

October 2016

A Threat to America's Global Vigilance, Reach, and Power—High-Speed Maneuvering Weapons

Unclassified Summary

High-speed maneuvering weapons (HSMWs), whether self-propelled or launched by rocket booster, operate in regimes of speed, altitude, and maneuverability that have the capability to frustrate existing missile defense systems. With other world powers actively flight-testing HSMWs, the USAF and Joint Forces face an emerging threat that may impede operations and constrain the United States' global presence. At the request of the U.S. Air Force, the National Academies of Sciences, Engineering, and Medicine conducted a study to assess the current status of high-speed weapons and identify opportunities to improve the United States' ability to defend against high-speed threats. The report finds that existing doctrine and organizational structure may not be adequate to defend against the threat of high-speed maneuvering weapons and that no single technology offers a straightforward countermeasure.

ABOUT THE STUDY

Throughout the course of the study, the committee held four data-gathering meetings and met with the following organizations: Air Force Air Combat Command (ACC), Air Force Research Laboratory (AFRL), National Air and Space Intelligence Center (NASIC), Missile Defense Agency (MDA), U.S. State Department, U.S. Pacific Command (PACOM), U.S. North America Command (NORTHCOM), Defense Advanced Research Agency (DARPA), Air University, Office of the Secretary of Defense (OSD), Naval Research Laboratory (NRL), Sandia National Laboratories, and RAND. While the final report is classified, an unclassified summary is available for download at <http://nap.edu>.

Read, purchase, or
download a free
PDF of this report at
<http://nap.edu>

ADDITIONAL RELEVANT REPORTS FROM THE NATIONAL ACADEMIES

- [Hypersonic Technology for Military Application \(1989\)](#)
- [Review and Evaluation of the Air Force Hypersonic Technology Program \(1998\)](#)
- [Evaluation of the National Aerospace Initiative \(2004\)](#)
- [A Review of United States Air Force and Department of Defense Aerospace Propulsion Needs \(2006\)](#)
- [C4ISR for Future Naval Strike Groups \(2006\)](#)
- [Future Air Force Needs for Survivability \(2006\)](#)
- [Identification of Promising Naval Aviation Science and Technology Opportunities \(2006\)](#)
- [U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond \(2008\)](#)
- [Materials Needs and R&D Strategy for Future Military Aerospace Propulsion Systems \(2011\)](#)
- [Capability Planning and Analysis to Optimize Air Force Intelligence, Surveillance, and Reconnaissance Investments \(2012\)](#)
- [Making Sense of Ballistic Missile Defense: An Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives \(2012\)](#)
- [Recapturing NASA's Aeronautics Flight Research Capabilities \(2012\)](#)
- [U.S. Air Force Strategic Deterrence Analytic Capabilities: An Assessment of Tools, Methods, and Approaches for the 21st Century Security Environment \(2014\)](#)

COMMITTEE ON FUTURE AIR FORCE NEEDS FOR DEFENSE AGAINST HIGH SPEED WEAPON SYSTEMS: Mark Lewis, Institute for Defense Analyses, *Chair*; Thomas R. Bussing, Raytheon Company, Missile Systems; Richard P. Hallion, Air Force Historian (retired); Terry J. Jagers, Decisive Analytics Corporation; Eric D. Knutson, Lockheed Martin Corporation, Skunk Works; Richard W. Mies, The Mies Group, Ltd.; Gary O’Connell, Science Applications International Corporation; Malcolm O’Neill, Assistant Secretary of the Army for Acquisition, Logistics, and Technology (retired); Brian Shaw, National Intelligence University; Suzanne Vautrinot, Kilovolt Consulting, Inc.; David A. Whelan, The Boeing Company, Defense, Space, and Security

STAFF: Joan Fuller, Director, Air Force Studies Board; Dionna C. Ali, Research Assistant; Marguerite E. Schneider, Administrative Coordinator; Tony Fainberg, Consultant

This Report Highlights was prepared by the Air Force Studies Board based on the unclassified summary of the report *A Threat to America's Global Vigilance, Reach, and Power: High-Speed Maneuvering Weapons* (2016). The study was supported by the U.S. Air Force. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the sponsors. Copies of the report are available free of charge from <http://www.nap.edu>. Learn more about the Air Force Studies Board at <http://nas.edu/afsb>.

Division on Engineering and Physical Sciences

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The nation turns to the National Academies of Sciences, Engineering, and Medicine for independent, objective advice on issues that affect people’s lives worldwide.

www.national-academies.org