistant Secretary concurred. She stated that DCMA engineering support to the RAMICS program will be delineated in the MOA by stating the specific areas and activities that DCMA will support and by referencing the systems engineering plan.



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**Defense Contract Management Agency Comments.** The Acting Director nonconcurred. He stated that the DCMA revised MOA will not have the systems engineering plan as a desired outcome or the focus of engineering support. Instead, he stated that the MOA will delineate DCMA engineering support to the RAMICS program by stating the specific areas and activities that DCMA will support and by referencing the systems engineering plan.

**Audit Response.** The Navy comments were responsive to the recommendation. The DCMA commitment to use the MOA to delineate specific engineering support to the RAMICS program including a reference to the systems engineering plan meets the intent of our recommendation.

**c. Clarify the provisions regarding the support that the Defense Contract Management Agency will provide on planning for the integrated logistic support.**

**Navy Comments.** The Deputy Assistant Secretary concurred. She stated that the MOA will require DCMA to perform needed integrated logistic support in specific areas and activities.

**Defense Contract Management Agency Comments.** The Acting Director concurred, stating that the NSWC-PC will delineate required integrated logistics support for the program in the revised MOA. He also stated that the revised MOA will allow DCMA to provide integrated logistic support assistance as requested by the program office.

**Audit Response.** The Navy and DCMA comments were responsive to the recommendation.

**d. Clearly delineate responsibilities between Defense Contract Management Agency personnel and Navy technical representatives from the Naval Surface Warfare Center, Panama City, Florida, for providing support to the Program Manager, Mine Warfare for surveillance of Northrop Grumman subcontractors.**

**Navy Comments.** The Deputy Assistant Secretary concurred. She stated that the MOA will require DCMA to perform earned value analysis of subcontractor performance by specific areas and activities in support of the program.

**Defense Contract Management Agency Comments.** The Acting Director concurred, stating that the revised MOA will identify DCMA responsibilities. The MOA will state that the Naval Surface Warfare Center, Panama City will act as the program office's technical direction agent for on-site surveillance of Northrop Grumman subcontractors and will be responsible for all duties assigned in the engineering assignment agreement. As agreed to by the program office, DCMA responsibilities will be limited to conducting earned value analysis of subcontractor performance and other assistance as requested.

**Audit Response.** The Navy and DCMA comments were responsive to the recommendation.

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**C.2. We recommend that the Director, Defense Contract Management Agency establish a surveillance plan for the Rapid Airborne Mine Clearance System that describes oversight activities the program integrator and program support team will perform in support of the program.**

**Defense Contract Management Agency Comments.** The Acting Director concurred. He stated that DCMA functional specialists would perform surveillance in accordance with the assigned strategies within the risk-rated processes of the MOA and DCMA AIMO Melbourne. He stated that the frequency and intensity of DCMA surveillance will vary depending on the assigned risks of the processes, program phase, and activities that the contractor is performing. He stated that DCMA will also perform surveillance activities as the program manager requests, and that DCMA will implement the surveillance plan in conjunction with the MOA by June 30, 2007.

**Navy Comments.** Although not required to comment, the Deputy Assistant Secretary of the Navy for Integrated Warfare Systems agreed with the recommendation. She stated that DCMA functional specialists will perform surveillance in accordance with the assigned strategies within the MOA and in accordance with the risk-rated processes of DCMA AIMO Melbourne. She also stated that DCMA's surveillance frequency and intensity will vary depending on the assigned risks of the processes, program phase, and activities that the contractor is performing. Further, the Deputy Assistant Secretary stated that DCMA will also perform surveillance activities as the program manager requests, and that DCMA will implement the surveillance plan in conjunction with the MOA.

**Audit Response.** The DCMA and Navy comments were responsive to the recommendation.

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## Appendix A. Scope and Methodology

We evaluated whether management was cost-effectively developing and readying the program for the LRIP phase of the acquisition process. We reviewed requirements and capabilities, testing, systems engineering, contracting, acquisition strategy, and funding documents dated from October 2000 through September 2006. We interviewed staff from the offices of the Assistant Secretary of the Navy (Research, Development, and Acquisition); the Deputy Chief of Naval Operations; the Commander, Operational Test and Evaluation Force; the Commander, Mine Warfare Command; the Program Manager, Mine Warfare; the Program Manager, Multi-Mission Helicopters, the Commander, Naval Surface Warfare Center, Panama City; the Commander, and the Director, Defense Contract Management Agency.

We performed this audit from March 2006 through December 2006 in accordance with generally accepted government auditing standards.

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

**Use of Technical Assistance.** Two electrical engineers and two computer engineers from the Electronics Engineering and Information Technology Branches, Technical Assessment Directorate of Investigative Policy and Oversight, Department of Defense Office of Inspector General assisted in the audit. The engineers evaluated and reviewed RAMICS systems engineering, software, and other acquisition planning related documentation.

**Government Accountability Office High-Risk Area.** The Government Accountability Office has identified several high-risk areas in DoD. This report provides coverage of the DoD Weapons Systems Acquisition high-risk area.

### Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) issued a report discussing contract incentive fees across DoD. This subject is relevant to the audit of the RAMICS program, as discussed in Appendix E.

### GAO

GAO Report No. GAO-06-66, "DoD Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes," December 2005

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## Appendix B. Background Information

When fielded, RAMICS will provide the Navy with rapid-response, surface and near-surface mine reacquisition and neutralization capabilities. After reacquiring previously identified mines, RAMICS will fire a supercavitating\* projectile from the MH-60S helicopter using laser targeting. By supercavitating, the projectile maintains its trajectory through the water and maintains enough kinetic energy to neutralize the targeted mine. A description of the RAMICS system, information on related organic airborne mine countermeasures systems, and a discussion of RAMICS program history and acquisition strategy follow.

**System Description.** The Navy will integrate RAMICS hardware and software on the MH-60S helicopter. The Navy will accomplish this integration by using the RMK. The RMK includes four subsystems unique to RAMICS and two subsystems for interface with the MH-60S helicopter.

