Natick Soldier Research, Development and Engineering Center

Army Research Opportunities Overview for JAPBI

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Vision

The Soldier's RDEC – Ensuring dominance through superior scientific and engineering expertise

Mission

Providing the Army with innovative science and technology solutions to optimize the performance of our Soldiers.

Mission Areas

DoD Combat Feeding

Soldier and Squad Performance Optimization

Warfighter Protection

Expeditionary Maneuver Support

Airdrop and Aerial Delivery

B&B Goals

T5. By 2019, Army S&T will demonstrate the viability of establishing correlations between quasi-static and dynamic mechanical properties for advanced engineered ceramics, composites and textile based armor platforms and architectures and ballistic performance. These correlations should relate material properties such as hardness for ceramics, and strength, stiffness and tenacity for fiber systems to ballistic performance including penetration velocities, and back face deformation. The purpose of this goal is to identify the material properties that must be improved to further reduce the weight of armor systems.

H1. By 2019, Army S&T will deliver survivability criteria and test methodology for ballistic induced behind helmet blunt trauma to develop injury based performance criteria for combat helmets. The purpose of this goal is to have a medically based criteria for helmet acceptance.

H2. By 2019 deliver injury curves for acute cervical spine injuries associated with head supported mass. By 2022 deliver injury curves for chronic cervical spine injuries associated with head supported mass. The purpose of these goals is to have a medically based criteria for helmet weight.

T3. By 2019, Army S&T will develop prototype armor designs with no greater than a 20% increase in areal density to defeat emerging small arms threats. This research area includes foreign exploitation as well as domestically produced advanced next generation kinetic threats. The purpose is to demonstrate armors that defeat potential threats and continually inform the community of the trade space between protection levels and armor system weight.

E7, T2, S9, and H3 (combined). By 2021, Army S&T will deliver a standardized blast test methodology for dismounted personnel subject to air bursting or buried explosive threats correlated to Soldier injury. The methodologies will be traceable to operationally relevant threats and injury criteria for blast overpressure.

S1. By 2021, Army S&T will deliver threat based protection requirements for ballistic and blast loading to the eyes and ears. These requirements will be linked to expected battlefield threats and injury data.

S6. By 2021, Army S&T will develop vision protection technology that will not fog in any combat environment (hot, cold, wet).

T13. By 2030, Army S&T will develop squad-level active protection for small arms threats. The purpose of this goal is to off-load the protection from the individual Soldiers to a squad-level asset such as a robotic vehicle. While this is a long term goal, it will require immediate research in novel defeat mechanisms and sensing technology.

IP Goals

Area	Time Frame	Description
Signature Management	Far	Non-traditional approaches are required. Requirements/threat space analysis
Test Methodology Development	Mid	Development of reliable, repeatable, cost effective, validated test methods. Objective – correlated to operational threats and probability of injury & predictive operational life span test method; Threshold – relative test methodology
Multi-functional materials	Far	Inherent functionalities engineered into flexible substrates. e.g. signature management, flame resistance, durability, moisture and temperature regulation, etc. Focus is to reduce size, weight, bulk and stiffness of OCIE.
Systems Integration	Mid	Assessing entire Soldier system (human + equipment), the intended capability and functionalizing materials and configurations strategically to maximize efficiencies.
Personal Water Filtration	Mid	Desalination, TIC/TIM, individual capability, lightweight, durable, remaining operational life indicator
Responsive/Adaptive Materials	Far	Materials that respond to physical stimuli whether environmental or physiological to provide capabilities such as sensing, physical augmentation, heat, cold, threat detection.
Flame Resistance	Near	Materials development, test standardization, requirements analysis
Vector Protection	Near	Durability, alternative chemistries, longer lasting (e.g. abrasion, laundering, volatility), requirements analysis
Environmental Protection	Near	Extreme climate protection

Technology Readiness Levels

- *Used to identify the maturity of a technology, component or system*
- *Drives types of funds that can be spent on research and acquisition*
- *Software-, Engineering-, and Manufacturing Readiness Levels similar*

RD&ECs/Lab

Product Manager

TRL	Definition	Description	BA
1	Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.	6.1
2	Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.	
3	Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.	6.2
4	Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.	
5	Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.	6.3
6	System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.	
7	System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.	6.4
8	Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.	
9	Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.	6.5

Technology Transfer Mechanisms

Flexibility through ***non-funded*** federal partnering agreements	
Cooperative Research and Development Agreements (CRADAs)	•One or more federal laboratories working with one or more non-federal partner(s) toward a common R&D objective.
Testing Service Agreements (TSA)	•Straight fee-for-service testing, not a collaborative effort. •Customer owns all test data, Gov't release is prohibited
Patent License Agreements (PLAs)	•Non-exclusive, partially exclusive, or exclusive.
Educational Partnership Agreement (EPA)	•For the purpose of encouraging and enhancing study in scientific disciplines at all levels of education.

Cooperative Research and Development Agreements (CRADA)

Presumes alignment of government and commercial/academic technical objectives

- Federal partners can provide personnel, services, facilities, equipment, *but no $$$'s to non-federal partners.*
- Non-federal partners can provide personnel, services, facilities, equipment, and $$$'s.
- Each party retains ownership of solely invented IP and joint inventions will be jointly owned.
- Federal government retains a non-exclusive license to all IP arising under the CRADA, for use by or on behalf of the government.
- Government agrees to negotiate a royalty bearing exclusive license to government owned IP arising under the CRADA.

