

Preparing to Meet Tomorrow's Undefined Threats with Today's Acquisition Reform Initiatives

NMD Joint Program Office Staying One Step Ahead

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The application of Department of Defense (DoD) Acquisition Reform initiatives in a joint program environment presents unique acquisition management challenges to the National Missile Defense (NMD) Program. Service parochialism; geopolitical considerations; the presence of "rice bowl" programs, processes, and procedures; as well as institutionalized organizations can and do present significant roadblocks to joint acquisition programs.

The NMD Development Challenge

To remove real and perceived roadblocks and arrive at cost-effective solutions to these acquisition environment challenges, Army Maj. Gen. Joe Cosumano, Jr., the NMD Program Manager, challenged industry to accept a large measure of program responsibility for system integration.

As part of that challenge, he tasked industry to propose how they would integrate the diverse Service-oriented development programs into a single product called the NMD System. Further, to facilitate acquisition of this NMD System and ensure appropriate leveraging of Service personnel expertise, he directed that the NMD JPO create a "fed-

Personal Reflections

Each of the military services fully embraces the tenets of Acquisition Reform. They document their reforms and the resulting accomplishments in numerous periodicals and trade magazines. Yet, as I researched joint acquisition principles while attending the Advanced Program Management Course at the Defense Systems Management College, very few articles documenting joint Acquisition Reform successes were available. This does not suggest that joint program offices are devoid of Acquisition Reform successes; it simply means that there is scant documentation about joint acquisition programs available for review. This article shares how the NMD Joint Program Office (JPO) in the Ballistic Missile Defense Organization (BMDO) successfully applied Acquisition Reform initiatives to the NMD joint acquisition program.

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erated" management organizational structure.

The JPO is a multi-Service organization, a sub-unit within the Ballistic Missile Defense Organization (BMDO) with its own distinct charter. As such, it has the unique challenge and mission to acquire, develop, and integrate a defense system that provides the United States with an active Ballistic Missile Defense to counter limited ballistic missile attacks from threat nations. Congress increased this procurement challenge with an aggressive and ambitious schedule.

Simply stated, the schedule for completion of the NMD System technology development to counter a "threshold" threat is CY 2000. Then, should the legislative and executive branches of government decide to deploy an NMD System, it must be deployed and operationally capable within another three years. The common description for this requirement is the "NMD 3+3 Program."

To reduce the development and integration risk of the NMD System development, NMD acquisition strategists directed the acquisition of a Lead System Integrator (LSI) contractor. The LSI will design, develop, integrate, test, and support NMD System development planning. Two large aerospace companies, The Boeing Company and the United Missile Defense Company, competed for this contract.

During the initial phase of the LSI procurement, the companies were awarded a six-month Concept Definition contract, starting in April 1997, to propose an NMD Program architecture. The second phase of the LSI procurement (Execution Phase) began with award of the LSI contract by BMDO's Acquisition Executive, Air Force Lt. Gen. Lester Lyles, to Boeing.

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Aggressive Use of Acquisition Reform

Because the joint nature of the NMD Program demands aggressive application of DoD's Acquisition Reform principles, each Service supporting the NMD JPO tailored the DoD Directive 5000.1 acquisition fundamentals to their own particular acquisition requirements and circumstances. They did this to obtain the best value for the NMD Element development contracts now under their control that are part of the NMD System, and will eventually transition to the LSI contractor.

Adaptation of previous Service-unique acquisition practices to the present needs of the NMD JPO is a significant task and presents difficult management concerns, choices, and options to the Services. In addition, the Service organizations supporting the JPO have long-standing organizational/management structures that may also require modification to address the requirements of the NMD JPO material development.

