INSTITUTE FOR DEFENSE ANALYSES

IDA Paper P-4374

Study on the Mission, Roles, and Structure of the Missile Defense Agency (MDA)

General Larry D. Welch, USAF (Ret.), Project Co-leader
Dr. David L. Briggs, Project Co-leader

R.D. Bleach
G.H. Canavan
S.L. Clark-Sestak
R.W. Constantine
C.W. Cook
M.S. Fries
D.E. Frost
D.R. Graham
D.J. Keane
S.D. Kramer
P.L. Major
C.A. Primmerman
J.M. Ruddy
G.R. Schneiter
J.M. Seng
R.M. Stein
S.D. Weiner
J.D. Williams

PREFACE

This paper was prepared in response to a task titled “Missile Defense Agency Structure, Roles, and Missions,” for the Executive Director, Missile Defense Agency (MDA).

CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

The Institute for Defense Analyses (IDA) was tasked by the Department of Defense to carry out an independent study to examine and make recommendations with respect to the long-term missions, roles, and structure of the Missile Defense Agency (MDA). The full tasking is described in Chapter I. The scope of the review included panel discussions with leadership from the Army; Navy; Air Force; Joint Staff; Under Secretary of Defense for Policy; Under Secretary of Defense for Acquisition, Technology, and Logistics; Director, Operational Test and Evaluation; Program Analysis and Evaluation; and the Defense Information Systems Agency, as well as MDA. Several discussions were also held with contractors supporting MDA. The review also included site visits to United States Strategic Command (USSTRATCOM), United States Northern Command, Air Force Space Command, the Missile Defense Integration and Operations Center, and MDA at Redstone Arsenal.

The MDA charter and mission is to provide centralized management to develop and integrate programs of sensors, interceptors, command and control, and battle management into a ballistic missile defense system (BMDS). Specifically, the MDA is directed per Executive-level and DoD-level guidance as follows:

- To defend the United States, deployed forces, allies and friends from ballistic missile attacks of all ranges in all phases of flight.
- To develop and deploy, as directed, a layered BMDS.
- To enable the fielding of elements of the BMDS as soon as practicable.
- To provide capability in blocks, improving the effectiveness of fielded capability by inserting new technologies as they become available.

The direction to the Defense Department in National Security Presidential Directive (NSPD)-23 was to "deploy a set of initial missile defense capabilities beginning in 2004," which was understood to be an initial capability to defend against a limited launch of ballistic missiles from North Korea to the U.S. homeland. The currently deployed system meets that guidance. There is a broad consensus within the Department of Defense, defense contractors, and the independent-study members that an organization like the MDA, with its special authorities and a centralized approach to management and

oversight of the missile defense program, was essential to rapidly develop and deploy the current set of ballistic missile defense capabilities.

The approach that allowed MDA to rapidly develop and deploy an initial set of capabilities has been less successful in fostering the planning and preparation needed to adequately address future operations of deployed systems and follow-on procurement and sustainment. Under this approach, the MDA is functioning as the research, development, test, and evaluation (RDT&E); procurement; testing; initial fielding; and operating entity. The Military Departments that will eventually assume responsibility for operating and sustaining the BMDS have not been heavily involved in preparing to assume these responsibilities. This has made it difficult to incorporate Service perspectives and to transfer functions for individual systems within the BMDS to the Lead Services as directed by the basic guidance for BMDS development and deployment.

The BMDS is not subject to the traditional 5000 series acquisition directives or the Joint Capabilities Integration Development System and Joint Requirements Oversight Council (JROC) approval processes. MDA's processes for both requirements generation and acquisition have evolved over time. As currently used in the MDA, the capability-based approach defines a specific increment of capability to be developed and establishes criteria to determine that an increment of capability has been achieved and is available to be deployed.

With the assignment of specific responsibilities for BMDS in the Unified Command Plan, USSTRATCOM has developed the Warfighter Involvement Process to better represent the Combatant Commands' priorities for ballistic missile defense capabilities. Although that process is evolving to represent the Combatant Commands, there is not a similar process to involve the Military Departments.

To increase the involvement of other parts of DoD and to ensure appropriate oversight of BMDS development, acquisition, and procurement, the Department established the Missile Defense Executive Board (MDEB) to make recommendations to the Deputy Secretary of Defense on implementation of policies and plans, program priorities, and investment decisions. The MDEB is emerging as a useful forum for greater involvement by DoD stakeholders in missile defense matters. Although the MDA continues to function with special authorities, the evolution of MDA's management approach has tightened the control and oversight to better predict and control progress in developing, fielding, and supporting the BMDS. A proposed *BMDS Life Cycle Management Process* developed by the MDEB (described in Chapter V) will further

refine the management and oversight approach for continued development and fielding of the BMDS.

A major issue is the process for and timing of transferring responsibility for operations and maintenance and follow-on procurement for a fielded system to a Lead Service. A Lead Service has been designated for each BMDS component except Command and Control, Battle Management, and Communications, which will remain with MDA. The planned schedule stretches far into the future, and there are complex and contentious issues to be resolved. Chapter V of this report addresses the issues in some detail and provides specific recommendations.

TOP-LEVEL RECOMMENDATIONS

- Retain centralized management with significant special authorities, which will continue to be essential to growing BMDS capability to meet future needs.
- The primary role of the MDA should be the RDT&E needed to continue to develop and improve U.S. capabilities to deal with existing and future ballistic missile threats. In this context RDT&E includes initial procurement and deployment of a component of the BMDS.
- There should be increased interaction between the MDA and other relevant parts of the DoD to achieve increased oversight of ballistic missile defense priorities and deployment decisions and to ensure that the Military Departments have both the understanding and the obligation to properly prepare to sustain and operate the components of the BMDS.
- The *Life Cycle Management Process* proposed by the MDEB should be implemented as soon as possible with modifications discussed in this report. Notably, while the proposed Defense-wide BMDS funding account (to be managed by the MDA for the entire life cycle of an element) is an acceptable interim solution, for the long term, budgeting responsibility for operations and sustainment should devolve to the Services.
  - Responsibility for operations and sustainment for deployed systems should be transferred to the designated Lead Service quickly.
  - Responsibility for executing follow-on procurement of BMDS components should be transferred to the designated Lead Service as soon as adequate confidence in the performance and suitability of the component has been established.
  - While the independent study group agrees that there is a need to move toward more normal acquisition processes, the need for continuous evolution of the BMDS will require that the approach to setting requirements for increments of capability and developing and fielding

those increments remain as special authorities with oversight of the MDEB.

  - The Warfighter Involvement Process should be further developed to provide for stronger interface to ensure that the priorities of the combatant commanders and the Military Departments are well understood and reflected as feasible in decisions to develop and field added increments of capability.
  - The responsibility for developing, deploying, and sustaining the integrated Command and Control, Battle Management, and Communications system should remain with the MDA.

- Early in the concept-development phase of each element, a Lead Service should be designated by the Deputy Secretary of Defense.
- The MDA and the designated Lead Service for each element of the BMDS (including those BMDS elements currently not within the MDA) should form a Joint Program Office (JPO) with leadership of the JPO shifting from the MDA to the Service acquisition executive on transfer of responsibility for follow-on procurement of the system to the Lead Service.
  - Follow-on procurement of systems and system upgrades should be managed by the JPO.
  - The RDT&E function for a program that is part of the BMDS should continue to be funded and controlled by the MDA, even after JPO leadership has transferred to the Lead Service.
  - Configuration control to ensure that system changes are compatible with the MDA's integration needs should remain an MDA function within the JPO. Configuration control includes software changes and changes to non-BMDS functions of multi-mission systems that could impact integration into the BMDS.
- Within the spectrum of MDA RDT&E activities, science and technology should receive renewed emphasis and increased funding.
- The MDA should retain its current capability-based approach as well as its current block structure, although system performance should be described in terms more easily understood by other DoD stakeholders and be clearly connected to identified needs.
- For mid-course intercept systems, the balance between qualitative improvements and deploying more of existing capabilities should be strongly in favor of qualitative improvements. Without such a focus, the current system capabilities will become obsolete regardless of the numbers of interceptors deployed.

- Responsibility for developing and deploying defenses against cruise missiles should not be assigned to the MDA. Adding this challenge to the current portfolio would not likely benefit progress in either ballistic or cruise missile defense.

I. TASKING

This report is the product of a 6-month independent study in response to Congressional direction in the National Defense Authorization Act for Fiscal Year 2008, Section 222, as given in Table I-1. The study examined and assessed the current and future missions, roles, and structure of the Missile Defense Agency (MDA). It also evaluated the MDA's relations with other parts of the Department of Defense (DoD) with respect to missile defense, specifically the requirements process, acquisition process, and transition and transfer of operations and sustainment of the Ballistic Missile Defense System (BMDS) elements to the Military Departments. This panel report includes recommendations on the MDA's future roles and missions; its future structure; improving the MDA interface with other parts of DoD; support for the warfighter; and whether there are functions and responsibilities that, in whole or in part, should be added to or removed from the MDA portfolio.

