Opening Remarks for
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Director, Ballistic Missile Defense Organization
before the
Subcommittee on Strategic Forces
Committee on Armed Services

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Good afternoon, Mr. Chairman and Members of the Committee. It is a pleasure to be here to present the Department's Ballistic Missile Defense program. I have a formal statement that I would like to submit for the record, and a brief set of remarks I would like to go through quickly, and then I welcome your questions.

Over the past few years, Congress and the Administration have consistently directed that BMDO focus on three priorities: developing and fielding highly effective theater missile defenses (TMD); developing for deployment a national missile defense (NMD) capability; and maintaining a substantial advanced missile defense technology program. Mr. Chairman, the Fiscal Year 1999 budget request reflects those priorities and maintains both program focus and momentum to meet these challenges.

The total Fiscal Year 1999 budget request for the Ballistic Missile Defense Organization is $3.6 billion. Our budget includes $3.1 billion for RDT&E, $409 million for procurement, and $17 million for military construction activities. Combining these three budget categories, Theater Air and Missile Defense programs account for $2.1 billion or roughly 59 percent of the budget, while National Missile Defense represents $962 million or 27 percent. We are requesting $253 million for Advanced Technologies, which is about 7 percent of the budget. BMD Technical Operations accounts for $194 million and is about 5 percent of the budget. Finally, two of our new program elements, Threat & Countermeasures and International Cooperative programs represent a total of $72 million or 2 percent of the budget. These last two program elements do not represent new program efforts. Our revised budget structure simply raises their visibility.

Developing and fielding missile defense does present a unique challenge to all of us who participate in the program. This is because missile defense represents an entire mission area - one which cuts across all the Services - rather than a single Service weapon system. As the Committee is keenly aware, when conflicts arise, the military is called upon to fight jointly - in an integrated manner. Therefore, in the area of missile defense, we strive to develop and acquire missile defense systems in the same joint manner. This way, from the ground-floor, we build into those systems the ability to communicate, share information, and fight together and - as an overall architecture - we procure the optimum combination of sensors and interceptor systems. Joint mission area development and acquisition is especially important in missile defense, where the time of missile flights is measured in mere minutes and every second saved in early warning, sharing target information and launching interceptors can increase our battlespace to defeat an attacking missile. This is absolutely critical in theater missile defense, where timelines are even shorter.

This past year, the Department has given BMDO the additional responsibility to develop and integrate a joint architecture for both theater air and missile defense.

This makes absolute sense and allows us to prepare for the joint warfighter a single integrated air picture for his theater of operations. The missile defense programs we have structured are built on the important foundation of interoperability. This literally means the ability to detect and track missile threats using a combination of space-, sea- and ground-based sensors; communicating that information within the entire missile defense system; and allowing the joint warfighter to make the most effective and efficient use of interceptors. The missile defense program we have structured is focused on developing and acquiring several TMD systems that can work effectively alone as well as together.

Mr. Chairman, while we have many challenges working with Congress, together we are on the verge of fielding a comprehensive, highly effective missile defense that is responsive to the existing and emerging threat to the United States, our forward deployed forces, our allies and friends. I have provided a set of charts in my handout which provide a detailed overview of our TMD, NMD and Technology programs.

The first chart illustrates the master schedule for our TMD and NMD programs. It outlines our current funding, the FY 1999 request, and our projected Future Years Defense Plan or FYDP level. In addition, the chart also outlines some of the key milestones for each of these major defense acquisition programs, including when these programs go into production and fielding.

[CHART 1 - BMD MASTER SCHEDULE]

While the TMD and NMD programs comprise the lion's share of our budget request, are we still developing several critical missile defense technologies. The second chart lists those programs, along with the same type of budget information I showed for TMD and NMD. Instead of a development and acquisition schedule, I have listed the primary focus of these tech base programs. My only regret is that we do not have additional resources available for the tech-base - literally our seed corn for the future.

[CHART 2 - BMD ADVANCED TECHNOLOGY MASTER PLAN]

Theater Missile Defense

Mr. Chairman, I realize there is growing concern that we are pursuing several TMD systems and that together, these may not be affordable. I assure you, I share that concern about affordability. My prepared statement provides detailed information on our cost control and affordability initiatives currently underway. However, the TMD Family of Systems approach - the combination of ground, sea, and air-based TMD systems - is absolutely vital to ensure we develop a highly effective defense.