The four subsystems unique to RAMICS are the:

- targeting sensor subsystem, which is a blue-green laser and receiver;
- gun subsystem, which is a MK 44 Bushmaster (the Bushmaster includes a gun control unit, a turret control unit, an ammunition can, an ammunition feed mechanism, and a power source);
- munition subsystem, which is a MS-MK 258 Mod 1 Armor Piercing Fin Stabilized Discarding Sabot Tracer cartridge (the Mod 1 incorporates a modified projectile nose to allow supercavitation); and
- fire control subsystem, which consists of the hardware and software that coordinates and controls the gun subsystem and the targeting sensor subsystem.

Two other subsystems are needed for RAMICS to interface with the MH-60S helicopter.

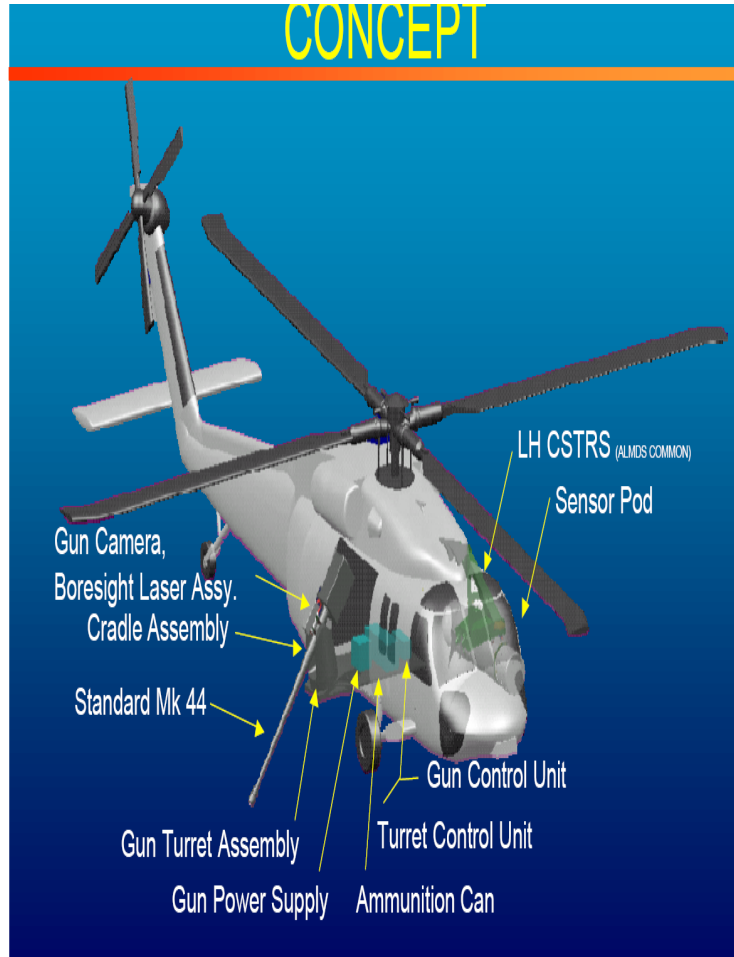
- The first subsystem is the common console, which Lockheed Martin Systems Integration in Owego, New York, was developing. The common console is responsible for the display; command, control, and recording; built-in test, direction; and management of the gun subsystem and targeting sensor subsystem. The common console provides the link between the portions unique to RAMICS in the RMK and the helicopter operations systems.

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\* Supercavitation is the use of cavitation (forcing water to move at extremely high speed) effects to create a bubble of air around the projectile, which enables the projectile to travel through the water faster.

- The second subsystem is the carriage, stream, tow, and recovery system, which Concurrent Technologies Corporation is developing. The carriage, stream, tow, and recovery system will provide the mechanical interface to the MH-60S helicopter.

The following illustration provides a conceptual depiction of the RMK components as integrated with the MH-60S helicopter.



Source: Program Manager, MW

**Figure B-1. RMK Components Integrated with the MH-60S Helicopter**

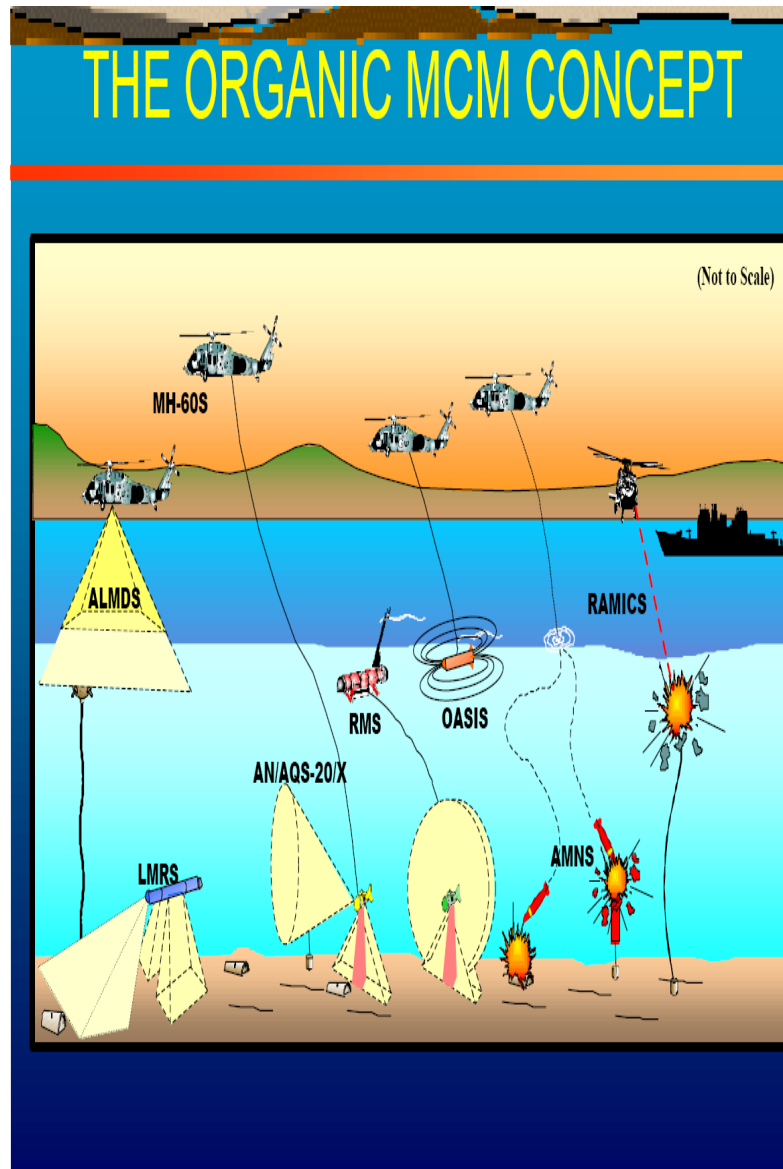
ALMDS	Airborne Laser Mine Detection System
LH CSTRS	Lockheed Carriage, Stream, Tow, and Recovery System

