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STATEMENT

BY

DR. CHARLES E. MCQUEARY

DIRECTOR, OPERATIONAL TEST AND EVALUATION

OFFICE OF THE SECRETARY OF DEFENSE

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

STRATEGIC FORCES SUBCOMMITTEE

FEBRUARY 25, 2009

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HASC – FEBRUARY 25, 2009

Dr. Charles E. McQueary
Director, Operational Test and Evaluation (DOT&E)
Office of the Secretary of Defense

Madam Chairman, Congressman Turner, distinguished Members of the Committee, good afternoon. I am pleased to have this opportunity to speak to you about the testing of the Ballistic Missile Defense System, or BMDS. As requested in Chairman Tauscher's letter, I will address three areas:

First, I will give you a brief synopsis of my assessment of missile defense testing programs as described in my annual report submitted to you on 28 January.

Second, I will discuss my assessment of the Missile Defense Agency's three-phase review of BMDS which emphasizes the need for basing BMDS test planning and test design on critical factors.

Finally, I will discuss future test and evaluation actions that I see as needed to ensure that the BMDS and its elements – particularly the Ground-based, Midcourse Defense system – will work in an effective, suitable, and survivable manner.

First: My assessment of missile defense testing programs to date.

Overall, the MDA experienced a good year with its ground and flight test programs, notwithstanding continuing challenges with targets.

Aegis Ballistic Missile Defense (Aegis BMD) demonstrated the capability to detect, track, and engage simple short- and medium-range ballistic missile targets for a variety of mission scenarios. The Navy's Commander, Operational

Test & Evaluation Force completed the operational test and evaluation of the AEGIS BMDS 3.6.0.1 program leading to the transition of that capability to the Navy. Ground-based Midcourse Defense (GMD) demonstrated a limited capability to defend against simple, long-range ballistic missile threats launched from North Korea toward the United States. Terminal High Altitude Area Defense (THAAD) demonstrated the capability to detect, track, and engage both short-range non-separating and simple-separating targets. The Command, Control, Battle Management Communications element (referred to as C2BMC) demonstrated the capability to provide situational awareness to warfighters worldwide and control the AN/TPY-2 radar in its forward-based mode.

The MDA continues to make progress acquiring, testing, and fielding the elements of the BMDS. Progress has been steady across all elements with the greatest progress seen with Aegis BMD, THAAD, and C2BMC. While GMD experienced some delays, it achieved a significant milestone with the successful integration of multiple sensors in the FTG-05 intercept test in December. The MDA continued to increase operational realism in all its testing. The ground test program is robust, although the MDA is still using unaccredited models and simulations. The MDA has identified the need for the investment in a comprehensive set of models for threats, environmental conditions and post intercept debris. I strongly endorse this effort as these models are fundamental to any assessment of operational effectiveness. From an element perspective, test program data are not yet sufficient to validate and accredit BMDS models and

simulations at the system or element level. Validated models are essential to make a quantitative assessment of BMDS capabilities. This limitation is particularly evident in GMD testing as all intercepts have occurred within a small portion of the threat battlespace and under nearly identical intercept conditions. Although the MDA has plans to test over a wider range of intercept conditions and threat battlespace, until this is accomplished, there will be insufficient data to accredit the models and simulations needed to assess GMD operational effectiveness.

Target limitations of both availability and performance attributes continue to impact both the pace and the productivity of MDA flight testing. It is important that we provide both the ground based sensors and the exo-atmospheric kill vehicle with the most realistic target presentation possible. The operational realism of recent GM tests has been limited in part by the targets' characteristics. Even with the MDA's target program improvements, there is significant risk in this area. Additionally, both Aegis BMD and THAAD need advanced targets to demonstrate expanded capabilities.

Second: My assessment of the MDA's three-phase review of BMDS.

The MDA has embarked on a process to develop a revamped Integrated Master Test Plan or IMTP that will document planned testing through the Future Years Defense Plan (FYDP). A principal focus is to ensure that future testing will provide sufficient validation data to anchor the models and simulations. This effort directly addresses the concerns I raised last year in my testimony before you. I applaud General O'Reilly's obvious personal commitment to this initiative.

The three-phased review process began with an agency wide effort to identify the critical factors for each element and the overall BMDS. My assessment is that this is a prudent approach, one which begins with the end -state in mind. The process began by identifying the critical factors necessary to examine system capability. The goal is to build a foundation of models and simulations that will allow us to understand performance at the system, element or sub-element level. In addition, both the developmental and operational test communities are identifying the other data, such as reliability and maintainability data, that need to be captured to support their respective evaluations. Phase 1 began in December and is rapidly coming to closure. This review has been particularly useful in highlighting common gaps across the elements such as modeling of threats, debris and general environmental conditions. The next step is to design tests that ensure that critical data are collected throughout the various types and phases of testing, including both ground and flight tests. To ensure that the required data are collected to validate the models and simulations, the test design team will integrate the accreditation criteria with other test requirements as they develop the revised Integrated Test and Evaluation Master Plan. This is Phase 2. Experience has shown that the effort to integrate the myriad of test requirements is the most challenging step. This will be the largest and most diverse program to undertake this process. While the challenge is daunting, it is a worthy effort. Finally, the best test design is of little value if it is not adequately resourced. Phase 3 is performed to ensure that all funding and required range and test assets, including

targets, come together in time and space as needed to achieve successful test outcomes. This is a rigorous and promising approach and I fully support it.