Table I-1. Study Tasking

National Defense Authorization Act for Fiscal Year 2008, SEC. 222. Study on Future Roles and Missions of the Missile Defense Agency

(A) IN GENERAL.—The Secretary of Defense shall enter into an agreement with one of the Federally Funded Research and Development Centers under which the Center shall carry out an independent study to examine, and make recommendations with respect to, the long-term structure, roles, and missions of the Missile Defense Agency.

(B) MATTERS INCLUDED.—

(1) REVIEW.—The study shall include a full review of the structure, roles, and missions of the Missile Defense Agency.

(2) ASSESSMENTS.—The study shall include an examination and assessment of the current and future—

(a) Structure, roles, and missions of the Missile Defense Agency;

(b) Relationship of the Missile Defense Agency with—

the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics

the Office of the Under Secretary of Defense for Policy;

the Director of Operational Test and Evaluation;

the Commander of the United States Strategic Command and other combatant commanders;

the Joint Requirements Oversight Council; and

the military departments;

(c) Operations and sustainment of missile defenses;

(d) Acquisition process for missile defense;

(e) Requirements process for missile defense; and

(f) Transition and transfer of missile defense capabilities to the military departments.

(3) RECOMMENDATIONS.—The study shall include recommendations as to how the Missile Defense Agency can be made more effective to support the needs of the warfighter, especially with regard to near-term missile defense capabilities. The study shall also examine the full range of options for the future of the Missile Defense Agency and shall include, but not be limited to, specific recommendations as to whether—

(a) the Missile Defense Agency should be maintained in its current configuration;

(b) the scope and nature of the Missile Defense Agency should be changed from an organization focused on research and development to an organization focused on combat support

(c) any functions and responsibilities should be added to the Missile Defense Agency, in part or in whole, from other entities such as the United States Strategic Command and the military departments; and

(d) any functions and responsibilities of the Missile Defense Agency should be transferred, in part or in whole, to other entities such as the United States Strategic Command and the military departments.

II. BACKGROUND: HISTORY AND MANDATE OF BALLISTIC MISSILE DEFENSE

A. HISTORY OF ROLES AND MISSIONS

There has been an enduring national commitment to ballistic missile defense, including direction currently embodied in law. The commitment has been expressed in Presidential direction since the 1960s (Sentinel, Safeguard, Site Defense, etc.). The objectives have been pursued in a centralized organization (the MDA and its predecessors) over multiple administrations—President Ronald Reagan, President George H. Bush, President William Clinton, and President George W. Bush.

1. Early Ballistic Missile Defense Programs

In the 1970s, program offices in the Services were created to manage the research and development and deployment of BMDSs. Oversight for space technology and systems related to ballistic missile defense was provided by the DoD Director of Defense Research and Engineering. In 1974, after a congressional ban on prototyping limited-site defense was imposed, the Army's Ballistic Missile Defense Organization (BMDO) was formed to develop, deploy, and operate the Safeguard system, as well as conduct advanced ballistic missile defense technology development. In 1975, a field operating agency in the Army called the Ballistic Missile Defense Advanced Technology Center was created to formulate and execute approved ballistic missile defense programs of exploratory and advanced development in ballistic missile defense technology within the guidance and direction of the Ballistic Missile Defense Program Manager.

2. Strategic Defense Initiative Organization

President Reagan's speech on 23 March 1983 started activities that resulted in a more centralized DoD approach to management and oversight of the U.S. ballistic missile defense program. Since then, the management and oversight of the U.S. Ballistic Missile Defense program has gone through several fundamental changes.

Key changes began with the formation of the Strategic Defense Initiative Organization (SDIO) in 1984. Many of the programs that were underway in the Services

and agencies were transferred to the SDIO, along with their funding. During the period 1984 to 1992, the principal focus was on the defense of the United States against strategic attacks by the Soviet Union and other countries with intercontinental ballistic missile (ICBM) capability. Advanced technologies that could be applied to the problem were explored, with a significant portion of the program devoted to science and technology. Space-based systems such as Brilliant Pebbles (a large number of orbiting interceptors) and directed-energy systems such as lasers were considered. Miniaturizing interceptor and sensor components was given particular emphasis. The existence of the 1972 Anti-Ballistic Missile Treaty necessitated distinctions between defense against strategic ballistic missiles and defense against theater missiles. The SDIO emphasized the former, but it was recognized that the technologies being developed also had applications to the latter. The Anti-Ballistic Missile Treaty severely limited both development and testing of certain parts of a possible strategic ballistic missile defense, but theater systems were relatively unconstrained.

3. Ballistic Missile Defense Organization

The next major change began in 1992, shortly after the Persian Gulf War and the dissolution of the Soviet Union. The SDIO was renamed the Ballistic Missile Defense Organization to reflect the growing concern with ballistic missiles other than ICBMs. Defense against long-range ballistic missiles was de-emphasized. Funding in support of strategic technology projects was also significantly reduced. Theater ballistic missile defense, on the other hand, received top priority, with the intent to develop and deploy such systems when the maturity of the technology supported it. At one point, the Joint Staff established priorities for the systems under development, giving highest priority to the theater ballistic missile defense systems closest to production and deployment. The standard Joint Staff requirements process was applied to these programs, as was the acquisition process mandated in DoD 5000. For the most part, funding came from the BMDO, but the Services played major roles in system development. An event that strongly influenced new emphasis on national missile defense was the North Korean August 1998 launch over Japan of a Taepo Dong 1 missile, with apparent intercontinental potential.

4. Missile Defense Agency

The most recent major change in the ballistic missile defense organization and program began shortly after the start of the George W. Bush Administration in 2001. Changes were made to the direction and pace of the program, including: (1) the BMDO

was changed to the Missile Defense Agency (MDA) to give the heightened status of an agency and to reflect focus on ballistic missiles of all ranges; (2) the Ballistic Missile Defense program was exempted from the Joint Staff requirements processes and DoD 5000 acquisition regulations and program review procedures; and (3) in 2002, President Bush gave guidance to begin deployment of a set of initial missile defense capabilities in 2004. The MDA was also given control of the missile defense budget and was not subject to the normal program assessment and budget reviews by staff in the Office of the Secretary of Defense (OSD).

The U.S. withdrawal from the Anti-Ballistic Missile Treaty in June 2002 removed the legal need to treat strategic and theater systems' development and deployment differently. The treaty applied only to strategic defense against ICBMs and sea-launched ballistic missiles (i.e., homeland defense) and, among other things, clearly prohibited the testing or deployment of theater-class assets against ICBMs or sea-launched ballistic missiles (i.e., in support of homeland defense). The treaty also prohibited the forward deployment of homeland defense assets, the use of mobile assets in a strategic defense role, or the linkage of strategic and theater class defense assets. Relief from these treaty constraints permitted a move toward a unified, global BMDS to defend against all ranges of ballistic missiles in all phases of flight.

B. MANDATE AND DIRECTION FOR THE MDA

In conjunction with arms reductions, nonproliferation efforts, and deterrence policies, missile defense capability is intended to contribute to deterrence and to mitigate the consequences if deterrence fails. According to National Security Presidential Directive (NSPD)-23:

> The new strategic challenges of the 21st century require us to think differently, but they also require us to act. The deployment of effective missile defenses is an essential element of the United States' broader efforts to transform our defense and deterrence policies and capabilities to meet the new threats we face.

A set of Presidential Instructions, Congressional Acts, and DoD Instructions pertaining to ballistic missile defense are listed below, in chronological order, with their key points highlighted.

1. National Missile Defense Act of 1999 (Public Law 106-38), 22 July 99
   - "It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense System capable of defending

the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) ….”

2. Missile Defense Program Direction, Secretary of Defense Memorandum, 2 January 2002
   - “Apply a capability-based requirements process for missile defense”
   - “Baseline the capability and configuration of its elements”
   - “Develop for deployment, when directed, a useful military capability to detect, track, intercept, and defeat ballistic missiles in all phases of flight against all ranges of threats”
   - “Plan and execute work such that efforts in particular areas of the BMDS may be truncated or stopped if the results are unsatisfactory…”
   - “Budgeting for RDT&E [research, development, test, and evaluation] is the responsibility of MDA; budgeting for procurement is the responsibility of the Military Departments”
3. Ballistic Missile Defense Program Implementation Guidance, Under Secretary of Defense for Acquisition, Technology, and Logistics [USD(AT&L)], 13 February 2002
   - “Plan and execute an evolutionary, capability-based acquisition approach to develop and deploy missile defense capabilities as soon as practical”
   - “…baseline the system capability…”
   - “Obtain the advice of the warfighter community on desired operational features and approaches to system deployment.”
4. National Policy on Ballistic Missile Defense, National Security Presidential Directive-23, 16 December 2002
   - “… the United States plans to begin deployment of a set of missile defense capabilities in 2004. These capabilities will serve as a starting point for fielding improved and expanded missile defense capabilities later.”
   - “…missile defenses…are an added and critical dimension of contemporary deterrence.”
5. Missile Defense Agency (MDA), DoD Directive 5134.9, 9 October 2004
   - “…adequately characterize its military utility”
   - “Develop for fielding a useful military capability to detect, track, intercept and defeat ballistic missiles.”
   - “To defend the United States, deployed forces, allies, and friends from ballistic missile attacks of all ranges in all phases of flight.”

