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Naval Forces' Defense Capabilities Against Chemical and Biological Warfare Threats—*Summary*

NAVAL STUDIES BOARD

Background. U.S. naval forces must be prepared to respond to a broad array of chemical and biological warfare (CW and BW) threats. To help review its preparedness, the Chief of Naval Operations asked the National Research Council (NRC) to assess the U.S. Navy's defense capabilities against CW and BW threats. In particular to what extent are capabilities being developed to enable naval forces to sense and analyze quickly the presence of chemical and biological agents, withstand or avoid exposure to such agents, deal with contamination under a broad spectrum of operational conditions, and over what period will these capabilities be realized. To carry out this study, the NRC formed the Committee for an Assessment of Naval Forces' Defense Capabilities Against Chemical and Biological Warfare Threats.

The Committee focused its efforts on evaluating the current operational posture of naval forces for defending against CW and BW threats across all of its operations and on opportunities for improving those capabilities by operational and technical means.



Overview

CW and BW—A Real and Present Threat to Naval Forces. With few exceptions, the Navy needs to improve its preparedness for today's chemical or biological threats. In particular, more attention should be paid to address threats in port, at shore installations, and throughout the logistics trains. While the Marine Corps appears to have paid more attention to this problem, improvement is still possible. Effective approaches for defense should be based on the following:

- *Recognize Chemical Weapons and Biological Weapons Constitute Different Threats.* These weapons differ in the effects that each produces, and there are unique requirements for dealing with each. CW is expected to be a threat at the tactical or operational level while BW is more likely a theater- or strategic-level threat.
- *Manage to Risk, Not Threat Alone.* Threat alone should not form the basis for developing a defense, as it can drive requirements to unrealistically expensive levels. Instead of managing to threat alone, balanced risk assessments should form the basis for deciding "how much (capability) is enough."
- *Adopt Reasoned View of Chemical and Biological Weapons Exposure Environments.* Requirements for defense against chemical and biological weapons should be based

on operationally realistic exposure environments. Levels of protection should be established to accept casualties that are consistent with those expected from conventional operations spanning similar time and spatial domains.

General Findings and Recommendations

- *Naval Leadership for Chemical and Biological Warfare Defense.* The Navy's senior leadership should commit to strengthening and integrating chemical and biological defense throughout all Navy functions in order to achieve both near-term and sustained improvements.
- *Getting Started with Operational Net Assessments.* CW or BW defense alone will never be perfect, and a defense-in-depth strategy should form the basis for the future. The Navy and Marine Corps should start operational net assessments.

Operations: Specific Findings and Recommendations

- *Operational Requirements.* The Navy, and in some respects the Marines, have not defined the chemical or biological warfare defense operational requirements for mission success. This should be remedied throughout the entire force by defining a comprehensive concept of operations with supporting policies and practices.
- *Focal Point for Concept of Operations.* The Navy Warfare Development Command (NWDC) and the Marine Corps Combat Development Command (MCCDC) should be clearly designated as the primary authorities and given requisite resources for developing policy, concepts of operations, and doctrine for CW and BW defense.
- *Readiness.* Navy readiness for CW and BW defense needs improvement. Sustained improvements toward remedying these deficiencies require establishing standards for readiness, training and exercising to those standards, and developing a reporting system attuned to this area. Special urgency should be given to bases and shore installations and to the logistics chain.

Science and Technology: Specific Findings and Recommendations

Research, development, and acquisition for CW and BW defense are carried out through the Joint CBD Program. The Committee was unable to make projections for specific periods because both the National Institutes of Health and the Department of Homeland Security are playing a major role in this area, and the Program itself is undergoing a major reorganization and reassignment of responsibilities. In general, the Committee believes that the Department of the Navy should follow closely and leverage any such future activities to accelerate developments appropriately. In the end, the Committee offers observations on activities in the context of the near-, mid-, and far-term based on technical or development difficulties associated with a particular area.

Non-medical Science and Technology

- *Joint CBD Program: Non-medical S&T Program.* The focus on contamination avoidance that has been the Program's central philosophy is unrealistic. A risk

management approach which assumes that contamination will happen and focuses on managing the response is needed. Also, the requirements and acquisition processes of the Program have pushed acquisition schedules out far too long for providing capabilities that could improve the current operational posture.

- *Navy Participation.* The Navy has been the least aggressive of the Services in its participation. While some Navy personnel appear well informed and committed to their assignments they do not have sufficient support from senior Navy leadership and commands to analyze joint requirements in the naval context.
- *Test and Evaluation.* A test and evaluation program should be undertaken by the Navy that is much more serious and comprehensive than is currently the case. Both modeling and simulation and realistic test environments are needed.

Medical Defense

- *General.* A clear differentiation should be made between medical response to chemical agents and to biological agents. The latter is clearly the most challenging from a medical perspective.
- *Medical Training.* Enhanced training of naval personnel, medical, and—as noted for operations—non-medical, represents the highest-payoff, near-term investment.
- *Technical and Operational Shortfalls.* Many shortfalls in medical capabilities result from over reliance on the Joint CBD Program. The nature of these shortfalls in terms of naval-specific requirements must be defined. The requisite analysis should be undertaken by the naval services doctrine and warfare development centers.
- *Medical Policy Issues.* The certification of critical laboratory reagents and the slow progress toward certification of drugs and vaccines for BW pathogens by the Food and Drug Administration (FDA) is a major problem for the Joint CBD Program in developing BW defense capabilities. While FDA has taken steps to accelerate certification, the Joint Program has been slow to act upon “openings” to shorten development and approval times. Liaison and cooperation between DoD and the Department of Health and Human Services is critical in this connection, and this kind of dialogue cannot be assumed to represent the Navy’s interests or needs.

Conclusion—Leadership to Sustain the Commitment

In the short term, a strategy to implement the recommendations contained in this report can produce dramatic improvements to force readiness and overall situational awareness. The Navy and Marine Corps can make good progress in the short and mid-term, but need to accelerate the improvement of their capability to successfully sustain operations in the face of robust adversary use of chemical or biological weapons. Naval leadership needs to increase priority for protecting naval forces against CW and BW threats. Guided by sound risk management practices, naval forces can go far in reducing the dangers and threat of any chemical or biological attack.

For further information,

Copies of the complete report, *Naval Forces' Defense Capabilities Against Chemical and Biological Warfare Threats*, can be obtained on the National Academy Press Web site
<<http://www.nap.edu/catalog/11034.html>>.

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