STATEMENT OF

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BEFORE THE HOUSE ARMED SERVICES COMMITTEE

SUBCOMMITTEE ON CYBER, INFORMATION TECHNOLOGIES, AND INNOVATION

POSTURE HEARING

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Chairman Bacon, Ranking Member Khanna, and distinguished members of the subcommittee, thank you for inviting me to provide testimony for the House Armed Services Subcommittee on Cyber, Information Technologies, and Innovation hearing on the Department of Defense's (DoD) Science, Technology, and Innovation Posture. In my capacity as the Director of the Test Resource Management Center (TRMC), I am honored to be here today and discuss our Nation's test infrastructure.

Introduction

If we are going to be able to deter or prevail in future conflicts, we must rapidly experiment, iterate, and field new capabilities. Business as usual for the DoD will not get us there. We must engage industry in new ways, like the Software Acquisition Pathway, and with new contract vehicles like the Commercial Solutions Opening process via Other Transaction Authority. We must harness competition to drive down cost and maximize value to the taxpayer. We need to look far outside the walls of the Pentagon to combine the abilities of other federal agencies (like the National Aeronautics and Space Administration and National Laboratories), industry performers, academia, non-profits, and international partners. We need a whole-of-nation approach, and then some.

The TRMC continues to fulfill its mission to improve our capability to test by investing in upgrades at both DoD and non-DoD facilities, and by working with emerging technologies to ensure the right test capabilities are in place when the time comes to conduct experimentation, testing, and evaluation.

I would like to focus my testimony on several portfolios: hypersonics, autonomy, knowledge management/big data analytics, and electronic warfare (including electromagnetic spectrum).

Hypersonics

One of our Nation's highest priorities is hypersonics. In order to achieve the technological advances needed to accelerate the development and delivery of hypersonic technologies and systems to the Joint Force, our Nation needs the ability to rapidly iterate after frequent testing. Four innovations will help us get there: MACH-TB, SkyRange, HyperCorr, and overland corridors.

MACH-TB, which stands for Multi-Service Advanced Capability Hypersonics Test Bed, is accelerating the pace of hypersonic experimentation and testing by providing an affordable, rapid flight test capability for DoD programs, NASA, National Labs, academia, and industry. Historically, a hypersonic development program would have flight tested a new aeroshell material or Global Positioning System (GPS) for the first time in a full system weapon test and may have been able to perform only one test per year. If the test failed, there may not have been an opportunity to test again for another many months. Because of the high stakes involved in each test, the program had to over-engineer the components and materials being tested. The aeroshell material would have to be thicker and heavier, which would sacrifice range and maneuverability. The GPS would require redundancy, which would crowd out other equipment.

In contrast, MACH-TB leverages commercial space launch services to test hypersonic system components and materials prior to a full system weapon test. This approach allows developers to test components and materials under hypersonic conditions at relatively low cost,

iterate and improve based on real data, and rapidly re-test to ensure components and materials are proven out before they are integrated into an "all-up-round" for a full system weapon test. In order to collect data from MACH-TB tests, we are repurposing Global Hawk and Reaper uncrewed vehicles to create a flying test range anywhere needed, called SkyRange. MACH-TB and SkyRange go hand-in-hand. Additionally, we have partnered with the Defense Innovation Unit (DIU) to utilize commercial technology advancements to further accelerate hypersonic developments.

HyperCorr, which is short for hypersonic correlation, will enable us to correlate the real-world data from MACH-TB tests to calibrate hypersonic wind tunnels and improve models and simulation. In addition, we will be able to synchronize test results between facilities, increasing program flexibility to test in different facilities rather than being encouraged to use the same facility to ensure consistency of test results.

Overland corridors are the final piece of the puzzle. In order to test end-game performance in realistic operational conditions, we need the ability to fly hypersonic systems at a large land test range. The Department has been studying this issue per congressional direction in section 218 (c) of the FY 2024 National Defense Authorization Act (NDAA) and looks forward to briefing Congress soon on the way forward.

Autonomy

Many of the exciting capabilities for autonomous vehicles, like drone swarms, are coming from venture-capital-backed, non-traditional companies that do not have experience navigating the thousands of pages of federal acquisition regulations or getting onto a military installation to conduct a test. The TRMC is partnered with the Defense Innovation Unit, Project

Overmatch, and INDOPACOM to expand the capacity of the DoD's autonomy testing capability, which is needed to accelerate the development of robotic autonomous systems. Our goal is to integrate live, virtual, and constructive capabilities to enable near-continuous test and assessment of integrated all domain swarming drones and their future enhancements. By deploying mobile testing capabilities that can adapt to new technology, threats, and geography, the TRMC is improving the accessibility of DoD test ranges to non-traditional companies to enable them to go fast, accelerating their development of additional capabilities.

Knowledge Management/Big Data Analytics

Current test data collection and validation techniques are labor intensive, often taking weeks to validate and synchronize the gigabytes of data from many different sources. Artificial intelligence and machine learning (AI/ML) are giving us new opportunities to compress that time from weeks to hours, getting test data in the hands of designers and developers faster. We have created the Cloud Hybrid Edge-to-Enterprise Evaluation & Test Analysis Suite (CHEETAS), a best-of-breed compilation of commercial software tools for data crunching—enhanced by AI/ML—and available to any program in the DoD.

Electronic Warfare and Electromagnetic Spectrum

Future battlefields will be highly contested, with adversaries attempting to jam our signals and prevent communications. We are working across the Department to integrate ranges and airspaces, so that we can replicate realistic conditions and scenarios over large areas, giving us a playbox for testing and training across all domains. I am limited to how much I can share in this forum, but look forward to briefing the committee further on the topic.

In addition, the Department is exploring whether new technologies could enable further sharing of spectrum with commercial users. The concept is similar to noise-cancelling headphones, filtering out everything besides the desired signal. More rigorous testing is needed in operationally realistic scenarios to know whether it will meet the Department's needs.

Conclusion

Thank you again for this opportunity to testify. We share the goals of going fast and delivering new capabilities to our Warfighters. I welcome your questions and look forward to engaging with you on these topics.