[CHART 3 - THEATER MISSILE DEFENSE]

My third chart illustrates how and where our TMD systems can engage attacking ballistic missile threats. Our lower-tier systems, PAC-3 and Navy Area, are the most mature and nearest to deployment. These two systems will only be able to defend against missiles of the 1,000 to nearly 1,300 kilometer range. THAAD, our most mature upper-tier TMD system, establishes a multi-tiered system that can engage longer-range missile threats and provide multiple shot opportunities. This increases the overall system effectiveness. Depending upon the location of the ship relative to

the attacking missile launch point, Navy Theater Wide can provide extensive coverage by intercepting missiles in the ascent and upper-tier phases of flight. MEADS, our international cooperative program with Germany and Italy, defends the maneuver force against ballistic and cruise missiles as well as other air-breathing threats. MEADS is unique because it is designed to be lightweight enough to travel with the maneuver force and provide 360 degrees of protection. This is something no other ground-based TMD system can do. Finally, while not part of my budget yet a critical element of our Family of Systems, the Air Force Airborne Laser program can provide a critical boost-phase intercept capability. This is particularly important against longer range ballistic missiles that may carry weapons of mass destruction or advanced countermeasures designed to defeat our terminal defenses. BMDO is working with the Services to ensure that these systems can talk, see, work and fight as an integrated team with one sole purpose - to provide the joint warfighter with the most effective system capability to protect our forward deployed forces, coalition forces, friends and allies.

Patriot PAC-3 is currently in the Engineering and Manufacturing Development (EMD) phase of the acquisition process. PAC-3 is being fielded in the course of three phased upgrades. Currently, we have fielded the first two of these phases or "configurations" of PAC-3, providing the Army with improved operational performance. These two configurations are available in the Middle East today in the case of a conflict with Iraq. The third and final configuration incorporates the hit-to-kill interceptor missile. Hit-to-kill interceptors provide us a capability to counter threats with weapons of mass destruction.

Navy Area. Following last year's successful intercept flight test, the Navy Area program was approved for entry into EMD on February 22, 1997. The program will commence Development Test flight testing in Fiscal Year 1999, followed by an at-sea demonstration of the User Operational Evaluation System (UOES) in Fiscal Year 2000. LRIP will begin in Fiscal Year 2000, with an FUE date of Fiscal Year 2001.

Theater High Altitude Area Defense (THAAD). The THAAD program is the most mature of our upper-tier TAMD systems. In 1997, as a result of our failure to achieve an intercept in flight tests and the need to reduce technical and programmatic risk, the QDR endorsed a plan to restructure the program and to achieve a FUE in 2006, vice 2004. Following a successful THAAD intercept flight test, we plan to execute the User Operational Evaluation System - or UOES - missile buy for 40 missiles. This decision will not be based solely on one intercept flight test. While the formal contract commencement is planned to follow the first successful intercept, we intend to execute a phased implementation strategy that includes two interim progress reviews and a subassembly review. The first review will follow the completion of FT-08, ground tests and a 60-day planning session. This review would give authority for partial "turn-on" to buy long lead items. A second review will take place prior to the full commencement of hardware purchases. Finally, a Government subassembly review will be conducted following flight test 10 - if necessary - to review plans to complete assembly of the missiles. This phased approach limits government financial and technical risk by allowing additional ground testing and flight testing prior to purchase of all hardware components. This provides us with early interim systems for testing in addition to providing the warfighter with an interim capability in Fiscal Year 2001, in case of a contingency conflict, until the objective system is fielded.

The next THAAD flight test is scheduled for May of this year. After last year's flight test, BMDO and the Army, and the contractor, each commissioned an Independent Review Team to review program processes and the design of the THAAD missile. I believe the IRT has had a direct, positive impact on the way the THAAD program conducts its business. As a result, we have increased the rigor in our ground testing program to verify the design as we prepare for our next flight test. That is where we detected the most recent technical problems.

I applaud the THAAD team for discovering the faulty components during their ground-tests and quality assurance checks - well before we tried to fly the interceptor. This drives home a point I will make in a few minutes about of testing program. The next flight test is scheduled for later this Spring.

Navy Theater Wide (NTW). The Navy Theater Wide program is currently in the Program Definition & Risk Reduction phase of development and is preparing for an initial Defense Acquisition Board (DAB) Review in next month. The Navy program office has proposed - and I fully endorse - and evolutionary acquisition approach consisting of an initial Block I system followed by a more-capable Block II system. The Milestone I-level DAB will be asked to review and approve this proposed evolutionary acquisition strategy.

MEADS - our cooperative program with Germany and Italy - is currently in the Project Definition and Validation phase, which is scheduled to be completed in the first quarter of Fiscal Year 1999. Negotiations for the next phase are currently underway with our international partners. The QDR recommended continuation of the MEADS program and increased the Fiscal Year 1999 funding level to provide a bridge to this next RDT&E phase. In light of the QDR guidance, the importance of this international program and continuing Congressional interest in out-year funding, I raised MEADS as an issue during the Department's POM deliberations this past Fall. Nonetheless, other defense program priorities at the time superseded addressing the issue. During the POM process this Spring, the Department will identify the resource requirements for all BMD programs and future funding of MEADS alternatives will be reviewed at that time.

