

GAO

Report to the Chairman and Ranking  
Minority Member, Subcommittee on  
Military Research and Development,  
Committee on National Security, House  
of Representatives

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June 1998

# NAVY MINE WARFARE

## Plans to Improve Countermeasures Capabilities Unclear



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**National Security and  
International Affairs Division**

B-279054

June 10, 1998

The Honorable Curt Weldon  
Chairman  
The Honorable Owen Pickett,  
Ranking Minority Member  
Subcommittee on Military  
Research and Development  
Committee on National Security  
House of Representatives

As requested, we reviewed the Navy's mine countermeasures efforts. This report discusses the Navy's plans for improving mine countermeasures (MCM) capabilities; provides information on the status of current research, development, test, and evaluation (RDT&E) programs; and evaluates the process the Department of Defense (DOD) used to prepare the annual certification required by Public Law 102-190.

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**Background**

Enemy sea mines were responsible for 14 of the 18 Navy ships destroyed or damaged since 1950, and producing countries have developed and proliferated mines that are even more difficult to detect and neutralize. After the Gulf War, during which two Navy ships were severely damaged by sea mines, the Navy began several actions to improve its mine warfare capabilities.

The Navy's current MCM capabilities are in a special purpose force that consists of 12 mine-hunter, coastal (MHC) and 14 MCM ships, 1 command and support ship, 24 mine-hunting and clearing helicopters, 17 explosive ordnance disposal detachments, a very shallow water detachment, and a marine mammal detachment. According to the Navy, the cost of operating and maintaining this MCM force from fiscal year 1992 through 2003 will be about \$1.9 billion. Because the Navy's MCM ships lack the speed and endurance they would need to accompany carrier battle groups and amphibious ready groups on overseas deployments, the Navy has changed its strategy of maintaining only a special purpose force to also developing mine countermeasure capabilities to be placed on board combat ships within the fleet.

The Navy has consolidated operational control of all surface and airborne mine warfare forces under the Commander, Mine Warfare Command, and improved the readiness of these forces through exercises and training. The

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Navy also initiated research and development projects to address the weaknesses in its MCM program, especially the lack of on-board MCM capability throughout the fleet, and created a Program Executive Office for mine warfare, which brought together disparate MCM programs and their associated program management offices.

In a prior report,<sup>1</sup> we discussed weaknesses in the Navy's ability to conduct effective sea mine countermeasures. We reported that critical MCM capabilities were unmet and reviewed the Navy's efforts to address these limitations. At that time, the Navy had not established clear priorities among its mine warfare research and development programs to sustain the development and procurement of the most needed systems. Consequently, the Navy experienced delays in delivering new systems to provide necessary capabilities. DOD concurred with our recommendation that a long-range plan be developed to identify gaps and limitations in the Navy's MCM capabilities and establish priorities. DOD said the process was ongoing and consisted of developing an overall concept of MCM operations and an architecture within which needs and shortfalls in capabilities could be evaluated and prioritized. DOD also said that critical programs would be identified and funded within the constraints of its overall budget.

Congress previously expressed its concern that the Navy had failed to sufficiently emphasize mine countermeasures in its research and development program and noted the relatively limited funding allocation. As a result, mine warfare programs were designated as special congressional interest items. To support continuing emphasis on developing the desired mine countermeasures, Congress added a certification requirement in the National Defense Authorization Act for fiscal years 1992 and 1993. This required the Secretary of Defense to certify that the Secretary of the Navy, in consultation with the Chief of Naval Operations and the Commandant of the Marine Corps, had submitted an updated MCM master plan and budgeted sufficient resources for executing the updated plan. It also required the Chairman of the Joint Chiefs of Staff to determine that the budgetary resources needed for MCM activities and the updated master plan are sufficient. This certification requirement will expire with the fiscal year 1999 budget submission unless it is renewed.

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<sup>1</sup>Navy Mine Warfare: Budget Realignment Can Help Improve Countermeasure Capabilities (GAO/NSIAD-96-104, Mar. 13, 1996).

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## Results in Brief

The Navy has not decided on the mix of on-board and special purpose forces it wants to maintain in the future and committed the funding needed for developing and sustaining those capabilities. This decision will determine the types and quantities of systems to be developed and their priority. It also affects the schedule and cost of those developments and the design and cost of the platforms on which they will operate. A final force structure decision will likely be determined by the level of resources the Navy decides to dedicate to the MCM mission in the future—a decision that depends on numerous issues outside the MCM arena such as conflicting priorities among the various Navy warfare communities—aircraft, surface ships, and submarines.