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**Related Organic Airborne Mine Countermeasures Systems.** The Navy plans to install four other related Organic Airborne Mine Countermeasures systems separately on the MH-60S helicopter. The systems are the:

- Sonar Mine Detecting Set, which is a towed system that will provide the Navy with an organic, flexible, and highly capable tool for detecting, classifying, and localizing bottom, close-tethered, and volume mines.
- Airborne Mine Neutralization System, which is a non-towed mine neutralization system that will allow the Navy to reacquire and neutralize previously detected unburied bottom and moored mines, which are too deep for RAMICS.
- Airborne Laser Mine Detection System, which is a non-towed system that will provide the Navy with a system that detects, classifies, and localizes surface and near-surface mines, and sends these data to the RAMICS or the Airborne Mine Neutralization System so that these systems can reacquire and neutralize the mines.
- Organic Airborne and Surface Influence Sweep, which is a towed system that will provide the Navy with a shallow water influence minesweeping capability to support limited mine clearance operations.

The following illustration shows the Organic Airborne Mine Countermeasures (MCM) concept, with RAMICS deployed along with the Sonar Mine Detecting Set (AN/AQS-20X), the Airborne Mine Neutralization System (AMNS), the Airborne Laser Mine Detection System (ALMDS), the Organic Airborne and Surface Influence Sweep (OASIS), and other systems to perform mine neutralization and clearance.



Source: Program Manager, MW

**Figure B-2. Organic Airborne Mine Countermeasures Concept**

RMS	Remote Mine Hunting System
LMRS	Long-Term Mine Reconnaissance System

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**Program History.** The RAMICS Advanced Technology Demonstration proved the system concept in FY 2001. On July 29, 2002, RAMICS entered the system development and demonstration phase of the acquisition process as a result of the Navy Acquisition Executive approving Milestone B. Other significant program events include the following.

- August 23, 2002 - The Program Manager, MW had the RAMICS system development and demonstration contract awarded to Northrop Grumman.
- July 12, 2004 - The Program Manager, MW notified the Navy Acquisition Executive of anticipated cost and schedule deviations from the approved acquisition program baseline for RAMICS because of revisions to the availability of the MH-60S helicopter for flight testing along with contractor cost and schedule overruns.
- April 26, 2005 - The Navy Acquisition Executive approved the RAMICS Acquisition Program Baseline Change 2, which postponed the planned LRIP decision review from February 2006 to August 2008.
- December 14, 2005 - The Program Manager, MW modified the RAMICS system development and demonstration contract with Northrop Grumman to show the impact of Acquisition Program Baseline Change 2 on the program.

The system development and demonstration contract, as modified in December 2005, will need to be modified again to include developmental and operational tests not currently in the contract, which need to be completed before the LRIP decision review, as discussed in finding A.

**Acquisition Strategy.** The overall acquisition strategy for RAMICS is a single step to full capability. The Navy will use an evolutionary acquisition approach to incrementally upgrade the RAMICS. To implement the acquisition strategy for RAMICS, the Program Manager, MW plans to:

- exercise the LRIP options on the system development and demonstration contract in FY 2008 to build two to eight systems (four were planned as of November 2006) and to refurbish one of the two engineering development models for use as a test article for the initial operational test and evaluation in FY 2010, and
- award a full-rate production contract to Northrop Grumman in the first quarter of FY 2011.



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## Appendix C. Planned Integration Testing

The Program Manager, MW has preliminarily planned five tests to determine whether the prime contractors for the RMK and the MH-60S helicopter were able to successfully integrate the RMK with the helicopter. The five test phases are the: Common Console and Cockpit Software; Weapon Systems Integration Team Ground Tests; Captive Carriage; Jettison (mass representative shapes); and Weapon Systems Integration Team Contractor Test. Discussion of the purposes of the five tests, whether the tests were on contract with Northrop Grumman, and the planned test dates follow.

**Common Console and Cockpit Integration Test.** The purpose of the Common Console and Cockpit Software test is to test the radar altimeter function, to include RAMICS cockpit displays for the pilot and tactical displays for RAMICS operators. This test is on contract and scheduled for February 2007 through April 2007.

**Weapon Systems Integration Team Ground Tests.** The Weapon Systems Integration Team Ground Tests will be the first time that the components and special equipment unique to RAMICS, including the common console, will be fully integrated with a MH-60S helicopter. Contractor tests will include regression tests against the other four anti-mine systems that will be integrated with the MH-60S helicopter. These tests will determine whether changes necessary for the helicopter to accommodate RAMICS will affect the other systems. The Weapon Systems Integration Team Ground Tests will also include an evaluation of hardware and software changes. This test was an option on the contract. The Program Manager, MW had not exercised the option on the Northrop Grumman contract; however, the Program Manager, Multi-Mission Helicopters contracted for the tests with the Sikorsky Corporation (which is responsible for the helicopter). The Program Manager, MW plans to have the contractor conduct the tests in the fourth quarter of FY 2007.