Airborne Laser. Finally, closing out my remarks about theater missile defense, I would like to talk about an element of our Family of Systems architecture, but managed and budgeted by the U.S. Air Force. The Airborne laser is the Department's primary boost-phase intercept program for theater missile defense. BMDO and the Air Force work very closely to ensure that ABL is effectively integrated into the Family of Systems. When ABL is developed and deployed it will provide our warfighters with a powerful capability and will strengthen our overall missile defense architecture.

National Missile Defense.

Turning to our National Missile Defense program, the primary mission of the NMD system is to defend the United States against a limited ballistic missile threat by a rogue nation, should such a threat emerge. In addition, the NMD system would have some capability against a small accidental or unauthorized launch of a ballistic missile from more nuclear capable states.

To ensure the Department has the required capability to defend the Nation against an emerging threat, it has adopted an ambitious strategy known as "3 plus

3." By 2000, we will be in a position to make a deployment decision, if warranted by the threat, which would result in the deployment of an initial NMD system by 2003.

Literally, as we approach the 2000 deployment decision and assess the threat to the United States, we will be in a position to determine which NMD system element "tools" we will need to address the threat.

During the past year, we have conducted two very successful NMD flight tests that demonstrated sensor performance for the two competing contractor exoatmospheric kill vehicle (EKV) designs. EKVs are a major subcomponent of the GBI - indeed it is the "front end" of the interceptor that "sees" the target and destroys it by colliding with it at an incredibly high velocity. The first sensor flight test took place on June 23, 1997, and the second test occurred on January 16, 1998. The purpose of these tests was to analyze the ability of an EKV sensor to identify and track objects in space, including a representative threat target and decoys. Data gathered during the tests indicate that both EKV sensors performed extremely well. Neither of these flight tests attempted an intercept.

The next flight test for the NMD program will be the first intercept attempt under the "3 plus 3" program. During this test, we will attempt to intercept and destroy a "dummy" warhead deployed from a Minuteman ICBM launched out of Vandenberg AFB, California. A second intercept attempt, using the other competing EKV design, will follow and provide the data necessary to downselect to one EKV design. These represent important milestones on the path to the integrated system test in 1999 that will demonstrate overall system capabilities against threat-representative targets.

In the very near future, BMDO and the Joint Program Office will announce the award of the Lead Systems Integration (LSI) contract. Two industry teams are competing for this contract: the Boeing Company and the United Missile Defense Company, a joint venture between Lockheed Martin, Raytheon and TRW. The LSI contractor's main task will be to complete element development and integrate the elements into a system in time to provide the Department a viable deployment option in the year 2000. We have received two excellent proposals and will continue to evaluate them in the coming weeks.

The NMD program is progressing very well - especially considering the high risk schedule to which our team is working. I consider this a tremendous challenge - the likes of which we seldom see in the Department - to develop and be in a position to deploy a major defense system within such a short period of time.

Missile Defense Testing.

Mr. Chairman, I realize Congress is concerned about our testing program - simply whether or not we are conducting enough TMD and NMD tests to validate performance. The most visible of all our test activities are flight tests. Flight testing represents a particular challenge for complex and advanced systems like missile defense hit-to-kill interceptors. This is especially true when test events are limited in number and compressed in time. As an integral part of any defense acquisition program, test and evaluation activities are most successful when they can be conducted according to some important principles. These are:

- Event - rather than schedule - driven test events that allow us to apply test outcomes deliberately within the systems engineering process
- Stable funding that permits adequate testing
- A disciplined engineering approach extending throughout the system development activity, to include its test and evaluation
- Modeling and simulation activities, including full program life-cycle modeling and simulation
- Ground testing using hardware-in-the-loop and software-in-the-loop test capabilities to derive vital preflight information, especially when conducted in realistic environments
- Flight testing that provides verification of system performance and also the ability to acquire extensive data needed for successive phases of engineering and development - the latter signifies substantial amounts of instrumentation in the testing process
- Finally, because success can never be assured in any test, spare resources such as targets, interceptors and range instrumentation support are needed to conduct a testing program consistent with these principles.

[CHART 4 - BMD TEST PHILOSOPHY]

Mr. Chairman, my final chart outlines the BMD testing philosophy which strives to adhere to these principles to ensure a coherent and rigorous testing process for all our systems. This chart outlines how we progress from computer models and simulations, to hardware testing, to system-level testing, and then conclude with flight tests. This represents a progressive learning process which culminates in system verification through flight testing. Despite the valuable information that flight testing produces - even in the absence of a successful intercept - we recognize that investments made in a flight test, the publicity attendant to it, and the limited time and resources for accomplishing the performance verification of our interceptors, ***all*** place a high premium of achieving successful flight test outcomes.

