RESEARCH
AND ENGINEERING

UNDER SECRETARY OF DEFENSE
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WASHINGTON, DC 20301-3000

19 NOV 2024

MEMORANDUM FOR CHAIR, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Defense Science Board Study on Nuclear Survivability of the Joint Force

Russia and China's modernization of their strategic and non-strategic arsenals, along with their reliance on the threat of nuclear weapon use for regional coercion, increases the risk of limited nuclear use, resulting in the failure of strategic deterrence. Vladimir Putin's veiled threats to use nuclear weapons in the conflict with Ukraine, for example, have led to questions not only about how to deter the use of nuclear weapons, but also about the ability of United States (U.S.) forces to survive, respond, and prevail following another country's use of nuclear weapons. Progress by North Korea in its nuclear weapons and delivery capabilities and the growing potential of Iran's nuclear program have raised additional concerns about nuclear dangers and the potential for opportunistic aggression accompanied by small-scale nuclear use in a second or third theater. In the event of an adversary's use of a nuclear weapon, particularly if the weapon is used against a U.S. ally, the U.S. military may be called upon to respond and contribute to the defeat of an adversary. Alternatively, the United States may already be embroiled in a conventional conflict that escalates to nuclear use, putting the warfighter at risk.

Continuing to operate after an adversary uses a nuclear weapon will present challenges for the Department of Defense (DoD), beginning with the survivability of U.S. forces, including both personnel and equipment. As the DoD undertakes several efforts to modernize and/or acquire new nuclear and non-nuclear capabilities, and as the DoD plans and exercises for major contingencies against nuclear-armed adversaries, consideration must be given to the full range of nuclear survivability options. Such options span from hardening techniques and redundancy/recovery to tactics, techniques, and procedures to ensure the Joint Force can continue operating and achieving objectives on the battlefield. Efforts at the Military Service level to increase nuclear survivability must be coordinated to ensure a balanced Joint Force.

The Defense Science Board (DSB), working through its Permanent Subcommittee on Threat Reduction (the Permanent Subcommittee), is asked to undertake a study and provide recommendations on the DoD's current understanding of, and attention to, operations in a post-nuclear weapon employment environment. The study will capitalize on previous and ongoing Joint and Military Service studies, requirements, and other initiatives. This should include assessing:

- A spectrum of options covering adversary nuclear employment (number of weapons used, yield, method of employment, terrain, troop exposure) consistent with adversary and U.S. doctrine, strategy, and capabilities;
- DoD directives and governance, to include the roles and responsibilities of the Combatant Commands;

- Access and maneuverability of the Joint Force in military operations and/or humanitarian response;
- Nuclear survivability of mission critical weapon and communication systems and infrastructure (e.g., launch facilities, defense critical infrastructure);
- Medical response and operations, including advances in radiobiological and medical countermeasures to mitigate effects of personnel radiation exposure, burn treatment, equipment, and supplies;
- Coordination with allies, as well as any international organizations and authorities on the foregoing topics; and
- Technical and operational standards, capabilities, and expertise that support all the above.

The Permanent Subcommittee findings, observations, and recommendations will be presented to the full DSB for its thorough, open discussion and deliberation at a properly noticed and public meeting, unless the meeting must be closed in accordance with one or more of the exemptions found in subsection 552b(c) of title 5, U.S. Code. The DSB will provide its findings and recommendations to the Under Secretary of Defense for Research and Engineering (USD(R&E)) as the Sponsor of the DSB. The nominal start date of the study period for this terms of reference (ToR) will be within 30 days of when this ToR is signed. In no event will the duration of the study exceed 12 months from the start date to development of the final briefing/report.

In support of this ToR and the work conducted in response to it, the DSB and the Permanent Subcommittee have my full support to meet with DoD leaders. The DSB staff, on behalf of the DSB and the Permanent Subcommittee, may request the Office of the Secretary of Defense and DoD Component Heads to timely furnish any requested information, assistance, or access to personnel to the DSB or the Permanent Subcommittee. All requests shall be consistent with applicable laws; applicable security classifications; DoD Instruction 5105.04, "Department of Defense Federal Advisory Committee Management Program"; and this ToR. As special government employee members of a DoD federal advisory committee, the DSB and the Permanent Subcommittee members will not be given any access to DoD networks, to include DoD email systems.

Material provided to the DSB and the Permanent Subcommittee, becomes a permanent part of the DSB's records. All data and information provided is subject to public inspection unless the originating Component office properly marks the data or information with the appropriate classification and Freedom of Information Act exemption categories before the data or information is released to the DSB and the Permanent Subcommittee. The DSB has physical storage capability and electronic storage and communications capability on both unclassified and classified networks to support receipt of material up to the TS/SCI level.

The DSB and the Permanent Subcommittee will operate in conformity with and pursuant to the DSB charter; chapter 10 of title 5, U.S. Code (commonly known as "the Federal Advisory Committee Act"); and other applicable federal statutes, regulations, and policy. Individual DSB and Permanent Subcommittee members and the Permanent Subcommittee as a whole do not have the authority to make decisions or provide recommendations on

behalf of the DSB nor report directly to any Federal representative. The members of the Permanent Subcommittee and the DSB are subject to certain Federal ethics laws, including section 208 of title 18, U.S.Code, governing conflicts of interest and the Standards of Ethical Conduct regulations in 5 Code of Federal Regulations, Part 2635.

Heidi Shyu