**Captive Carriage.** The captive carriage test will include a mounted gun, the common console, and a representative of the pod that will contain the RMK components. The representative pod will be the same size, weight, and shape of the actual RAMICS pod and will have the same aerodynamic properties. This test will determine the flight ability of RAMICS and determine whether RAMICS adversely affects the flight of the MH-60S helicopter. During this test a Sikorsky pilot will fly the helicopter to determine whether the helicopter can achieve the necessary flight maneuvers and speed, and has the correct center of gravity. The test will be run by Sikorsky with the involvement of a Navy copilot. The Program Manager, MW had not yet exercised the contract option for this test. According to the test leader for the Program Manager, MW, there is no risk to the program if the Program Manager, MW does not exercise this contract option because Sikorsky has primary responsibility for captive carriage. The captive carriage test is tentatively scheduled for FY 2008.

**Jettison (Mass Representative Shapes).** The Jettison (mass representative shapes) test will ensure that RAMICS can separate quickly and cleanly from the MH-60S helicopter, if needed for safety purposes. The Program Manager, MW

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had not exercised the contract option for this test as of December 2006. The Program Manager, Multi-Mission Helicopters had included the test on Sikorsky's contract. According to the test leader for the Program Manager, MW, this test, like the captive carriage test phase, will not adversely affect the program if the Program Manager, MW does not exercise the contract option for this test because Sikorsky has primary responsibility for Jettison (mass representative shapes). The jettison test is tentatively scheduled for FY 2008.

**Weapon Systems Integration Team Contractor Test.** The Weapon Systems Integration Team Contractor Test will involve full integration of RAMICS with the MH-60S helicopter. The test will verify that the changes to the helicopter cockpit for RAMICS do not adversely affect the helicopter, and that RAMICS is functional on the MH-60S helicopter. The Weapon Systems Integration Team Contractor Test will culminate with the firing of the gun from the MH-60S helicopter for the first time. The Weapon Systems Integration Team Contractor Test will also enable the contractor to obtain realistic data about reliability, availability, and maintainability data because RAMICS will be performing its full mission, to include flying, reacquiring targets, and neutralizing targets through firing the gun. The Program Manager, MW had not yet exercised the contract option for the test that is tentatively scheduled for March 2008 through October 2008.

## Appendix D. Architecture Product Descriptions

The following table lists the descriptions of the architecture products, which CJCS Instruction 6212.01D requires program sponsors to include in CPDs. The footnotes in the table column “Framework Products” show the 11 architecture product descriptions that were not included in the March 2006 draft CPD and the 3 that were not included in the May 2006 CPD.

Framework Products	Framework Product Name	General Description
AV-1 <sup>1,2</sup>	Overview and Summary Information	Scope, purpose, intended users, environment depicted, and analytical findings.
OV-1	High-Level Operational Concept Graphic	High-level graphical/textual description of operational concept.
OV-2 <sup>1</sup>	Operational Node Connectivity Description	Operational nodes, operational activities performed at each node, connectivity, and information exchange need lines between nodes.
OV-3 <sup>2</sup>	Operational Information Exchange Matrix	Information exchanged between nodes and the relevant attributes of that exchange.
OV-4 <sup>1</sup>	Organizational Relationships Chart	Organizational role, or other relationships among organizations.
OV-5	Operational Activity Model	Operational activities, relationships among activities, inputs and outputs.
OV-6c	Operational Event-Trace Description	One of three products used to describe operational activity sequence and timing—traces actions in a scenario or sequence of events and specifies timing of events.
OV-7 <sup>1</sup>	Logical Data Model	System data requirements and structural business process rules of the operational view.
SV-1 <sup>1</sup>	System Interface Description	Identification of systems nodes, systems, and system items and their interconnections, within and between nodes.
SV-2 <sup>1</sup>	System Communications Description	Systems nodes and their related communications lay-downs.
SV-4 <sup>1</sup>	System Functionality Description	Functions performed by systems and the information flow among system functions, including information assurance functions.
SV-5 <sup>1</sup>	Operational Activity to Systems Function Traceability Matrix	Mapping of systems back to operational capabilities or of system functions back to operational activities.
SV-6 <sup>1</sup>	Systems Data Exchange	Provides details of systems data being exchanged.
SV-11 <sup>1</sup>	Physical Schema	Physical implementation of Logical Data Model entities, for example, message format, file structures, and physical schema.
TV-1	Technical Standards Profile	Extraction of standards that apply to the given architecture, including information assurance functions.
TV-2 <sup>1,2</sup>	Technical Standards Forecast	Emerging standards that are not currently approved. The TV-2 should also be used to document technical issues affecting program implementation.

<sup>1</sup> Architecture product description not included in the draft CPD dated March 23, 2006.

<sup>2</sup> Architecture product description not included in the draft CPD dated May 18, 2006.

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## Appendix E. Other Matter of Interest

During the audit we noted another matter of interest concerning the management of contract incentive fees.

The Government Accountability Office (GAO) issued Report No. GAO-06-66, "DoD Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes," on December 19, 2005. GAO reported that DoD:

- did not effectively link award and incentive fee criteria to acquisition outcomes; and
- had acquisition schedules lengthen and costs grow, and yet still paid contractors billions of dollars in award and incentive fees.

Consistent with the GAO findings, the RAMICS program office did not effectively link incentive fee criteria to desired program outcomes on the contract with Northrop Grumman. The RAMICS program office could pay incentive fees even though program schedules lengthened and costs grew. Specifically, the cost performance report for December 31, 2004, showed that the contractor was running 12 percent over schedule and 25 percent over cost. This report was the most recent cost performance report, and the contractor provided it to the Program Manager, MW before the Navy Acquisition Executive approved RAMICS Acquisition Program Baseline Change 2, June 2005. Change 2 lengthened the program acquisition schedule and increased program cost for completing the system development and demonstration phase of the acquisition process. Subsequently, on December 14, 2005, the Program Manager, MW used contract modification P00019 to:

- increase the total potential incentive fees on the contract from \$2.8 million to \$3.6 million; and
- make the criteria for earning incentive fees less stringent on three of the five incentive categories in the basic contract.

The three incentive fee categories that contained less stringent criteria were:

- Technical Performance-System Effectiveness "Over Depth;"
- Scheduled Delivery; and
- Software Reuse.

A comparison of the criteria in the original contract with the criteria in modification P00019 follows.