Testing Service Agreements

Unique federal laboratory facilities/capabilities are available to the private sector for testing purposes

- A Testing Service Agreement (TSA) is a simple two party agreement that can be turned around in a few days.
- Cost to the purchaser is equal to the laboratory's cost to provide the service.
- The purchaser retains sole ownership of the test results and the government is prohibited from disclosing data to third parties.
- The government does not derive any rights in or to the purchaser's Intellectual Property.
- The government is ***prohibited from directly competing*** with private testing service companies.

Cooperative Agreement Funding Opportunity

Under a Cooperative Agreement, a principle purpose is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized by law of the U.S. instead of acquiring property or services for the direct benefit or use of the U.S. government

Cooperative Agreement (CA)

- Public Benefit
- Substantial involvement is expected between the agency and the recipient
- Funding Agreement
- Rigid Patent Rights

Opportunities for Funded Contracts

BAA and Unsolicited Proposals must comply with the FAR but still provide the offeror with more flexibility than a typical contract solicitation.

Broad Agency Announcement (BAA)

- The BAA is an open solicitation for proposals.
- It is funded to fulfill requirements for scientific study and experimentation.
- The BAA does not focus on specific systems or hardware.
- The solicitation is divided into topic groups that are of interest to the sponsoring lab and identifies a POC for that area.

Unsolicited Proposals (UP)

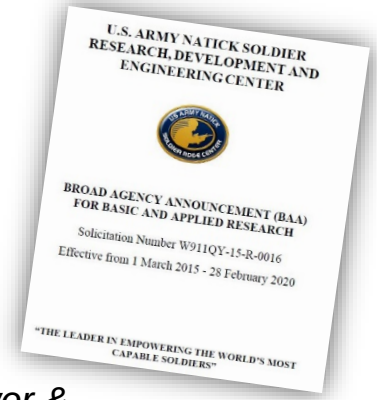
- Innovative and unique;
- Independently originated and developed by the offeror;
- Prepared without Government endorsement or involvement;
- Include sufficient detail to permit a proper evaluation;
- Not be an advance proposal for a known agency requirement;
- Not address a previously published agency requirement.

BAAs and UPs are always subject to availability of appropriate agency research funds (usually 6.3) in a fiscal year

NSRDEC BAA

C. **Warfighter Systems Technologies**

1. *Ballistic Protection for Individuals*
2. *Integrated Protective Headborne Equipment and Injury Diagnostic/Assessment Tools*
3. *Modular Personal Protection Equipment (MPPE) and Injury Diagnostic Assessment Tools*
4. *Chemical/Biological Protection for Individuals*
5. *Flame and Thermal Protection for the Individual Soldier*
6. *Biotechnology*
7. *Countersurveillance*
8. *Body Worn Interactive Materials*
9. *Body-Worn Systems, Hand Held Devices, and Smart-Lightweight Electronic Components/ Modules for Soldier Protection, Knowledge Management and Cognitive Improvement*
10. *Biomechanics*
11. *Materials Nanotechnology*
12. *Anthropometry*
13. *Advanced Protection, Integration Technologies/ Systems and Assessment Methods*
14. *Warrior Performance*
15. *Soldier Power Sources, Power & Data Distribution and Management*
16. *Future Warrior Technology Integration*
17. *Technology Assessment and Simulation Tools*
18. *Ecological Approach to Warfighter Survivability; Perception-Action-Cognition*
19. *Tactical Medical Equipment and Systems*
20. *Integrated Sound, Light and Blast Management for the Ears and Eyes*
21. *Soldier Centric Information Portrayal & Management Technologies*


U.S. ARMY NATICK SOLDIER RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

BROAD AGENCY ANNOUNCEMENT (BAA) FOR BASIC AND APPLIED RESEARCH

Solicitation Number W911QY-15-R-0016

Effective from 1 March 2015 - 28 February 2020

"THE LEADER IN EMPOWERING THE WORLD'S MOST CAPABLE SOLDIERS"

Additional Information and POCs for each area are listed in the BAA

Federal Business Opportunities (FedBizOps or FBO)	•http://www.fbo.gov •Search W911QY-R-15-0016
Testing Facilities and Equipment	•http://nsrdec.natick.army.mil/media/print/Facilities&Equipment_Web.pdf

NSRDEC BOTAA

This Solicitation provides an opportunity for nontraditional defense contractors to work with the NSRDEC on mission enhancing prototypes. This new form of contracting vehicle is Non-FAR Based and can be utilized for rapid prototype development.

What is considered a prototype project? A prototype project can generally be described as a preliminary pilot, test, evaluation, demonstration, or agile development activity used to evaluate the technical or manufacturing feasibility or military utility of a particular technology, process, concept, end item, effect, or other discrete feature. Prototype projects may include systems, subsystems, components, materials, methodology, technology, or processes.

What is a non-traditional defense contractor? as per 10 USC 2302(9) this is an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation of sources by the Department of Defense for the procurement or transaction, any contract or subcontract for the Department of Defense that is subject to full coverage under the cost accounting standards prescribed pursuant to section 1502 of title 41 and the regulations implementing such section.

What does Non-FAR Based Agreement mean? The resultant award of any OTA using the procedures under NSRDEC BOTAA are NOT made or issued under the provisions of the Competition in Contracting Act of 1984 (P.L. 98-369), FAR Part 6 or any other FAR based regulation. However, the information provided in the BOTAA is intended to ensure competitive procedures are used to the maximum extent practicable when entering into agreements to carry out these prototype projects.

http://www3.natick.army.mil/NSRDEC-BOTAA.aspx

Questions?