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STATEMENT

BY

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BEFORE THE

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Chairman Levin, Senator McCain, distinguished Members of the Committee, thank you for the opportunity to discuss the Ballistic Missile Defense System, or BMDS, its test program, recent results, and challenges. I will focus my remarks in three areas:

First, my assessment of current missile defense programs, the details of which are in my annual report submitted to you on February 12th;

Second, the major events from last year that will shape the course of future BMDS testing; and

Finally, the challenges to BMDS test and evaluation.

Current missile defense programs

Ground-based Midcourse Defense, or GMD, has not yet attempted an intercept of an intercontinental ballistic missile target. The intercept flight tests it has conducted on intermediate range missiles have been conducted under a limited set of operationally-realistic engagement parameters.

GMD flight test FTG-05, conducted in the first quarter of Fiscal Year 2009, was the third successful intercept using the currently fielded operational capability. It was the first flight test requiring the GMD fire control to correlate multiple sensor inputs and supply a weapons task plan to the exo-atmospheric kill vehicle. FTG-06 was conducted in January 2010; it was the first flight test of an interceptor equipped with the Capability Enhancement II (CEII) Exo-atmospheric Kill Vehicle and was meant to demonstrate the use of the sea-based X-band radar to perform tracking and discrimination. The intercept attempt failed for reasons that the MDA continues to investigate.

Aegis Ballistic Missile Defense, or Aegis BMD, has demonstrated that it can detect, track, and engage simple non-separating and separating short range ballistic missiles (those with ranges below about 1000 kilometers). Using Aegis BMD 3.6 hardware and software and SM-3 Block IA hit-to-kill interceptors, Aegis BMD has demonstrated it is operationally effective for performing midcourse intercept of short-range ballistic missiles. Additionally, follow-on operational testing of Aegis BMD 3.6.1 hardware and software demonstrated Aegis BMD's capability to engage simple short range ballistic missiles in the terminal phase with modified SM-2 Block IV warhead interceptors.

During 2009, Aegis BMD completed two U.S. flight tests, Stellar Daggers and FTM-17. The two tests addressed midcourse-phase and terminal-phase engagement capabilities for Aegis BMD 3.6.1. Stellar Daggers performed a simultaneous engagement of a short range ballistic missile in the terminal phase of flight with a modified SM-2 Block IV interceptor, and a cruise missile target with a SM-2 Block IIIA interceptor. FTM-17 completed the planned follow-on operational test and evaluation flight testing phase for Aegis BMD 3.6.1. It also provided a venue for regression testing of midcourse-phase engagement capability following the upgrade from Aegis BMD 3.6 to Aegis BMD 3.6.1. The latter introduced the capability for terminal intercepts and merged anti-submarine warfare functionality into the system software.

The Terminal High Altitude Area Defense, or THAAD, has demonstrated the ability to detect, track, and engage unitary and simple separating short-range ballistic missiles. In six flight tests, THAAD intercepted four of four unitary short range ballistic missiles, and two of two simple separating short range ballistic missiles. One flight test demonstrated a salvo engagement of two THAAD interceptors against a single threat, consistent with plans for actual tactical operations. THAAD has also demonstrated a capability to intercept threat missiles both inside and outside the atmosphere, the only BMDS element specifically designed with this capability. Although THAAD has demonstrated the ability to detect, track, and successfully engage a target exhibiting medium-range, ballistic missile characteristics, it has not yet been tested against a true medium range ballistic missile.

During 2009, THAAD conducted flight tests FTT-10a and FTT-11. In March, THAAD successfully completed FTT-10a, a salvo of two THAAD interceptors against a single separating short range ballistic missile. The MDA "cold conditioned" the first THAAD interceptor before the test to simulate operations in a cold environment. The test was a combined developmental and operational test, with minimal contractor involvement. FTT-10a was also a BMDS-level test, with Aegis BMD providing a cue to THAAD as part of the engagement. In December, THAAD attempted FTT-11, an exo-atmospheric intercept of a complex separating short range ballistic missile. The target, planned as an air launch from a C-17 cargo aircraft, had a relatively low infrared signature and radar cross section. This was the first flight test to include all major tactical software builds planned for initial deployment, including radar advanced discrimination algorithms. Unfortunately, after the target was released from the C-17, it failed to deploy properly and was lost. DOT&E is assessing the extent to which the data that would have been collected during this test can be collected during subsequent testing.

