



Broad Agency Announcement
Advanced Sources for Single-event
Effects Radiation Testing (ASSERT)
Microsystems Technology Office
HR001123S0047
July 5, 2023

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PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title:** Advanced Sources for Single-event Effects Radiation Testing (ASSERT)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001123S0047
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** 12.910 Research and Technology Development
- **Dates:** (All times listed herein are Eastern Time)
 - Posting Date: July 5, 2023
 - Proposers Day: July 13, 2023
 - Abstract Due Date August 4, 2023 at 4:00 PM
 - FAQ Submission Deadline: August 31, 2023 at 4:00 PM
 - Proposal Due Date: September 15, 2023 at 4:00 PM
 - Estimated period of performance start: February 2024
- **Concise description of the funding opportunity:** The Advanced Sources for Single-event Effects Radiation Testing (ASSERT) program will develop new capabilities for single-event effect (SEE) testing of 3D heterogeneously integrated (3DHI) electronic components and circuits. These capabilities will transform the current radiation-hardened electronics design and development process, resulting in the rapid deployment of next generation electronics to space and strategic warfighters. Key program goals include the generation of energetic particles with penetration depths of up to 5 mm in silicon with high-radiation-relevant linear energy transfers (LETs) and beam diameters < 0.2 μm .
- **Anticipated individual awards:** Multiple awards are anticipated.
- **Anticipated funding type:** 6.2
- **Types of instruments that may be awarded:** Procurement contract, cooperative agreement or other transaction.
- **Agency contact:**
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PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. This BAA is being issued, and any resultant selection will be made, using the procedures under Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any negotiations and/or awards for FAR-based procurement contracts will use procedures under FAR 15.4, Contract Pricing. Proposals received as a result of this BAA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA BAAs are posted on the System for Award Management (SAM) website, under the Contract Opportunities link, at <https://sam.gov/>, and, as applicable, the grants.gov website at <http://www.grants.gov/>. The following information is for those wishing to respond to the BAA.

The Microsystems Technology Office (MTO) at DARPA seeks innovative proposals for the research and development of experimental radiation sources and techniques for single-event effects (SEE) testing of advanced node and 3D heterogeneously integrated (3DHI) electronics. The ASSERT (Advanced Sources for Single-event Effects Radiation Testing) program comprises a single Technical Area that addresses two principal Technical Challenges (TC1 and TC2): TC1 deep penetration depths with space-radiation-relevant linear energy transfers (LETs)¹; and TC2 charge tracks with fine spatial resolution. The two challenges are interconnected and proposals must respond to both. The program is expected to be UNCLASSIFIED.

Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

A. Background

Radiation threatens electronic systems from three main natural sources – galactic cosmic rays, charged particles trapped by planetary magnetic fields, and solar particle events – and from man-made sources such as particle accelerators, reactors, and nuclear weapons. Electronics are susceptible to upset, degradation, and failure resulting from total ionizing dose (TID), displacement damage dose (DDD), and the instantaneous response to single ionizing particles, i.e., “single-event effects” (SEE). In particular, SEEs threaten the reliability of the U.S. nuclear arsenal, spacecraft, avionics, and terrestrial systems such as server farms and autonomous vehicles.

¹ Linear energy transfer (LET) is a key SEE test parameter and is measure of the energy deposited per unit length as an energetic particle travels through a material. Space-radiation-relevant LETs fall in the range of 0.1 to 100 MeV-cm²/mg.

Today, the principal method for SEE testing in the U.S. relies on heavy-ion sources that produce large diameter beams for part- and board-level radiation qualification of electronics.² These sources produce relatively large beam spot areas ranging from a few square centimeters to up to 60 cm × 60 cm with penetration depths up to hundreds of microns.³ However, emerging advanced electronics are more complex and highly integrated than previous generations, potentially combining digital, analog, and optical functions using 3D topologies and multiple material types. 3D components are expected to reach multiple millimeters in vertical extent with a complexity and level of integration that will make it difficult, if not impossible, to de-package and disaggregate into constituent parts to perform radiation testing using current heavy-ion sources.

SEE testing of fully-integrated components will require an irradiation source that provides a combination of multi-millimeter penetration depths, space-radiation-relevant LETs, and fine spatial resolution and control to provide the linear and angular precision necessary to probe sensitive areas and to isolate faults. Current SEE testing methods are unable to simultaneously meet all of these requirements, necessitating the development of new sources and techniques to characterize and qualify next-generation microelectronics for applications in DoD strategic programs and space, airborne, and terrestrial missions requiring high reliability in radiation environments. Furthermore, data from ASSERT sources must be validated by comparison to relevant heavy-ion data to demonstrate that the new SEE sources can accurately reproduce device responses resulting from strategic and space radiation environments.

The process of testing with ion beams is slow and laborious, a problem exacerbated by the increasing complexity of electronics. In addition to providing new capabilities for 3DHI radiation qualification, ASSERT sources must be compact and cost-effective to enable implementation in laboratory and industrial settings where they can become incorporated into the development process. In this way, radiation qualification will be integrated throughout the design and fabrication flow, with ASSERT sources providing the means to rapidly identify radiation design flaws and to facilitate swift correction and design optimizations. **A key program goal is to reduce the time from design to radiation-qualified component by a factor of ten.**

In support of the development of innovative sources for SEE characterization of advanced node and 3D electronics, the ASSERT program will address two key interrelated Technical Challenges (TCs).

Technical Challenge #1: *Achieving deep penetration depths*

SEE qualification of 3D device topologies and stacked packaging will require charge tracks that deliver space-radiation-relevant LETs at deep penetration depths. Sources should be capable of producing LETs ranging from 0.1 to 100 MeV-cm²/mg while simultaneously achieving penetration depths up to 5 mm in silicon. Furthermore, energetic particles should be able to penetrate relevant packaging, oxides, overlayers, metallization, etc. without the need for de-lidding, substrate thinning, or other time consuming and potentially destructive methods.

² A. Rusek, “NASA Space Radiation Laboratory,” Domestic High-Energy Single-Event Effects (HiSEE) Testing Users Meeting, 13 April 2021.

³ Rusek, 8.

Current alternatives to heavy-ion approaches are unable to simultaneously meet LET, penetration depth, and spatial requirements for 3DHI characterization. *Ion microbeam* approaches⁴ operate at relatively low beam energies to enable fine focusing but, as a result, have penetration depths that are limited to tens of microns. *Pulsed laser* approaches have demonstrated fine spatial resolution and, recently, excellent correlation with heavy-ion test data.⁵ However, the pulsed laser approach requires optical access to the devices-under-test (DUTs) and is unable to penetrate metallization, packaging, and surfaces with even moderate roughness.

Technical Challenge #2: Achieving fine spatial resolution

Emerging 3D devices are more complex and highly integrated than devices of the previous decade and will require sub-micron beams with the linear and angular precision necessary to selectively probe the sensitive areas of a chip and to isolate the faults caused by resulting charge tracks. The shape and lateral extent of the deposited charge profile is critical to reproducing the device response induced by a heavy-ion strike. In addition to the spatial extent of the charge profile, the position of the charge profile must be known with sufficient accuracy to enable selective probing of the DUT.

Existing ion-based approaches – both *heavy-ion* and *ion microbeams* – cannot meet this goal due to mass, energy, and beam space charge limitations that prevent fine focusing using electrostatic or magnetic means, or because of low beam energies that limit penetration depths. *Pulsed laser* alternatives can achieve the necessary spatial resolution and positioning accuracy but their need for clear, unmetallized surfaces renders them unusable for many advanced and emerging electronic topologies.

B. Program Description

The ASSERT program seeks to develop novel, compact SEE test sources and techniques to enable the radiation-hardness characterization of advanced 3D components, inform new device designs and selection, update radiation-hardening-by-design (RHBD) rules, and validate new computational models and simulation tools. ASSERT sources will be used to characterize mixed-signal devices containing a multiplicity of materials including but not limited to silicon, GaAs, wide bandgap materials such as SiC and GaN, and emerging ultrawide bandgap materials such as cubic boron nitride, gallium oxide, and silicon nitride.