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**Incentive Fee Category: Technical Performance – System Effectiveness  
“Over Depth”**

**Original Contract.** RAMICS must simultaneously meet all threshold (minimum required) performance requirements and then successfully demonstrate system performance at the desired water depth.

**Modification P00019.** RAMICS must simultaneously meet performance requirements that can be measured in contractor ground testing and then successfully demonstrate system performance at the desired water depth.

**Comparison.** The system effectiveness criteria in modification P00019 were less stringent than those in the original contract because the contractor ground test will not measure all of the RAMICS performance threshold requirements. Specifically, the performance of developmental testing of RAMICS when integrated with the MH-60S helicopter during flight tests and the conduct of operational testing are needed to determine whether the RAMICS meets performance threshold requirements. Further, under the revised criterion, the contractor would receive the incentive fee earlier in the acquisition process than under the original criterion.

**Incentive Fee Category: Scheduled Delivery**

**Original Contract.** The delivery incentive is available only if a “fully functional system,” meeting all of the threshold performance requirements of the “RAMICS Performance Specification is delivered ahead of schedule.”

**Modification P00019.** The delivery incentive is available only if a fully functional system in the ground test configuration meeting all of the threshold performance requirements of the “RAMICS Technical Performance Criteria Table... is delivered upon completion of the Ground Test.”

**Comparison.** The schedule criterion in modification P00019 was less stringent than that in the original contract because RAMICS in the ground test configuration will not have undergone integration testing with the MH-60S helicopter. It will also be less mature than a fully functional system, which would be subjected to developmental flight integration testing and operational testing. Under this revised criterion, the contractor would also receive the incentive fee earlier in the acquisition process than under the original criterion.

**Incentive Fee Category: Software Reuse**

**Original Contract.** To be eligible for this incentive, the software to be reused must be from “a fielded non-developmental system that is past Initial Operating Capability.”

**Modification P00019.** To be eligible for this incentive, the software to be reused must be from system that has been field demonstrated or achieved a Milestone C, LRIP decision.

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Under both the original contract and modification P00019, the contractor was eligible to receive up to 50 percent of the software incentive pool based on satisfactorily completing the critical design review.

**Comparison.** The software reuse criterion in modification P00019 was less stringent than that in the original contract because the software coming from a system that has achieved an LRIP decision is normally less mature than software that has been successfully demonstrated during an operational evaluation supporting a full-rate production decision.

**Payment of Incentive Fee.** In January 2005, the RAMICS program office made an incentive fee payment to Northrop Grumman for software reuse. Under the terms of the original contract, the contractor was eligible to receive up to \$313,000 of the \$626,000 in the software incentive pool based on the contractor satisfactorily completing the critical design review. After the critical design review was held in May 2004, the incentive fee board awarded the contractor an incentive fee of \$191,477. The board based the incentive fee award on the estimated amount of software lines of code that the contractor reused from the Airborne Laser Mine Detection System and the RAMICS advanced technology demonstrator. The board determined the amount of the incentive fee based on the contractor reusing software lines of code from the Airborne Laser Mine Detection System, a fee of \$170,414, and reusing lines of code from the RAMICS advanced technology demonstrator, a fee of \$21,062. Because the Airborne Laser Mine Detection System achieved an LRIP decision in June 2005, its software met the software reuse criterion in modification P00019. However, the software from the RAMICS advanced technology demonstrator did not qualify under the software reuse provisions of modification P00019 because its software had not been used in a system that had achieved an LRIP decision.

The ability of the contractor to demonstrate the successful reuse of software will not be known until RAMICS has undergone thorough developmental and operational testing. Accordingly, the RAMICS program office's use of the results of the critical design review may not have been the best criteria for determining how well the contractor reused software from other proven systems in developing RAMICS. In our opinion, the RAMICS program office would have been able to make a more informed decision on how effectively the contractor reused software from other proven systems after the contractor demonstrated that the reused software enabled RAMICS to reacquire and neutralize mine targets when fully integrated with the MH-60S helicopter. The RAMICS program office staff advised us that on the next RAMICS contract, they would ensure that the incentive award criteria would more clearly demonstrate that the contractor merited an incentive fee.

## **Conclusion**

The Program Manager, MW did not effectively link contract incentives to desired acquisition outcomes. Specifically, after the contractor had incurred cost and schedule overruns, the Program Manager, MW negated the motivational value of the incentive fees by modifying the contract to provide the contractor the opportunity for earning higher incentive fees, for lesser accomplishments than provided under the original contract.

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In future contracting actions, the Program Manager, MW must work to ensure that contract incentives are linked to the contractor achieving desired acquisition outcomes.

### **Corrective Actions Taken by DoD**

DoD concurred with the recommendations in GAO Report No. GAO-06-66 to:

- address desired outcomes and the role the award fee should play in the overall acquisition strategy,
- remind the acquisition workforce to follow existing policies,
- provide guidance to the acquisition work force on “rollover” (applying unearned award fee money from one period to another), and
- develop a communication plan to share proven incentive strategies across the entire DoD acquisition workforce.

As a result, DoD has begun corrective actions to promote improved management of award and incentive fee contracts. Specifically, on March 29, 2006, the Under Secretary of Defense for Acquisition, Technology, and Logistics issued the memorandum “Award Fee Contracts (FAR 16, DFARS 215, DFARS 216),” which requires DoD Components to structure award fee contracts in ways that focus the Government’s and contractor’s efforts on meeting or exceeding cost, schedule, and performance requirements. The memorandum states that the contractor’s ability to earn award fees needs to be directly linked to achieving desired program outcomes. Additionally, the memorandum established limitations on the ability to “roll over” unearned award fee money from one period to another. In this regard, the memorandum states that the use of “rollover” provisions should be the exception rather than the rule. Further, when a contractor will miss a milestone in terms of cost, schedule, and performance, as occurred with RAMICS, the contractor may only earn a portion of the fee that was rolled over, even if its subsequent performance is excellent. Finally, the memorandum states that the DoD has established the “Award and Incentive Fees Community of Practice,” which will serve as a repository for related materials including policy information, training courses, and examples of good award fee arrangements.

