

## PROBLEM STATEMENT

**REQUIREMENT TITLE:** Critical Chemicals for Defense

**CRITICAL SECTOR:** Kinetic Capabilities

**BACKGROUND:** In order to strengthen the national industrial base during times of disruption, President Joseph R. Biden, Jr. signed Executive Order (E.O.) 14017, America’s Supply Chains, on February 24, 2021. The E.O. calls for a comprehensive review of supply chains in critical sectors, including the Defense Industrial Base (DIB). The Department of Defense (DoD) one-year report, submitted in response to the E.O., Securing Defense-Critical Supply Chains, outlined the DoD’s commitment “to strengthen the industrial base and establish a network of domestic and allied supply chains to meet national security needs.” Given the breadth and scale of defense supply chains, the report focused on the following four sectors in which critical vulnerabilities pose the most pressing threat to national security: (1) kinetic capabilities; (2) energy storage and batteries; (3) castings and forgings; and (4) microelectronics.

Under kinetic capabilities, chemicals are essential for the proper functioning of defense systems as part of energetic formulations that go into explosives, propellants, and pyrotechnics. The DoD needs a healthy supply of chemicals to maintain defense readiness and enable the services to innovate and apply more sustainable solutions for national security. In support of this mission, the Manufacturing Capability Expansion and Investment Prioritization (MCEIP) office intends to continue the investments in onshoring production of critical chemicals for the defense industry that are currently not being manufactured in the United States and are being sourced from foreign (often adversary) nations.

Many of the chemicals listed below, or their precursors, have applications in commercial markets, including but not limited to, agriculture, pharmaceuticals, energy, automotive and aerospace, consumer goods (e.g., food and beverage, cosmetics, personal care) and their packaging, electronics, and appliances, etc. Therefore, this funding opportunity will not only secure chemical supply for the defense industry but will also improve America’s supply chains and contribute to strengthening the Nation’s economy.

**DESIRED OBJECTIVE:** The MCEIP office is seeking chemicals suppliers to create a more resilient industrial base, increase domestic capacity, increase competition, and thereby drive down chemical products cost.

The prototype solution shall demonstrate technical and manufacturing feasibility of establishing commercially viable production lines of as many chemicals as possible from the list provided below and may include their precursors. The resulting prototype solution must meet the criteria for Technology Readiness Level (TRL) 6 or above, with TRL 6 defined<sup>1</sup> as “system/subsystem model or prototype demonstration in a relevant environment.”

A successful prototype solution will demonstrate development of synthetic routes for the listed chemicals that can subsequently be scalable to desired quantities (see below) and produce chemicals that meet the performance criteria for the targeted application. Such criteria are included in the Military Specification for each of the chemicals. In the event of such specification being cancelled, the most recent active version shall be used. In those cases when there is no Military Specification for any given chemical included herein, an alternative (commercial) specification shall be provided.

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<sup>1</sup> Defined in accordance with the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) Office of the Executive Director for Systems Engineering and Architecture (SEA) Technology Readiness Assessment Guidebook, dated June 2023, <https://www.eto.mil/wp-content/uploads/2023/07/TRA-Guide-Jun2023.pdf>

Appendix A, which contains Controlled Unclassified Information (CUI), is available on the DIBC members-only site at <https://private.dibconsortium.org> and is accessible by U.S. companies with a valid DD 2345.

Chemicals:

- Dibutyl Sebacate
- Dioctyl Sebacate
- Copper (I) 5-nitrotetrazole (DBX-1), and its precursors:
  - Sodium 5-nitrotetrazole (NaNT)
  - Aminotetrazole nitrate (Procten)
  - 5-Aminotetrazole
- Bismuth trioxide
- Triphenyl bismuth
- Benzylamine
- Glyoxal
- Tetraacetyldiamino Hexaazaisowurtzitane (TADA)
- Oxamide
- Isophorone Diisocyanate
- Hexamethylene Diisocyanate
- N-100 (curative agent)
- N-3200 (curative agent)
- 4-Chloronitrobenzene
- Charcoal
- Barium Peroxide
- Barium Carbonate
- Cesium Nitrate
- Amorphous Boron (Powder)
- Methyl Aniline
- Ethyl Aniline
- Colored Smoke Dyes and Precursors
  - Quinizarin: Tech and Sublimed
  - Leucoquinizarin
  - Quinaldine
  - Nitroanthraquinone

**ANTICIPATED FUNDING:** Multiple awards are probable with individual Project Agreement funding estimated between \$1M - \$24M, subject to the availability of future Government funding. Companies are advised if selected for award, prototype solutions are subject to negotiation.

**ANTICIPATED SECURITY LEVEL:** Classified information up to and including Secret is expected.

**ESTIMATED PERIOD OF PERFORMANCE (POP):** Up to five years.

**ANTICIPATED DATA RIGHTS:** Government Purpose Rights, as appropriate for any data developed using Government funding.

**TECHNICAL POCs:** Designated technical subject matter experts (SMEs) for Army, National Aeronautics and Space Administration (NASA), Navy, Missile Defense Agency (MDA), Space Force, and Air Force will be provided upon selection for award.

**FOLLOW-ON PRODUCTION:** Companies are advised that any prototype Project Agreement awarded in response to this Problem Statement may result in the award of a follow-on production contract or transaction without the use of further competitive procedures in accordance with 10 United States Code (U.S.C.) §4022(f). The follow-on production contract or transaction may also be available for use by one or more organizations in the DoD and, as a result, the magnitude of the follow-on production contract or agreement could be significantly larger than that of the prototype OT agreement. As such, any prototype Project Agreement will require the two criteria required by 10 U.S.C. §4022(f) be met and documented in order to use the follow-on production authority without the use of additional competitive procedures.