For ASSERT sources to become a part of the standard for SEE testing and qualification, they must be able to produce effects that are comparable to those resulting from high radiation environments. Historically, this has been achieved using an *empirical correlation approach* in which existing heavy-ion beam data are used to inform testing using a proposed alternative source. The alternative source parameters are chosen to reproduce the known heavy-ion responses (i.e., single-event upsets, latchups, transients, etc.) in the DUT. However, identifying the conditions for empirical correlation can be time consuming, as the alternative source

⁴ R.A. Reed et al., “Single-event effects ground testing and on-orbit rate prediction methods: The past, present, and future,” IEEE Trans. on Nuclear Science 50(3), Jun. 2003.

⁵ J.M. Hales et al., “Quantitative prediction of ion-induced single-event transients in an operational amplifier using a quasi-Bessel beam pulsed-laser approach,” IEEE Trans. on Nuclear Science 70(4), 2023.

parameter space can be large. Furthermore, this correlation approach requires the availability of pre-existing heavy-ion data to determine the conditions for generating a SEE response at a prescribed LET value. These data are not available for emerging 3D and heterogeneously integrated components.

In contrast, a *predictive approach* does not rely on pre-existing heavy-ion data. Instead, source parameters are selected to produce a specified carrier distribution within the DUT that is representative of the expected operational environment. To achieve this, the ability to calculate the Equivalent LET (LET_E) is critical, requiring the simulation of the ASSERT source-generated carrier distribution and accurate characterization of the source parameters. Success in ASSERT will be measured, in part, by the accuracy of predicting the heavy-ion response in electronic components using the proposed source. Target DUTs will increase in complexity during the course of the program and include devices such as large area diodes, operational amplifiers, memory devices, and complex system-on-a-chip devices. A list of devices will be provided at program kickoff and relevant heavy-ion data will be provided as Government Furnished Information (GFI).

The ASSERT program metrics include:

- LETs that can be varied over the range of 0.1 to 100 MeV-cm²/mg at the sensitive region of the DUT
- Independently variable penetration depths up to 5 mm in silicon
- Spot diameters
 - <1 μ m at the surface of the DUT (Phases 1 and 2)
 - <0.2 μ m at 5 mm penetration depth (Phase 3)
- Development and validation of a predictive SEE testing approach using ASSERT sources

In addition to the program metrics, ASSERT sources should meet the following requirements:

- Beam penetration through metallization and packaging without de-lidding, substrate thinning, backside illumination, etc.
- Beam position accuracy $\pm 1 \mu$ m at the surface of the DUT (Phase 2); $\pm 0.2 \mu$ m at 5 mm penetration into the DUT (Phase 3) [Note 1]
- Maximum pulse width of 2 ps FWHM (full-width half max)
- Pulse repetition frequency (PRF) of 1,000 Hz (minimum) [Note 2]
- Overall system volume <61 m³ (i.e., the interior volume of a 40-foot shipping container, 11.2 m \times 2.2 m \times 2.3 m) [Note 3]

[Note 1] “Position accuracy” may be accomplished by beam steering, mechanical positioning of the DUT relative to the beam, or any combination thereof. Other methods may be proposed. In all cases, proposals should include sufficient technical information to enable an assessment of the feasibility of the approach as well as the method(s) by which the beam position will be measured and monitored.

[Note 2] The PRF addresses testing throughput, i.e., the ability to generate statistically-significant quantities of data from realistic components in a reasonable amount of time. The PRF may be user-defined as long as a justification is provided.

[Note 3] The “system volume” includes the source, electrical power conditioning, power supplies/storage, thermal management, vacuum system, beam optics, and triggering and controls. To promote access to the source technologies, a priority will be placed on proposed solutions with the size, weight, power, and cost (SWaP-C) that supports the widest possible dissemination of ASSERT sources throughout the academic, commercial, and U.S. government SEE testing communities.

Proposals shall also identify potential transition partners and describe how proposed sources would be integrated into the microelectronic design and development process to disruptively shorten the time required to test and qualify radiation-hardened components.

To meet program metrics, potential approaches may use pulses of alternative energetic particles or photons to circumvent the fundamental tradeoffs between range and LET associated with heavy ions. Other approaches may be proposed for consideration provided they can meet overall program goals and metrics. All proposals should provide sufficient technical information to support the feasibility of the proposed approach to simultaneously achieve the fine spatial resolution, high LET, and millimeter penetration depths necessary for 3DHI characterization.

Examples of technologies of interest include but are not limited to:

- *Short-pulse relativistic electron beams.*⁶ The range and stopping power of electrons have been well-characterized in a wide variety of materials. While individual electrons have a significantly lower energy transfer rate compared with ions, bunches of electrons aggregated in femtosecond-duration pulses have the potential to achieve space-radiation-relevant LETs with millimeter ranges in silicon and can penetrate metallization and packaging. This approach is enabled by the recent development of multi-MeV, femtosecond electron sources for ultrafast, time-resolved imaging of atomic and molecular dynamics.⁷
- *Ultrashort pulse (USP) X-rays.* USP X-rays are another technique that can generate lengthy charge tracks with LETs relevant to space radiation environments. In this case, an incident X-ray photon interacts with the semiconductor material and transfers energy through the photoelectric effect. For example, a 2017 study demonstrated that X-ray pulses can produce radiation effects comparable to laser SEE data using femtosecond titanium sapphire (Ti:sapphire) laser interactions with a gallium target.⁸ Potential

⁶ V. Wyrwoll et al., “Pulsed electron beam induced SEU effects in SRAM memory,” 2021 21th European Conference on Radiation and Its Effects on Components and Systems (RADECS), Vienna, Austria, 2021, pp. 1-7.

⁷ A. Grabenhofer et al., “Development of an ultra-short pulse electron beam source for advanced accelerator/radiation source research at Northern Illinois University,” IEEE Int. Vacuum Electronics Conference, 22-24 April 2014.

⁸ M.P. Belova et al., “Investigation of ionizing transients by femtosecond X-ray source ionization,” Proc. 30th Int. Conference on Microelectronics, 9-11 October 2017.

implementations include tabletop-laser-generated X-ray sources and X-ray free electron lasers (FELs).

C. Program Structure

The total ASSERT program duration will be 54 months organized in a three-phase effort: 18-month Phase 1 (Base); 24-month Phase 2 (Option); and 12-month Phase 3 (Option). In Phase 1, multiple awards are anticipated. It is expected that fewer performers will be funded to participate in Phase 2 and Phase 3 of the program. Options may be exercised, at the Government's sole discretion, based on technical progress and funding availability.

The program comprises a single Technical Area that addresses the two principal Technical Challenges (TCs) described in the previous section. The TCs are interrelated and proposals shall provide integrated solutions that simultaneously address both challenges.

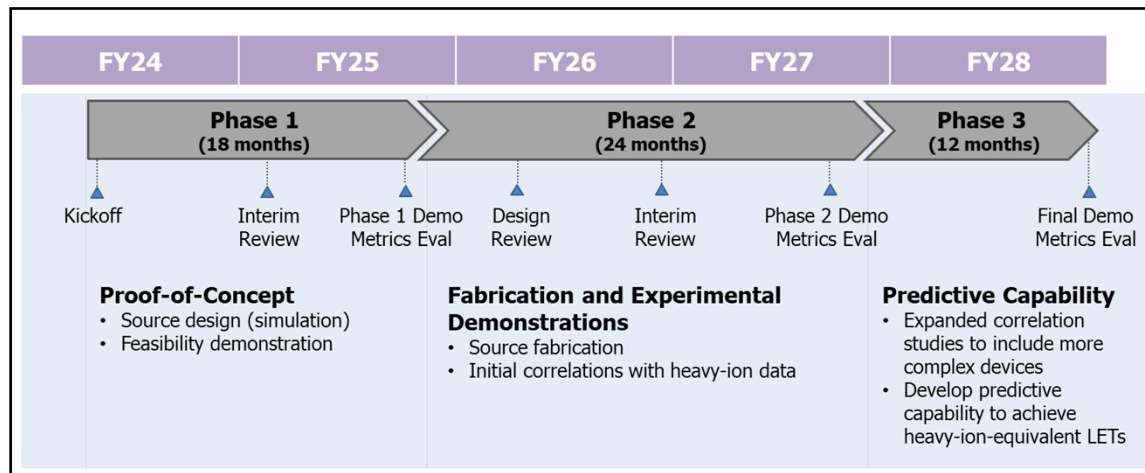


Figure 1: ASSERT phase structure and schedule.