Command, Control, Battle Management, and Communications, or C2BMC, has demonstrated the ability to command and control the AN/TPY-2 X-band radar in its forward-based mode, and provide track data to other BMDS elements for engagement support (GMD) and simulated launch-on engagements (Aegis BMD). C2BMC has provided situational awareness information to military command authorities during all three GMD flight tests. During the past two years, C2BMC has demonstrated Aegis BMD launch on Aegis BMD cueing in three ground tests, and simulated Aegis BMD launch on AN/TPY-2 cueing in four ground tests and two flight tests. THAAD does not currently have a launch-on-remote capability which will require modifications to the THAAD fire control software to achieve.

Major events

In the first quarter of Fiscal Year 2009, the MDA implemented an evaluation-based strategy for testing the BMDS, an approach that DOT&E has been advocating for the past several years. This approach emphasizes testing under so-called Critical Engagement Conditions (CECs), and collecting the data on system performance under those conditions necessary to verify, validate, and accredit, or VV&A, the BMDS models and simulations to be used to assess overall BMDS capability. The MDA codified this approach in an Integrated Master Test Plan (IMTP) that documents their planned testing through the period spanning the Future Years Defense Program. The MDA staff, staff from the Combatant Commands and the BMDS Operational Test Agency participated in developing the IMTP, as did staff from DOT&E.

DOT&E has been involved in the evolution of the evaluation-based strategy and the revised IMTP since General O'Reilly initiated its development in December 2008. For example, DOT&E provided the MDA with critical operational issues the new test program must resolve. Over the next six months, the DOT&E staff reviewed with MDA staff the details underpinning all the CECs associated with resolving the critical operational issues, the ground and flight testing needed to collect the associated data, and the development of the final integrated test schedule. This effort culminated in an IMTP approved jointly by MDA and DOT&E in July 2009.

In August 2009, when the President announced the phased, adaptive approach (PAA) for the defense of Europe, MDA initiated a revision of the IMTP to incorporate the testing needed to support the PAA. DOT&E participated in this effort in a manner analogous to its participation in the development of the previous

IMTP. My office provided the MDA with a detailed test concept for Phase 1 of the PAA as well as a test concept outline for the remaining phases. That concept included the need for a test of Aegis Block 3.6.1 and SM-3 Block IA against longer-range threats than had previously been tested, as well as the need to test the use of launch-on-remote capability.

In particular, when the President announced the PAA for the defense of Europe, a revision of the new IMTP became necessary. The PAA uses Aegis BMD and forward-based sensors to defend Europe and the United States from short-, medium-, intermediate-, and intercontinental-range ballistic missiles as Aegis BMD evolves with increasing capability. While the MDA has adequately demonstrated current Aegis BMD capability to defeat short range ballistic missiles, the MDA test program has not yet demonstrated current Aegis BMD capability to defeat medium or intermediate range ballistic missiles. The MDA must successfully complete flight tests against these longer-range threats to demonstrate ballistic missile defense of Europe.

The revised IMTP, approved jointly by DOT&E and the MDA this past February, incorporates such tests. Phase 1 of the IMTP is the most detailed, as it concentrates on testing and fielding near term defenses by the end of 2011. Both Aegis BMD and THAAD will conduct flight tests to demonstrate capability against intermediate and medium range ballistic missiles respectively. The MDA will also conduct ground testing of the command, control, and communications required to support Phase 1 implementation. U.S. European Command is working to develop the operations concept and the tactics, techniques, and procedures that will be used during these ground tests.

