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OPERATIONAL TEST
AND EVALUATION

MAR 04 2016

MEMORANDUM FOR VICE CHAIRMAN OF THE JOINT CHIEFS OF STAFF
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ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT AND ACQUISITION
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DIRECTOR, MARINE CORPS OPERATIONAL TEST AND EVALUATION ACTIVITY
COMMANDER, JOINT INTEROPERABILITY TEST COMMAND

SUBJECT: Guidance on Threat Representation in Operational Test and Evaluation of Space Systems

This memorandum provides guidance to ensure the realistic representation of threats in the Operational Test and Evaluation (OT&E) of space systems. OT&E under "realistic combat conditions" is required by Title 10 U.S.C. §2399, policy, and regulation. The Military Services have normally subjected space systems to representative natural hazards and phenomena during the course of integrated testing campaigns, which should continue.

However, threat representation in space systems' OT&E has been constrained by both real and assumed limitations. First among these limitations has been the widespread assumption that space systems would enjoy a non-hostile environment. Due to the relentless pursuit of offensive space control capabilities by potential adversaries, that assumption is no longer valid and the OT&E of space systems must realistically reflect the hostile wartime environment we are likely to face.

To ensure adequate representation of realistic threats in the OT&E of all segments of space systems, including ground and control, orbital and spaceborne, and user equipment, Military Service acquisition officials and Operational Test Agencies (OTAs) will need to identify and address the resource and infrastructure limitations that currently constrain our ability to conduct adequate testing of space systems. In addition to the persistent cyber threats which target all Department of Defense (DOD) systems and forces, including the orbital, ground, and user segments of our space systems, our space forces face electronic warfare, kinetic, and directed energy threats. OTAs must insist on current, validated threat assessments for their space systems, and must adequately and realistically represent each of these threats in OT&E.

Furthermore, in order to ensure operational realism, OTAs must whenever possible employ actual threat systems in OT&E. If an actual threat system is not available, then the Military Service acquisition official and OTA should act in advance of OT&E to develop or procure the threat system. If acquisition and employment of actual threats is not practical or would violate U.S. or DOD policy or introduce unmitigated and unacceptable operational, security, or safety risks, then OTAs should use realistic, accredited threat surrogates during OT&E in lieu of actual threat system.

If the actual threat system or realistic threat surrogate is not available for OT&E, despite Military Service efforts to develop or procure it, then the OTA should employ accredited threat modeling and simulation (M&S). As a last resort, if no other representation of the threat is available, then OTAs should employ white cards or other methods of artificial threat stimulation.

Space systems requirements documentation should adequately describe the systems' expected threat environment and resilience in the face of that threat. Furthermore, the fact that a space system or segment has not been designed for defense or resilience against a specific threat does not justify exclusion of that threat from the test environment.

OT&E should employ threats to space systems in a realistic laydown and sequence, within the context of a representative adversary concept of operations, and preferably directed by a designated opposing force (OPFOR) commander planning the coherent employment of the threat capabilities. The OT&E environment should stress the system under test and instill a sense of realism for system operators as they employ and adjust their own tactics, techniques, and procedures to preserve and defend their mission capabilities. The OTA must reflect the impact of threat activity in the OT&E evaluation of space system operational effectiveness, suitability, and survivability.

Military Services will need to innovate to overcome some of the limitations that have previously constrained the operational testing for space systems. For example, if the operational risk of exposing orbiting satellites to some electro-magnetic and cyber threats is too high, the OTA's OT&E OPFOR could employ these threats against satellites connected to their crewed operational ground control segment during thermal vacuum chamber testing prior to launch.

Similarly, OTAs might use data from Military Services' testing of destructive and degrading threats against non-flight test satellites in ground chambers. Regardless of the specific test means available, the OTA's evaluation must assess the resilience of space systems against the threats they face, with appropriate realism and confidence caveats when limited by unmitigated constraints.

The acquisition and test communities will need to leverage the space-related expertise and resources of many organizations and individuals to mitigate the infrastructure and resource limitations which currently impede the Department's ability to portray realistic space threats in OT&E. For example, test planners should make use of the expertise and resources of organizations such as the Joint Navigation Warfare Center, the Space Security and Defense Program, the Test Resource Management Center, and adversary tactics organizations such as the 527th Space Aggressor Squadron.

OTAs should take immediate steps to improve their ability to adequately represent space threats, including the following: identifying and tracking space threat representation capabilities, including their availability, location, and connectivity; identifying and prioritizing space threat representation gaps, and requesting funding to fill those gaps; documenting space threat operational and system-level concepts of operations (CONOPS) and blue system defensive CONOPS; designating OPFORs for space threat representation in OT&E; and developing M&S capabilities which support the assessment of system- and mission-level impacts of space threats.

I expect to see a thorough representation of threats in all space systems Test and Evaluation Master Plans and test plans submitted for my approval, and look forward to working with you and your staffs on this important issue. My point of contact for this policy is Col Shawn Smith, who may be reached at DSN 372-3815/Commercial 571-372-3815.

J. Michael Gilmore
Director

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