The objectives for each program phase are:

Phase 1 (Base) – The principal objectives of Phase 1 are to design a high energy particle source for SEE testing and to demonstrate that the approach is capable of meeting ASSERT program requirements and metrics as summarized in Table I. In Phase 1, the feasibility of the proposed approach shall be supported by proof-of-concept demonstrations. These demonstrations can be made with computational simulations or by experimental means; a combination of both would be considered the most compelling.

Computational simulations shall be physics-based and of sufficient rigor to demonstrate the feasibility of the approach and to allow a realistic assessment of the level of technical risk. Proof-of-concept experiments must demonstrate that the source concept is capable of producing SEE responses in known devices and be accompanied by computational simulations that provide evidence that the source concept is capable of meeting the full Phase 1 metrics. Performers must justify the Phase 1 simulation approach(es) and support the viability of the source design to meet final program objectives.

There are no system volume constraints on Phase 1 proof-of-concept experiments. For example, experimental studies conducted at larger accelerator or synchrotron facilities would be an acceptable means of demonstrating proof-of-concept and/or providing validation for design simulations. Note, however, that the proposed design approach must meet the system volume requirement of $<61 \text{ m}^3$.

In addition to source design, performers shall also develop a predictive SEE testing approach that includes correlation of induced effects with existing heavy-ion data, source characterization, simulations of beam and material interactions, and a testing plan for multiple devices of increasing complexity (to be specified at program kickoff).

Approximately six weeks prior to the end of the Phase 1 period of performance, a review will assess the ASSERT source design and predictive SEE testing approach. Progress towards meeting Phase 1 metrics may be demonstrated by simulations and/or supported by experimental measurements. Key items to be reviewed include the maturity and feasibility of the proposed source design, its likelihood of meeting the Phase 2 metrics within the proposed budget, the Phase 2 fabrication and testing schedule, and risks and risk mitigation. The predictive SEE testing approach shall be presented with sufficient details to support an assessment of its feasibility and risks.

Phase 2 (Option) – The principal objective of Phase 2 is to fabricate and experimentally demonstrate the source concept developed in Phase 1. Success in this Phase will be measured by experimental performance against the metrics summarized in Table I. The Phase 2 experimental source and system do not have to be packaged in a 40-foot shipping container but successful designs shall demonstrate compatibility with the $<61 \text{ m}^3$ ($11.2 \text{ m} \times 2.2 \text{ m} \times 2.3 \text{ m}$) form factor. In the first half of Phase 2 (i.e., during the months leading up to the Interim Review), performers shall use their predictive approach to interpret the charge track data generated by their source and to provide correlations with heavy-ion data. A list of specific devices will be provided at the program kickoff and references to existing heavy-ion data will be provided. Performers are not expected to have to experimentally generate their own heavy-ion data but are encouraged to use existing data to verify and validate their approach. Initial correlation studies may be simulation-based using ASSERT source design parameters or made in combination with experimental measurements using ASSERT source surrogates as may be found at larger accelerator or synchrotron facilities.

In the second half of Phase 2 (i.e., after the Interim Review), performers shall demonstrate correlation between SEE data generated by the ASSERT source and heavy-ion data according to the Phase 2 metrics described in Table I. The government will specify target devices and provide heavy-ion data ($50 \text{ MeV-cm}^2/\text{mg}$ at 0.5 mm range) as Government Furnished Information (GFI) for comparison with ASSERT source-generated data.

There are two correlation metrics included in Table I, one *analog* and one *digital*, that aim to be representative of a wide range of possible SEEs. In general, SEEs can be divided into two categories. The first category of SEEs (analog) includes the range of effects with continuous characteristics such as single-event transients (SETs) with different amplitudes and time signatures, or single-event leakage current (SELC) with the jumps in current that can take many

different values. The efficacy of using the ASSERT source to emulate this category of effects will be evaluated by the analog correlation metric in Table I, which will be estimated by the quantitative agreement between SETs generated using the ASSERT source and traditional accelerator facilities.

The second category of SEEs (digital) includes the range of events that are binary in nature (i.e., they are either induced or not for a particular experiment). This category includes single-event upsets (SEUs), single-event latchup (SEL), among many others. The efficacy of using the ASSERT source to emulate this category of effects will be evaluated by the digital correlation metric in Table I, which will be estimated by the quantitative agreement between SEE thresholds measured using the ASSERT source and traditional accelerator facilities. The list of devices will be provided at the program kickoff, and the benchmark heavy-ion data to calculate these metrics will be provided as GFI.

Approximately six weeks prior to the end of the Phase 2 period of performance, a review will assess the progress towards meeting Phase 2 metrics and the potential to advance to Phase 3.

Phase 3 (Option) – A key program objective is to develop a predictive SEE testing approach where ASSERT source parameters can be tuned to produce an Equivalent LET that can accurately reproduce the radiation response in a DUT without the need for pre-existing heavy-ion data. In support of this objective, Phase 3 will extend the correlation studies initiated in Phase 2. Phase 3 will culminate in a validation of the predictive SEE testing approach with demonstrations of associated carrier distributions using tuned ASSERT source parameters and comparisons with existing heavy-ion data. The government will specify target devices and provide heavy-ion data (100 MeV-cm²/mg at 5 mm range) as GFI for comparison with ASSERT source-generated data.

To facilitate technology transition, performers shall provide a complete system design package by the end of Phase 3. The system should meet the <61 m³ total volume requirement (i.e., the interior volume of a 40-foot shipping container) described in Section I.B. The design package shall include, but not be limited to, mechanical piece part and assembly drawings; bill of materials; control system schematics and relevant control software; documentation (i.e., operation, maintenance, and safety); and a list of potential vendors and suppliers.

Supplemental testing option: Throughout the program, DARPA will work with transition partners to identify devices and components critical to future space and strategic missions. Therefore, to help position ASSERT efforts for future transition opportunities, proposals shall include a separately priced option for the testing and analysis of additional devices and components using the proposed ASSERT source. If exercised, this option would be performed concurrent to the Phase 3 period of performance. Proposers should assume devices of varying complexity, e.g., large area diodes, operational amplifiers, memory devices, processors, and complex system-on-a-chip devices. DARPA is not defining specifics as to the scope of the option, so proposers are free to use their judgment to propose the option deemed appropriate to meet the general objective stated above; however, the basis for the parameters, cost, etc., to include the identification of the representative devices utilized to define the proposed option, must be provided as supporting documentation. Proposers further should ensure that the

supplemental option is clearly delineated in the Statement of Work and cost proposal. Finally, because this option is supplemental, it will not be evaluated as part of the ASSERT evaluation/selection process.

The ASSERT program metrics and their progression by phase are summarized in Table I.

Table I: ASSERT program metrics

Metric	Units	Phase 1	Phase 2	Phase 3
Range ⁽¹⁾	mm	5 ⁽³⁾	0.5	5
Maximum Equivalent LET ⁽²⁾	MeV-cm ² /mg	100 ⁽³⁾	50	100
Minimum Equivalent LET ⁽²⁾	MeV-cm ² /mg	0.1 ⁽³⁾	1	0.1
Spot diameter	μm	< 1 ⁽³⁾	< 1 ⁽⁴⁾	< 0.2 ⁽⁵⁾
Analog correlation accuracy	%	--	80	95
Digital correlation accuracy	%	--	70	90

⁽¹⁾ In silicon

⁽²⁾ At the depth specified by the phase Range metric

⁽³⁾ Simulation or proof-of-concept experimental data

⁽⁴⁾ At device surface

⁽⁵⁾ At 5 mm penetration depth

D. Technical Area(s)

The ASSERT program comprises a single Technical Area. Proposals must address the two principal Technical Challenges (TCs) described in Section I.A.