Federated Management

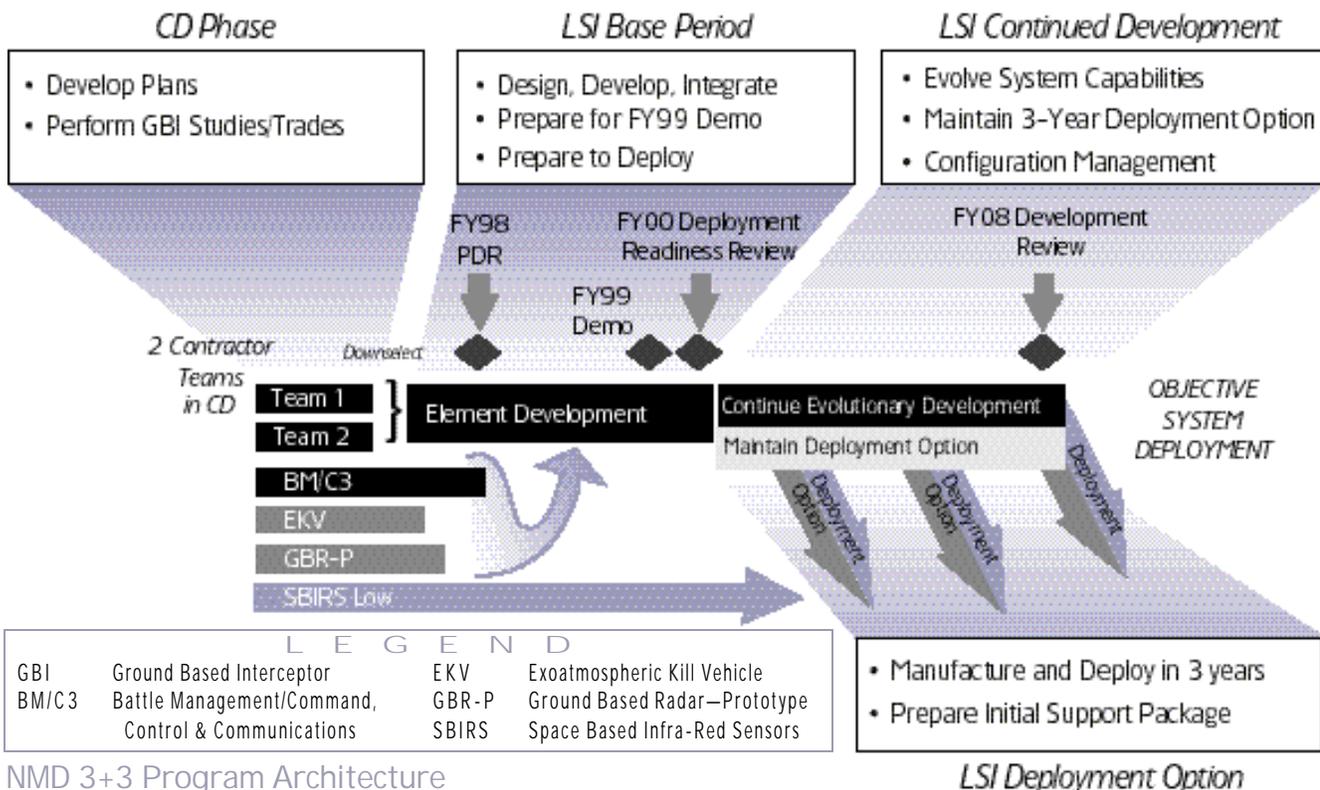
The management of a geographically distributed NMD JPO presented nu-

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merous coordination challenges to NMD's Program Manager (PM). To meet these challenges, JPO implemented numerous initiatives to enhance program control. Specifically, the creation of a cutting-edge Intranet to rapidly disseminate key program information, extensive use of secure NMD video-conferences, NMD PM All-Hands Update memoranda, and the orchestration of numerous Integrated Product Teams (IPT) kept NMD stakeholders, BMDO management, and JPO personnel informed.

The Services' role in the NMD System development over the course of many years has and will be significant. Over the years, the Services managed numerous technology programs that currently provide the foundation of NMD System development activities. Boeing, the government's LSI contractor, will partner with a federated JPO, and assume development and integration responsibility for the NMD System.

The LSI, leveraging upon past Service efforts, will select/modify existing program work and even initiate new NMD Element developments (if required) to satisfy NMD user requirements. With its



NMD 3+3 Program Architecture

System-level perspective, the LSI contractor will have the authority to allocate or re-balance Element-level requirements.

The prominent, enhanced integration role of the LSI contractor is a paramount ingredient of the government's plan to make the 3+3 NMD development and deployment a reality. Only a System-level approach to NMD integration can ensure timely development decisions by all parties.

Do Lessons Learned Apply?

The last major land-based missile development system designed and deployed to provide the United States with a Ballistic Missile Defense capability was the SAFEGUARD system. A fundamental question to answer is whether the *now* NMD System development can use the *then* SAFEGUARD program as a model. The correct answer is yes, no, and maybe.