Since 1992, the Navy has spent about \$1.2 billion in RDT&E funds to improve its mine warfare capabilities. However, this investment has not produced any systems that are ready to transition to production. Delaying factors include funding instability, changing requirements, cost growth, and unanticipated technical problems. A few systems, such as the Airborne Mine Neutralization System and the Shallow-Water Assault Breaching system, are scheduled for production decisions within the next 2 to 3 years. Other systems were not produced because the Navy never funded their procurement. The Navy plans to spend an additional \$1.5 billion for RDT&E over the next 6 years.

Most officials we interviewed said the annual certification process has served to increase the visibility of MCM requirements within DOD and the Navy, with positive results and should continue to be required. However, as currently conducted, the annual certification process does not address the adequacy of overall resources for this mission, nor does it contain any measures against which the Navy's progress in enhancing its MCM capabilities can be evaluated. The Chairman, Joint Chiefs of Staffs' review for resource sufficiency, which is conducted because of the congressional mandate, occurs after the Navy's budget proposals for its MCM program have been formalized. Therefore, the review does not affect specific Navy MCM acquisition programs or overall MCM resource decisions.

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## Future Force Structure Has Not Been Decided

Although it has developed a strategy for overcoming deficiencies in its MCM capabilities, the Navy has not decided on the composition and size of its future on-board and special purpose MCM force. Navy officials have acknowledged the need to maintain some special purpose MCM force, while the Navy is moving toward an on-board MCM capability. The Navy currently

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has no on-board MCM capabilities and relies on a force of MCM capabilities that are specifically dedicated to that mission.

The Navy has two assessments in progress to develop the information it needs to decide on the mix of its future on-board and special purpose forces. The objectives of these assessments are to determine (1) the quantities and types of on-board MCM systems the Navy will need to procure to meet fleet requirements in fiscal years 2005-2010; (2) the optimal force mix to meet fleet requirements in the 21st century; and (3) the numbers and types, if any, of special purpose MCM assets that will still be needed in the fiscal year 2010-2015 time frame. Initial results are expected to be available in October 1998, in time to influence the development of the fiscal year 2001 Navy resource program, with a final report in January 1999. Navy officials do not expect this phase of the assessments to provide them all of the information that is needed to tailor the future MCM force structure. They do expect, however, that it will give them a good idea of how to plan procurement, training, and maintenance for the on-board systems expected to be deployed in the fiscal year 2001-2005 time frame.

To address the lack of on-board capability, the Navy accelerated the delivery of a Remote Minehunting System and established a contingency shallow-water mine-hunting capability in one Navy Reserve helicopter squadron using laser mine detection systems, and it is including mine-hunting systems in upgrades to existing and in new construction submarines. Maintaining the special purpose force is costly, and Navy resource managers have been evaluating how to pay for the operations and support costs of this force while pursuing costly development of on-board capabilities. A final force structure decision will likely be driven by the level of resources the Navy intends to dedicate to the MCM mission in the future—a decision that depends on numerous issues outside the MCM arena such as conflicting funding priorities among the various Navy warfare communities (aircraft, surface ships, and submarines).

A decision on the future force structure is, however, still needed because that decision will determine the types and quantities of systems to be procured, set priorities among systems, and determine the level of resources required for development, procurement, and sustainment. For example, the Navy is currently debating whether to retire the current mine-hunting helicopters, the MH-53, in favor of maintaining only H-60 series helicopters. This helicopter decision will directly affect the types

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and quantity of airborne MCM capabilities the Navy will be able to field in the future.

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## Research and Development Investment Has Not Yet Paid Dividends

Since 1992, the Navy has invested about \$1.2 billion in RDT&E funds to improve its mine warfare capabilities. The Navy plans to spend an additional \$1.5 billion for RDT&E over the next 6 years. It is currently managing 28 separate MCM development programs and several advanced technology and advanced concept technology demonstrations. (See app. I for the status of selected programs.)

So far, according to a Navy official, this investment has not produced any systems that are ready to transition to production. A few systems, such as the Airborne Mine Neutralization System, the Shallow-Water Assault Breaching system, Distributed Explosive Technology, and a Closed Loop Degaussing system, are scheduled for a production decision over the next 2 to 3 years. Other systems, such as communications data links for the MH-53 helicopters and the airborne laser mine-detection system (Magic Lantern Deployment Contingency), were not produced because the Navy never funded their procurement.

Delays experienced in a number of MCM development programs result from the same kinds of problems that are found in other DOD acquisitions such as funding instability, changing requirements, cost growth, and unanticipated technical problems. For example, although the MCM funding program is small, the Navy has reduced funding for its MCM research and development programs after budget approval. (See app. II for two program examples.) These problems in MCM acquisition programs show that the design, development, and production of needed systems are complex and that technical processes must operate within equally complex budget and political processes. If programs are not well conceived, planned, managed, funded, and supported, problems such as cost growth, schedule delays, and performance shortfalls can easily occur.