In addition, there is a draft Deputy Secretary of Defense Memorandum on the Ballistic Missile Defense System (BMDS) Life Cycle Management Process (described in Chapter V).

III. MISSIONS, ROLES, AND STRUCTURE OF THE MDA

A. MISSIONS

During the past 25 years, the mission of the missile defense program has evolved from (1) a technology program to determine the feasibility of ballistic missile defense to (2) a technology development program to provide a shield over the United States against ballistic missiles to (3) a program known as Global Protection Against Limited Strike, or GPALS, to protect the United States, its friends, and allies from a limited ballistic missile attack to (4) a program to provide theater-based defenses against short- and medium-range ballistic missiles and to thwart potential light attacks of long-range missiles from "rogue"-class adversaries to (5) the current broad program of integrated sensor, interceptor, and command and control, battle management, and communications (C2BMC) capabilities.

The MDA was established in January 2002 to provide centralized management to develop and integrate these programs (of sensors, interceptors, command and control, and battle management) into a BMDS. The broad definition of the MDA's current mission includes the need to develop and deploy a BMDS capable of defeating ballistic missiles of all ranges in all phases of flight to defend the United States, deployed forces, allies, and friends. To that end, DoDD 5134.9 of 9 October 2004, drawing on NSPD-23, defined the MDA's mission as follows:

- To defend the United States, deployed forces, allies and friends from ballistic missile attacks of all ranges in all phases of flight.
- To develop and deploy, as directed, a layered BMDS.
- To enable the fielding of elements of the BMDS as soon as practicable.
- To provide capability in blocks, improving the effectiveness of fielded capability by inserting new technologies as they become available.

The currently deployed BMDS has met the mandate to begin to deploy a set of missile defense capabilities. This achievement was facilitated by the limited goal of an initial capability without specific performance requirements. Further, the program received high priority in funding, personnel, and other resources. There is a consensus within the DoD, current MDA contractors, and the study panel that an MDA-like

organization and approach that had flexible contracting rules and special authorities were essential to rapidly deploying the current set of ballistic missile defense capabilities.

The ballistic missile defense mission requires a continued focus on qualitative improvements in sensors, interceptors, command and control, and battle management. The pressures for continued deployments of current capabilities can have an adverse impact on investments in RDT&E needed to increase capability to deal with a wide range of possible threats. Such a trend toward more deployments of current capabilities would seriously degrade the ability to increase the future capability of BMDS.

The appropriate balance between fielding current capabilities and investing in improving capabilities varies with specific systems. There is a particular need for the MDA to invest more in improvements for exoatmospheric intercepts, where future success will require improvements in multiple components of the BMDS (e.g., interceptor capabilities, sensors and sensor networks, and battle management systems). It will also require continued investment in procurement and infrastructure to provide basing, connectivity, training, and system development and testing. Although the MDA has identified some possible ideas to achieve improved capabilities, these need further study to verify their feasibility in light of realistic funding expectations. Sustained, robust research and development are essential to providing increments (blocks) of increased capability to deal with a wider range of threat characteristics.

B. MDA ROLES AND AUTHORITIES

For the development of future ballistic missile defense capabilities, an RDT&E focus for the MDA is vital. Additional demands for follow-on procurement and operations and sustainment for expanding deployments of current elements detract from this primary focus.

The MDA Director's current roles fall into three core functions: head of Defense Agency, Acquisition Executive, and BMDS Program Manager. Observations and assessments regarding the execution of some aspects of these functions are offered below.

1. Head of Defense Agency

The approach that provided rapid development and fielding of an initial BMDS capability has been less successful in fostering the planning and preparation needed to adequately address future operations of deployed systems and follow-on procurement and sustainment. The MDA is currently functioning as an RDT&E, procurement, testing,

initial fielding, and operating entity, with too little interaction with the Military Departments that must eventually assume responsibility for operating and sustaining the BMDS. This arrangement has made it difficult to incorporate Service perspectives and to transfer functions for individual systems within the BMDS to Lead Services, as was planned for and directed by the basic guidance for BMDS development and deployment. For example, the program offices that manage the development and deployment of most of the systems within the BMDS are MDA program offices reporting to the Missile Defense Program Executive Officer with, in many cases, little involvement of the Lead Service. Operations and sustainment activities are also funded by the MDA; in some cases, they are principally contractor operations, again, with minimum involvement of a Lead Service. Exceptions to this are the Aegis-Standard Missile 3 system and Patriot, in which the host system serves both a core Service mission need, as well as the missile defense function.

In some respects, the MDA charter has expanded well beyond that envisaged in the Secretary of Defense guidance that established the MDA in 2002, with the apparent acquiescence of OSD and the Military Departments. The 2002 directive specifically charged the MDA with budgeting for and executing development of BMDS capabilities. The Military Departments were charged with budgeting for and executing procurement and sustainment. In most cases, however, the MDA has procured and sustained elements of the BMDS, and the Military Departments have not adequately planned or prepared for procurement or sustainment.

Budgeting for RDT&E is the responsibility of the MDA, and the Director of the MDA serves as the principal DoD official responsible for presenting the BMDS budget to Congress. In 2003 (FY04 National Defense Authorization Act), Congress gave the MDA the flexibility to use RDT&E funding to develop and field assets. Authority to use RDT&E for fielding has now been limited. In FY09 the MDA can continue to field capabilities previously approved by the Congress, but RDT&E funding may not be used for military construction or procurement or advance procurement for Terminal High Altitude Area Defense (THAAD) Fire Units 3 and 4 or Standard Missile-3 Block 1A interceptors. While constrained agility in using funding authorizations decreases management flexibility and may slow development and deployment, it should not have been expected that all the special authorities would continue or would have a need to continue in full force beyond achieving the President’s goal of deploying a set of initial capabilities beginning in 2004.

2. Acquisition Executive

In 2002, the Secretary of Defense and the USD(AT&L) gave the MDA the flexibility to pursue capability-based acquisition outside of the Joint Capabilities Integration Development System (JCIDS) requirements process and DoD 5000 acquisition direction until Milestone C. In practice, the process for obtaining a Milestone C decision as spelled out in the guidance has not been implemented, although some programs are in a status normally associated with Milestone C or beyond. For example, programs such as THAAD have progressed to what could, by DoD 5000 standards, be considered full rate production; in the case of Sea-Based X-Band Radar (SBX), they have progressed to near program completion without meeting the formal requirements of Milestone C.

While BMDS is not subject to the traditional JCIDS requirements generation process and Joint Requirements Oversight Council (JROC) approval process specified in Chairman of the Joint Chiefs of Staff Instruction 3170, the MDA's process has evolved over time. As currently used in the MDA, the capability-based approach defines a desired and achievable increment of capability and establishes criteria to determine that an increment of capability has been achieved and is ready to be deployed. The approach needs to involve the ultimate user throughout to determine that the deployable capability would be a militarily useful increment of capability. User involvement in this process is described more fully in Chapter VI of this report.

3. BMDS Program Manager

In accordance with the MDA charter, the Director controls BMDS development through an enterprise-level management structure that integrates work, enables capability trades among BMDS elements, and enables decision-making in response to BMDS events.

The MDA Director's responsibility to manage program execution includes authority to formulate acquisition strategy for MDA programs under the overall acquisition policy direction of the USD(AT&L), make program commitments and terminations, conduct source selections, award contracts, analyze performance, make affordability tradeoffs, document the BMDS program of work, and report progress.

An important function of the overall direction of the BMDS RDT&E effort is to ensure robust science and technology portfolios—these enable continued improvements in capability to combat the wide range of possible increasing adversary capabilities.

There is also a need to reduce manufacturing costs for components for which higher inventories are needed.

Given the minimal involvement of normal DoD participants to date in developing and acquiring systems, the DoD now needs to develop management mechanisms and processes to move to a more normal mode of operation for fielded systems and for follow-on procurement. For example, the United States Strategic Command (USSTRATCOM), the MDA, Director, Operational Test and Evaluation (DOT&E), and the Lead Service need to agree on the combination of required development testing and operational test and evaluation.

The MDA is responsible for the Developmental Testing and Evaluation of BMDS elements. DOT&E has insight into the test and evaluation activity and results, but does not have a formal oversight role. However, DOT&E does have the responsibility to annually assess the adequacy and sufficiency of the MDA testing program for the BMDS (in accordance with the National Defense Authorization Act for 2006, Section 234).

C. ORGANIZATIONAL STRUCTURE

The organizational structure for managing the MDA includes a set of functional managers, program managers, knowledge center managers, and two national teams. The responsibilities of these three types of managers, national teams, and review boards are described below.

1. Functional Managers

The functional managers are the deputies for operations, engineering, acquisition management, advanced technology, test/integration and fielding, and international affairs. They execute BMDS-level leadership in their areas of expertise. In addition, functional managers are tasked with:

- Providing the program managers with trained, qualified personnel.
- Leveraging DoD personnel, Federally Funded Research and Development Centers (FFRDCs), other government activities, universities, and industry.
- Exercising hiring responsibility and annual assessment of assignment rotations.
- Overseeing career development of matrixed staff.
- Developing agreements (such as a Memorandums of Agreement, or MOA) to provide support in their functional area if required.

- Collaborating with Program Directors and Program Managers to determine appropriate levels of support and funding.