Third: Future T&E actions that I see as needed to ensure that the BMDS and its elements – particularly the Ground-based, Midcourse Defense system – will work in an effective, suitable, and survivable manner.

Current BMDS test program progress varies depending on which mission the MDA is testing, the long-to-intermediate-range threat strategic mission or the intermediate-to-short-range threat regional/theater mission. Flight testing at the strategic level has only examined a small and confined portion of the potential battlespace while testing at the regional and theater level has examined a larger portion of the battlespace. As a result, there are more data available to verify, validate, and accredit models and simulations for both the THAAD and AEGIS Ballistic Missile Defense elements.

A combination of flight and ground testing together with verified, validated, and accredited models and simulations are needed to characterize the operational effectiveness, suitability, and survivability of the BMDS and its elements. A carefully designed, rigorous flight test program that exercises BMDS capabilities across the battlespace under selected, representative conditions is required to anchor ground tests and models and simulations. High fidelity ground testing is required to examine additional areas of the battlespace that are either not physically or politically feasible (or too costly) to test. Both flight and ground test

venues provide opportunities to conduct operationally realistic tests using trained warfighters employing actual tactics, techniques, and procedures. They also generate operating hours on the system that produce reliability and availability data used to assess suitability measures such as Operational Availability, Mean Time to Repair, and Mean Time Between System Abort. Finally, verified, validated, and accredited models and simulations can generate large amounts of data to predict performance across the entire battlespace that includes the full compliment of threats, defended areas, mission scenarios, and environmental conditions.

Survivability environments include nuclear; chemical, biological, toxic industrial chemicals, and radiological; physical security; information operations; electromagnetic environmental effects; hostile natural; and electronic warfare. The multi-service Operational Test Agency (OTA) Team has been working with the MDA to characterize the impact of these environments on the performance of the BMDS elements and components and has been assessing BMDS survivability. To accomplish this, the OTA Team uses component survivability plans, specialty engineering data, component test data, ground and flight test data, and analyses to determine capabilities and limitations of the BMDS in hostile natural and man-made environments.

The approach laid out by General O'Reilly, if fully resourced and executed as planned will provide a solid foundation for an independent assessment of the

operational effectiveness, operational suitability and survivability of each block of capability.

I see the operational test community participating in all phases of testing to the degree that is appropriate for the stage of development. An integrated approach that leverages combined developmental and operational testing to the maximum extent feasible is essential. I fully anticipate that much of the data needed for the operational test agency's evaluation will be collected during the developmental phase and from the use of models and simulations that are validated and accredited based upon developmental flight tests. As we all recognize, the complexity of the systems and the physical and fiscal constraints on flight testing will necessitate the examination of much of the system's capability in ground tests that leverage modeling and simulation.

When the MDA has completed its developmental test objectives for a given block of capability, including a demonstration of the appropriate maturity of the reliability, availability and maintainability program, and has provided validated models that support accreditation for operational testing, I would expect the Agency to conduct an operational test readiness review. Once the MDA decides it is ready to proceed to a dedicated operational test, the OTA Team will develop and execute a plan for a flight test that exercises the capability in an end to end fashion against a realistic portrayal of the threat to be countered. This test would be a confirmatory test within the envelope previously validated during development testing as well as modeling and simulation. While this would be an

independent operational test, the OTA would share all data collected with the agency and the developer to ensure the prudent use of the taxpayers' money. This approach ensures the independent confirmation of the operational effectiveness of the block capability developed by the MDA. The OTA would simultaneously assess the essential elements of training and supportability to ensure delivery of an operationally suitable block capability to the warfighter.

In conclusion,

The MDA experienced another good year with its ground and flight test programs, notwithstanding continuing challenges with targets. The challenge in the months ahead will be to complete a re-structured Integrated Master Test Plan to ensure that future testing will lead to validated models and simulations while demonstrating system capabilities with increasing operational realism. We are working closely with the MDA and the OTA Team to define the critical engagement conditions for flight testing that will ultimately lead to increased statistical confidence in their models and simulations. We are also working to ensure that hit-to-kill missile defenses are tested against increasingly complex target scenes that include not only target deployment artifacts but appropriate countermeasures as well. This will be included in future test plans.

Through individual element successes and system tests, the BMDS continues to demonstrate its maturing capabilities. We still have a long way to go to reach the objective end state, however, we are closer to meeting our objectives than we were a year ago. The MDA's renewed commitment to a rigorously

engineered, disciplined, event driven approach to flight and ground testing is already realizing dividends. It will ultimately lead to more rigorous and operationally realistic flight and ground testing and validated and accredited models and simulations.

This concludes my remarks and I welcome your questions.