Two examples of mine warfare programs that have been in the research and development phase for many years without advancing to procurement are the AQS-20, an airborne mine-hunting sonar, and the Airborne Mine Neutralization System. The AQS-20 began in 1978 as an exploratory development model and was scheduled for a limited rate initial production decision in fiscal year 1999. The Navy terminated the program in 1997 in favor of a follow-on sonar, the AQS-X, with added mine identification capability and a tow requirement from a H-60 helicopter instead of a

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MH-53 helicopter. During the intervening 19 years, the program was plagued by cost growth, changing requirements, and a funding shortfall. The development of the Airborne Mine Neutralization System began in 1975, but a production decision is not scheduled until fiscal year 2000. The principal reason for the delay is that the program was canceled and restarted two times because of funding instability.

Contributing to difficulties in transitioning programs into production are a number of management and internal control weaknesses noted during the annual Federal Manager's Financial Integrity Act certification. Since 1992, the Program Executive Office has attempted to improve internal controls within five subordinate program offices by developing financial and acquisition management information and reporting systems. At its request, the Naval Audit Service is reviewing the state of internal controls within one of the program offices and expects to issue a report in the fall of 1998.

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## Certification Requirement Has Had a Positive Impact

A majority of officials we interviewed said that the annual certification requirement was useful because it served to increase the visibility of MCM requirements within DOD and the Navy. Most said that some form of the certification should continue to be required. However, as currently prepared, the annual certification does not address the adequacy of overall resources for this mission, nor does it provide for objective measures against which progress can be evaluated. Moreover, the Chairman, Joint Chiefs of Staff's involvement in the certification process occurs too late to have a significant impact.

The annual certification does not address the adequacy of overall resources for this mission because the Navy's budget for MCM programs addresses only the adequacy of funding for the budget year, not the out years. Further, nothing in the certification process provides objective measures against which progress can be evaluated. Such measures have been developed within the MCM community. For example, the time required by a tactical commander to clear a certain area of mines with and without various capabilities could be used in making individual program decisions. Likewise, there are mean times between repairs and average supply delay times to gauge reliability and supportability for the MCM and MHC ships.

In the past, the DOD staff has not been willing to challenge Navy decisions regarding the content and adequacy of its MCM program. Instead, it focused on analyzing the consistency of the program from year to year.



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Consequently, DOD has been able to certify annually that the budget contains adequate resources for the program.

However, in November 1997, the Secretary of Defense expressed his concern about the Navy's financial commitment to mine warfare programs. As a result, the Navy added about \$110 million to MCM programs over the future years defense planning period.

The inclusion of the Chairman, Joint Chiefs of Staff, in the certification process was intended to give the regional commanders in chief an opportunity to influence the development of the MCM budget. We believe, however, and DOD and Navy officials agree, that the Chairman, Joint Chiefs of Staff's determination has not added any significant value. Although the Joint Staff has assessed joint MCM requirements and capabilities, its conclusions have not been used as a basis for challenging the Navy's MCM programs or suggesting alternatives. Moreover, since the Joint Staff's review has occurred after, rather than before, the Navy's budget proposals for MCM programs have been formalized, it has had no impact on specific Navy acquisition programs or overall resource decisions.

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## Conclusions

To have an effective program, the Navy needs to decide on the size, composition, and capabilities of its future MCM forces. This decision will assist in prioritizing and disciplining its research, development, and procurement efforts. As with other mission areas, the types and quantities of systems to be procured and their platform integration will most likely be driven by the level of resources the Navy allocates to the MCM mission in the future. What is required is for the Navy leadership and the various warfare communities to agree on the composition and structure (size) of future MCM forces and commit the necessary resources to their development and sustainment. Without such an agreement, budgetary pressures may result in degradation of the special purpose forces before the Navy has demonstrated and fielded effective, on-board capabilities within the fleet.

The certification requirement has forced DOD and the Navy to pay increased attention to the MCM mission, and most officials involved support its continuation in some form. However, the certification has not provided any assurance that the resources for the MCM mission are "sufficient" because it has only addressed the adequacy of funding for the particular budget year and because the DOD staff and the Chairman of the Joint Chiefs of Staff have not challenged Navy resource allocation or budget

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decisions. If the Chairman of the Joint Chiefs of Staff's involvement in the certification process is still considered important, it must occur in time to influence Navy decisions on requirements and funding. Overall budgetary pressures, the high operations and maintenance costs associated with the special purpose MCM fleet, and the Navy's expectation of potential increased capabilities from on-board systems still early in development may combine to result in budgetary shifts from current special purpose forces before potential on-board capabilities are realized.

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## Recommendations

We recommend that the Secretary of Defense, in conjunction with the Chairman, Joint Chiefs of Staff, and the Secretary of the Navy, determine the mix of on-board and special purpose forces DOD plans to maintain in the future and commit the funding deemed necessary for the development and sustainment of these desired capabilities. We also recommend that the Secretary of Defense direct the Secretary of the Navy to sustain the special purpose MCM forces until the Navy has demonstrated and fielded effective, on-board capabilities.

