

Blurring The Line Between R&D and Operations

The Missile Defense Agency's Acquisition Approach

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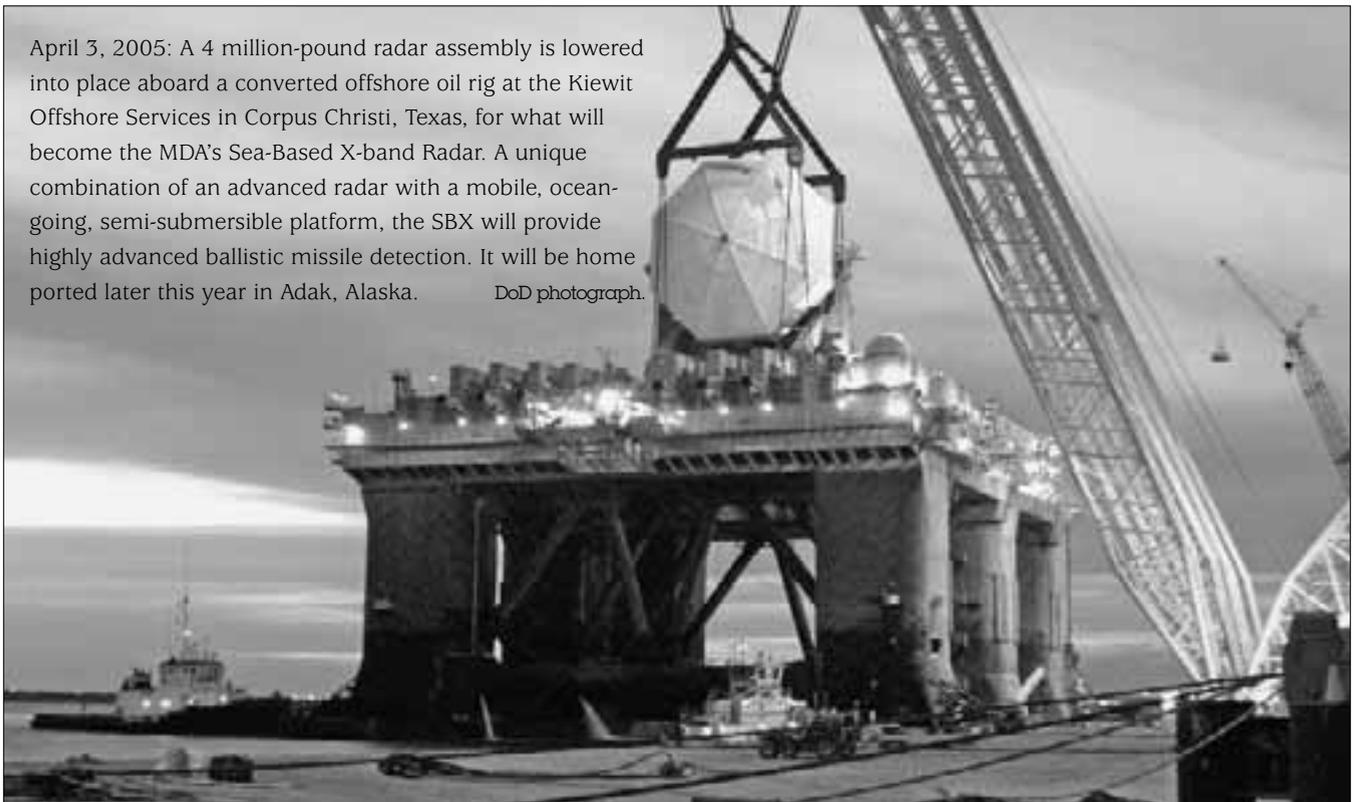
Dramatic changes have been made in the way in which the Department of Defense develops and procures weapon systems. There is a movement away from the strict requirements-based approach that emphasized a formalized identification of deficiencies, an identifiable and predictable threat, and strict system performance parameters. In the vanguard of this defense acquisition process revolution is the Missile Defense Agency's embrace of capabilities-based acquisition and spiral development. Since its adoption of these processes in January

"Create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation."