### **Corrective Actions Planned by the Program Manager, Mine Warfare**

The Program Manager, MW recognized that the contract incentives that were included in the contract with Northrop Grumman were not beneficial to the Navy and were not changed to match the rebaselined contract. The Program Manager, MW staff stated that they were working to change the contract incentives, to include replacing the incentives for software reuse, maintainability, and reliability with incentives for meeting technical threshold values for RAMICS within cost and schedule limits. We believe that the Program Manager, MW planned corrective actions will effectively link contract incentive fee criteria to desired program outcomes.

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## **Appendix F. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense for Acquisition, Technology, and Logistics  
  Director, Acquisition Resources and Analysis  
Under Secretary of Defense (Comptroller)/Chief Financial Officer  
  Deputy Chief Financial Officer  
  Deputy Comptroller (Program/Budget)  
Director, Operational Test and Evaluation  
Director, Program Analysis and Evaluation  
Director, Defense Procurement and Acquisition Policy

### **Department of the Navy**

Assistant Secretary of the Navy (Research, Development, and Acquisition)  
Commander, Operational, Test and Evaluation Force  
Program Manager, Mine Warfare  
Program Manager, Multi-Mission Helicopters  
Program Manager, Littoral Combat Ships  
Commander, Naval Surface Warfare Center, Panama City  
Naval Inspector General  
Auditor General, Department of the Navy

### **Other Defense Organizations**

Director, Defense Contract Management Agency

### **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 Homeland Security and Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Reform



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# Department of the Navy Comments



DEPARTMENT OF THE NAVY  
OFFICE OF THE ASSISTANT SECRETARY  
RESEARCH, DEVELOPMENT AND ACQUISITION  
1000 NAVY PENTAGON  
WASHINGTON, DC 20350-1000

MARCH 9, 2007

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,  
DEPARTMENT OF DEFENSE

SUBJECT: Draft Report on the Acquisition of the Navy Rapid Airborne Mine Clearance System  
(Project No. D2006-D000AE-0153.000)

Ref: (a) DoD IG Memo of January 22, 2007

In response to the reference (a) request, I have reviewed the subject document and concur with the attached comments on the draft report on the Acquisition of the Navy Rapid Airborne Mine Clearance System.

A handwritten signature in cursive script that reads "E. Anne Sandel".

E. Anne Sandel  
Deputy Assistant Secretary of the Navy  
Integrated Warfare Systems

Attachments:  
As stated

**COMMENTS TO DODIG'S DRAFT REPORT  
ACQUISITION OF THE NAVY RAPID  
AIRBORNE MINE CLEARANCE SYSTEM (RAMICS)  
(D2006-D000AE-0153)**

**Recommendation A.1:** We recommend that the Assistant Secretary of the Navy (RDA):

**a. Revise the RAMICS exit criteria for the LRIP decision review to require the PM, Mine Warfare to obtain developmental test results and an operational assessment that:**

**(1) Demonstrate the capability of the RAMICS to reacquire and neutralize mines while in flight on the MH-60S helicopter.**

**(2) Demonstrate RAMICS can operate and function with the MH-60S helicopter.**

**Response to Recommendation A.1.a:** Partially Concur. Navy considers the existing RAMICS exit criteria to be adequate for the LRIP decision. As required by DODINST 5000.2 exit criteria must be substantially satisfied for the program to continue with additional activities within an acquisition phase or to proceed into the next acquisition phase. Program's plans to conduct developmental testing on an H-3 helicopter, an operational assessment on an H-3, and Weapon System Integration Team Contractor Test (WSIT CT) on the MH-60S helicopter, this plan will provides the required test results to support a LRIP decision.

**Response to Sub-Recommendation A.1.a.(1):** Partially Concur. The H-3's planned installation and gross weight makes the H-3 a suitable MH-60S alternative. While installed on the H-3, RAMICS will demonstrate reacquisition and neutralization of mines while in flight. Planned developmental test on the H-3 will validate sensor performance. MH-60s integration will be conducted during the WSIT CT. WSIT CT will be conducted in several phases. The first phase will consist of basic hand shaking and communication path verification. Each subsequent phase of WSIT CT will delve further into the function envelope for RAMICS. The second phase will continue the ground checks and with a production representative airframe. Captive Carriage and Jettison tests will also be conducted during this time and will establish a flight envelope. The primary focus of this phase is to determine if there are any adverse affects of gun firing on the airframe. We will obtain our firing and lifetime firing limits on the MH-60S with these tests. By final WSIT CT, we will be able to determine if there is any degradation of the weapon system's performance.

**Response to Sub-Recommendation A.1.a.(2):** Partially Concur. RAMICS operation and function with the MH-60S helicopter will be tested during WSIT CT.

**Recommendation A.1.b:** Delay the LRIP decision review, as necessary, to enable the PM, Mine Warfare to meet the revised exit criteria identified in A.1.a.

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**Response to Recommendation A.1.b: Do Not Concur.** As discussed above, the Navy considers the existing RAMICS exit criteria to be adequate for the LRIP decision.

**Recommendation A.2:** We recommend that the Program Manager, Mine Warfare:

**a. Coordinate with the Commander, Operational Test and Evaluation Force to update the test and evaluation master plan to require an operational assessment before the low-rate initial production decision review.**

**Response to Recommendation A.2.a: Concur.** RAMICS Program Office continues to work with Commander, Operational Test and Evaluation Force (COMOPTEVFOR) to generate a testable test strategy. Program office is working COMOPTEVFOR to update the Test and Evaluation Master Plan (TEMP). Estimated target completion date is 31 December 2007.

**b. Update and obtain all required approvals for the following program draft planning documents:**

- (1) test evaluation master plan, including test event descriptions,
- (2) systems engineering plan, and
- (3) software development plan

before the low-rate initial production decision planned for August 2008, in accordance with DoD Instruction 5000.2, "Operation of the Defense Acquisition System," May 12, 2003; Under Secretary of Defense for Acquisition, Technology, and Logistics memorandum, "Policy for Systems Engineering in DoD," February 20, 2004; and Software Engineering Institute, "Key Practices of the Capability Maturity Model, Version 1.1," February 1993.