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## Matters for Congressional Consideration

The certification process has increased DOD's and the Navy's attention to the MCM mission. Since the certification requirement is scheduled to expire this year, Congress may wish to consider extending the annual certification requirement until the Navy has determined the mix of on-board and special purpose forces it will maintain in the future and has fielded effective, on-board MCM capabilities. To strengthen the certification process, Congress may wish to consider amending the requirement to ensure that the participation by the Chairman, Joint Chiefs of Staff, occurs before the Navy's fiscal year budget is submitted to the Office of the Secretary of Defense.

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## Agency Comments and Our Evaluation

In commenting on a draft of this report (see app. III), DOD concurred with our recommendation that the Secretary of Defense direct the Secretary of the Navy to sustain the special purpose MCM forces until the Navy has demonstrated and fielded effective on-board capabilities. DOD partially concurred with our first recommendation that the Secretary of Defense determine the mix of on-board and special purpose forces DOD plans to maintain in the future and commit the necessary funding. DOD has directed the Navy to ensure that both current and future mine warfare programs are adequately funded. In an April 7, 1998, letter to the Secretary of the Navy, the Secretary of Defense expressed his concern about the Navy's

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lack of commitment of the necessary resources to mine warfare and noted that currently, requirements exceed resources allocated. He directed the Navy to (1) protect the mine warfare program from any further funding reductions until some on-board capabilities are available, (2) avoid using the funds currently planned for the special purpose forces to fund the development of on-board capabilities, and (3) develop a future years funding plan that matches requirements with resources.

DOD, however, cited the Navy as having primary responsibility for MCM forces, whereas our recommendation was directed to the Secretary of Defense. We agree that the Navy does have primary responsibility, but the Secretary of Defense has had a special role through the certification process. As we conclude in the report, the certification requirement has had a positive impact. Therefore, we have added a matter for congressional consideration to the report that suggests that the certification requirement be extended.

DOD partially concurred with our recommendation that the Secretary of Defense direct that involvement by the Chairman, Joint Chiefs of Staff, occur early enough to affect annual Navy budget submissions. DOD said the Chairman is involved early enough to affect budget decisions. Our recommendation, however, is based on our conclusion that the certification process has not been effective in assuring the adequacy of resources. This conclusion is based, in part, on the late involvement of the Chairman, Joint Chiefs of Staff. For example, we note that the Navy's fiscal year 1999 budget submission went to Congress in late January 1998, yet the Secretary of Defense's certification, which includes the Chairman's determination regarding the sufficiency of the Navy's resources in fiscal year 1999, was submitted in May 1998. Although the Chairman, Joint Chiefs of Staff, has input in the budget process, the certification requirement provides an additional opportunity to have an effect in assuring the sufficiency of resources. Since DOD only partially concurred and to strengthen the certification process, we have deleted our recommendation regarding the Chairman's participation and added a matter for congressional consideration that the annual certification requirement be amended to ensure the participation by the Chairman, Joint Chiefs of Staff, before the Navy's budget is submitted to the Office of the Secretary of Defense. The intent of our matters for consideration is to give additional attention to the sufficiency of budget resources the Navy has devoted to MCM.

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DOD also provided some updated information in its comments and we have incorporated it into our report as appropriate.

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## Scope and Methodology

To obtain information on the status of Navy plans, programs, and the certification process, we interviewed and obtained documentation from officials of the Office of the Secretary of Defense, the Joint Staff, the Defense Intelligence Agency, the Secretary of the Navy, the Chief of Naval Operations, the Naval Air and Sea Systems Commands, the Office of Naval Intelligence, and the Office of Naval Research in the Washington, D.C., area, and the Navy Operational Test and Evaluation Force and the Surface Warfare Development Group in Norfolk, Virginia. We also interviewed and obtained information from officials engaged in MCM scientific and technical research and development activities at the Naval Undersea Warfare Center in Newport, Rhode Island; the Navy Coastal Systems Station in Panama City, Florida; and the Applied Physics Laboratory of Johns Hopkins University, in Laurel, Maryland.

To gain an understanding of existing capabilities and requirements, and an operational perspective, we interviewed and obtained information from the staff and operational units of the Commander in Chief, Atlantic Command and the Commander in Chief, Atlantic Fleet in Norfolk, Virginia; and the Commander, Mine Warfare Command, in Corpus Christi, and Ingleside, Texas.

We conducted our review between September 1997 and March 1998 in accordance with generally accepted government auditing standards.

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We are sending copies of this report to the Chairman, Senate Committee on Armed Services; the Chairman, Subcommittee on Defense, Senate Committee on Appropriations; the Chairman, Subcommittee on National Security, House Committee on Appropriations; the Secretaries of Defense, the Army, and the Navy; and the Commandant of the Marine Corps. Copies will also be provided to other interested parties upon request.