E. Schedule/Milestones

The total period of performance is 54 months, organized into three phases: 18-month Phase 1 (Base); 24-month Phase 2 (Option); and 12-month Phase 3 (Option). A high-level schedule is shown in Fig. 1. A mandatory program kickoff meeting will be held to present the technical approaches, discuss technical and programmatic items of concern, and interact with the government team and other program performers.

Regular technical and financial reporting is required by all performers.

For planning and budgeting purposes, a target start of February 2024 may be assumed.

All proposals should include the following meetings and travel in the proposed schedule and costs:

- Attendance at a program kickoff meeting to be held in the Washington, D.C. area.

- Proposals should budget for four two-day technical meetings to be attended in-person⁹ over the course of the 54-month period of performance:
 - Phase 1: One meeting in the Washington, D.C. area (in addition to the program kickoff meeting)
 - Phase 2: One meeting in the Los Angeles, CA area and one meeting in the Washington, D.C. area
 - Phase 3: One meeting in the Los Angeles, CA area
- Proposers should anticipate at least one site visit per phase by the DARPA Program Manager along with other members of the government team, during which they will have the opportunity to demonstrate progress towards agreed-upon milestones.
- Budgeting to attend and present results at appropriate technical conferences is acceptable (one per 12-month period, at conferences consistent with the information being disseminated); beyond this level, attendance will require substantial justification.

The following program milestones are applicable to Phase 1:

- A Program Kickoff meeting to be held within one month of the program start.
- An Interim Review to be held approximately 12 months after program start. The Interim Review will take the place of a quarterly program review (QPR).
- Demonstration of all Phase 1 technical metrics approximately six weeks prior to the end of the period of performance.
- Delivery of Phase 1 designs, simulation results, and test data (if applicable) for IV&V at least six weeks prior to the end of the Phase 1 period of performance.

The following program milestones are applicable to Phase 2:

- A kickoff meeting to be held at the start of Phase 2.
- A Design Review of the Phase 2 source and system including a detailed analysis of components and sub-systems, materials, structures, fabrication methods, testing, and schedule. The Design Review shall take place within three months of the Phase 2 start, coinciding with the first QPR.

⁹ Depending on the circumstances, virtual meetings may replace in-person gatherings.

- An Interim Review to be held approximately 12 months after Phase 2 start. The Interim Review will take the place of a QPR.
- Demonstration of all Phase 2 technical metrics at least six weeks prior to the end of the period of performance.
- Delivery of Phase 2 designs, simulation results, and test data for IV&V at least six weeks prior to the end of the Phase 2 period of performance.

The following program milestones are applicable to Phase 3:

- A kickoff meeting to be held at the start of Phase 3.
- Demonstration of all Phase 3 technical metrics at least six weeks prior to the end of the period of performance.
- Delivery of Phase 3 designs, validation of the predictive SEE testing approach, simulation results, and test data for IV&V at least six weeks prior to the end of the Phase 3 period of performance.
- Delivery of a final design package to include, but not be limited to, mechanical piece part and assembly drawings; bill of materials; control system schematics and relevant control software; documentation (i.e., operation, maintenance, and safety); and a list of potential vendors and suppliers at least six weeks prior to the end of the Phase 3 period of performance.

F. Deliverables

Technical progress towards the goals of the program represents the major deciding factor for funding decisions for the subsequent phase, and will be monitored through monthly technical updates, QPRs, interim reviews, design reviews, and occasional site visits by the DARPA Program Manager along with other members of the government team. In addition, all performers shall participate in and support program-wide reviews scheduled at the Program Manager's discretion. All performers should be prepared to respond to off-schedule delivery of technical updates and summary slides at the DARPA Program Manager's request. Table II is a summary of the program deliverables by phase.

All performers shall deliver the following:

- *Detailed spending plans* (or detailed program plans for fixed-price award instruments) at program kickoff and upon the execution of subsequent option awards.

- *Monthly financial reports*, due within ten business days of the end of each month, including updated commitments and expenditures.
- *Brief monthly technical updates* in either written or slide presentation format to include:
 - A summary of the previous month's progress.
 - Notable achievements.
 - Areas of technical and/or programmatic concern.
- *Quarterly technical status reporting* (both slide presentations and written reports). Slide presentations shall be provided to the government team prior to the QPR and written reports shall be due within ten business days of the end of the given quarter. Reporting shall include:
 - Details of technical work to-date.
 - Charts and explanations of how well the system meets, exceeds, or falls short of specified program goals (as described in this BAA).
 - Technical and/or programmatic concerns.
 - Risk assessment and risk mitigation strategies.
 - Plans for the next quarter's work.

Deliverables associated with particular Phases:

- Phase 1 Interim Review reporting
 - Takes the place of a QPR.
 - In addition to addressing information normally covered at a QPR, the Phase 1 Interim Review report shall present a forward-looking plan and schedule that supports the feasibility of meeting the technical metrics by the end of Phase 1.
 - Slide presentations shall be provided to the government team prior to the Review and written reports shall be due within ten business days of the review date.
- End-of-Phase 1 Review reporting (see below for details)
- Phase 1 Completion Report (see below for details)
- Phase 2 Design Review reporting
 - Takes the place of a QPR.
 - In addition to addressing information normally covered at a QPR, the Phase 2 Design Review shall present comprehensive fabrication plan, testing approach, and schedule.
 - Slide presentations shall be provided to the government team prior to the Review and written reports shall be due within ten business days of the review date.

- Phase 2 Interim Review reporting
 - Takes the place of a QPR.
 - In addition to addressing information normally covered at a QPR, the Phase 2 Interim Review report shall present a forward-looking plan and schedule that supports the feasibility of meeting the technical metrics by the end of Phase 2.
 - Slide presentations shall be provided to the government team prior to the Review and written reports shall be due within ten business days of the review date.
- End-of-Phase 2 Review reporting – details provided below
- Phase 2 Completion Report – details provided below
- Phase 3 Final Design package to include, but not be limited to, mechanical piece part and assembly drawings; bill of materials; control system schematics and relevant control software; documentation (i.e., operation, maintenance, and safety); and a list of potential vendors and suppliers.
- Final Technical report due at the conclusion of the performer's program effort (i.e., at contract end)

End-of-phase Review meetings will be scheduled approximately six weeks before the end of each phase's period of performance. The end of each phase represents a major technical milestone in the program and the review meetings will be used to communicate the technical progress made, particularly with respect to the metrics, during the entire phase. Slide presentations shall be provided to the government team in advance of the End-of-phase Review meeting. End-of-phase Review deliverables include:

- Charts documenting key findings and explanations of how well the work meets, exceeds, or falls short of specified program goals (as described in this BAA).
- Designs, simulation results, experimental demonstrations and test data (if applicable) for IV&V.
- Reporting on the predictive SEE testing approach with supporting simulations and experimental measurements, as appropriate.
- Plans, projections, and schedule for the next program phase with an updated risk assessment in each of the critical program areas and material that supports the feasibility of meeting the next phase's objectives.

Phase Completion Reports take the place of the phase’s final quarterly technical status report and shall be delivered within ten business days of the end of the phase. The written report shall include:

- A description of the technical development and achievements in the areas of the ASSERT source and predictive SEE testing approach.
- Charts and explanations of how well the system meets, exceeds, or falls short of specified program goals (as described in this BAA).
- Results of simulations and experimental measurements.
- Insights into technical challenges and risk mitigation activities.
- Plans, projections, and schedule for the next program phase with an updated risk assessment in each of the critical program areas and material that supports the feasibility of meeting the next phase’s objectives.
- Other negotiated deliverables specific to the objectives of the individual efforts. These may include registered reports, experimental protocols, publications, data management plan, intermediate and final versions of software libraries, code, and APIs, including documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.