In a broad sense, the "yes" answer includes allowances for 20-40 years of technology improvements and cost growth. Many observers point to the similarities between NMD and SAFEGUARD planning that started in 1955. Congress halted this U.S. Army Air Defense program effort short of full operational capability in 1975.

In 1976, Congress ordered the deactivation of the interceptors and put most of the facilities in Army "caretaker" status. Now, 23 years later, SAFEGUARD "lessons learned" provide a valuable reference for developing the NMD System.

On the "no" side, consider the present deployment time required for NMD and contrast it with the time allowed to develop the SAFEGUARD Anti-Ballistic Missile Defense site. While this latter task took much longer than that allocated to

THE SECOND PHASE OF THE LSI PROCUREMENT (EXECUTION PHASE) BEGAN WITH AWARD OF THE LSI CONTRACT BY BMDO'S ACQUISITION EXECUTIVE, AIR FORCE LT. GEN. LESTER LYLES, TO BOEING. PICTURED ARE MEMBERS OF THE GOVERNMENT TEAM DURING A BRIEFING TO COMPETITORS PRIOR TO CONTRACT AWARD.



LSI COMPETITORS INSPECTING A DEACTIVATED AND DEMILITARIZED SITE.



NMD (three years), the totality of the SAFEGUARD site and the number of its missiles were much larger. Thus, a "no" answer applies. However, aspects of the historic program still apply to NMD facilities and military construction requirements.

A major difference was that the *then* SAFEGUARD program was a "national priority" program. The *now* NMD is a constrained development program that will neither start construction nor deploy until justified by an actual or perceived Intercontinental Ballistic Missile threat.

Therefore, the lesson learned is to do early planning for a transition to execution of a National Priority Program and not wait until the National Command Authority orders deployment to start planning. *Now* as *then*, the NMD System and its deployment must become a top national priority if the NMD is to be operational within the proposed three-year period. Thus, you have a "maybe" answer.

Significant lessons learned can also come from "The Stanley R. Mickelsen SAFEGUARD Complex, North Dakota Pro-



ABROKEN RELIC OF A PROUD PAST. ASPECTS OF THE SAFEGUARD ANTI-BALLISTIC MISSILE DEFENSE HISTORIC PROGRAM STILL APPLY TO NMD FACILITIES AND MILITARY CONSTRUCTION REQUIREMENTS TODAY.



OLDER PERIMETER ACQUISITION RADAR PROVIDED TIMELY WARNING FOR SAFEGUARD ANTI-BALLISTIC MISSILE SYSTEM.

ject History.” This 1995 document illustrates how industry and the government had to work together as a close-knit team to activate a new operational anti-ballistic missile site. This fact and the need for integrated teamwork, prompted the NMD leadership to ensure early involvement by industry in NMD integration planning.

Even the Theater High Altitude Air Defense Program (THAAD) provided NMD invaluable “lessons learned” in shaping its acquisition strategy and developmental test program.

First, NMD enhanced the emphasis placed on the development/improvement of specific procurement processes (system engineering, software development, and system testing). Then we modified the NMD’s current System Evaluation Plan (analogous to a Test and Evaluation Master Plan) to ensure that appropriate “checks and balances” actually verify satisfaction of system performance requirements. In addition, NMD established common software metrics and checkout procedures for test and operational-related software across all NMD Elements.

Second, we focused on another lesson learned to ensure that the NMD test program includes adequate, event-driven, flight test intervals. We also changed the NMD test program to provide sufficient time to ensure appropriate consideration and resolution of anomalies, failures, and delays before new testing begins. In addition, we decided upon a deliberate series of pre-flight ground tests with emphasis on quality management to ensure that the test-configured hardware and software is fully “wrung-out” before the flight test.

Third and perhaps the most important lesson we learned from the THAAD Program, is that flight test success requires management commitment. Improved processes can only happen with the PM’s support and direction. Only a concerted management effort can ensure that “details” receive adequate attention and that execution of pre-flight checks and post-flight analyses receive the requisite discipline. An oft-repeated adage applies here: “Those who do not learn from history, are doomed to repeat it.”

Use of Theater Missile Defense Technology for NMD

The informed American public asks, “Why not use existing U.S. anti-missile systems to perform the NMD task?” Rapt taxpayers glued themselves to Cable News Network footage during Operation Desert Storm. They saw U.S. Army Air Defense Batteries, using a modified and unproven missile from the Patriot Air Defense System, engaging Iraqi SCUD missiles. This technical achievement is indelibly etched in America’s collective memory. Consequently, the same American taxpayer now wants to know why the Patriot missile that shot down SCUD missiles cannot be used against an Intercontinental Ballistic Missile and its re-entry vehicles.