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Please contact me at (202) 512-4841 if you have any questions about this report. The major contributors to this report are listed in appendix IV.

A handwritten signature in black ink that reads "Katherine V. Schinasi". The signature is written in a cursive style with a large initial 'K'.

Katherine V. Schinasi  
Associate Director  
Defense Acquisitions Issues

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## Abbreviations

DOD	Department of Defense
MCM	mine countermeasures
MHC	mine-hunter, coastal
RDT&E	research, development, test, and evaluation

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# Status of Selected Mine Countermeasures Research and Development Programs

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## Programs Emphasized During Fiscal Years 1996-97

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### Remote Minehunting System

Program description: The Remote Minehunting System program develops a new remotely operated mine-hunting system that is capable of detecting and classifying mines. It is intended to provide the surface fleet with an on-board means of finding and avoiding mined waters. The program has a three-fold strategy to develop a new vehicle, upgrade it with state-of-the-art mine-hunting sensors, and provide a supportable, incremental operational contingency system to the fleet during the development process.

Platform: Surface combatants.

Mine threat: Bottom & moored mines/deep to very shallow water.

Program start date: Fiscal year 1993.

Date of estimated completion of research & development phase: Fiscal year 2002, milestone III on version 4 (proposed).

Current status: Milestone III on version 3 had been scheduled for fiscal year 1999; however, due to cost and schedule problems, the program has been restructured to drop version 3 and continue development of version 4.

Funding (fiscal years 1992-97): \$44.1 million.

Programmed funding (fiscal years 1998-03): \$103.7 million.

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### Magic Lantern

Program description: The Magic Lantern is a helicopter mounted laser/camera system that detects and classifies moored mines. The objective of the Magic Lantern<sup>1</sup> Deployment Contingency system is to field an advanced development model on one detachment of Naval Reserve SH-2G helicopters to provide on-board mine reconnaissance capability for surface and near surface water. In fiscal year 1996, Congress directed a competitive evaluation field test of the Airborne Laser Mine Detection System technologies. These technologies included Magic Lantern, ATD-111, and the Advanced Airborne Hyperspectral Imaging System. This field test took place in late 1997. The Navy expects to send the final report to Congress by the end of April 1998.

Platform: SH-2G helicopters.

Mine threat: Floating and shallow-water moored mines.

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<sup>1</sup>Magic Lantern is the trade name of one of the manufacturers (Kaman) of the Airborne Laser Mine Detection System technologies. Airborne Laser Mine Detection System is the Navy project title under which these technologies have been pursued and funded.



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**Appendix I**  
**Status of Selected Mine Countermeasures**  
**Research and Development Programs**

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Program start date: Fiscal year 1992 (Start of the Airborne Laser Mine Detection System program).

Date of estimated completion of research & development phase: Fiscal year 1999.

Current status: Installation of contingency systems on H-60 helicopters.

Funding (fiscal years 1992-97): \$73 million.

Programmed funding (fiscal years 1998-03): \$29.3 million.

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**Programs Emphasized**  
**During Fiscal Years**  
**1998-2003**

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**Near-Term Mine**  
**Reconnaissance System**

Program description: This system is intended to provide an unmanned undersea vehicle mine reconnaissance capability in the form of a single operational prototype, as a stop-gap, interim clandestine offboard system. The system is to be launched and recovered from a SSN-688 class submarine.

Platform: SSN-688 class submarines.

Mine threat: Bottom and moored mines in deep through very shallow water.

Program start date: Fiscal year 1994.

Date of estimated completion of research & development phase: Fiscal year 2003.

Current status: Initial operational capability is scheduled for fiscal year 1998. The system is scheduled to participate in the Joint Countermine Advanced Concept Technology Demonstration II in June 1998.

Funding (fiscal years 1994-97): \$42.3 million.

Programmed funding (fiscal years 1998-03): \$29.6 million.

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**Radiant Clear**

Program description: Radiant Clear is a joint Navy-Marine Corps effort to graphically depict the littoral environment and coastal defenses through the application of advances in the processing of data collected by national systems.

Platform: Not applicable.

Mine threat: Very shallow water to the beach.

Program start date: Fiscal year 1996.

Date of estimated completion of research & development phase: Open.

Current status: Demonstration, May 1998.

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**Appendix I**  
**Status of Selected Mine Countermeasures**  
**Research and Development Programs**

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Funding (fiscal years 1996-97): \$2 million.  
Programmed funding (fiscal years 1998-03): \$6 million.