One other noteworthy event occurred recently. The Airborne Laser, now designated the Airborne Laser Test Bed, successfully engaged a boosting, threat-representative short range ballistic missile. This accomplishment demonstrates that it is technologically possible to “shoot down” a boosting, ballistic missile using a laser carried on a large aircraft. The program had to overcome difficult technological challenges, such as the effects of the atmosphere on the laser beam and the difficulty of holding the laser on the desired aim-point sufficiently long to cause the threat missile to fail. However, the engagement was not an operational test conducted under operationally-realistic conditions using an aircraft that is fully ready to conduct combat operations. For example, the Active Ranging System (ARS), a precision laser ranging system that is a key component of the detection and tracking system, was not available for the test. To compensate, the aircrew utilized the aircraft’s Wide Area Surveillance System as well as a priori knowledge of the threat missile launch location, timing, and aim point; this approach generally could not be used during combat. The incorporation of the ARS and numerous other capabilities would be necessary before the Airborne Laser (ABL) could be evaluated for operational effectiveness, operational suitability, and survivability when performing missile defense. The ABL would need to incorporate a laser with sufficient power to successfully engage, at operationally realistic standoff ranges and without a priori knowledge, a variety of threat missile types using countermeasures designed to defeat laser effectiveness. It must demonstrate reliability, availability, and maintainability, particularly during missions performed from deployed locations. It must also implement basic survivability features, including self-protection systems and airframe modifications to reduce the effects of damage caused by anti-aircraft weapons. If the Department should determine at a future time that it is appropriate to develop and field an Airborne Laser system, an extensive program of additional developmental testing culminating in realistic operational testing would be needed.

Challenges to future BMDS testing.

Targets. Terminal High Altitude Area Defense (THAAD) flight testing has experienced target failures. The one flight test completed in 2009 was a successful repeat of a flight test first attempted in September 2008 that suffered a target failure. The second flight test attempted in 2009 also ended with a target failure. When the targets have flown successfully, THAAD has successfully intercepted and destroyed them. These target failures have prevented THAAD from progressing to flight testing against threat-representative medium range ballistic missiles.

GMD also has experienced target failures. Flight test FTG-03a was a repeat of FTG-03 that suffered a target failure. The target used for flight test FTG-05 did not deploy the associated objects needed to accomplish important test objectives. The MDA delayed flight test FTG-06 due primarily to readiness issues associated with the first-time flight of a new longer-range target. This new target flew nominally and correctly deployed its associated objects when FTG-06 was flown this past -January.

The MDA recognizes that its targets are very complex. This complexity is a key factor contributing to the failures that have occurred. Such failures may well be a fact of life for several more years until the MDA can transition from using its legacy targets and field a new set of more reliable targets.

Executing the IMTP. The IMTP is a rigorous plan for obtaining the test information needed to assess BMDS performance quantitatively. However, I am concerned that it is success-oriented with limited schedule flexibility and no incorporation of repeat, or backup, tests to compensate for test failures. The ripple effects of a test failure, such as the recent GMD flight test FTG-06, can be significant. An Aegis BMD test failure in the next year could affect the full implementation and assessment of Phase 1 of the phased, adaptive approach for the defense of Europe, as Aegis BMD would not have demonstrated capability against the longer-range threats that might need to be countered in that timeframe.

Test Complexity. Realistic BMDS testing is difficult. Assessing the capability of each phase of the PAA will require some of the most complex testing ever attempted by the Department of Defense. The majority of the testing is planned to be conducted on the Pacific test ranges. The MDA will be challenged to replicate realistic radar acquisition and intercept geometries in the Pacific. In addition, testing of the command and control linkages and systems to be used for the first phase of European missile defense will have to be conducted using ground testing in the theater and surrogate testing elsewhere concurrent with development and implementation. Executing the first operationally-realistic combined test of Aegis BMD, THAAD, and Patriot in 2012 will tax MDA's capabilities for test planning and execution. In particular, performing the planning and marshalling the resources necessary to handle the safety requirements associated with what could be as many as ten missiles---both targets and interceptors---in flight nearly simultaneously will be a substantial challenge, as will executing the actual test.

Conclusion.

The ability to conduct comprehensive and objective assessments of BMDS capability is still a number of years away. If the MDA can execute the revised IMTP, the data needed to validate models and perform quantitative assessments of BMDS performance will become available. However, it will take as many as five to seven years to collect those data.

This concludes my remarks and I welcome your questions.