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ACQUISITION,
TECHNOLOGY
AND LOGISTICS

MAY 16 2014

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Defense Science Board Study on Defense Strategies for Advanced Ballistic and Cruise Missile Threats

Current and next generation foreign ballistic and cruise missiles are increasingly threatening the survivability of high-value U.S. air vehicles, sea-based combatants, land bases, and ground forces. The proliferation of advanced technology, including precise guidance, stealth technology, electronic warfare systems, multimode missile seekers, and improved deception and countermeasures, has reduced the defense capabilities of U.S. systems. A wide range of possible U.S. responses exists, but a broad review of the specific active and passive defense enhancements, strike options, and deterrence opportunities would strengthen the U.S. preparation for countering these missile threats and improving system survivability.

The purpose of this Defense Science Board (DSB) Task Force is to review current and future ballistic and cruise missile threats, assess the implications of those systems to the survivability of U.S. critical assets, review current U.S. responses to those threats and counter-measures that might nullify those responses, and investigate and prioritize a proposed short- and long-term U.S. response. A key Task Force concern should be the cost-effectiveness of any proposed recommendations.

A key component of developing a U.S. response is an analysis of the current missile threats and a projection of their future capabilities. Ballistic missile technology has proliferated to potential adversaries, and missile accuracy, range, maneuver, lethality, and countermeasure improvements will become increasingly challenging to long-range active defense sensors and interceptors. Cruise missile technology has also proliferated, and missile accuracy, speed, radar cross section, flight altitude, and maneuver improvements will become increasingly challenging to the survival of our high value assets. In addition to these missile advances, threat electronic and cyber warfare advancements can further reduce the survivability of our high-value assets by directly attacking our active defense systems, as well as the supporting command and control networks, communication links, and intelligence, surveillance, and reconnaissance (ISR) systems.

The United States should respond early to threats that have lower development costs and higher potential impacts. The Task Force should prioritize the most critical survivability concerns for near-term response, extrapolate the current missile threat, and prioritize the threat capabilities that should drive U.S. defense system and technology investment. Additionally, the Task Force should investigate the effects chains for the highest priority missile threats and highlight areas of potential vulnerability. These vulnerabilities may be exploited though a range of measures, to include: reducing threat sensor performance through electronic or cyber-attacks; hardening; adding target decoys; increasing background clutter; or using other deceptive

techniques. Improvements to our active defense system may also include enhancement of long-range sensor and interceptor performance through new target discrimination or combat identification techniques. Based on the threat effects, chain vulnerabilities, and the effectiveness of possible defense measures, the Task Force should review all current counter missile efforts and prioritize the defense system and technology needs for near and far-term investment. The Task Force should also look more broadly at possible responses, including improvements to our passive defenses, possibilities for pre-missile launch strike, disruption of the threat missile supply chains, and approaches for improved deterrence. Alternative, more resilient defense architectures should be investigated, including architectures with larger stand-off distances enabled by long-range strike missiles, improved ISR sensing, and autonomous air, land, and sea systems. Finally, in some instances, the United States may be fielding systems that are in effect lucrative targets that cannot be economically defended. In these instances, the Task Force should consider the possibility of employing alternate military systems to accomplish the required military objectives and missions with substantially reduced vulnerability.

I will sponsor the study. Mr. Bob Stein and Mr. Jim Carlini will serve as Co-chairmen of the study. Mr. James Macstravic will serve as Executive Secretary. Captain James CoBell, U.S. Navy, will serve as the DSB Secretariat Representative.

The study will operate in accordance with the provisions of Public Law 92-463, the "Federal Advisory Committee Act" and Department of Defense (DoD) Directive 5105.04, the DoD Federal Advisory Committee Management Program." It is not anticipated that this study will need to go into any "particular matters" within the meaning of title 18, U.S.C., section 208, nor will it cause any member to be placed in the position of action as a procurement official.

Frank Kendall