In conjunction with the OSD testing organizations, I recently initiated an independent Task Force on Reducing Risk in BMD Flight Test Programs out of shared recognition of the challenge that flight testing represents. The report of that Task Force highlights a number of important aspects of our overall BMD test and evaluation program.

The Task Force noted that there have been deviations from that philosophy in the past. Nonetheless, our programs have been making adjustments over recent months to use our test & evaluation infrastructure more effectively. The Task Force found that PATRIOT's test and engineering approach was deliberate and is following a supportable schedule with adequate resources, and the PATRIOT program manager is staying the course. In light of this, flight test delays should not be viewed as failure - but rather proves we are event-driven and focusing our energies on resolving technical challenges.

National Missile Defense has applied its additional funding, as intended, to increase the number of flight tests as well as supporting ground tests. The program manager has provided resources for both his targets program and engineering program to provide spare targets and system hardware.

The Task Force's insights have generated a set of recommendations that I have shared with our PEOs and Program Managers, and I will be evaluating with them

alternatives for how we might implement the recommendations for the benefit of all of our programs. The Task Force was directed to identify any additional ways we could bring the best technology and best practices to bear on our T&E programs for hit-to-kill interceptors. Its recommendations point to engineering disciplines and management practices at both my level and that of the individual system program managers. There may be value in taking its recommendations as the basis for a follow-on review team to report more specifically on the technical attributes that our test managers and infrastructure managers must plan for in their future test activities.

Our existing and planned T&E and M&S facilities are complete and well-suited to meet the needs or our programs as they develop hardware from flight testing. The Task Force has reported persuasively that we need to maintain greater discipline in using those capabilities as intended. BMDO recognizes its important role, not only in bringing best technology and practices to bear, but in helping our programs apply them in consistent ways to help solve the engineering challenges of building hit-to-kill interceptors.

As we incorporate these important Task Force recommendations, I also have the challenge to maintain both our costs and schedules. In missile defense we - together - have to strike a fine balance between putting these systems into the hands of the warfighter as soon as possible and providing a robust, event-driven test schedule.

Advanced Technology

Finally, Mr. Chairman, I would like to close by briefly outlining our Advanced Technology effort. As the Committee is aware, for many years the primary focus of the BMD program was the development of fundamental technologies. Under the SDI program, the focus was largely directed toward the development and demonstration of technologies for a missile defense system capable of defending the United States against missile attack. The funding dedicated to technology development was significant and accounted for a large percentage of our annual budget.

Dividends from past investments have been substantial. For instance, today's PAC-3 program emerged from a technology development program called ERINT. And there are many, many other similar examples.

Today, our technology budget accounts for only 7 percent of the overall BMDO budget request. This concerns me because a robust technology investment is still absolutely necessary to address both near-term technology needs that our programs may experience and future threats.

In spite of, and because of, our reduced technology resources I have instituted two major efforts that maximize our technology investments and seek greater cooperation with the Services in this critical area.

We have established a Joint Technology Board to ensure strong partnership with the Services to identify missile defense technology needs and help leverage one another's investments. In addition, we have begun a Technology Master Planning process which literally tries to build a "roadmap" for our entire technology program. We start with an identification of our technology needs, develop a prudent development process and end with an investment strategy for our advanced technology program. The roadmap will help us refine our technology "insertion" plans, where technologies can be "inserted" into our acquisition programs to address

technical issues that either reduce system costs or increase system performance. In addition, it will focus our efforts to develop and demonstrate new systems to counter emerging missile threats. My prepared statement provides much more detail on both these efforts and the very important area of advanced technology. I am concerned that failure to properly invest in our technology base will undermine our long-term ability to respond to the proliferation of weapons of mass destruction and the missile systems to deliver them.

In closing, Mr. Chairman, I appreciate the opportunity to appear before the Committee and share my perspective on the BMD program and budget. I must tell you how impressed I am with the combined Government-industry team that is working to develop and field highly effective missile defenses. This is true in every part of our program: TAMD, NMD, Technology and our Management team. Missile Defense is a very challenging field. In many ways, this team is charting new ground for the Department. As I noted at the beginning of my statement, BMDO is responsible for a new concept: ***joint mission area acquisition.*** This requires incredible levels of support from the Services and the OSD staff to embrace the notion of *jointness.*

In many ways, this requires a cultural change for the Services and Department - to look beyond a single Service solution - because we must develop and acquire our missile defense systems in the *jointly.* While our critics may focus on the differing interests of one Service over another, the most important message I want to convey to the Committee is that today, we are working together better than ever before to build into all our missile defense systems the capability to communicate and fight ***together.*** That is our mission and I am confident that we will succeed.

Thank you Mr. Chairman, I look forward to working closely with you and the Members of the Committee on this important program. Mr. Chairman, that concludes my statement. I look forward to answering the Committee's questions.