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**Shallow Water Assault Breaching System**

Program description: This system is an explosive line charge system that is delivered from a rocket motor and deployed from a manned Landing Craft, Air Cushion at a standoff range of 200 feet.  
Platform: Manned Landing Craft, Air Cushion.  
Mine threat: Very shallow water and surf zone, optimized for 3-10 feet water depth.  
Program start date: Fiscal year 1992.  
Date of estimated completion of research & development phase: Fiscal year 1999, milestone III.  
Current status: Fiscal year 1998, developmental and operational testing.  
Funding (fiscal years 1992-97): \$35.3 million.  
Programmed funding (fiscal years 1998-03): \$10.9 million.

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**Distributed Explosive Technology**

Program description: The Distributed Explosive Technology program is a distributed explosive net that is delivered by two rocket motors and deployed from a manned Landing Craft, Air Cushion at a standoff range of 200 feet. It is designed to provide a wide swath of mine clearance in the surf zone.  
Platform: Manned Landing Craft, Air Cushion.  
Mine threat: Surf zone, optimized for depths less than 3 feet to the beach.  
Program start date: Fiscal year 1992.  
Date of estimated completion of research & development phase: Fiscal year 1999, milestone III.  
Current status: Fiscal year 1998, developmental and operational testing.  
Funding (fiscal years 1992-97): \$47 million.  
Programmed funding (fiscal years 1998-03): \$19.5 million.

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**AQS-20**

Program description: The AQS-20 was to be an airborne towed high speed mine-hunting sonar. It was to work in conjunction with the Airborne Mine Neutralization System. The AQS-20 was to provide the capability to search, detect, localize, and classify mines.  
Platform: MH-53 helicopters.  
Mine threat: Bottom, close tethered, and volume mines in deep and shallow water.  
Program start date: 1978.  
Date of estimated completion of research & development phase: Fiscal

year 2001.

Current status: Transitioning to AQS-X, a follow-on advanced sonar with the addition of mine identification capability and towed capability from the H-60 helicopter. An advanced sonar fly-off is planned for fiscal year 1999.

Funding (fiscal years 1992-97): \$73.1 million.

Programmed funding (fiscal years 1998-03): \$76.3 million.

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## Programs Emphasized Beyond Fiscal Year 2003

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### Advanced Lightweight Influence Sweep System

Program description: This system is a magnetic and acoustic system and is to rapidly sweep and clear influence mines by emulating the signatures of amphibious assault craft. It is to be an on-board mine countermeasures asset and capable of night operations.

Platform: Remotely controlled surface craft, but other platforms are being explored.

Mine threat: Influence mines in shallow and very shallow water.

Program start date: Fiscal year 1993.

Date of estimated completion of research & development phase: Fiscal year 2000, scheduled transition from Advanced Technology Demonstration status to acquisition program.

Current status: To be a part of the Joint Countermine Advanced Concept Technology Demonstration II in June 1998 (approximate 6 months slippage from original schedule).

Funding (fiscal years 1992-97): \$49.8 million.

Programmed funding (fiscal years 1998-03): \$7 million.

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### Airborne Mine Neutralization System

Program description: This system is an expendable, remotely operated, explosive mine neutralization device that is towed by a helicopter. It is intended to rapidly destroy mines and operate in day or night. Originally, it was intended to operate in conjunction with the AQS-20 sonar. With the termination of the AQS-20 and transition to AQS-X, the system will operate with the AQS-14A sonar, which will be integrated with a laser line scan system to provide interim mine identification capability.

Platform: MH-53 helicopters.

Mine threat: Bottom and moored mines in deep or shallow water.

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**Appendix I**  
**Status of Selected Mine Countermeasures**  
**Research and Development Programs**

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Program start date: Fiscal year 1975.  
Date of estimated completion of research & development phase: Fiscal year 2000, milestone III is scheduled.  
Current status: Engineering, manufacturing, and development contract award scheduled for second quarter, fiscal year 1998.  
Funding (fiscal years 1992-97): \$12.4 million.  
Programmed funding (fiscal years 1998-00): \$22.6 million.

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**Rapid Airborne Mine Countermeasures System**

Program description: This system is an advanced technology demonstration program and is intended to employ laser targeting and supercavitating projectiles to neutralize near surface moored contact mines. Its objective is to provide fast reacting organic helicopter capability to safely and rapidly clear mines.  
Platform: Helicopter.  
Mine threat: Near surface moored contact mines.  
Program start date: Fiscal year 1998.  
Date of estimated completion of research & development phase: Fiscal year 2004.  
Current status: Fiscal year 1998, demonstration of lethality against key mine types.  
Programmed funding (fiscal years 1998-04): \$65 million.