At the conclusion of the effort, a Final Technical Report replaces the Phase Completion Report/final quarterly technical report and is due no later than end of period of performance.

Table II: Deliverables by Phase

Phase 1 (18 months)	Phase 2 (24 months)	Phase 3 (12 months)
<ul style="list-style-type: none"> • <i>Program Kickoff</i>: Detailed spending plan (or detailed program plan for fixed-price award instruments). • <i>Monthly financial reports</i>: Due within ten business days of the end of each month. • <i>Monthly updates</i>: Brief technical updates in either written or slide presentation format. • <i>Quarterly technical status reports</i>: Slide presentations provided to the government prior to the QPR; written 	<ul style="list-style-type: none"> • <i>Phase 2 Kickoff</i>: Detailed spending plan (or detailed program plan for fixed-price award instruments). • <i>Monthly financial reports</i>: Due within ten business days of the end of each month. • <i>Monthly updates</i>: Brief technical updates in either written or slide presentation format. • <i>Quarterly technical status reports</i>: Slide presentations provided to the government prior to the QPR; written 	<ul style="list-style-type: none"> • <i>Phase 3 Kickoff</i>: Detailed spending plan (or detailed program plan for fixed-price award instruments). • <i>Monthly financial reports</i>: Due within ten business days of the end of each month. • <i>Monthly updates</i>: Brief technical updates in either written or slide presentation format. • <i>Quarterly technical status reports</i>: Slide presentations provided to the government prior to the QPR; written

<p>reports due within ten business days of end of the given quarter.</p> <ul style="list-style-type: none"> • <i>Interim Review reporting:</i> Held approximately 12 months after program start, taking the place of a QPR. The report shall include a forward-looking plan and schedule that supports the feasibility of meeting the technical metrics by the end of Phase 1. Slide presentations shall be provided to the government prior to the Review; written reports shall be provided within ten business days of end of the given quarter. • <i>End-of-Phase reporting:</i> Held approximately six weeks before the end of the Phase 1 period of performance. Slides and relevant materials for IV&V review shall be provided to the government team in advance of the Review. • <i>Phase Completion Report:</i> The written Report takes the place of the phase's final quarterly technical status report and shall be delivered within ten business days of the end of Phase 1. 	<p>reports due within ten business days of end of the given quarter.</p> <ul style="list-style-type: none"> • <i>Design Review:</i> Held within three months of the Phase 2 start, coinciding with the first QPR. Performers shall present a comprehensive fabrication plan, testing approach, and schedule. Slide presentations shall be provided to the government team prior to the Design Review and written reports shall be provided with then business days of the Review. • <i>Interim Review reporting:</i> Held approximately 12 months after Phase 2 start, taking the place of a QPR. The report shall include a forward-looking plan and schedule that supports the feasibility of meeting the technical metrics by the end of Phase 2. Slide presentations shall be provided to the government prior to the Review; written reports shall be provided within ten business days of end of the given quarter. • <i>End-of-Phase reporting:</i> Held approximately six weeks before the end of the Phase 2 period of performance. Slides and relevant materials for IV&V review shall be provided to the government team in advance of the Review. • <i>Phase Completion Report:</i> The written Report takes the place of the phase's final quarterly technical status report and shall be delivered within ten business days of the end of Phase 2. 	<p>reports due within ten business days of end of the given quarter.</p> <ul style="list-style-type: none"> • <i>Final Design Package</i> delivered at the end of the program, to include, but not be limited to, mechanical piece part and assembly drawings; bill of materials; control system schematics and relevant control software; documentation (i.e., operation, maintenance, and safety); and a list of potential vendors and suppliers • <i>Final Technical Report:</i> The written Report takes the place of the phase's final quarterly technical status report and shall be delivered within ten business days of the end of the contract.
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G. Government Furnished Equipment/Property/Information

At the start of the program, the government will specify target devices and will provide heavy-ion data as GFI for comparison with ASSERT source-generated data. Information will be provided, as appropriate, during the relevant phases of the program.

H. Intellectual Property

Proposers shall identify in their proposal any pre-existing technical data or commercial/non-commercial software that they will deliver to the Government with less than unlimited rights. See Section IV.B.10. for more information related to intellectual property.

It is desired that all non-commercial software (including source code), software documentation, hardware designs and documentation, and technical data generated by the program be provided as deliverables to the Government, with a minimum of Government Purpose Rights (GPR), as lesser rights may adversely impact the lifecycle costs of affected items, components, or processes.

II. Award Information

A. General Award Information

Multiple awards are anticipated. The resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications (see Section VI.B.3., “Representations and Certifications”). The Government reserves the right to remove proposers from award consideration should the parties fail to reach agreement on award terms, conditions, and/or cost/price within a reasonable time, and the proposer fails to timely provide requested additional information. Proposals identified for negotiation may result in a procurement contract, cooperative agreement, or other transaction, depending upon the nature of the work proposed, the required degree of interaction between parties, whether or not the research is classified as Fundamental Research, and other factors.

Proposers looking for innovative, commercial-like contractual arrangements are encouraged to consider requesting Other Transactions. To understand the flexibility and options associated with Other Transactions, consult <http://www.darpa.mil/work-with-us/contract-management#OtherTransactions>.

In accordance with 10 U.S.C. § 4022(f), the Government may award a follow-on production contract or Other Transaction (OT) for any OT awarded under this solicitation if: (1) that participant in the OT, or a recognized successor in interest to the OT, successfully completed the entire prototype project provided for in the OT, as modified; and (2) the OT provides for the award of a follow-on production contract or OT to the participant, or a recognized successor in interest to the OT.

In all cases, the Government contracting officer shall have sole discretion to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the section below on Fundamental Research

B. Fundamental Research

It is DoD policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 defines fundamental research as follows:

‘Fundamental research’ means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.

As of the date of publication of this solicitation, the Government expects that program goals as described herein may be met by proposed efforts for fundamental research and non-fundamental research. Some proposed research may present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Based on the anticipated type of proposer (e.g., university or industry) and the nature of the solicited work, the Government expects that some awards will include restrictions on the resultant research that will require the awardee to seek DARPA permission before publishing any information or results relative to the program.

University or non-profit research institution performance under this solicitation may include effort categorized as fundamental research. In addition to Government support for free and open scientific exchanges and dissemination of research results in a broad and unrestricted manner, the academic or non-profit research performer or recipient, regardless of tier, acknowledges that

such research may have implications that are important to U.S. national interests and must be protected against foreign influence and exploitation. As such, the academic or non-profit research performer or recipient agrees to comply with the following requirements:

- (a) The University or non-profit research institution performer or recipient must establish and maintain an internal process or procedure to address foreign talent programs, conflicts of commitment, conflicts of interest, and research integrity. The academic or non-profit research performer or recipient must also utilize due diligence to identify Foreign Components or participation by Senior/Key Personnel in Foreign Government Talent Recruitment Programs and agree to share such information with the Government upon request.
 - i. The above described information will be provided to the Government as part of the proposal response to the solicitation and will be reviewed and assessed prior to award. Generally, this information will be included in the Research and Related Senior/Key Personnel Profile (Expanded) form (SF-424) required as part the proposer's submission through Grants.gov.
 - 1. Instructions regarding how to fill out the SF-424 and its biographical sketch can be found through Grants.gov.
 - ii. In accordance with USD(R&E) direction to mitigate undue foreign influence in DoD-funded science and technology, DARPA will assess all Senior/Key Personnel proposed to support DARPA cooperative agreements for potential undue foreign influence risk factors relating to professional and financial activities. This will be done by evaluating information provided via the SF-424, and any accompanying or referenced documents, in order to identify and assess any associations or affiliations the Senior/Key Personnel may have with foreign strategic competitors or countries that have a history of intellectual property theft, research misconduct, or history of targeting U.S. technology for unauthorized transfer. DARPA's evaluation takes into consideration the entirety of the Senior/Key Personnel's SF-424, current and pending support, and biographical sketch, placing the most weight on the Senior/Key Person's professional and financial activities over the last 4 years. The majority of foreign entities lists used to make these determinations are publicly available. The DARPA Countering Foreign Influence Program (CFIP) "Senior/Key Personnel Foreign Influence Risk Rubric" details the various risk ratings and factors. The rubric can be seen at the following link:
<https://www.darpa.mil/attachments/092021DARPACFIPRubric.pdf>
 - iii. Examples of lists that DARPA leverages to assess potential undue foreign influence factors include, but are not limited to:
 - 1. Executive Order 13959 "Addressing the Threat From Securities Investments That Finance Communist Chinese Military Companies":
<https://www.govinfo.gov/content/pkg/FR-2020-11-17/pdf/2020-25459.pdf>
 - 2. The U.S. Department of Education's College Foreign Gift and Contract Report: [College Foreign Gift Reporting \(ed.gov\)](https://www.ed.gov/collegereports)

3. The U.S. Department of Commerce, Bureau of Industry and Security, List of Parties of Concern: <https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern>
 4. Georgetown University's Center for Security and Emerging Technology (CSET) Chinese Talent Program Tracker: <https://chinatalenttracker.cset.tech>
 5. Director of National Intelligence (DNI) "World Wide Threat Assessment of the US Intelligence Community": [2021 Annual Threat Assessment of the U.S. Intelligence Community \(dni.gov\)](https://www.dni.gov/2021-Annual-Threat-Assessment-of-the-US-Intelligence-Community)
 6. Various Defense Counterintelligence and Security Agency (DCSA) products regarding targeting of US technologies, adversary targeting of academia, and the exploitation of academic experts: <https://www.dcsa.mil/>
- (b) DARPA's analysis and assessment of affiliations and associations of Senior/Key Personnel is compliant with Title VI of the Civil Rights Act of 1964. Information regarding race, color, or national origin is not collected and does not have bearing in DARPA's assessment.
- (c) University or non-profit research institutions with proposals selected for negotiation that have been assessed as having high or very high undue foreign influence risk, will be given an opportunity during the negotiation process to mitigate the risk. DARPA reserves the right to request any follow-up information needed to assess risk or mitigation strategies.
- i. Upon conclusion of the negotiations, if DARPA determines, despite any proposed mitigation terms (e.g. mitigation plan, alternative research personnel), the participation of any Senior/Key Research Personnel still represents high risk to the program, or proposed mitigation affects the Government's confidence in proposer's capability to successfully complete the research (e.g., less qualified Senior/Key Research Personnel) the Government may determine not to award the proposed effort. Any decision not to award will be predicated upon reasonable disclosure of the pertinent facts and reasonable discussion of any possible alternatives while balancing program award timeline requirements.
- (d) Failure of the academic or non-profit research performer or recipient to reasonably exercise due diligence to discover or ensure that neither it nor any of its Senior/Key Research Personnel involved in the subject award are participating in a Foreign Government Talent Program or have a Foreign Component with an a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer may result in the Government exercising remedies in accordance with federal law and regulation.
- i. If, at any time, during performance of this research award, the academic or non-profit research performer or recipient should learn that it, its Senior/Key Research Personnel, or applicable team members or subtier performers on this award are or are believed to be participants in a Foreign Government Talent Program or have Foreign Components with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer , the performer or recipient

will notify the Government Contracting Officer or Agreements Officer within 5 business days.

1. This disclosure must include specific information as to the personnel involved and the nature of the situation and relationship. The Government will have 30 business days to review this information and conduct any necessary fact-finding or discussion with the performer or recipient.
 2. The Government's timely determination and response to this disclosure may range anywhere from acceptance, to mitigation, to termination of this award at the Government's discretion.
 3. If the University receives no response from the Government to its disclosure within 30 business days, it may presume that the Government has determined the disclosure does not represent a threat.
- ii. The performer or recipient must flow down this provision to any subtier contracts or agreements involving direct participation in the performance of the research.

(e) Definitions

i. Senior/Key Research Personnel

1. This definition would include the Principal Investigator or Program/Project Director and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the award. These include individuals whose absence from the project would be expected to impact the approved scope of the project.
2. Most often, these individuals will have a doctorate or other professional degrees, although other individuals may be included within this definition on occasion.

ii. Foreign Associations/Affiliations

1. Association is defined as collaboration, coordination or interrelation, professionally or personally, with a foreign government-connected entity where no direct monetary or non-monetary reward is involved.
2. Affiliation is defined as collaboration, coordination, or interrelation, professionally or personally, with a foreign government-connected entity where direct monetary or non-monetary reward is involved.

iii. Foreign Government Talent Recruitment Programs

1. In general, these programs will include any foreign-state-sponsored attempt to acquire U.S. scientific-funded research or technology through foreign government-run or funded recruitment programs that target scientists, engineers, academics, researchers, and entrepreneurs of all nationalities working and educated in the U.S.
2. Distinguishing features of a Foreign Government Talent Recruitment Program may include:

- a. Compensation, either monetary or in-kind, provided by the foreign state to the targeted individual in exchange for the individual transferring their knowledge and expertise to the foreign country.
- b. In-kind compensation may include honorific titles, career advancement opportunities, promised future compensation or other types of remuneration or compensation.
- c. Recruitment, in this context, refers to the foreign-state-sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the U.S. or in the foreign state.
- d. Contracts for participation in some programs that create conflicts of commitment and/or conflicts of interest for researchers. These contracts include, but are not limited to, requirements to attribute awards, patents, and projects to the foreign institution, even if conducted under U.S. funding, to recruit or train other talent recruitment plan members, circumventing merit-based processes, and to replicate or transfer U.S.-funded work in another country.
- e. Many, but not all, of these programs aim to incentivize the targeted individual to physically relocate to the foreign state. Of particular concern are those programs that allow for continued employment at U.S. research facilities or receipt of U.S. Government research funding while concurrently receiving compensation from the foreign state.

3. Foreign Government Talent Recruitment Programs DO NOT include:

- a. Research agreements between the University and a foreign entity, unless that agreement includes provisions that create situations of concern addressed elsewhere in this section,
- b. Agreements for the provision of goods or services by commercial vendors, or
- c. Invitations to attend or present at conferences.

iv. Conflict of Interest

- 1. A situation in which an individual, or the individual's spouse or dependent children, has a financial interest or financial relationship that could directly and significantly affect the design, conduct, reporting, or funding of research.

v. Conflict of Commitment

- 1. A situation in which an individual accepts or incurs conflicting obligations between or among multiple employers or other entities.
- 2. Common conflicts of commitment involve conflicting commitments of time and effort, including obligations to dedicate time in excess of

institutional or funding agency policies or commitments. Other types of conflicting obligations, including obligations to improperly share information with, or withhold information from, an employer or funding agency, can also threaten research security and integrity and are an element of a broader concept of conflicts of commitment.

vi. Foreign Component

1. Performance of any significant scientific element or segment of a program or project outside of the U.S., either by the University or by a researcher employed by a foreign organization, whether or not U.S. government funds are expended.
2. Activities that would meet this definition include, but are not limited to:
 - a. Involvement of human subjects or animals;
 - b. Extensive foreign travel by University research program or project staff for the purpose of data collection, surveying, sampling, and similar activities;
 - c. Collaborations with investigators at a foreign site anticipated to result in co-authorship;
 - d. Use of facilities or instrumentation at a foreign site;
 - e. Receipt of financial support or resources from a foreign entity; or
 - f. Any activity of the University that may have an impact on U.S. foreign policy through involvement in the affairs or environment of a foreign country.
3. Foreign travel is not considered a Foreign Component.

vii. Strategic Competitor

1. A nation, or nation-state, that engages in diplomatic, economic or technological rivalry with the United States where the fundamental strategic interests of the U.S are under threat.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This language can be found at <http://www.darpa.mil/work-with-us/additional-baa>.