**Response to Recommendation A.2.b: Concur.** The PMS 495 AMCM Systems Engineering Plan (SEP) is being updated. Estimated target completion date is 30 June 2007. The Software Development Plan (SDP) is being reviewed and updated. Estimated target completion date is 31 March 2007.

**Recommendation B.1:** We recommend that the Commander, Naval Surface Warfare Center, Panama City, Florida, update the draft capability production document for the Rapid Airborne Mine Clearance System in accordance with:

**a. Chairman of the Joint Chiefs of Staff Instruction 3170.01E, "Joint Capabilities Integration and Development System," May 11, 2005, to define in measurable terms and verifiable through test and evaluation, computer memory and processing margins to support systems capability growth.**

**b. Chairman of the Joint Chiefs of Staff Manual 3170.01B, "Operation of the Joint Capabilities Integration and Development System," May 11, 2005, to define in measurable terms and verifiable through test and evaluation, nuclear, biological, and chemical requirements to protect equipment from system degradation.**

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**c. Chairman of the Joint Chiefs of Staff Instruction 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," March 8, 2006, to define architecture product descriptions that are relevant to the Rapid Airborne Mine Clearance System.**

**Response to Recommendation B.1.a: Concur:** Capability Production Document (CPD) due at Milestone C, documents the refined, desired operational capabilities and expected system performance. The RAMICS CPD will contain demonstrated requirements stated in the RAMICS Performance Specification, section 3.3.3. Section 11.3.4 of the CPD will be changed to state "Computer hardware resource utilization such as processor capacity, memory capacity, input/output device capacity, auxiliary storage capacity, and communications/network equipment capacity will be measured and adhere to the requirements. The system shall be designed so that processing and memory utilization will allow for a 50% reserve capacity to provide for efficiency of operation and expandability." Draft version of the CPD is targeted for completion date by 31 March 2007.

**Response to Recommendation B.1.b: Concur in principle.** The CPD documents the refined, desired operational capabilities and expected system performance. While this recommendation is valid, no nuclear, biological, and chemical requirements are defined in the AMCM Specification. Thus these requirements will not be included in the RAMICS CPD. Estimated target completion date is 31 March 2007.

**Response to Recommendation B.1.c: Concur.** The draft CPD will be updated to add the suggested language provided in the DODIG draft report on page 14 under the paragraph titled "Descriptions of Architectural Products" to section 6.1.1 ("Because of the limited requirements of RAMICS to exchange information with the MH-60S helicopter, the architectural products AV-1, OV-3 and TV-2 are not included in the Appendix A.") Estimated target completion date is 31 March 2007.

**Recommendation B.2: We recommend that the Deputy Chief of Naval Operations for Resources, Requirements, and Assessment define the total number of Rapid Airborne Mine Clearance Systems required for operations, training, and maintenance, and the projected life-cycle cost for the Rapid Airborne Mine Clearance System in accordance with Chairman of the Joint Chiefs of Staff Manual 3170.01B, "Operation of the Joint Capabilities Integration and Development System," May 11, 2005.**

**Response to Recommendation B.2: Concur-** OPNAV N85 is responsible for developing the Organic Airborne Mine Countermeasures weapons systems and procuring those systems required to support training of the two MH-60S Fleet Replacement Squadrons and six Expeditionary Squadrons. Currently, OPNAV N85 intends to procure 22 RAMICS systems to support this training. However, a study is currently being conducted to further define the correct number of systems needed to support Fleet training. This report will be finalized by 31 March 2007 and will be used during the

POM-10 budget cycle to adjust (if necessary) the intended RAMICS buy plan. OPNAV N86 procures the organic systems that populate the MIW Mission Package and are deployed on the Littoral Combat Ship. Currently, N86 intends to procure 24 Mission Packages (1 RAMICS in each) and an additional 10% spares, for a total of 26 systems. At this time, OPNAV N81 is conducting a comprehensive study to validate this MIW Mission Package requirement. This study is also due to be completed by the end of March 2007. Again, the results of this study may change the OPNAV N86 RAMICS buy plan in POM-10. Following completion of the two studies and any adjustments to the overall system buy, the RAMICS draft-CPD will be updated and the Life Cycle Cost Estimate finalized. This will be completed Q1FY2008 as OPNAV N85 begins preparing the CPD for Navy staffing in support of the RAMICS Milestone C decision.

**Recommendation B.3:** We recommend that the Program Manager, Mine Warfare modify contract N00024-02-C-6324 with Northrop Grumman Corporation, as required, to ensure that the contractor designs the Rapid Airborne Mine Clearance System to meet the revised capability requirements in the draft capability production document resulting from implementing Recommendations B.1.a, B.1.b, and B.1.c.

**Response to Recommendation B.3:** Concur. NSWC Panama City is in progress of writing the Statement of Work (SOW) for FY 2008 work to Northrop Grumman. The updated draft CPD will be provided to Northrop Grumman. Estimated target completion date is 30 July 2007.

**Recommendation C.1:** We recommend that the Program Manager, Mine Warfare and the Director, Defense Contract Management Agency coordinate to revise the memorandum of agreement for the Rapid Airborne Mine Clearance System to:

- a. Focus the limited Defense Contract Management Agency support resources on the Program Manager, Mine Warfare's identified priorities and risk areas.
- b. Reference the Rapid Airborne Mine Clearance System systems engineering plan as the focus for Defense Contract Management Agency systems engineering support.
- c. Clarify the provisions regarding the support that the Defense Contract Management Agency will provide on planning for the integrated logistic support.
- d. Clearly delineate responsibilities between Defense Contract Management Agency personnel and Navy technical representatives from the Naval Surface Warfare Center-Panama City, Florida, for providing support to the Program Manager, Mine Warfare for surveillance of Northrop Grumman subcontractors.

**Response to Recommendation C.1.a:** Concur. RAMICS Program Office is working with Defense Contract Management Agency (DCMA) on a revised Memorandum of Agreement (MOA) for their support of the RAMICS program concentrating on the Mine Warfare Program Office's priorities and risk areas. Estimated target completion date for the MOA is 31 March 2007.