2. Program Managers

Program managers focus on execution of their programs, and there is a Program Manager for each of the BMDS elements. For some elements, the Services have parallel offices. Today, the MDA and Service offices collaborate informally or through MOAs established for each program element. Merging the parallel offices into a Joint Program Office (JPO) would enhance collaboration and facilitate the transfer of roles and responsibilities from the MDA to the Services at the appropriate time.

3. Knowledge Center Managers

Knowledge Center Managers promulgate knowledge and lessons learned across the Agency, do quick-reaction problem-solving and reviews in the product areas, maintain technology awareness within and outside the Agency, assist executing elements with resolving issues, and foster the development of the MDA workforce in each product area.

4. National Teams

Leveraging the talents of industry with selected assistance from FFRDCs and academia, the MDA created two national teams to provide technical oversight, broad technical expertise, and coordination in two key areas—systems engineering and C2BMC. A key component of the national team concept is an industry consortium. Consisting of Boeing, Lockheed Martin, Northrop Grumman, General Dynamics, and Raytheon, the consortium is partnered with the MDA on two specific overarching system-level subject areas that apply to all the elements.

National Team "S," led by Boeing, is focused on systems engineering and integration. It participates in the following activities:

- Analyze alternatives.
- Create future BMDS architectural options.
- Engineer the integrated and layered BMDS.
- Assess through testing the BMDS capabilities.

National Team "B," led by Lockheed Martin, is focused on bridging multiple command systems into an integrated BMDS with overarching command and control. National Team B participates in the following activities:

- Develop, field, and sustain the BMDS C2BMC system.
- Implement a layered Missile Defense C2BMC system of systems.
- Integrate existing capabilities (Elements).
- Extend/Modify capability over time to produce a flexible distributed system.

5. Internal Corporate Boards

The MDA has also created a structure of internal working groups, panels, reviews, and boards to provide integration and coordination. The boards and panels correspond to the three core MDA responsibilities. The Executive Management Board and the Personnel Policy Board serve the Director of MDA in his capacity as head of a defense agency. The Acquisition Strategy Panel provides him input in his role as acquisition executive. Finally, the Program Change Board and the Integration Synchronization Group address program manager considerations, with the Integration Synchronization Group acting as the single integrating body supporting all the corporate boards. An important focus of these efforts is to ensure that decisions made regarding one program element do not unknowingly have a negative impact on another program element.

6. The Missile Defense Executive Board

For external DoD oversight of the MDA, the 2002 Secretary of Defense memo designated the Senior Executive Council, chaired by the Deputy Secretary of Defense and supported by the Missile Defense Support Group, which reported to USD(AT&L). In 2007, the Missile Defense Support Group was replaced by the Missile Defense Executive Board (MDEB). The principal function of the MDEB is to review and make appropriate recommendations to the Deputy Secretary of Defense regarding the implementation of strategic policies and plans, program priorities, and investment options. It is chaired by the USD(AT&L) and encompasses relevant senior officials from OSD (Director of Defense Research and Engineering, Policy, Intelligence, DOT&E, and Program Analysis and Evaluation) and representation from the Services, Joint Staff, USSTRATCOM, Department of State, and the Director, MDA. The MDEB meets every 2 months and has four Standing Committees, the functions of which are as follows:

1. **Policy and Oversight** advises the MDEB on missile defense strategic policy direction, conducts and oversees international activities, and represents DoD in inter-Agency matters.
2. **Operational Forces and Programs** oversees fielding schedules and deployments and oversees agreements, documentation, and requirements between the MDA, the DoD components, and the fielding organizations.
3. **Acquisition and Budget Development** ensures that program and budget development is integrated effectively into the MDEB's oversight role; oversees implementation of acquisition guidance to include transition and transfer of responsibility and authorities; and provides oversight for procurement, operation, and support.
4. **Test and evaluation** oversees the test and evaluation planning and resource roadmap and provides technical recommendations and oversight for the conduct of an integrated test and evaluation program and investment strategy.

The MDEB is emerging as a useful forum for greater DoD involvement in missile defense matters as the overall MDA structure has evolved to better integrate the activities required for a BMDS that is expanding in scope. Although the MDA continues to function with special authorities, the evolution of MDA's management approach has tightened the control and oversight to better predict and control progress in developing, fielding, and supporting the BMDS.

D. PROGRAM STRUCTURE

The MDA structure of capability developments also has evolved. The original biennial block structure was introduced by MDA director LtGen Kadish to establish the concept of incremental blocks of capability. The fixed biennial schedule proved incompatible with the development challenges within each block, however, and resulted in frequent changes in funding and other commitments. The revised block approach now being used is no longer tied to fixed 2-year increments. Instead, as shown in Figure III-1, it is based on defined increments of capability, primarily measured by components placed in the field to address particular adversaries and defended areas.

When the MDA, in coordination with the Combatant Commands through the Warfighter Involvement Process (see Chapter VI), determines that a capability is desired and is achievable, the MDA commits to schedule, cost, and performance baselines. Capability-development programs not now integrated into the BMDS, such as Airborne Laser and Multiple Kill Vehicle, will be considered for inclusion in the blocks when they are sufficiently mature.

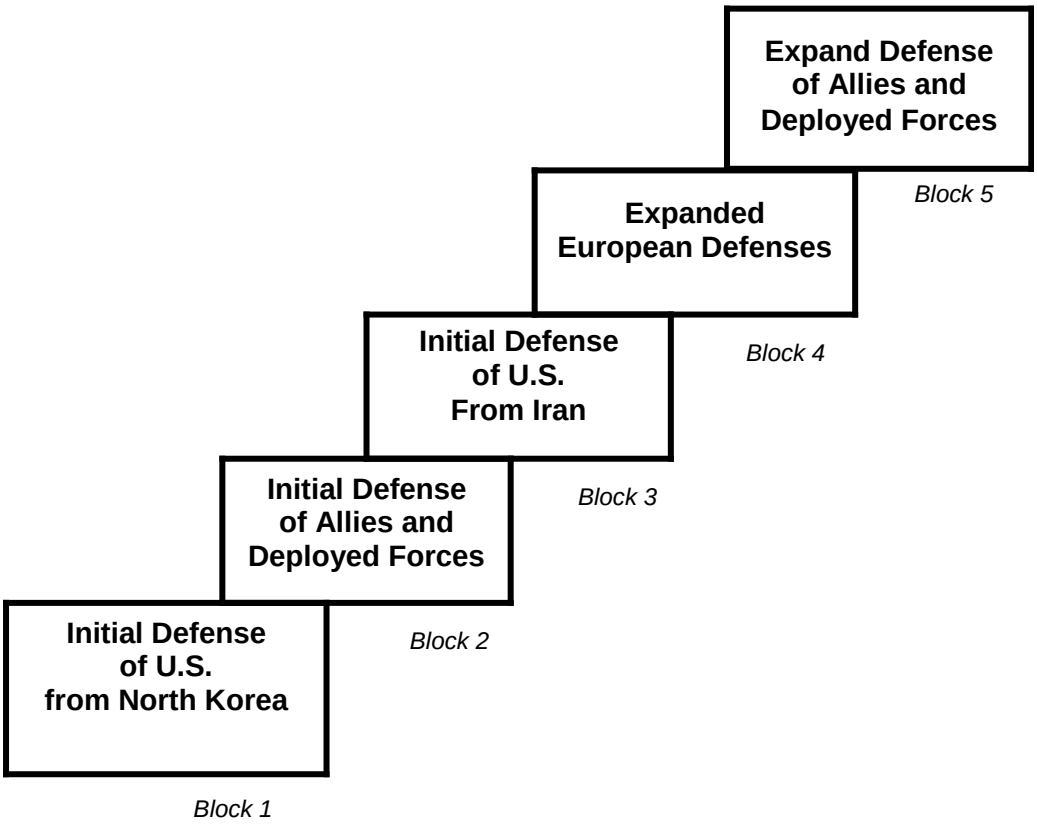

Figure III-1. The Current Block Approach

Blocks 1 and 3 are to provide a limited defense against long-range ballistic missiles from either North Korea or Iran. The baseline system providing the capabilities is to include the following:

- Forty-four long-range interceptors at sites in Alaska and California.
- Fixed site radars in Alaska, California, United Kingdom, and Greenland.
- Mobile or transportable radars (Aegis, TPY-2 , THAAD, and Sea-based X-Band Radar).
- Defense Support Program sensors and follow-ons for initial warning and trajectory information.

Block 2 is to provide a defense of deployed forces, allies, and friends against short- to medium-range ballistic missiles in one region or theater. It adds sea-based midcourse interceptors, THAAD interceptors and sensors, modified Standard Missile 2 sea-based terminal interceptors, and Patriot system integration.

Blocks 4 and 5 are to provide a limited defense of allies and deployed forces in Europe against long-range ballistic missiles from Iran, as well as defense of deployed

forces, allies, and friends against short- to medium-range ballistic missiles in two regions or theaters. These blocks add a long-range interceptor site in Europe, forward-based radar in Europe, and expanded Global Command and Control and Battle Management capability.