Deputy Secretary of Defense Paul Wolfowitz, October 2003

2002, the MDA has made remarkable progress in restructuring its approach to the development of a fully integrated ballistic missile defense system (BMDS). The MDA is now faced, however, with an even larger—and perhaps more difficult—task: turning these principles into formalized and institutionalized programmatic processes in the face of significant cultural and organizational challenges. Those challenges are based on the fact that MDA's approach significantly alters the traditional roles and responsibilities of acquisition organizations, operational units, and contractors.

April 3, 2005: A 4 million-pound radar assembly is lowered into place aboard a converted offshore oil rig at the Kiewit Offshore Services in Corpus Christi, Texas, for what will become the MDA's Sea-Based X-band Radar. A unique combination of an advanced radar with a mobile, ocean-going, semi-submersible platform, the SBX will provide highly advanced ballistic missile detection. It will be home ported later this year in Adak, Alaska. DoD photograph.



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The MDA's approach is unprecedented for such a large program. Although some DoD acquisition organizations have, in the past, bridged the organizational and cultural gap between research and development and operational use, the BMDS will be the first large-scale program that comes into operation while still, in effect, in an R&D mode. This capability-based approach calls into question who "owns" the particular system and significantly alters the traditional DoD role of the acquisition community.

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Although much of MDA's acquisition approach is still undergoing refinement, the fundamental precepts are in place.

Despite recent testing setbacks, a rudimentary missile defense system will soon go operational, the overall BMDS program management of the system remaining with MDA. There will be no formal turnover from the acquisition community to the Services for many of the missile defense elements and components. MDA will concurrently test and operate the BMDS while on alert, and day-to-day operations will be performed by a mix of contractors, National Guard, and servicemembers. Contractor logistics support (versus a large Service-led logistics "tail") will be the key to maintaining the system. These initiatives are a significant break with existing DoD processes and will serve as a model for the development and fielding of large-scale future joint systems.

Unique Nature of the BMDS Program

There is a well-established and formalized process for transitioning a system from R&D to operational use that allows the Service to formally identify and allocate funding to operate the system, to train personnel, and to develop logistics procedures. A variety of factors, however, will require the BMDS to operate in a manner that is not in clear concert with the existing DoD processes. Although these factors are unique, they have relevance to other future high tech joint systems. A major issue is that BMDS elements and components will be fielded in very small numbers; for example, only a handful of ground-based mid-course interceptors are initially planned. This is in contrast with most weapon systems, which are produced using a fairly rigid lockstep process, manufactured in mass quantities, and often require a long logistics and maintenance tail. A modern BMDS negates the need for a large number of military personnel to be identified, trained, and equipped.

Another unique factor is that unlike most DoD weapon systems under development currently, the BMDS will provide a new capability that is non-existent today: the interception and destruction of an incoming ballistic mis-

sile. Since the BMDS provides a new capability, integration testing—both horizontally and vertically—occurs across the entire system, as opposed to the long series of formalized processes and regression tests that are necessary to ensure that adding a new capability does not degrade existing capabilities. The lack of any current capability today to defeat a ballistic missile attack negates the need to defer fielding of the BMDS.

Another consideration is the unprecedented level of integration required among BMDS early warning sensors, weapons sensors, and interceptors. The speed required to track, identify, and

engage a ballistic missile calls for an extraordinary level of sensor fusion. No single sensor or weapon can achieve the capability required to engage a ballistic missile traveling at high speeds across oceans and continents. Only through continued, centralized management of all BMD systems will MDA be successful in developing a program that meets the unique characteristics of a missile defense engagement.

Restructuring the Missile Defense Program

MDA's approach was brought about by Defense Secretary Rumsfeld's January 2002 memorandum on MDA program direction, which fundamentally restructured the missile defense program by canceling the missile defense operational requirements documents (ORDs). This was the most fundamental redirection of the missile defense program since its inception in 1983. Like all ORDs, the missile defense ORDs mandated discrete and exact levels of effectiveness (key performance parameters) for each missile defense element. A theater air and missile defense capstone requirements document was also established; it laid out the overall framework for the entire missile defense mission.