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**Explosive Neutralization Advanced Technology Demonstration**

Program description: The Explosive Neutralization Advanced Technology Demonstration, as a group of four subsystems, is intended to demonstrate the capability to neutralize anti-invasion mines in the surf zone and craft landing zone. Two of the subsystems will consist of line charges and surf zone array, which are to be launched from an air cushion vehicle and propelled by new rocket motors for extended range and increased stand-off. These two subsystems will also have a third subsystem, a fire control system, for accurate placement of explosives. The fourth subsystem, the beach zone array, will consist of a glider and an array system. The glider, an unmanned, unpowered air vehicle, will be released by an air deployment vehicle. The glider will approach the beach by means of a global positioning system guidance and control system. To detonate and clear mines, it will deploy the array of nylon webbing and shaped charges over a predesignated target.  
Platform: Unmanned air vehicle.  
Mine threat: Anti-invasion mines in the surf and craft landing zones.  
Program start date: Fiscal year 1993.  
Date of estimated completion of research & development phase: Fiscal

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**Appendix I**  
**Status of Selected Mine Countermeasures**  
**Research and Development Programs**

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year 2005 for the line charges, surf zone array, and fire control system and fiscal year 2009 for the beach zone array.

Current status: Demonstration of fieldable prototype of the beach zone array scheduled for fiscal year 1998.

Funding (fiscal years 1993-97): \$63.7 million.

Programmed funding (fiscal years 1998-03): \$87.8 million.

# Programmatic Examples of Funding Instability

Two examples of mine warfare programs that have been in the research and development phase for many years without advancing to procurement are the AQS-20, a mine-hunting sonar, and the Airborne Mine Neutralization System. The following tables illustrate the changes, including the recent series of internal Department of Defense (DOD) increases and decreases, to these programs' funding. The changes depicted in table II. 1 resulted in a delay in the AQS-20 schedule. The production decision slipped 1 year, from second quarter fiscal year 1998 to second quarter fiscal year 1999.

**Table II.1: AQS-20 and Airborne Mine Neutralization System Funding Profile, as of March 1996**

	Fiscal year		
	1995	1996	1997
As presented in the fiscal year 1996 President's budget	\$218 (actual)	\$12,791 (estimated appropriation)	\$20,123 (estimate)
Reprogramming from Airborne Laser Mine Detection System	8,947		
Congressional undistributed reductions		-346	
Revised inflation rates		-55	-843
Reinitiate Airborne Mine Neutralization System			10,400
AQS-20/MK 105 realignment			1,200
Realignment to Shallow Water Mine Countermeasures program element			-10,431
Realignment to Remote Minehunting System			-7,285
<b>Total, as presented in the fiscal year 1997 President's budget</b>	<b>\$9,165 (adjusted actual)</b>	<b>\$12,390 (adjusted appropriation)</b>	<b>\$13,164 (revised estimate)</b>

Source: Fiscal year 1997 Navy budget estimates for research development, test, and evaluation (RDT&E).

The changes depicted in table II.2 resulted in delays in the schedules of both the AQS-20 and the Airborne Mine Neutralization System. The production decision for the AQS-20 slipped an additional 6 months, to the fourth quarter fiscal year 1999. The production decision for the Airborne

**Appendix II  
Programmatic Examples of Funding  
Instability**

Mine Neutralization System slipped 1 year, from third quarter fiscal year 1999 to third quarter fiscal year 2000 due to funding constraints.

**Table II.2: AQS-20 and Airborne Mine Neutralization System Funding Profile, as of February 1997**

Dollars in thousands)

	Fiscal year			
	1996	1997	1998	1999
As presented in the fiscal year 1997 President's budget	\$12,355 <sup>a</sup> (actual)	\$13,164 (revised estimate)	\$13,069 (estimate)	\$5,694 (estimate)
Estimated appropriation		19,164		
Small Business Innovative Research assessment	-194			
General reductions	-187		-46	-99
Navy Working Capital Fund adjustments		-807	80	-58
Cost growth related to AQS-20 design complexity, contractor requirements			4,500	10,200
Technical evaluation cost growth			-1,100	
Restructuring of Airborne Mine Neutralization System				4,200
<b>Total, as presented in the fiscal year 1998-99 President's budget</b>	<b>\$11,974 (adjusted actual)</b>	<b>\$18,357 (adjusted appropriation)</b>	<b>\$16,503 (revised estimate)</b>	<b>\$19,937 (revised estimate)</b>

<sup>a</sup>The \$45 difference between the figure of \$12,390 shown in table II.1 and the figure of \$12,355 is unexplained in the budget documents.

Source: Fiscal year 1998-99 Navy budget estimates for RDT&E.

The changes depicted in table II.3 reflect the addition of two new initiatives, the Configuration Theory Tactical Decision Aid and the Shallow Water Influence Minesweep System. Congress increased the fiscal year 1998 budget request by \$2 million for the Shallow-Water Influence Minesweep System program.