The answer to this question rests on an understanding of the difference between the "performance envelope" for a Theater Missile Defense (TMD) missile and that required for an NMD missile. In simple terms, TMD's performance envelope (requirements) has a comparatively limited need for battlespace (kill distance) and a lesser requirement for defense against sophisticated threat missiles traveling at much higher speeds than SCUD missiles. The difference in the *TMD capabilities* and *NMD requirements* is significant when you compare the battlespace and distance requirements of a missile defense to protect the national homeland against Intercontinental Ballistic Missiles.

Both defense systems, however, require and use early warning data. The NMD's need for timely information, accurate intelligence, and large quantities of data necessitate a much higher level of coordinated battle planning and rapid interface with other existing national resources.

The difference in warning data requirements exists because for a tactical battle scenario, the warning time is very short for a missile intercept. The intercept occurs at a relatively short range from the interceptor launch site in tactical battle.

On the other hand, an Anti-Ballistic Missile system capable of defending the United States needs a comparatively long warning of a hostile launch. An Anti-Ballistic Missile also requires a very fast, long-range, and extremely accurate hit-to-kill interceptor to eliminate a threat as far away from U.S. territory as possible.

Some TMD technologies apply to the development and acquisition of the NMD. One example of TMD technology in the NMD toolbox is the Ground-Based Radar, developed as part of the THAAD System. This and other ground-based sensor systems represent a cornerstone of present NMD System planning.

More Aggressive Acquisition Implementation

Early in 1997, the BMDO Contracts Directorate released a Request for Proposal

(RFP) for an LSI contract to determine who, in American industry, was interested in "integrating the NMD System, following DoD Acquisition Reform guidance on *performance-based requirements*."

The use of performance-based requirements was a hallmark of BMDO's acceptance of Acquisition Reform and best commercial practices. Industry response to the draft RFP was good, reflected by a large number of firms (77) asking to be placed on the "bidder's list" and from subsequent receipt of strong, credible proposals.

Following the LSI contract award, the government is transitioning its integration functions and support to its "new integration partner." The transition will truly test the resolve of the acquisition streamlining initiatives adopted and agreed to between the JPO, the Services, and the LSI contractor.

Acquisition Reform and Streamlining Initiatives That Worked

Since the genesis of the LSI concept and procurement JPO implementation, numerous Acquisition Reform measures and streamlining initiatives have arrived to support the NMD challenge. These include:

Use of Integrated Product and Process Development (IPPD) Teams. The NMD Program makes extensive use of Office of the Secretary of Defense oversight and program IPT infrastructure. Five teams are now in place.

Program IPTs are flexible working teams that exist for as long as necessary to satisfy the intended objectives. As such, they hold regularly scheduled meetings and use the principal NMD Program members and stakeholders to resolve issues, reduce risks, and impart "value added" to the NMD. The current government IPT role will change to accommodate the LSI contractor's participation as needed.

Implementation of Electronic Commerce. Creating an NMD Internet "LSI Home Page" helped provide the NMD

Team and bidders with up-to-date information. During the LSI procurement, 77 potential bidders registered to receive procurement data. The cost of providing this information on the World Wide Web is insignificant in comparison to reproduction, labor, and postage costs to mail the same information.

Digital Bidders' Library. The NMD JPO used a CD-ROM, "Bidders' Library" for the LSI CD Competition. Using electronic media, potential bidders received two compact disks containing 89 complete reference documents. Each disk contained tens of thousands of pages of reference material. The use of commercial technology avoided duplicating and distribution costs for many hundreds of pounds of bidder reference material.

Since CD contract award, the JPO has sent hundreds of additional documents to the competing contractors in digital format (whenever possible), with a small number distributed in hard copy.

Use of a Statement of Objectives (SOO). The JPO used five pages of NMD requirements described as objectives rather than the more familiar multi-page, detailed work statements or requirements in a traditional Statement of Work.

Focus On "Performance-Based" Specifications. The JPO focused on "performance" rather than detailed designs to better concentrate on satisfying user needs. This practice provides the LSI maximum trade space without compromising performance requirements. The source of the performance requirements was the user's Capstone Requirements Document, embodied in a 21-page portion of the NMD Systems Requirements Document, which is now a part of the LSI contract.