E. RECOMMENDATIONS FOR THE FUTURE MISSIONS, ROLES, AND STRUCTURE OF THE MDA

The missions of the MDA should continue to be:

- To lead the integration of a complex set of global-scale ballistic missile defense activities that cut across OSD, the joint establishment, the Military Departments, government agencies, a wide spectrum of the defense industry, and allies.
- To develop and mature a diverse set of current and evolving technologies applicable to the challenging problems of ballistic missile defense.
- To maintain a long-term focus on constantly improving U.S. capabilities in order to deal with a wide range of ballistic missile threat characteristics.

The core functions of the MDA should continue to include:

- Portfolio manager of Ballistic Missile Defense.
- Architect for integrated BMDS.
- Acquisition Executive and program manager for BMDS, to include element and system integration.
- Developer of BMDS elements, including upgrades.
- Program manager of the BMDS technology base.

To ensure execution of these core functions, the MDA should retain a centralized management structure.

The MDA should remain a defense agency whose principal focus is RDT&E to develop, field, and integrate ballistic missile defense capabilities, including follow-on RDT&E. In this context, MDA's role should include procurement and deployment of an initial capability, but should not include follow-on procurement, operations, or sustainment of components other than C2BMC. Within the spectrum of the MDA's RDT&E activities, science and technology should receive renewed emphasis and increased funding.

The appropriate balance between investing in qualitative improvements and buying greater quantities varies, depending on the element:

- For the ground-based midcourse interceptor component, the balance between qualitative improvements and deploying more of existing capabilities should be strongly in favor of qualitative improvements. Without such a focus, the current system capabilities will become obsolete regardless of the number of interceptors deployed.
- For BMDS sensors, there should be a more even balance between qualitative improvements and inventory increases. Certain advanced BMDS concepts place a heavy premium on relatively large sensor inventories and placement flexibility.
- For theater BMDS systems, where protection capability will require large inventories of interceptors, the balance can be weighted more toward increasing deployment numbers.

USSTRATCOM, the MDA, DOT&E, and the Lead Service need to agree on the combination of required developmental testing and operational test and evaluation required for an element transfer. If necessary, the MDEB should assist in obtaining consensus on these requirements.

The MDA and the Lead Service should establish a JPO for each element of the BMDS (including those BMDS elements currently not within the MDA) when RDT&E activities reach the point at which a program office is appropriate. The JPO should be manned by both MDA and the Lead Service and should report to the Missile Defense Program Executive Officer until the system is ready for initial deployment, at which point the lead is transferred to the Lead Service. Transfer to the Lead Service as soon as possible—perhaps in some cases even before initial deployable capability is reached—is necessary to allow MDA to focus more intensely on continued growth in capability. Rapid transfer also will help ensure the timely integration of missile-defense-capable systems into the broader joint force supporting Combatant Command missions.

The RDT&E function for a program that is part of the BMDS should continue to be funded and controlled by the MDA, even after JPO leadership transfers to the Lead Service. MDA's RDT&E span of control would encompass the responsibilities of funding and supervising people and contracts.

MDA's capability-based approach should be retained. To ensure this is an effective approach, the MDA should more clearly describe and articulate to the wider community of DoD stakeholders how knowledge points are defined and used for determining that an increment of capability has been demonstrated. The MDA should also support the USSTRATCOM process for influencing development and deployment priorities and for determining when an increment of capability provides a useful military capability that should be deployed.

MDA's current block structure should be retained, although system performance should be (1) described in terms more easily understood by other DoD stakeholders and (2) clearly connected to identified needs.

IV. RELATIONS WITH OTHER PARTS OF THE DoD

A. OVERVIEW

A major reason for the isolation of the Military Departments and other elements of the Department from BMDS decisions has been the perception that if MDA authorities—to include budgeting authority—were to move to the normal system, ballistic missile defense needs would not compete well with other Service priorities. The subject of transfer to Military Departments is discussed more fully in the next chapter, but because it is such a driving force in the current relationships between the MDA and other elements of DoD, comments on it are also included in this chapter. The perception of competition with other Service priorities should not be the deciding factor controlling the timing of movement of responsibility to the Lead Military Departments. The DoD has the needed authorities and mechanisms to ensure that the DoD's priorities prevail when necessary. For example, once funding has been transferred to the executing Service, the Deputy Secretary of Defense can decide during DoD's programming and budgeting processes whether changes in Service funding priorities need to be made.

The following paragraphs list some of the issues resulting from the lack of early involvement of other DoD elements in preparing and planning for the longer term operations, sustainment, and future evolution of the BMDS.

B. RELATIONS WITH OTHER DOD ORGANIZATIONS

1. Military Departments

The Military Departments identified the following issues to the panel:

- **Inadequate visibility into the planning, programming and budgeting process.** While the Services generally recognize that the MDA was able to meet the mandate to deploy an initial BMDS in 2004 because of the special authorities it was granted, the result was that the Military Departments did not participate in their designated roles. Thus, in spite of specific direction to the contrary in the January 2002 Secretary of Defense memorandum, the planning, budgeting, and long-term sustainment planning has been almost exclusively done within the MDA.

- **Insufficient involvement in the requirements process.** There has been little or no input from the Military Departments into the requirements process, that is, involvement with the Warfighter Involvement Process and in particular the generation of the Prioritized Capabilities List (PCL), discussed in Chapter VI. To date this process has involved only the Combatant Commands and the MDA. It has not significantly involved the Services, which must ultimately operate and sustain BMDS components and systems.
- **Insufficient attention to integrating missile defense capabilities with other joint force capabilities.** It is necessary to improve methods to integrate missile defense capabilities (particularly the non-Ground-Based Midcourse Defense components of the BMDS) into forces provided for joint maneuver and deployment operations.

2. The Joint Staff and Combatant Commands

The Joint Staff and Combatant Commands, with issues similar to those of the Military Departments, have identified the following issues to the panel:

- **Insufficient involvement in setting performance objectives and an inadequate understanding of the capabilities to be fielded.** The Warfighter Involvement Process executed by USSTRATCOM has made a start to correct this situation. Nevertheless, the Joint Staff and some Combatant Commands continue to believe that they have insufficient involvement in the PCL and the associated Achievable Capabilities List (ACL) and Capability Assessment Report process (described more fully in Chapter VI). The PCL contains quantitative Combatant Command requirements for key system characteristics (called attributes in the document), such as the probability of engagement success. However, the process does not provide a mechanism for evaluating performance against the attribute. Also the 2-year time cycle for the Capability Assessment Report may not fit with changing military requirements. In short, there is a failure to understand the total process, and more important, there is no reclama mechanism to respond to the process if it does not properly reflect the highest-priority needs.
- **Insufficient attention to integrating missile defense capabilities with other joint force capabilities**. Same issues as noted previously by the Services.
- **Inadequate JROC Role**. The JROC reviews and validates all JCIDS documents for designated high-interest programs. The MDA has been exempted from the JCIDS requirement process; however, the JROC is moving to establish oversight of ballistic missile defense requirements (JRCOM 193-07) to improve Department-wide capability integration. This is in line with some other efforts in the Department to return certain MDA processes to more normal procedures.

3. OSD

Because the MDA has successfully met the mandate for rapid early deployment in 2004, OSD organizations generally believe that there is a need to bring the Agency more into normal acquisition processes, while allowing it to retain sufficient flexibility to respond to a wider range of threat characteristics and technology opportunities. Specifically they see the need for

- Earlier coordination and involvement in MDA efforts.
- Meaningful recurring evaluation of cost, schedule, and performance (including testing and modeling and simulation).
- Independent analysis to help ensure that trade-offs are adequately examined and evaluated.
- More normal oversight over planning, programming, and budgeting.

C. RECOMMENDATIONS FOR RELATIONSHIPS WITH OTHER PARTS OF THE DOD

The concerns identified in this chapter are addressed by recommendations in Chapters III, V, and VI.

V. REQUIREMENTS, ACQUISITION, OPERATIONS AND SUSTAINMENT, AND TRANSITION AND TRANSFER

A. OVERVIEW

The requirements, acquisition, operations and sustainment, and transition and transfer of BMDS elements involve interrelated responsibilities and organizations; consequently, these functions are being addressed together in this chapter. The management structure and processes proposed by the MDEB in the *Business Rules for Life Cycle Management* address most of the management and governance deficiencies that have been identified.

The proposed business rules do, however, raise issues regarding the assignment of MDA and Lead Service funding and execution responsibilities for fielded components. The proposed new rules would alter the guidance on MDA and Service roles contained in the 2002 Secretary of Defense memorandum in four important ways:

- MDA will assume funding responsibility for all life-cycle phases.
- MDA will assume execution responsibility for procurement.
- Transfer of execution responsibility for operations and sustainment to a Service will be predicated upon performance certification.
- More normal oversight procedures will be implemented.

To illustrate the implications, Table V-1 summarizes the program formulation and execution roles.

Table V-1: Program Formulation and Execution Responsibilities

	Responsibility	Development and Initial Procurement	Follow-on Procurement	Operations &and Sustainment
Current Practice*	Funding	MDA	MDA	MDA
	Execution	MDA	MDA	MDA
MDEB Proposed	Funding	MDA	MDA	MDA
	Execution	MDA	MDA	Lead Service
Study Recommendation	Funding	MDA	MDA	Lead Service
	Execution	MDA	Lead Service	Lead Service

*Current budget flexibility permits MDA to employ its funding across all phases of the BMDS life cycle as needed for expeditious fielding of BMDS capabilities. Thus, although the 2002 Secretary of Defense guidance calls for the Lead Services to fund and execute follow-on procurement, operations, and sustainment, these responsibilities have remained with MDA to date.

