

PROBLEM STATEMENT

Requirement Title: Propulsion Systems and Energetics Prototyping for Joint, Army, Navy, NASA, Air Force (JANNAF)

Critical Sector: Kinetic capabilities

BACKGROUND: JANNAF's mission is to promote and facilitate exchange of technical and programmatic information among the Military Departments, Defense Agencies, National Aeronautics and Space Administration (NASA), United States (U.S.) industry and academia; to establish standards; to effect coordination and avoid unnecessary duplication of basic research, applied research, advanced technology development, advanced component development and prototypes, and system development and demonstration programs in the areas of missile, gun, and space propulsion and energetics; to accomplish problem solving in areas of joint interest; and to support collaboration to maintain and strengthen the domestic rocket propulsion industrial base.

The JANNAF Charter includes two principal areas of JANNAF: the Technical Executive Committee (TEC) and the Programmatic and Industrial Base Executive Committee (PEC). JANNAF focuses on the technology, development, and production capabilities for all types of propulsion systems and energetics for tactical, strategic and missile defense rockets and missiles, for space boost and orbit transfer, for in-space propulsion, and for gun systems across the Military Departments, Defense Agencies, and NASA.

- Technical areas of interest include chemical synthesis; thermochemistry; combustion phenomena; physical, chemical, and mechanical properties and manufacturing process development of propellants, explosives, and fuels; special test equipment and techniques; theoretical and experimental performance; analytical test techniques; component and propulsion unit design; nondestructive evaluation; operational serviceability; life-cycle costs; reliability; environment protection; exhaust plume technology; interior ballistics; material areas specifically related to missile, space, and gun propulsion; and the evaluation of hazards and safety measures related to these areas.
- Programmatic and industrial base areas of interest include integrated program plans and key decision points; industrial base assessments; risks and opportunities with respect to skills, knowledge, and experience; identification of commonality, innovative acquisition, and partnership opportunities; integrated assessments to identify rocket propulsion industrial base (RPIB) rationalization opportunities; special actions from senior agency, department, or Executive Office of the President (EOP) leadership; and information provided to decision makers for either situational awareness or policy decisions.

Desired Objective: The objective for the Propulsion Systems and Energetics Prototyping for JANNAF projects are to improve the state-of-the-art in the field of propulsion systems and energetics for tactical, strategic and missile defense rockets and missiles, for space boost and orbit transfer, for in-space propulsion, and for gun propulsion systems.

Prototyping shall include development of proof of concepts; agile development activities; and/or design, development, demonstration of technical utility. The performer must provide facilities and analysis tools to

support prototyping requirements as needed. Prototyping that will be conducted for JANNAF includes, but is not limited to, the following:

- System design, engineering, and integration
- Test and evaluation
- Mishap investigation and review
- Rocket propulsion testing
- Web-based tool development, data collection, and data storage
- Database development/maintenance and analysis
- Architecture analysis
- Analysis of alternatives
- Failure analysis
- Concept development and requirements analysis
- Limited experimental investigation and hardware assessments including but not limited to Plume/Wake/Hypersonic Signature Prediction codes (existing and soon to be fielded)

To support and to ensure the relevance of ongoing prototyping activities strategic outreach and engagement with the propulsion and energetics technical communities is required to aggregate, assess, and respond to relevant, evolving information in technical advancements in real time (i.e., when the threat shifts or there are technical advancements, the prototyping activities evolve to encompass changes).

- Technical planning and support for the Programmatic, Technical, and Industrial Base Committee Meetings (e.g., executive committees, steering groups, panels, joint service interchange meetings, workshops, etc.)
- Technical planning and support for technical conferences

In support of, and based on lessons learned from prototyping activities, the performer will be required to submit the following deliverables.

- Technical assessments and studies
- White Papers identifying and/or analyzing the industrial base and/or prototyping influences and outcomes
- Technical inputs to bi-annual JANNAF programmatic and industrial base master report/presentation for integrated program plans and key decision points
- Technical inputs to Journal of Propulsion and Energetics (Controlled Unclassified Information (CUI)) and JANNAF Newsletter

In support of prototyping activities, the performer must provide secure technology and capability to assess, store, and/or track sensitive and/or classified data. This will include but is not limited to the following.

- Data and documentation within JANNAF library (physical and digital)
- Propulsion and energetics codes
- Secure website and filesharing
- Database including International Traffic in Arms (ITAR)

Anticipated Funding: The Government anticipates approximately \$3M for the JANNAF plume/wake/hypersonic signature prediction codes prototype tasks annually, and an estimate of approximately \$2.5M for the other ancillary tasks annually. These estimates are subject to negotiation, if selected.

Anticipated Security Level of the Prototype Project: Awardee will access and store classified information up to and including Secret.

Estimated Period of Performance: 5 years

Anticipated Data Rights: Government Purpose Rights

Technical POC(s): Designated technical SMEs for Army, NASA, Navy, and Air Force will be provided upon selection for award.