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Managing Materials for a 21st Century Military

NATIONAL MATERIALS ADVISORY BOARD

Background

Since 1939, the U.S. government, in the form of the National Defense Stockpile (NDS), has been stockpiling critical strategic materials for national defense. The economic and national security environments, however, have changed significantly from the time the NDS was created. Current national security threats are more varied, production and processing of key materials is more globally dispersed, the global competition for raw materials is increasing, the U.S. military is more dependent on civilian industry, and industry depends far more on just-in-time inventory control. To help determine the significance of these changes for the strategic materials stockpile, the Department of Defense asked the NRC to assess the continuing need for and value of the NDS. This report begins with the historical context of the NDS. It then presents a discussion of raw-materials and minerals supply, an examination of changing defense planning and materials needs, an analysis of modern tools used to manage materials supply chains, and an assessment of current operational practices of the NDS.

Conclusions and Recommendations

The design, structure, and operation of the NDS are not effective in meeting 21st century national defense material needs and threats. In particular, there are three major threats to assuring the supply of critical materials that are not being adequately addressed by the current NDS approach. They are increased world demand, diminished domestic supply and processing capacity, and higher risk about supply disruptions.

The DoD also does not appear to fully understand its needs for specific materials. Furthermore, adequate information about the supply of these materials is lacking as are data on demand for particular materials for specific defense needs. A strong relationship between stockpile policy and national security objectives is missing.

A more effective system to ensure against disruptions would benefit from a well-defined and dynamic model of defense needs that identifies critical materials. In addition, there is an urgent need for better collection of data on the availability of these materials for defense needs that accounts for locations of secure supplies, potential supply disruptions, and the global use of materials in defense and civilian applications.

Because foreign dependence may become a problem when combined with political instability in source regions and greater global competition for mineral resources, the

federal government has a role in managing the supply of critical materials. A national defense-materials management system is needed that reflects current geopolitics, and the mutual dependence of U.S. defense needs and both commercial supply chains and global economic dynamics. Such supply-chain management concepts that include stockpiles only when necessary have been adopted by the private sector

The adoption of a total system approach—including appropriate policy, regulatory, and legislative changes is called for. Such a system would be based on a coordinated strategy designed to ensure the availability of critical materials to meet defense needs. While a materials inventory would be a component, a new system would assess supply risks, spot vulnerabilities in the supply chain, and design and manage that chain to be more resilient to disruption. Fundamental to the operation of this system are analyses that identify defense-specific materials needs.

The operation of this system should also be integrated with current defense planning; have a flexible policy framework that is integrated with current defense procurement policies; and contain the option of partnering with private industry. In addition, the system should possess an appropriate information system and forecasting tools; solicit advice from industry, academia, and other stakeholders; evaluate the potential benefits of recycling and substitution; and perform risk assessments accounting for existing and possible environmental constraints.

For Further Information Copies *Managing Materials for a 21st Century Military* of can be obtained from the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418, 201-334-3313, <http://books.nap.edu>. Support for this project was provided by the U.S. Department of Defense. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the sponsors. More information about the National Materials Advisory Board can be found at <http://www7.nationalacademies.org/nmab>.