The table depicts assignment of responsibility for the program funding and execution functions as done today, as proposed by the MDEB, and as recommended by the panel. As discussed in this chapter, the MDEB's proposed new business rules represent an attempt to resolve the thorny issue of who will take responsibility for funding fielded BMDS components by creating a defense-wide account for funding all life-cycle phases. The panel believes there are strong advantages to strengthening Lead Service involvement and responsibility. The panel therefore recommends that the defense-wide funding account be employed as an interim solution and a tool for managing the transfer of responsibilities from MDA to the Lead Services, but that the designated Lead Services be required to assume long-term funding responsibilities for the operation and sustainment of BMDS components.

B. PROPOSED BUSINESS RULES

Figure V-1 provides an overview of the life-cycle approach proposed in the new MDA business rules. More detailed descriptions from the MDEB document follow.

1. Key Points

a. Resources and Decision Authority

- USSTRATCOM and the Joint Staff J-8 are the co-leads for Warfighter/Service BMDS required capability statements; MDA is the lead for program planning to meet required capabilities; reconciliation is achieved through the MDEB, and the plan is approved by the Deputy Secretary of Defense.

- BMDS resources are managed by the MDA as a Ballistic Missile Defense Portfolio.
- OSD (Comptroller) and the MDA administer ballistic missile defense Defense-wide funds (RDT&E, Procurement, Operations and Support (O&S), and Military Construction, as required). Funding is provided to Lead Military Departments, agencies, and activities for execution.
- Programs that have been transferred to the Military Departments or with Service-specific roles are not normally included in ballistic missile defense Defense-wide funding, unless the MDA drives a change.
- Nothing precludes transfer of BMDS elements from the MDA to a Military Department as approved by Deputy Secretary of Defense. Transfer may include reprogramming of Defense-Wide funds.
- The MDEB recommends Courses of Action to the Deputy Secretary of Defense.
- The MDA/Service Boards of Directors are primary forums for resolving MDA/Service issues. Unresolved issues are to be elevated to other appropriate decision bodies (e.g., MDEB, JROC, Deputy's Advisory Working Group).

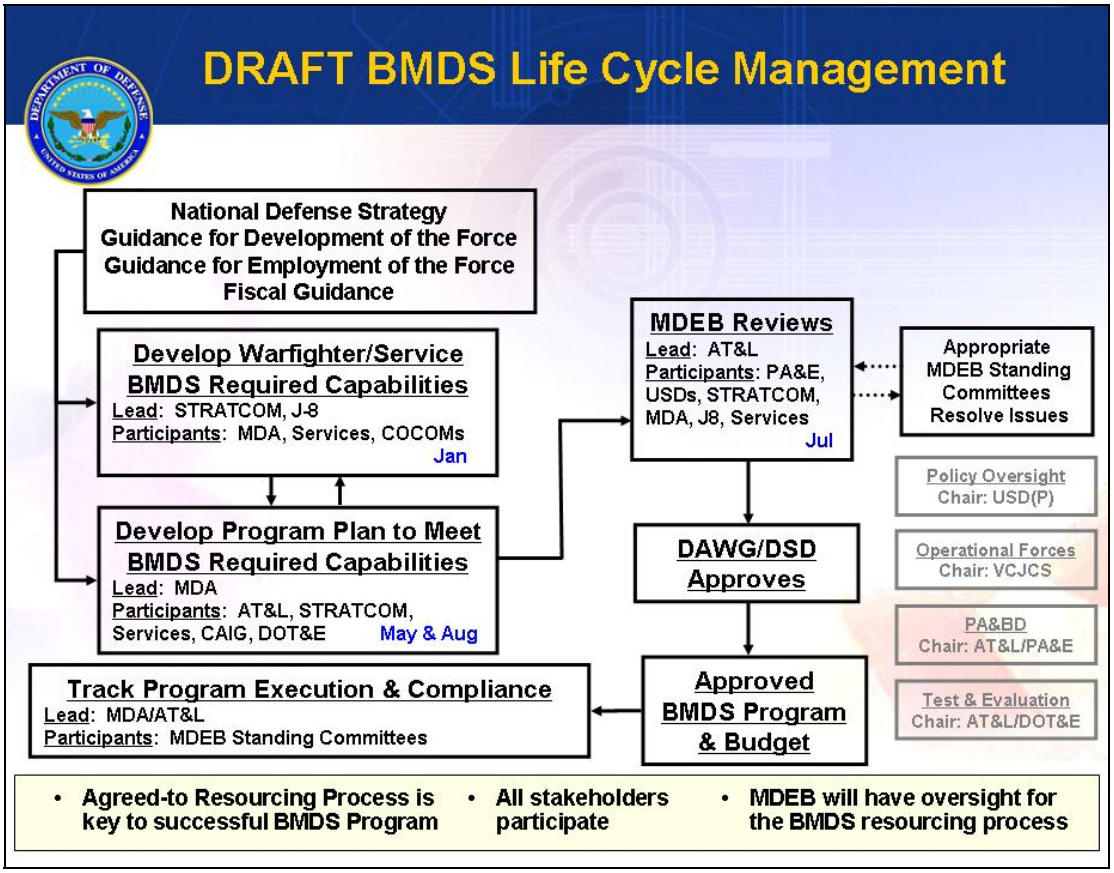

Figure V-1. Draft Proposal for Life-Cycle Management of the BMDS

b. Program Management

- Program Management is defined in the MDA/Lead Service MOA for each element.
- Lead Military Departments are to be designated early in development. The Lead Service will collaborate with the MDA on Life-Cycle System Planning.
- The MDA maintains BMDS configuration control. Joint configuration management processes ensure that Service and MDA requirements are met.
- For elements that have not transferred, the MDA is responsible for BMDS development, test, procurement, O&S and installations and environmental planning. For elements not in MDA (including those that have been transferred), Military Departments manage O&S and installations and environmental planning.

c. Testing

- The MDA is to work with USSTRATCOM, DOT&E, and the Military Departments to ensure that adequate integrated developmental test, operational test, and modeling and simulation are performed to verify operational performance before element transfer.
- If the MDA drives a change to fielded capability, the Agency is responsible for testing and modeling and simulation to verify the operational utility and to conduct any regression testing necessary to ensure that there are no adverse impacts to Service-specific capabilities.
- If a Service drives a change to a fielded capability, it is responsible for testing and modeling and simulation to verify the operational utility and to conduct any regression testing necessary to ensure that there are no adverse impacts to BMDS capability at large.

2. Observations on the Proposed Business Rules

The proposed business rules should significantly increase the involvement of other parts of the DoD. However, as noted in the overview, the panel believes that the Services' roles and responsibilities for fielded systems need to be strengthened. The transfer of execution responsibility to the Services and their increased involvement in BMDS are essential for at least three reasons:

- The BMDS will need a continuing focus on qualitative and quantitative improvements to deal with the wide range of potential threat capabilities. This will require intense focus on technology, system development, and initial deployment of new capabilities. As the BMDS expands in scope and depth, the performance of functions by the MDA that are normally within both the

province and the capabilities of the Military Departments will detract from the needed focus on future capabilities.

- Many of the BMDS components have other functions and must be closely integrated into the broader set of capabilities that the Military Departments provide for joint operations. For example, the Standard Missile 3 is hosted by the Aegis cruisers and destroyers that perform vital surveillance and air defense and strike missions for fleet operations. The THAAD system needs to be closely integrated with other Army air and missile defense systems. Defenses that must be provided for BMDS components may also provide multipurpose protection. The information available from BMDS sensors may be an important contributor to other joint operations. The MDA should be expected to take those needs into account while meeting the demand for continuing growth in ballistic missile defense capabilities.
- Much of the BMDS will operate from and in the Military Departments' infrastructure. Both efficiency and effectiveness require that the Military Departments have responsibility and authority to integrate support for BMDS into their broader infrastructures.

Negotiating the funding mechanism associated with transferring execution responsibility is inevitably difficult and contentious. The proposed business rules, which include a defense-wide budget for follow-on procurement, operations, and sustainment, would burden the MDA with responsibilities for long-term budgeting of operations and sustainment and for execution of follow-on procurements. These responsibilities would be counterproductive to the MDA core mission of continuously developing and fielding improved capabilities, focusing on RDT&E.

An extreme alternative solution to keeping funding within the MDA is to transfer all fielded functions of the BMDS from the MDA and to the Services. This opposite extreme also would be counterproductive in that it would weaken the needed roles of MDA for integrating capabilities across components.

The preferred alternative is that shown in Table V-1. Responsibilities for executing both follow-on procurements and operations and sustainment transfer to the Lead Service at an early date, and funding responsibility for O&S moves to the Lead Service at the transfer event. MDA would retain RDT&E oversight and integration responsibility for all elements, even after they had transferred.