For certain research projects, it may be possible that although the research to be performed by a potential awardee is non-fundamental research, its proposed subawardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research while its proposed subawardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed

efforts are fundamental research and why the proposed efforts should be considered fundamental research.

III. Eligibility Information

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities, Small Businesses, Small Disadvantaged Businesses and Minority Institutions are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

1. Federally Funded Research and Development Centers (FFRDCs) and Government Entities

a) FFRDCs

FFRDCs are subject to applicable direct competition limitations and cannot propose to this solicitation in any capacity unless they meet the following conditions. (1) FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector. (2) FFRDCs must provide a letter, on official letterhead from their sponsoring organization, that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs proposing to be awardees or subawardees.

b) Government Entities

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government Entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations and compete with industry. This information is required for Government Entities proposing to be awardees or subawardees.

c) Authority and Eligibility

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 4892 may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government Entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

2. Other Applicants

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

B. Organizational Conflicts of Interest

FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the solicitation. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date.

If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (subawardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

Government Procedures

In accordance with FAR 9.503, 9.504 and 9.506, the Government will evaluate OCI mitigation plans to avoid, neutralize or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the solicitation evaluation criteria and funding availability.

The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan.

If the Government determines that a proposer failed to fully disclose an OCI; or failed to provide the affirmation of DARPA support as described above; or failed to reasonably provide additional information requested by the Government to assist in evaluating the proposer's OCI mitigation plan, the Government may reject the proposal and withdraw it from consideration for award.

C. Cost Sharing/Matching

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument. Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

For more information on potential cost sharing requirements for Other Transactions for Prototype, see <http://www.darpa.mil/work-with-us/contract-management> and <https://acquisitioninnovation.darpa.mil>.

IV. Application and Submission Information

A. Address to Request Application Package

This announcement, any attachments, and any references to external websites herein constitute the total solicitation. If proposers cannot access the referenced material posted in the announcement found at www.darpa.mil, contact the administrative contact listed herein.

B. Content and Form of Application Submission

All submissions, including abstracts and proposals must be written in English with type not smaller than 12-point font. Smaller font may be used for figures, tables, and charts. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title/proposal short title. All monetary references in the proposal shall be in U.S. Dollars.

1. Abstract Format

Proposers are strongly encouraged to submit an abstract in advance of a full proposal. Abstracts should follow the format described below in this section. The cover sheet should be clearly marked "ABSTRACT" and the total length of Section II should not exceed 5 pages.

Section I. Administrative

A. Cover sheet to include:

- (1) BAA number (HR001123S0047);
- (2) Lead Organization submitting abstract;

- (3) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (4) Proposer's internal reference number (if any);
- (5) Other team members (if applicable) and type of organization for each;
- (6) Proposal title;
- (7) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (8) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (9) Total funds requested from DARPA, and the amount of cost share (if any); AND
- (10) Date proposal abstract was submitted.

(Note: An official transmittal letter is not required when submitting a Proposal Abstract.)

Section II. Abstract Details

A. Innovative Claims

Summary of innovative claims for the proposed research. This section is the centerpiece of the abstract and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art alternate approaches.

B. Technical Approach

Technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable production.

C. Deliverables

Deliverables associated with the proposed research and the plans and capability to accomplish technology transition and commercialization.

D. Cost and Schedule

Provide a cost estimate for resources (e.g., labor, materials) and any subcontractors over the proposed timeline of the project, broken down by Government fiscal year.

2. Full Proposal Format

All full proposals must be in the format given below. Proposals shall consist of two volumes: Volume I – Technical and Management Proposal (3 sections), and Volume II – Cost Proposal (4 sections). The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. Section II of Volume I, Technical and Management Proposal, shall not exceed 20 pages. The page limitation for full proposals includes all figures, tables, and charts. There is no page limit for Volume II, Cost Proposal.

A summary slide of the proposed effort, in PowerPoint format, should be submitted with the proposal. A template slide is provided as Attachment 2 to the BAA. Submit this PowerPoint file in addition to Volumes I and II of your full proposal. This summary slide does not count towards the total page count.

a. Volume I, Technical and Management Proposal

The following Volume I subsections are examples of language used in a BAA which should be revised to fit the needs of the program.

Section I. Administrative

A. Cover sheet to include:

- (1) BAA number (HR001123S0047);
- (2) Lead Organization submitting proposal;
- (3) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (4) Proposer's internal reference number (if any);
- (5) Other team members (if applicable) and type of organization for each;
- (6) Proposal title;
- (7) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (8) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
- (9) Total funds requested from DARPA, and the amount of cost share (if any); AND
- (10) Date proposal was submitted.

B. Official transmittal letter.

The transmittal letter should identify the BAA number, the proposal by name, and the proposal reference number (if any), and should be signed by an individual who is authorized to submit proposals to the Government.

Section II. Detailed Proposal Information

A. Executive Summary

Summarize the technical approach, anticipated performance, and expected outcomes of the proposed effort. The executive summary should be concise and to the point. Tables, graphs, and diagrams can be used as supplemental material along with narrative to convey the information.

B. Technical Approach

This section is the centerpiece of the proposal and should succinctly summarize the innovative claims for the proposed research and clearly describe the proposed approach without using any jargon. This section should demonstrate that the proposer has a clear understanding of the state-of-the-art and should provide sufficient justification for the feasibility of the proposed approach(es). This section should include a detailed technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable creation.

C. Statement of Work (SOW)

In plain English, clearly define the technical tasks/subtasks to be performed, their durations, and dependencies among them. The page length for the SOW will be dependent on the amount of the effort. The SOW must not include proprietary information. For each task/subtask, provide:

1. A general description of the objective (for each defined task/activity);
2. A detailed description of the approach to be taken to accomplish each defined task/activity;
3. Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
4. The completion criteria for each task/activity - a product, event or milestone that defines its completion.
5. Define all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities; AND
6. Clearly identify any tasks/subtasks (prime or subcontracted) that will be accomplished on-campus at a university, if applicable...

*Note: Each phase/option of the program must be separately defined in the SOW. Include a SOW for each subcontractor and/or consultant in the **Cost Proposal Volume**. Do not include any proprietary information in the SOW(s).*

D. Schedules and measurable milestones

Schedules and measurable milestones for the proposed research. (Note: Measurable milestones should capture key development points in tasks and should be clearly articulated and defined in time relative to start of effort.) Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options. Additionally, proposals should clearly explain the technical approach(es) that will be employed to meet or exceed each program metric and provide ample justification as to why the approach(es) is/are feasible. The milestones must not include proprietary information.

E. Results and Technology Transfer

Description of the results, products, transferable technology, and expected technology transfer. This should also address mitigation of life-cycle and sustainment risks associated with transitioning intellectual property for U.S. military applications, if applicable. See also Section IV.B.10, "Intellectual Property." If there are no proprietary claims, this should be stated.

F. Risk Analysis and Mitigation Plan

Identify the major technical and programmatic risks in the program. Include a risk matrix. For each risk, assign a probability of occurrence on a scale of 1-10, where 10 indicates a high likelihood that the risk will impact program success, as well as an assessment of impact, also on a scale of 1-10, where 10 indicates that this risk would maximally limit the program from delivering prototypes on schedule or meeting performance objectives. For each item with total risk (likelihood \times impact) exceeding 40, include a plan for mitigating the risk and assessing risk reduction.

G. Ongoing Research

Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.

H. Proposer Accomplishments

Discussion of proposer's previous accomplishments and work in closely related research areas.