**Appendix II**  
**Programmatic Examples of Funding**  
**Instability**

**Table II.3: AQS-20 and Airborne Mine Neutralization System Funding Profile, as of February 1998**

	(Dollars in thousands)		
	Fiscal year		
	1997	1998	1999
As presented in the fiscal year 1998-99 President's budget	\$18,357 (actual)	\$16,503 (estimated appropriation)	\$19,937 (estimate)
Appropriations		18,503	
Small Business Innovative Research assessment	-366		
Navy Working Capital Fund	-22	-598	-83
Configuration Theory Tactical Decision Aid			200
<b>Total, as presented in the fiscal year 1999 President's budget</b>	<b>\$17,969 (adjusted actual)</b>	<b>\$17,905 (adjusted appropriation)</b>	<b>\$20,054 (estimate)</b>

Source: Fiscal year 1999 Navy amended budget estimates for RDT&E.



# Comments From the Secretary of Defense



ACQUISITION AND  
TECHNOLOGY

## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

01 MAY 1998

Ms. Katherine V. Schinasi  
Associate Director, Defense  
Acquisition Issues  
National Security and International  
Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Ms. Schinasi:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "NAVY MINE WARFARE: Plans to Improve Countermeasures Capabilities Unclear," dated March 31, 1998, (GAO Code 707301/OSD Case 1580). The Department partially concurs with the report.

While the Navy reorients its mine warfare vision from a force consisting of primarily dedicated assets to one with a more flexible organic capability, it has been directed to ensure that current and future mine warfare programs are adequately funded. In addition, two assessments are in progress to assess the cost and effectiveness of mixes of dedicated and organic mine countermeasures forces. The results of these efforts will be used to shape future Navy mine countermeasures investment programs beginning with the Fiscal Year 2000 budget. Finally, the Navy's mine countermeasures capability is assessed annually by the Joint Staff. The results of these assessments are provided to the Chairman of the Joint Chiefs of Staff, and are used as input in the development of the President's Budget.

Comments on the report's recommendations are provided in the enclosure.

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

Sincerely,

George R. Schneiter  
Director  
Strategic and Tactical Systems

Enclosure



GENERAL ACCOUNTING OFFICE DRAFT REPORT - DATED MARCH 31, 1998

(GAO CODE 707301) OSD CASE 1580

“NAVY MINE WARFARE: PLANS TO IMPROVE  
COUNTERMEASURES CAPABILITIES UNCLEAR”

\* \* \* \* \*

DOD COMMENTS IN RESPONSE TO THE RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense, in conjunction with the Chairman, Joint Chiefs of Staff, and the Secretary of the Navy, determine the mix of organic and dedicated forces DoD plans to maintain in the future and protect the funding deemed necessary for the development and sustainment of these desired capabilities. (p. 8/GAO Draft Report)

Now on p. 8.

DOD RESPONSE: Partially concur. Proposing, fielding, and sustaining mine countermeasures (MCM) forces is primarily the responsibility of the Navy, subject to oversight by the Office of Secretary of Defense and the Office of the Joint Chiefs of Staff. Two assessments are in progress with full participation by the Navy to assess the cost and effectiveness of mixes of dedicated and organic forces:

- One is assessing the appropriate mix of organic and dedicated systems, including both those systems currently planned and those which could be funded during the Future Years Defense Program (FYDP) and beyond. Results of this assessment will be used in developing the Fiscal Year 2000 budget and associated FYDP.
- The second effort is broader in scope. It will analyze current MCM capabilities, projected capabilities for future systems, force levels, and organic/dedicated force mixes in the 2010-2015 time frame. The results of this assessment will be used to help shape future Navy MCM investment programs and plans. Initial results are expected by early 1999.

While the Navy reorients its mine warfare vision from a force consisting primarily of dedicated assets to one with a more flexible organic capability, the Department has directed the Navy to ensure that both current and future mine warfare programs are adequately funded.

RECOMMENDATION 2: The GAO also recommended that the Secretary of Defense direct the Secretary of the Navy to sustain the dedicated MCM forces until the Navy has demonstrated and fielded effective organic capabilities. (p. 8/GAO Draft Report)

Now on p. 8.

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**Appendix III**  
**Comments From the Secretary of Defense**

**DOD RESPONSE:** Concur. The current dedicated force will be needed to respond to the threats our forward deployed forces face until such time as we have fielded sufficient organic capabilities. The Secretary of Defense has directed that the readiness of the current dedicated force be maintained in the interim.

**RECOMMENDATION 3:** The GAO further recommended that the Secretary of Defense direct that involvement by the Chairman, Joint Chiefs of Staff, occurs early enough to permit an impact on annual Navy budget decisions. (p. 8/GAO Draft Report)

**DOD RESPONSE:** Partially concur. The Chairman, Joint Chiefs of Staff, is involved early enough in the Department's resource allocation process to affect budget decisions. In particular, the Department's MCM capability is assessed annually by the Joint Staff. The results of these assessments are provided to the Chairman, and are a basis for his inputs in the development of the President's Budget.

Now on p. 9.

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