C. TRANSFER ISSUES

The starting point for transfer is designation of a Lead Service. Table V-2 shows the current designations of Lead Services and planned transfer dates. For most systems,

the transfer date remains to be determined. This extended period of the MDA responsibility for a growing deployed BMDS is too long and may negatively affect the MDA's focus on developing new capabilities. It will also delay needed integration into the joint force capabilities.

Table V-2. Element Transfer Plan

Element	Lead Service	Transfer Date	Element	Lead Service	Transfer Date
THAAD	Army	Beyond FYDP	C2BMC	N/A	N/A
GBI	Army	Beyond FYDP	STSS	Air Force	Beyond FYDP
AN/TPY-2	Army	Beyond FYDP	ABL	Air Force	Beyond FYDP
PAC-3	Army	FY03	*UEWRs*	Air Force	FY12
Aegis BMD	Navy	Beyond FYDP	*Cobra Dane*	Air Force	FY08
SBX	Navy	FY10	EMR	Air Force	Beyond FYDP

Note: *Italics* indicate transfers for O&S that the panel believes should begin immediately.

The major unresolved issue in most cases is not the Military Departments' technical and operational capabilities to operate and sustain the system. For example, although funded by BMDO, the THAAD was an Army system developed in the Army before the formation of the MDA. The Navy is intimately involved with the ballistic missile defense functions on Aegis cruisers and destroyers and has full responsibility for operating those platforms now. Similarly, the Air Force is currently operating the Early Warning Radars as well as Defense Support Program and follow-ons as part of the existing missile attack warning and assessment system. The Air Force also currently operates the Cobra Dane radar in support of intelligence missions. Instead, the major unresolved issue contributing to the lengthy period shown in Table V-2 to consummate transfer is the difficulty in agreeing to the funding policy and mechanism. This should not be a driving factor. It is all DoD money appropriated to operate and sustain the BMDS. The proposed *Business Rules for Life Cycle Management of the BMDS* recommends that the funding henceforth be allocated to the Military Department from a Defense-Wide fund on an annual basis. The study group could find no reason why the defense-wide funding approach could not be immediately employed as an interim measure to facilitate the quick transfer of operations and sustainment execution responsibilities to the designated Military Departments for those systems shown in italics.

The transfer of responsibility for follow-on procurement is more complicated. Development and procurement to date have been performed under a set of rules that are different from the rules governing transition to full-rate production by a Service. Hence,

it will be necessary for the MDA, USSTRATCOM, the Lead Service, and DOT&E to agree on steps that will provide confidence in the performance and suitability of the system before transfer to the Lead Service. The MDEB should oversee the development of these criteria as necessary. It is important that the key elements of the MDA's acquisition flexibility be retained—simply requiring that the full set of DoD 5000 requirements be satisfied would be inconsistent with the reasons for relief from those provisions in the first instance.

The details of the management partnership between the MDA and Lead Service for each program can be formalized in an MOA. This MOA should be completed as early as possible, but it must be treated as a living document and updated as circumstances change. While each program within the BMDS will have different circumstances and Lead Service considerations, the general concept outlined above should apply to them all.

For future BMDS capabilities, a Lead Service for each program supporting BMDS components should be identified early in the program. To concentrate the MDA on RDT&E, "initial procurement" should be defined so that the transfer occurs as early as possible. The downside of an early transfer is much less than the downside of a later transfer, since the MDA focus should be on RDT&E.

To ensure early involvement of the Lead Service, the MDA program office for any future element should be established as a JPO, with manning from both MDA and the Lead Service. Further, from the outset, there needs to be increased involvement in the ballistic missile defense development, procurement, and operational structure by the Military Departments, Combatant Commands, the Joint Staff, and OSD. For programs that already exist within MDA or for existing BMDS component programs outside MDA, similar JPOs should be established. Such earlier involvement will facilitate preparation for deployment, follow-on procurement, and sustainment of BMDS capabilities.

The proposed funding of transferred responsibilities for O&S for components of the BMDS through a Defense-wide account is a sensible approach for varying transition periods, with the length of that transition period depending on the function and the system. For example, for systems where the Lead Service has a history of involvement, such as Standard Missile 3 in the Navy or THAAD in the Army, the transition period for O&S should be brief—as little as a single fiscal year.

D. RECOMMENDATIONS

1. New Business Rules

The business approach currently being developed (and planned for execution under the MDEB) should be put into effect as soon as possible, with the qualifications as described earlier in this chapter. This approach has the potential to address the major issues associated with the MDA-like approach to requirements, budgeting, and execution. Particular attention should be paid to:

- Increased Service engagement early in BMDS program definition and development.
- Increased Service, Combatant Command, Joint Staff, and OSD visibility into program decisions and approaches.
- Increased OSD oversight of major program decisions.
- Continuation (with some change) of an agile, streamlined management and capability-based decision process.
- The transfer of O&S and acquisition management for transferred systems to the Lead Service as a way to help MDA focus on RDT&E.

2. Acquisition and Requirements

- Existing program offices for BMDS components both within and outside the MDA should be converted to JPOs, with joint MDA and Lead Service manning, with the JPO lead determined by the individual program status.
- For future new programs, a Lead Service should be established at the outset and a JPO established with joint MDA and Lead Service manning.
- The JPO should report to the Ballistic Missile Defense Program Executive Officer (Director, MDA) until the program is ready for transfer to the Lead Service. On transfer, the JPO should report to the Lead Service acquisition executive.
- The MDA should remain responsible for ensuring that upgrades to deployed systems and follow-on systems are compatible with integration into the BMDS.
- When regression testing needs to be conducted (driven either by an MDA or a Service change to a fielded capability), the MDA and the Service must work together to determine what constitutes “no adverse impact” on the other party.
- The prerequisite for transfer of acquisition authority to the Lead Service should be establishing that the Lead Service is confident that it knows the capabilities of the system to be transferred. To provide adequate confidence in the performance and suitability of the system to meet Combatant Command needs, the following processes should be established:

- For current programs in the equivalent of low-rate production or beyond (such as GBI, THAAD, AN/TPY-2, and Aegis ballistic missile defense), the MDA, USSTRATCOM, DOT&E, and the Lead Service should agree on the combination of testing, modeling and simulation, and analysis needed to provide adequate confidence in the performance and suitability of the system to meet Combatant Command needs.
- For systems not yet in low-rate production, the MDA, USSTRATCOM, DOT&E, and the Lead Service should agree on a test and evaluation plan that provides adequate confidence in performance and suitability.
- Before the system enters low-rate production, DOT&E should provide an early operational assessment to USSTRATCOM for use in the Commander's military utility assessment.

3. Transition and Transfer

- The Department should immediately begin transfer of responsibility for operations and sustainment for deployed systems, systems ready for deployment, and follow-on to deployed systems. Specifically, responsibility for the following should be quickly transferred:
  - THAAD
  - Aegis BMD
  - SBX
  - UEWR
  - Cobra Dane
  - GBI
  - AN/TPY-2
- The transfer plan and process should be tailored for each element. It is not reasonable to set uniform rules applicable to every BMDS element.
- For multiuse systems, Combatant Command needs for other missions must be accommodated within the multiuse construct. The MDA must, however, retain configuration control to ensure continued viability and needed growth within the evolving BMDS.
- Functions that should stay within MDA include:
  - C2BMC
  - RDT&E for continued growth in capability for all BMDSs or ballistic missile defense functions of multiuse systems
  - Stewardship for technology development for BMDSs

- For continuing development of multiuse systems for capabilities other than BMDS, the Lead Service will solicit input from the MDA to ensure that MDA interface and functional requirements are met.

4. Follow-on Procurement and Operations and Sustainment

- There should be a funding transition period after transfer, where funding for O&S is provided on an annual basis from the Defense-wide account.
- Beyond a transition period—typically no more than a year—O&S responsibility should be supported in Service budgeting processes. (This differs from the proposed MDEB business rules, which make MDA responsible for budgeting via the defense-wide account forever.)

  For follow-on procurement, the MDA, USSTRATCOM, the Lead Service, and DOT&E should agree on what needs to be done to provide confidence in the performance and suitability of the system before transfer to the Lead Service. The Deputy Secretary of Defense should give the participants no more than 60 days to reach agreement. If they fail to do so, the MDEB should provide a recommendation to the Deputy Secretary of Defense that, if approved, resolves the issue.
- MDA should be responsible for budgeting for follow-on procurement via the Defense-wide account, and the Lead Service should be responsible for executing this function.

VI. IMPROVING THE MDA'S EFFECTIVENESS FOR THE WARFIGHTER

A. OBSERVATIONS

1. Business Cycle Rules and Support for the Warfighter

The proposed *Business Rules for Life Cycle Management of BMDS* provide a good start in correcting the deficiencies in warfighter and force-provider involvement. If successfully implemented, the rules will provide higher confidence that the developed and deployed elements serve Combatant Command needs and are functionally, operationally, and logistically integrated, as needed, into joint force operations. This was discussed more fully in Chapter V.

2. The Warfighter Involvement Process

USSTRATCOM operates a Warfighter Involvement Process, the intent of which is to provide Combatant Command influence on priorities for defining future BMDS development blocks. While the Warfighter Involvement Process provides a potential mechanism and process for Combatant Command influence on priorities, the current implementation does not satisfy the stated needs of some of the Combatant Commands most affected by the BMDS development and deployment. The main document produced by the Warfighter Involvement Process, which is then transmitted to the MDA, is the PCL. The Military Departments have not had any direct input to the PCL.

