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Department of Defense
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DEFENSE SCIENCE BOARD
Permanent Subcommittee on
Strategic Options
Capabilities for Difficult Target
Defeat
Executive Summary

November 2024

This report is a product of the Defense Science Board (DSB).

The DSB is a Federal Advisory Committee established to provide independent advice to the Secretary of Defense. Statements, opinions, conclusions, and recommendations in this report do not necessarily represent the official position of the Defense Department (DoD).



OFFICE OF THE SECRETARY OF DEFENSE
3140 DEFENSE PENTAGON
WASHINGTON, DC 20301-3140

**DEFENSE SCIENCE
BOARD**

**MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR RESEARCH AND
ENGINEERING**

SUBJECT: Executive Summary of the Permanent Subcommittee on Strategic Options Study on Capabilities for Difficult Target Defeat

Please see this executive summary of the Defense Science Board Permanent Subcommittee on Strategic Options Study on Capabilities for Difficult Target Defeat, chaired by me and Gen. Paul Selva, USAF ret.

The DSB Permanent Subcommittee on Strategic Options Study on Capabilities for Difficult Target Defeat was established to identify options for mission defeat of difficult targets to ensure U.S. operational dominance for various scenarios.

The study considered:

- Recent intelligence on threat attributes
- Additional intelligence needed
- Past related studies and programs
- “Effects chain” options
- New system architectures

The study results have been presented to senior DoD leaders.

Dr. Eric D. Evans
Chair, Defense Science Board

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Appendix A: Terms of Reference – Permanent Subcommittee on Strategic Options Study on Capabilities for Difficult Target Defeat



UNDER SECRETARY OF DEFENSE
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WASHINGTON, DC 20301-3000

RESEARCH
AND ENGINEERING

26 FEB 2024

MEMORANDUM FOR CHAIR, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Defense Science Board Permanent Subcommittee on Strategic Options Study on Capabilities for Difficult Target Defeat

Underground and concealed facilities continue to be widely used by adversaries to protect strategically important capabilities meant to disrupt United States (U.S.) military capacity. The limitations in targeting these facilities, especially during times of conflict, pose challenges to U.S. Forces, allies, and partners in accomplishing military objectives and necessitate the need to consider comprehensive defeat strategies. These strategies may encompass weapons effects to defeat various targets and deny, degrade, delay, and/or destroy adversary capacity. These defeat solutions are imperative in achieving the desired effect against adversary targets.

The Defense Science Board (DSB), working through its Permanent Subcommittee on Strategic Options (“the Permanent Subcommittee”), is directed to conduct a study on Capabilities for Difficult Target Defeat. The DSB, working through the Permanent Subcommittee, will identify options for mission defeat of difficult targets to ensure U.S. operational dominance for various scenarios. Areas of consideration will include (but not be limited to at the discretion of the Under Secretary of Defense for Research & Engineering (USD(R&E)):

- Recent intelligence on threat attributes and prevalence;
- Additional intelligence needed;
- Past studies and programs for addressing capabilities needed to defeat difficult targets;
- Development of an “effects chain” model for difficult target operation, including relevant inputs and outputs;
- Development of options for wide-area sensing and identification of difficult targets through multiple modalities and domains;
- Development of recommended system architectures for connecting detection, target identification, decision support, effects implementation, and damage assessment for implementation across several organizations.

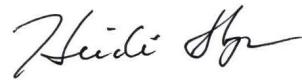
The Permanent Subcommittee findings, observations, and recommendations will be presented to the full DSB for its thorough, open discussion and deliberation at a properly noticed and public meeting, unless it must be closed pursuant to one or more of the exemptions found in subsection 552b(c) of title 5, United States Code (U.S.C.). The DSB will provide its findings and recommendations to USD(R&E) as the Sponsor of the DSB. The nominal start date of the study

period for this ToR will be within 30 days of when this terms of reference (ToR) is signed. In no event will the duration of the study exceed 12 months from the start date.

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 Department leaders. The DSB staff, on behalf of the DSB and the Permanent Subcommittee, may request the Office of the Secretary of Defense and Department of Defense (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.

Once material is provided to the DSB and the Permanent Subcommittee, it becomes a permanent part of the DSB's records. All data/information provided is subject to public inspection unless the originating Component office properly marks the data/information with the appropriate classification and Freedom of Information Act exemption categories before the data/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.C.; subsection 552b(c) of title 5, U.S.C.; 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.C., governing conflicts of interest, and the Standards of Ethical Conduct regulations in 5 Code of Federal Regulations, Part 2635.



Heidi Shyu

Appendix B: Permanent Subcommittee Membership

Task Force Chair

Dr. Eric Evans	MIT-LL
Gen. Paul Selva, USAF ret.	Private Consultant

DSB Secretariat

Ms. Elizabeth Kowalski	Designated Federal Officer
Mr. Sean Hagerty	Alternate Designated Federal Officer

Executive Secretary

Mr. Michael Holthe	OUSD(R&E)
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Membership

Mr. James Carlini	Leidos, Inc.
Mr. Kevin Doxey	Private Consultant
ADM William Fallon, USN ret.	Private Consultant
Mr. Bob Giesler	Private Consultant
Hon. Shirley Ann Jackson	Private Consultant
Dr. Ron Kerber	Private Consultant
Dr. John Manferdelli	VMware
Dr. Katherine McGrady	Center for Naval Analyses
Hon. Judith Miller	Private Consultant
Mr. Mark Russell	Raytheon
Hon. William Schneider, Jr.	Private Consultant
VADM Jan Tighe, USN ret.	Private Consultant
Dr. Bradford Tousley	Private Consultant

Consultants

Dr. Marc Viera	MIT-LL
Dr. Christopher Vergien	Private Consultant

Government Advisors

Mr. Robert Addis	OUSD(R&E)
Mr. James Baker	OSD
Ms. Kristen Baldwin	Air Force
Mr. Thomas Browning	OUSD(R&E)
Mr. William Chadwell	DIA
Dr. Ian Crone	DARPA
Mr. Jay Dryer	OSD
Mr. John Furlow	STRATCOM J8
Mr. Daniel Harper-Nixon	OUSD(R&E)
Mr. Logan Harr	OUSD(R&E)
Dr. Peter Highnam	OUSD(R&E)
Mr. Micah Howard	CAPE
Mr. Greg Hulcher	Air Force
Mr. Richard Johnson	OSD(P)
Mr. Thomas Johnson	CAPE
Mr. Matthew Kurtz	OSD(P)
Mr. Austin Long	J5
Dr. Raymond O'Mara	OUSD(R&E)
Mr. David Pendall	OSD
Dr. Frank Peterkin	OUSD(R&E)
Mr. Dale Rielage	OUSD(I&S)
Mr. Robert Rose	STRATCOM J8
Dr. Katherine Sixt	OUSD(R&E)
Mr. Robert Taylor	STRATCOM J8
Ms. Nina Wagner	OSD(P)
LTC Mathew Zulauf	OSD

Analytical Support

Ms. Ashlee Gilligan	Strategic Analysis, Inc.
Mr. Marcus Hawkins	Strategic Analysis, Inc.
Mr. Eric Tunkavige	Strategic Analysis, Inc.