Requiring Minimal Contract Data Requirements List/Contract Line Items (CDRL/CLIN). In a change that runs counter to past practice, the LSI Offerors were tasked to propose only those CDRLs that add value to the program or provide required government data/information.

Publication of a Single Acquisition Management Plan (SAMP). A single document, the NMD SAMP, provides a broad description of the NMD Program Manager's Plan for management of the NMD Program. The SAMP also describes the NMD management plan for the 3+3 program, the JPO management structure, and a consistent program management baseline.

Use of a Paperless Source Selection Process. To streamline the LSI source selection process, the evaluators used an automated source selection software program tool in the Concept Definition and the Execution Phase evaluations. This tool allowed the evaluators to enter comments and ratings and forward results "up the chain" via a secure local area network.

Holding Focused Technical Interchange Meetings. The JPO provided site visits to give the LSI offerors a better appreciation of those government assets available for integration into the offerors' plans. In addition, biweekly offeror meetings were held with the NMD Program Manager to provide timely updates, status check, and identify development issues. (The government opened normally closed meetings to the LSI competitors during the six-month Concept Definition phase and provided them insights into NMD Element development.)

Tangible Benefits of Innovative Solutions

Early application of the Integrated Process/Product Team concept will enable the JPO and the LSI to "bond" simultaneously, agreeing on work requirements and solutions, at a predetermined level of empowerment for the LSI. In addition, the NMD JPO's continuing use of other streamlining features like a paperless database, media conferencing, and an Internet "hot news" Web site for real-time information exchange, moves NMD acquisition into the category of "world class" acquisition practices.

The intrinsic value of the Ballistic Missile Defense Organization's manage-

ment thrust is to rapidly identify and eliminate non-value-added functions and requirements, and still provide tracking and compliance with the user's Capstone Requirements Document.

Streamlining NMD Management of the LSI Contractor

The NMD team wears the mantle of responsibility to develop insight into the feasibility and value for the associated costs of the contractor's efforts and processes. For that reason, the LSI solicitations and ensuing contracts did not include requirements for standard government management approaches or manufacturing processes.

As part of that responsibility, the JPO will evaluate contractor products and not the processes used to build the product, be it hardware, software, or facilities. An essential issue for the government is to determine the value of each product in light of its Life Cycle Cost and its contribution toward meeting performance objectives and risk reduction.

The Realities Of NMD Streamlining

Resources to fund NMD's development partner must come out of the existing NMD budget. The NMD development infrastructure must allow the LSI to satisfy NMD requirements as a normal expeditious task by using streamlining initiatives, void of previously cited, costly acquisition roadblocks.

Significant cost savings are possible by eliminating fractured and incomplete integration efforts, managed at the subsystem level of the NMD. The transition to system-level integration and performance management for NMD will ensure that the timely satisfaction of NMD System requirements is closely monitored.

Sharing Performance Responsibility

In light of economic and political realities, it makes sense to share NMD performance responsibility with a defense contractor if, and only if, there is assur-

ance the contractor can satisfy the NMD System performance objectives faster and more economically than the government can working alone.

The prospect that the LSI can or even will satisfy the government's performance task with a slight five-page Statement of Objectives and 22 pages of system performance requirements is difficult to accept for some.

This uneasiness and reluctance translated into a significant challenge for NMD's LSI Source Selection Team. They had to ensure that the winning proposal included a workable plan to satisfy the performance objectives, and had a strong NMD integration approach and fundamental credibility.

Government Acquisition Reform is mandatory if we in government are going to reduce DoD program costs. However, just streamlining government-mandated methods and processes cannot do the job alone. The new order of acquisition business requires more reliance, trust, and faith in the commercial sector.

The NMD JPO took advantage of DoD's acquisition initiatives and streamlining reforms to provide a basis upon which the NMD System can adapt to multiple threat considerations and scenarios. The NMD Program and team will continue to:

- Mature the performance capability of the NMD System until called upon to meet some future evolving threat.
- Evolve and employ acquisition streamlining/reforms and leverage lessons learned and quality program management.
- Make the NMD government/industry team concept stronger in order to make NMD a reality.

The objective is to stay ahead of the undefined threats and continue to provide a viable, cost-effective defense. The bottom line is for the NMD team to integrate, test, and plan for the most effective land-based anti-ballistic missile protection of the United States that is humanly and technologically possible.