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**Response to Recommendation C.1.b:** Concur. DCMA's engineering support to the RAMICS program will be delineated in the MOA by specific areas and activities that will be supported. The Systems Engineering Plan will be included in the MOA as a referenced document. Estimated target completion date for the MOA is 31 March 2007.

**Response to Recommendation C.1.c:** Concur. Integrated Logistic Support to the RAMICS program will be delineated in the MOA by specific areas and activities that will be supported. Estimated target completion date for the MOA is 31 March 2007.

**Response to Recommendation C.1.d:** Concur. Earned Value analysis to the RAMICS program will be delineated in the MOA by specific areas and activities that will be supported. Estimated target completion date for the MOA is 31 March 2007.

**Recommendation C.2:** We recommend that the Director, Defense Contract Management Agency establish a surveillance plan for the Rapid Airborne Mine Clearance System that describes oversight activities the program integrator and program support team will perform in support of the program.

**Response to Recommendation C.2:** Concur. DCMA surveillance risk planning and surveillance will be performed by the functional specialists in accordance with the assigned strategies within the MOA and to the risk rated processes in DCMA AIMO Melbourne's CMMI database. Surveillance frequency and intensity performed by DCMA will vary depending on the assigned risk to the process, phase of the program, and current activities being performed by the contractor. DCMA will also perform surveillance activities as requested by the RAMICS Program Office. The Surveillance Plan will be implemented in-conjunction with the MOA. Estimated target completion date is 31 March 2007.

# Defense Contract Management Agency Comments



DEFENSE CONTRACT MANAGEMENT AGENCY  
6350 WALKER LANE, SUITE 300  
ALEXANDRIA, VA 22310-3241

MAR 21 2007

IN REPLY  
REFER TO DCMA-DMI

MEMORANDUM FOR PROGRAM DIRECTOR, ACQUISITION AND CONTRACT  
MANAGEMENT, DEPARTMENT OF DEFENSE  
INSPECTOR GENERAL, OFFICE OF THE DEPUTY  
INSPECTOR GENERAL

SUBJECT: DoDIG Draft Report, Project Number D2006-D000AE-0153, Audit of the  
Acquisition of the Navy Rapid Airborne Mine Clearance System

Reference: DoDIG draft audit report, Project Number D2006-D000AE-0153,  
subject as above.

We have attached the Headquarters, Defense Contract Management Agency  
response to the finding and recommendations cited in the subject report.

Point of contact is Ms. Sonya Moman at (703) 530-3163 or  
sonya.moman@dcma.mil.

  
KEITH D. ERNST  
Acting Director

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**Defense Contract Management Agency  
Response To  
DODIG DRAFT REPORT  
Acquisition of the Navy Rapid Airborne Mine Clearance System  
Project No. D2006-D000AE-0153**

**Finding:**

The approved MOA between the Commander, DCMA Aircraft Integrated Maintenance Operations (AIMO), Melbourne, Florida, and the Program Manager, Mine Warfare, did not adequately define required DCMA AIMO support to the RAMICS program office. Also, the Commander did not formulate a surveillance plan to implement the program support that was defined in the MOA.

**DODIG Audit Recommendation C-1:**

The Program Manager, Mine Warfare and the Director, Defense Contract Management Agency should coordinate to revise the Memorandum of Agreement (MOA) for the Rapid Airborne Mine Clearance System to:

- a. Focus the limited Defense Contract Management Agency support resources on the Program Manager; Mine Warfare's identified priorities and risk areas.
- b. Reference the Rapid Airborne Mine Clearance System systems engineering plan as the focus for Defense Contract Management Agency systems engineering support.
- c. Clarify the provisions regarding the support that the Defense Contract Management Agency will provide on planning for the integrated logistic support.
- d. Clearly delineate responsibilities between Defense Contract Management Agency personnel and Navy technical representatives from the Naval Surface Warfare Center-Panama City, Florida, for providing support to the Program Manager, Mine Warfare for surveillance of Northrop Grumman subcontractors.

**DCMA Response:**

- a. Concur. DCMA has revisited the RAMICS MOA and has structured it to be an outcome-based format that focuses on the Program Manager's identified priorities and risk areas. The MOA is in the review process and will be implemented by March 31, 2007.
- b. Non-Concur. DCMA's revised MOA will not have the Systems Engineering Plan as a desired outcome or the focus of engineering support. DCMA's engineering support to the RAMICS program will be delineated in the MOA by the specific areas and activities that will be supported. The Systems Engineering Plan will be included in the MOA as a referenced document. The revised MOA will be implemented by March 31, 2007.



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- c. Concur. Integrated Logistics Support for the RAMICS program will be provided by Naval Surface Warfare Center, Panama City. Limited assistance on Integrated Logistic Support will be available as requested and will be referenced in the revised MOA. The revised MOA will be implemented by March 31, 2007.
- d. Concur. In accordance with the agreement with the Mine Warfare Program Office, DCMA's responsibilities will be limited to conducting Earned Value analysis on subcontractors and other assistance as requested. DCMA's responsibilities will be included in the revised MOA that will be implemented by March 31, 2007. The Naval Surface Warfare Center, Panama City, will act as the Program office's Technical Direction Agent for on-site surveillance of Northrop Grumman subcontractors and will be responsible for all duties assigned in the Engineering Assignment Agreement.

**DODIG Audit Recommendation C-2:**

The Director, Defense Contract Management Agency establish a surveillance plan for the Rapid Airborne Mine Clearance System that describes oversight activities the program integrator and program support team will perform in support of the program.

**DCMA Response:**

Concur. DCMA surveillance risk planning and surveillance will be performed by the functional specialists in accordance with the assigned strategies within the MOA and to the risk rated processes in DCMA AIMO Melbourne's CMMI database. Surveillance frequency and intensity performed by DCMA will vary depending on the assigned risk to the process, phase of the program, and current activities being performed by the contractor. DCMA will also perform surveillance activities as requested by the Program Office. The Surveillance Plan will be implemented in conjunction with the MOA, by March 31, 2007.

## **Team Members**

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# Inspector General Department of Defense