By canceling the ORDs, Rumsfeld recognized that success in the missile defense battle is only achievable if the BMDS is seen as a synergistic whole. In contrast, the missile defense ORDs had divided the missile defense elements into discrete and separate managerial and technical entities. The director of the then Ballistic Missile Defense Organization (BMDO) did not have ultimate authority over these elements because the element program managers reported to their respective Services and not to BMDO. This situation made the management of the BMD elements complex and unwieldy and achievement of a fully integrated system impossible.

While the cancellations of the missile defense ORDs was a dramatic departure from existing acquisition processes,

even more important was Rumsfeld's decision to transfer program management of some missile defense programs from the Services to MDA. This broke a long-standing programmatic management framework of the elements reporting to their respective Services and emphasized DoD's emphasis on joint materiel development programs and its willingness to undertake dramatic and unprecedented approaches. With the BMDS elements now under MDA management, a key challenge will be whether it is practical to transfer these programs back to the Services when the BMDS component or element has achieved a certain level of capability and the Service is willing to procure, support, and operate the capability.

Possible Categories of Transition and Transfer

A challenge for MDA is the fact that the transfer of certain BMDS elements to the Services would create organizational, budgetary, and cultural stovepipes that would hinder the use of the systems. According to the January 2002 directive, the BMDS management process will consist of three phases: development, transition, and procurement and operations. It is becoming clear, however, that the global nature of the BMDS will not allow for the firm, discreet categories envisioned at that time. A more appropriate paradigm may be that transition of BMDS elements can be viewed as fitting into a broad spectrum of three categories.

The first category consists of those elements that will undergo little or no transition to a Service. The Sea-Based X-band (SBX) Radar is one such system. The SBX will perform a vital surveillance and tracking function for the BMDS; however, the nature of the vessel and its mission is not conducive to its transition and transfer to the Navy (or any other Service). The SBX will perform strictly a missile defense role; therefore, it doesn't fit into traditional Naval doctrine or concepts of operations. The SBX's small manning requirement can be satisfied with minimal Navy participation. MDA may manage the SBX as long as it is in operation. The MDA Command, Control, Battle Management and Control is also in this category based on the need for a joint global command network to direct all aspects of the missile defense battle. This category would require MDA to continue producing, maintaining, and servicing the system for an indefinite period. Program management, configuration control, and the training of operators will also be the continued responsibility of MDA.

A second category lies with a collaborative transition effort between MDA, the Services, and the combatant commands. The Terminal High Altitude Area Defense program is the most conducive for this approach because there is a strong Service sponsor (Army), and it will be produced in enough quantities to make it possible for a Service to develop organizational and doctrinal structures. However, based on its ability to engage mid- to long-range

ballistic missiles, it will be a key element in the strategic, global BMDS mission and, therefore, it may not be practical to transfer full program management to the Army.

A key concern in this collaborative approach is how a Service can develop long-term funding plans through the program objective memorandum process for a BMDS element over which it doesn't have full authority. One possible approach is to see the MDA role as the procurement lead for the first or second fire unit of an element in a block, with the Service and the combatant commander making decisions on the ultimate quantity of the procurement.

The third category encompasses the traditional method involving full programmatic transfer from a research, development, test & evaluation (RDT&E) agency to the Service. Patriot Advanced Capability – Phase 3 is the best example of this type of transition. Because PAC-3 is a regional defense system, it does not have a significant role in the global BMDS mission. Because of its missile defense role, MDA would need to maintain configuration control over PAC-3; however, full programmatic responsibilities rest with the Army.

Further Challenges Face MDA

Developing the procedures to maintain an operational capability for elements and components that are still in a developmental status presents yet another challenge for MDA. To meet the challenge, MDA has instituted a concurrent test and operations process that will allow the simultaneous testing and improvement on the BMDS, while maintaining the system on alert and in an operational status. To continue testing on a fielded system is, of course, routine; however, it is rare and challenging for a high-tech system with no technological precedent, like the BMDS, to maintain a rigorous testing program while in an operational status.

The need to conduct concurrent test and operations rests with the presidential direction to deploy an initial missile defense capability in 2004. This decision changed the entire character and nature of the ballistic missile program. The test missiles, fielded in Alaska and California, are now to be used in an operational role also. It was recognized, however, that the testing program needed to continue. MDA decided it would not be prudent to transfer a BMDS element—even one that would have an operational capability—to a Service while it was still involved in a rigorous test program.

