



Defense Systems
Information Analysis Center

DSIAC TECHNICAL INQUIRY (TI) RESPONSE REPORT

Shortages and Risks to the U.S. Energetic Materials Supply Chain

Report Number:

DSIAC-2018-0887

Completed February 2018

DSIAC is a Department of Defense
Information Analysis Center

MAIN OFFICE

4695 Millennium Drive
Belcamp, MD 21017-1505
Office: 443-360-4600

REPORT PREPARED BY:

Scott Armistead

ABOUT DSIAC

The Defense Systems Information Analysis Center (DSIAC) is a U.S. Department of Defense information analysis center sponsored by the Defense Technical Information Center. DSIAC is operated by SURVICE Engineering Company under contract FA8075-14-D-0001.

DSIAC serves as the national clearinghouse for worldwide scientific and technical information for weapon systems; survivability and vulnerability; reliability, maintainability, quality, supportability, and interoperability; advanced materials; military sensing; autonomous systems; energetics; directed energy; and non-lethal weapons. We collect, analyze, synthesize, and disseminate related technical information and data for each of these focus areas.

A chief service of DSIAC is free technical inquiry (TI) research, limited to 4 research hours per inquiry. This TI response report summarizes the research findings of one such inquiry. For more information about DSIAC and our TI service, please visit www.DSIAC.org.

ABSTRACT

Defense Systems Information Analysis Center (DSIAC) staff conducted research on the U.S. energetic materials supply chain and provided links to a Government Accounting Office report that describes what the U.S. Department of Defense (DoD) and industry are doing to address challenges and risks. Staff provided information from DSIAC articles on the U.S. rocket propulsion industrial base and other related topics. They also provided information on the Undersecretary of Defense for Acquisition, Technology, and Logistics and the Joint Army Navy NASA Air Force Interagency Propulsion Committee, which are actively working on issues related to the DoD's critical energetics supply concerns. In addition, DSIAC staff included relevant information on energetic technologies related to rocket propellants from the Aviation and Missile Research, Development, and Engineering Center Weapons Development and Integration Directorate Report.

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1.0 TI Request

1.1 SUBJECT: Economics of the Energetic Materials Market
Related to Potential Shortage and/or Risk to the Supply Chain

1.2 DESCRIPTION

The inquirer requested a review of information on the economics of the energetics market and research to explain varying viewpoints on the potential risks facing the energetics supply chain. The inquirer requested this information considering recent discussion concerning critical energetic materials and risks to their supply chain. The inquirer identified that House Report 115-200, accompanying the House's original National Defense Authorization Act, contained a provision requiring a congressional briefing on the development of a "Naval energetic materials roadmap" [1]. However, the language did not survive the final bill (accompanied by House Report 115-404 [1]).

2.0 TI Response

Defense Systems Information Analysis Center (DSIAC) staff compiled information relevant to the inquirer's request from DSIAC Journal articles and open sources [2].

2.1 DSIAC PUBLICATIONS

2.1.1 Most Relevant DSIAC Publications

DSIAC staff recently completed a website article and several DSIAC Journal articles related to the energetic materials supply chain.

- “Solid Rocket Motors: GAO Studies Supply Concerns and Challenges” [3]:
 - The DSIAC website article contains a link to the Government Accounting Office (GAO) Report “SOLID ROCKET MOTORS - DOD and Industry Are Addressing Challenges to Minimize Supply Concerns.” The report specifically reviewed risks to the supply chain and what the GAO assessed that the U.S. Department of Defense (DoD) and industry were doing about the risks; the GAO did not make any recommendations [4].
- “The U.S. Rocket Propulsion Industrial Base: A Status Report” by Albert Defusco [5]:
 - The article contains additional information on risks to energetic materials supply chain and the DoD response.

2.1.2 Additional Relevant DSIAC Journal Articles

- “Breakthroughs in Engine Propulsion Research with High-Performance Computing” by L. Bravo et al. [6].
- “Space Travel Aided by Plasma Thrusters: Past, Present and Future” by A. Defusco et al. [7].
- “A Historical Overview of a Half Century of U.S. Missile Development” by J. Teague and E. Fleeman [8].
- “A Promising Future for US Navy: Vertical Launching Systems” by E. Fiore [9].

2.2 JOINT ARMY NAVY NASA AIR FORCE (JANNAF) INTERAGENCY PROPULSION COMMITTEE PROGRAMMATIC AND INDUSTRIAL BASE TEAM ANNUAL REPORT

The Office of the Undersecretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)) has staff responsible for working on issues associated with the DoD's critical

energetic materials supply concerns. Additionally, JANNAF's Programmatic and Industrial Base (PIB) Team is responsible for releasing the PIB's Annual Report, which is an excellent resource for information on the economics of the energetics market. OUSD(AT&L) and JANNAF are valuable sources for pertinent information regarding the inquiry topic.

2.3 AVIATION AND MISSILE RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER (AMRDEC), WEAPONS DEVELOPMENT AND INTEGRATION DIRECTORATE REPORT

AMRDEC recently published a 36-page report on enabling energetic technologies related to rocket propellants. The report is available through the Defense Technical Information Center.

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- [9] Fiore, E. "A Promising Future for US Navy: Vertical Launching Systems." *DSIAC Journal*, vol. 1, no. 2, Fall 2014, <https://www.dsiac.org/resources/journals/dsiac/fall-2014-volume-1-number-2/promising-future-us-navy-vertical-launching>.