Compiled by USSTRATCOM from Combatant Command inputs, the PCL is designed to include all warfighter needs. With the exception of desired key "attributes," which give quantitative warfighter needs, the PCL is qualitative. In the next step of the process, the MDA responds to the PCL with an Achievable Capabilities List (ACL). This is a logical and useful step, since the PCL is not constrained by cost and does not provide for in-depth consideration of the state of the technology. However, some Combatant Commands complain that there is little traceability of the ACL capabilities to PCL priorities and that the Combatant Commands have no reclama to the ACL. Hence, it does not adequately represent a consensus of Combatant Command priorities. To connect the Combatant Command priorities to actual MDA activities, the MDA has recently added a

third step to this process. This is the Capability Assessment Report, which is planned to be updated on a 2-year cycle.

B. RECOMMENDATIONS

- USSTRATCOM and the Joint Staff J-8 should develop and apply a more effective version of the Warfighter Involvement Process as the basis for defining future BMDS development blocks based on Combatant Command needs and priorities, while also considering the ability of the MDA to meet them within acceptable constraints of time, cost, and risk.
  - Particular attention should be devoted to (1) improving the development and prioritization methodology of the PCL so that it more adequately serves as a warfighter priority guide and (2) establishing a true linkage, including the quantitative attributes, between the PCL, the ACL, and the Capability Assessment Report.
  - The contemplated 2-year time cycle for the Capability Assessment Report should be considerably shortened.
  - The Combatant Commands need to be represented in decisions to (1) define the specific capabilities needed, (2) prioritize missile defense capabilities, and (3) evaluate the military contribution of proposed deployment through the Warfighter Involvement Process.
  - Needed is a more iterative Warfighter Involvement Process in which knowledgeable people from the MDA, the Combatant Commands, and Services meet frequently in a collaborative environment. The current process is couched exclusively in terms of desired capabilities; it takes no position on the specific programs intended to achieve those capabilities. As a result, the ACL is developed within the MDA without significant Combatant Command input.
  - The Military Departments should have a role in the Warfighter Involvement Process.
- USSTRATCOM should keep the ballistic missile PCL separate from its other mission areas in order to provide the MDA with a more focused and useful product.

VII. FUNCTIONS THAT SHOULD BE TRANSFERRED, IN WHOLE OR IN PART, INTO OR OUT OF THE MDA

A. OBSERVATIONS

The complex demands of developing and integrating a BMDS capable of defeating ballistic missiles of all ranges in all phases of flight require a level of management, engineering, analytic, and leadership capabilities that approaches the limit of reasonable expectation. Functions that are not essential to that set of objectives should therefore be transferred to or remain with other entities in the DoD, and dates for such transfers should be established immediately. As already discussed, this includes operations and sustainment of deployed systems and follow-on procurement.

There have been suggestions that the special management approaches, capabilities, and authorities of the MDA warrant adding cruise missile defense to the MDA portfolio. This would be a major addition to the already complex portfolio currently assigned, and further, there is little convergence between the functional demands of ballistic missile defense and cruise missile defense and only limited opportunities for dual use among host systems (i.e., Patriot and Aegis). In most respects, there is more convergence between cruise missile defense and air defense. While Integrated Air and Missile Defense is an important warfighting concept, managing all of it in the central manner now applied to ballistic missile defense may be beyond reasonable expectations. Still, there can be convergence in the command and control and battle management (C2BMC) needs of ballistic and cruise missile defense, with particular attention to Patriot and Aegis, which serve the dual role of air and missile defense.

B. RECOMMENDATIONS

- The MDA should not be assigned responsibility to develop and deploy defenses against cruise missiles.

ORGANIZATION OF THE STUDY

Project Co-leaders of the Study Panel:

General Larry D. Welch, USAF (Ret.), President, IDA

Dr. David L. Briggs, Lincoln Laboratory

Other Members of the Study Panel:

Dr. Richard D. Bleach, IDA

Dr. Gregory H. Canavan, Los Alamos National Laboratory

Ms. Susan L. Clark-Sestak, IDA

Mr. Richard W. Constantine, consultant

Dr. Charles W. Cook, IDA

Dr. Maile S. Fries, IDA

VADM David E. Frost (USN, Ret), consultant

Dr. David R. Graham, IDA

Mr. Dennis J. Keane, Lincoln Laboratory

Dr. Steven D. Kramer, IDA

Mr. Philip L. Major, IDA

Dr. Charles A. Primmerman, Lincoln Laboratory

Dr. John M. Ruddy, MITRE

Dr. George R. Schneiter, consultant

Dr. Jocelyn M. Seng, IDA

Mr. Robert M. Stein, consultant

Dr. Stephen D. Weiner, Lincoln Laboratory

VADM James D. Williams (USN, Ret), consultant

GLOSSARY

ABL	Airborne Laser
ACL	Achievable Capabilities List
AT&L	Acquisition, Technology and Logistics
BMD	Ballistic Missile Defense
BMDO	Ballistic Missile Defense Organization
BMDS	Ballistic Missile Defense System
C2BMC	command and control, battle management, and communications
CAIG	Cost Analysis Improvement Group
COCOM	Combatant Command
DoD	Department of Defense
DoDD	DoD Directive
DOT&E	Director, Operational Test and Evaluation
EMR	European Midcourse Radar
FFRDC	Federally Funded Research and Development Center
FYDP	Future-Years Defense Program
GBI	Ground-Based Interceptor
ICBM	intercontinental ballistic missile
J8	Joint Capability Development Directorate
JCIDS	Joint Capabilities Integration Development System
JPO	Joint Program Office
JROC	Joint Requirements Oversight Council
MDA	Missile Defense Agency
MDEB	Missile Defense Executive Board
MOA	Memorandum of Agreement
NSPD	National Security Presidential Directive
O&S	Operations and Support
OSD	Office of the Secretary of Defense
PA&E	Program Analysis and Evaluation
PCL	Prioritized Capabilities List
RDT&E	research, development, test, and evaluation

S&T	science and technology
SBX	Sea-Based X-Band Radar
SDIO	Strategic Defense Initiative Organization
STRATCOM	(also called USSTRATCOM)
STSS	Space Tracking and Surveillance System
T&E	test and evaluation
THAAD	Terminal High Altitude Area Defense System
UEWR	Upgraded Early Warning Radar
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics
USD(P)	Under Secretary of Defense for Policy
USSTRATCOM	United States Strategic Command
VCJCS	Vice-Chairman, Joint Chiefs of Staff

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED *(From–To)*
August 2008	Final	January 2008 – August 2008

4. TITLE AND SUBTITLE

Study on the Mission, Roles, and Structure of the Missile Defense Agency (MDA)

5a. CONTRACT NUMBER
DASW01-04-C-0003

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

General Larry D. Welch, USAF (Ret.), Project Co-Leader, Dr. David L. Briggs, Project Co-leader, R.D. Bleach, G.H. Canavan, S.L. Clark-Sestak, R.W. Constantine, C.W. Cook, M.S. Fries, D.E. Frost, D.R. Graham, D.J. Keane, S.D. Kramer, P.L. Major, C.A. Primmerman, J.M. Ruddy, G.R. Schneiter, J.M. Seng, R.M. Stein, S.D. Weiner, J.D. Williams

5d. PROJECT NUMBER

5e. TASK NUMBER
IDA Task DB-2-2921

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Institute for Defense Analyses
4850 Mark Center Drive
Alexandria, VA 22311-1882

8. PERFORMING ORGANIZATION REPORT NUMBER

IDA Paper P-4374

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Executive Director (MDA-DX)
Missile Defense Agency
7100 Defense Pentagon
Washington, DC 20301-7100

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited. (28 August 2008)

13. SUPPLEMENTARY NOTES

14. ABSTRACT

In response to a mandate by The National Defense Authorization Act for Fiscal year 2008, Section 222, the Institute for Defense Analyses (IDA) was tasked by the Department of Defense to carry out an independent study to examine and make recommendations with respect to the long-term missions, roles, and structure of the Missile Defense Agency (MDA). The scope of the review included panel discussions with leadership from the Army; Navy; Air Force; Joint Staff; Under Secretary of Defense for Policy; Under Secretary of Defense for Acquisition, Technology, and Logistics; Director, Operational Test and Evaluation; Program Analysis and Evaluation; and the Defense Information Systems Agency, as well as MDA. Several discussions were also held with contractors supporting MDA. The review also included site visits to United States Strategic Command (USSTRATCOM), United States Northern Command, Air Force Space Command, the Missile Defense Integration and Operations Center, and MDA at Redstone Arsenal. This report summarizes the study findings and recommendations.

15. SUBJECT TERMS

missile defense; MDA; ballistic; BMDS; MDEB; life cycle management process; RDT&E; JPO; Blocks; sensors; interceptors; command and control, battle management, and communications (C2BMC)

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
					David M. Altwegg, RADM (ret)
a. REPORT Uncl.	b. ABSTRACT Uncl.	c. THIS PAGE Uncl.	SAR	60	19b. TELEPHONE NUMBER *(include area code)* 703-697-7691