The fielding of a system while still, technically, in an R&D role required innovative thinking and approaches in the funding and in fielding systems. This new perspective in acquisition is shown in MDA's approach to operations and sustainment (O&S) costs of the BMDS. While logistics support for a fielded system is traditionally the responsibility

ity of the Service and is done by Service personnel, MDA has made the decision to fund the activity via contractor logistics support (CLS) through fiscal year 2009. This is a significant step in awareness that the traditional DoD logistics support process doesn't meet the requirements for the BMDS. CLS is traditionally a lifetime maintenance concept. MDA's commitment to life-cycle CLS indicates that no one Service will develop, organize, and support the BMDS. MDA's funding of this activity is a recognition that it will have to perform functions that an R&D agency has not performed in the past. It's another reflection of the fact that the traditional line between R&D and operations is becoming less and less defined.

There is a well-established and formalized process for transitioning a system from R&D to operational use. A variety of factors, however, will require the ballistic missile defense system to operate in a manner that is not in clear concert with the existing DoD processes.

phasize Service "ownership" and embrace joint warfighting concepts. For example, the Joint Forces Command has drafted joint operating concept papers that emphasize the elimination of Service stovepipes, shared assets, and joint materiel development systems. The draft documents stress that "rather than insisting upon ownership of organic assets, future commanders must become adept at achieving strategic and operational goals with shared joint assets and capabilities."

The MDA approach is also in concert with the strategic, top-down emphasis of the Joint Capabilities Integration and Development System (JCIDS), which is a dramatic departure from the former Requirements Generation System (RGS). The JCIDS

MDA's approach calls into question whether DoD's current management approach towards budgeting is adequate. DoD has fairly strict regulations that require all funding to be divided into five specific categories of spending, with the missile defense appropriations coming under the RDT&E account ("3600 money"). The regulations require that an acquisition organization using 3600 money fund all aspects of a developmental program, including test articles and activities; however, funding for the testing that is done after fielding of a system is to come under procurement or operations and maintenance appropriations. The operational fielding of the BMDS, in a limited capacity, makes these distinctions between RDT&E and O&S funding increasingly unwieldy. The fielded BMDS will be capable of providing an operational capability; however, it will continue to be managed by an acquisition organization—the MDA—using RDT&E funding. Through spiral improvements, an increasingly capable system will be developed, but it will still remain (technically) an acquisition program. While the existing DoD financial management approach mandates very discrete distinctions between funding acquisition (RDT&E) programs and operational systems, the BMDS will not fit easily into either category. Rather than attempting to fit the BMDS into either grouping, I recommend that the DoD reassess its budgeting management processes to accommodate the increasingly unclear distinction between R&D and operations.

In Accord with Defense Acquisition Reform Initiatives

MDA's approach is unique, imaginative, and in accord with the flexible and tailored nature of the new defense acquisition guidelines regarding joint operations. It is also in accord with the DoD doctrinal changes that de-em-

recognized that only through top-down direction (versus bottom-up identification of deficiencies) could fully joint concepts and programs be instituted. The RGS served well for strictly Service programs, but it would be difficult for one Service, using the bottom-up approach of the RGS, to envision or articulate the requirements for a fully integrated BMDS using air, sea, and land weapons, sensors, and associated Command, Control, Battle Management and Control. Services could identify requirements to defend against theater and tactical threats using the RGS, but it required top-down, strategic policy direction to tie all Service missile defense elements into the integrated whole that is the BMDS.

If joint doctrine and network-centric warfare are the paradigms for tomorrow's defense environment, it makes little sense to develop, procure, and manage weapon systems in an individual manner. The MDA approach recognizes that innovative and revolutionary processes are necessary to fully achieve an interoperable BMDS, and these processes are slowly coming into place to deploy a system that will, for the first time in history, be able to defend the nation against ballistic missile attack. The biggest hurdle ahead of MDA today is not technological but organizational and procedural, as it paves an approach that will serve as a precedent for the acquisition of future joint concepts and programs.

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