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Congressional Update: Senate Appropriators Examine Defense Innovation and Research Enterprise

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The Senate Appropriations Subcommittee on Defense (SAC-D) held a hearing to examine the Department of Defense's (DOD) innovation and research enterprise. The Subcommittee heard testimony from **Ms. Barbara McQuiston**, performing the duties of the **Under Secretary of Defense for Research and Engineering (USD(R&E))**, and **Dr. Stefanie Tompkins, Director of the Defense Advanced Research Projects Agency (DARPA)**.

Members on both sides of the aisle expressed the importance of investing in Defense research and development (R&D) and science and technology (S&T) at high levels to maintain technological dominance against adversaries in future conflicts. Parity, it seems, is not enough. Both McQuiston and Tompkins deferred questions about the Fiscal Year (FY) 2022 President's Budget Request (PBR) being inadequate to address DOD's challenges. McQuiston's reticence may stem from her role as performing the duties of—not even Acting—USD(R&E). This, plus the Biden-Harris Administration's nomination of a new Under Secretary of Defense for Acqusition and Sustainment (USD(A&S)) ahead of a new USD(R&E), indicates the possibility that she may be replaced in the future (likely) or that USD(R&E) may even be recombined with USD(A&S) (less likey).

Subcommittee members discussed key technology investments such as **artificial intelligence (AI), hypersonics, quantum science, autonomy, space technology,** and **microelectronics**. SAC-D Chairman Jon Tester (D-MT) highlighted that DOD needs for potential conflict with China should be key driver of future R&D and S&T efforts.

Key takeaways:

- Senator Tester named **US Indo-Pacific Command (INDOPACOM)** as the key warfighting component or "end user" requiring new capabilities produced from DOD research.
- McQuiston mentioned two groups led by Deputy Secretary of Defense Kathleen Hicks key to setting DOD's modernization goals: the Innovation Steering Group and the Disruptive Innovation Unit within USD(R&E). These groups have established 11 modernization priorities that include **5G communications**, **microelectronics independence, AI, hypersonics superiority**, and others.
- McQuiston noted that DOD would continue to **demand transparency** with academia in reporting outside sources of funding and participation by foreign nationals. The security of the U.S. research enterprise from foreign interference will be a continuing federal priority.
- **Space technology** was mentioned often, particularly satellite cybersecurity and integration with warfighters in the battlefield. Space technology investments will be key to the **Joint All-Domain Command and Control (JADC2) program**, which integrates data from many sources into a single network that warfighters at any echelon can access.
- McQuiston repeated the need to not merely invest in R&D but field actual capabilities to the warfighter on **rapid, commercially acceptable timelines**. Future fixes to historically onerous

DOD procurement processes may appear as Congressional mandates in the FY 2022 National Defense Authorization Act and the full FY 2022 PBR (expected in May 2021).

- Tompkins discussed potential applications for quantum science in cybersecurity, like **quantum encryption**. Other applications for **quantum computing** included simulation, prediction, and decision-support technologies for complexity.

Additional Highlights

- The **Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) program's** authorization will expire in FY 2022. Senator Shaheen (D-NH) noted that the Subcommittee should ensure it is permanently renewed with appropriate funding.
- McQuiston mentioned that USD(R&E) is working with the National Security Innovation Network (NSIN) to determine how best to focus Defense research. NSIN is a diverse network of technology professionals who organize regionally to help solve national security problems.
- McQuiston noted that DOD's prior investments in **mRNA vaccine research** made possible innovations in COVID-19 vaccine research and production, an example of how continued investment in the DOD R&D enterprise is necessary.
- Tompkins used the example of 5G networks as a way DOD-applied research could be quickly transferred to commercial application. In **cybersecurity**, Tompkins noted how DARPA has been working to transfer fielded solutions to operational components like **US Cyber Command**. Network operations and analytics, "graceful degradation and recovery," and intrusion attribution are all cyber solutions that can also transfer well to **industrial control systems**.
- McQuiston mentioned that **additive manufacturing** is key to current innovation in hypersonics. Manufacturing innovation and capabilities in this area could be scaled to support other technology efforts.
- McQuiston mentioned a **"Hack-a-Sat" program** where DOD was working with commercial industry to discover vulnerabilities in satellite networks.
- McQuiston indicated the success of the Defense Innovation Unit (DIU) in bringing new small business with new concepts and innovations. Both witnesses indicated that **more diversification is required** to reach non-traditional entities whose innovations may not reach DOD because of complex contracting and compliance requirements.

Resources

- The full recording of the hearing can be found here.
- A list of Members on SAC-D can be found here.