I. National Security Impact Statement

To reduce the potential for unintended foreign access to critical U.S. national security technologies developed under this effort, proposals shall describe:

- How the proposed work contributes to U.S. national security and U.S. technological capabilities. The proposer may also summarize previous work that contributed to U.S. national security and U.S. technological capabilities.
- Plans and capabilities to transition technologies developed under this effort to U.S. national security applications and/or to U.S. industry. The proposer may also discuss previous technology transitions to the benefit of U.S. interests.
- Any plans to transition technologies developed under this effort to foreign governments or to companies that are foreign owned, controlled or influenced. The proposer may also discuss previous technology transition to these groups.
- How the proposer will assist its employees and agents performing work under this effort to be eligible to participate in the U.S. national security environment.

J. Facilities and Equipment

Description of the facilities and equipment that would be used for the proposed effort and how they will support meeting program metrics.

K. Teaming

Describe the formal teaming arrangements which will be used to execute this effort. Describe the programmatic relationship between investigators and the rationale for choosing this teaming strategy. Present a coherent organization chart for the program team which includes, as applicable: (1) the programmatic relationship of team member; (2) the unique capabilities of team members; (3) the task of responsibilities of team members; (4) the teaming strategy among the team members; (5) the principal investigator (PI), co-PI, and program manager (if applicable) for each team member to include subcontractor's PI, co-PI, and program manager; and (6) the key personnel along with the amount of effort to be expended by each person during each year.

L. Security Management (as applicable)

Describe security management architecture and/or approach for the proposed effort. Detail unique additional security requirements information system certification expertise for controlled unclassified information (CUI) or classified processing, OPSEC, program protection planning, test planning, transportation plans, work being performed at different classification levels, and/or utilizing test equipment not approved at appropriate classification level (may not be applicable for fundamental research).

Section III. Additional Information

Information in this section may include a brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant prior papers may be included in the submission.

b. Volume II, Cost Proposal – {No Page Limit}

All proposers, including FFRDCs, must submit the following:

Section I. Administrative

Cover sheet to include:

- (1) BAA number (HR001123S0047);
- (2) Lead Organization submitting proposal;
- (3) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
- (4) Proposer's internal reference number (if any);
- (5) Other team members (if applicable) and type of organization for each;
- (6) Proposal title;
- (7) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail (if available);
- (8) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), and electronic mail (if available);
- (9) Award instrument requested:
Cost-Plus-Fixed Fee (CPFF), Cost-contract—no fee, cost sharing contract—no fee, or other type of procurement contract (*specify*), Cooperative Agreement, or Other Transaction;
- (10) Place(s) and period(s) of performance;
- (11) Total proposed cost separated by basic award and option(s), if any, by calendar year and by government fiscal year;
- (12) Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);

- (13) Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
- (14) Date proposal was prepared;
- (15) DUNS number;
- (16) TIN number;
- (17) CAGE Code;
- (18) Subcontractor Information;
- (19) Proposal validity period (120 days is recommended); AND
- (20) Any Forward Pricing Rate Agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available).

Attachment 1, the Cost Volume Proposer Checklist, must be included with the coversheet of the Cost Proposal.

Section II. Detailed Cost Information (Prime and Subcontractors)

The proposers', to include eligible FFRDCs', cost volume shall provide cost and pricing information (See Note 1), or other than cost or pricing information if the total price is under the referenced threshold, in sufficient detail to substantiate the program price proposed (e.g., realism and reasonableness). In doing so, the proposer shall provide, for **both the prime and each subcontractor**, a "Summary Cost Breakdown" by phase and performer fiscal year, and a "Detailed Cost Breakdown" by phase, technical task/sub-task, and month. The breakdown/s shall include, at a minimum, the following major cost items along with associated backup documentation:

Total program cost broken down by major cost items:

A. Direct Labor

A breakout clearly identifying the individual labor categories with associated labor hours and direct labor rates, as well as a detailed Basis-of-Estimate (BOE) narrative description of the methods used to estimate labor costs;

B. Indirect Costs

Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate);

C. Travel

Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.;

D. Other Direct Costs

Itemized with costs; back-up documentation is to be submitted to support proposed costs;

E. Material/Equipment

(i) An itemization of any information technology (IT) purchase, as defined by FAR 2.101 – Documentation supporting the reasonableness of the proposed equipment costs(vendor

quotes, past purchase orders/purchase history, detailed engineering estimates, etc.) shall be provided, including a letter stating why the proposer cannot provide the requested resources from its own funding for prime and all sub-awardees.

(ii) A priced Bill-of-Material (BOM) clearly identifying, for each item proposed, the quantity, unit price, the source of the unit price (i.e., vendor quote, engineering estimate, etc.), the type of property (i.e., material, equipment, special test equipment, information technology, etc.), and a cross-reference to the Statement of Work (SOW) task/s that require the item/s. At time of proposal submission, any item that exceeds \$2,000 must be supported with basis-of-estimate (BOE) documentation such as a copy of catalog price lists, vendor quotes or a written engineering estimate (additional documentation may be required during negotiations, if selected).

(iii) If seeking a procurement contract and items of Contractor Acquired Property are proposed, exclusive of material, the proposer shall clearly demonstrate that the inclusion of such items as Government Property is in keeping with the requirements of FAR Part 45.102. In accordance with FAR 35.014, "Government property and title," it is the Government's intent that title to all equipment purchased with funds available for research under any resulting contract will vest in the acquiring nonprofit institution (e.g., Nonprofit Institutions of Higher Education and Nonprofit Organizations whose primary purpose is the conduct of scientific research) upon acquisition without further obligation to the Government. Any such equipment shall be used for the conduct of basic and applied scientific research. The above transfer of title to all equipment purchased with funds available for research under any resulting contract is not allowable when the acquiring entity is a for-profit organization; however, such organizations can, in accordance with FAR 52.245-1(j), be given priority to acquire such property at its full acquisition cost.

F. Consultants

If consultants are to be used, proposer must provide a copy of the consultant's proposed SOW as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate and any other proposed consultant costs (e.g., travel);

G. Subcontracts

Itemization of all subcontracts. Additionally, the prime contractor is responsible for compiling and providing, as part of its proposal submission to the Government, subcontractor proposals prepared at the same level of detail as that required by the prime. Subcontractor proposals include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. If seeking a procurement contract, the prime contractor shall provide a cost reasonableness analysis of all proposed subcontractor costs/prices. Such analysis shall indicate the extent to which the prime contractor has negotiated subcontract costs/prices and whether any such subcontracts are to be placed on a sole-source basis.

All proprietary subcontractor proposal documentation, prepared at the same level of detail as that required of the prime, which cannot be uploaded to the DARPA BAA website (<https://baa.darpa.mil>, BAAT) or Grants.gov as part of the proposer's submission, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the proposer or by the subcontractor organization. This does not relieve the proposer from the requirement to include, as part of their submission (via

BAAT or Grants.gov, as applicable), subcontract proposals that do not include proprietary pricing information (rates, factors, etc.).

A Rough Order of Magnitude (ROM), or similar budgetary estimate, is not considered a fully qualified subcontract cost proposal submission. Inclusion of a ROM, or similar budgetary estimate, may result in the full proposal being deemed non-conforming or evaluation ratings may be lowered;

H. Cost-Sharing

The amount of any industry cost-sharing (the source and nature of any proposed cost-sharing should be discussed in the narrative portion of the cost volume).

I. Fundamental Research

Written justification required per Section II.B, “Fundamental Research,” pertaining to prime and/or subcontracted effort being considered Contracted Fundamental Research.

Note 1:

(a) “Cost or Pricing Data” as defined in FAR 15.403-4 shall be required if the proposer is seeking a procurement contract per the referenced threshold, but please see the exceptions in (c) and (d) below. Further, please note that adequate price competition is not considered to exist under this BAA, as all proposers are proposing unique solutions that are not in accordance with a common work statement.

(b) Per DFARS 215.408(5), DFARS 252.215-7009, Proposal Adequacy Checklist, applies to all proposers/proposals seeking a FAR-based award (contract).

(c) In accordance with DFARS 215.403-1(4)(D), DoD has waived cost or pricing data requirements for nonprofit organizations (including educational institutions) on cost-reimbursement-no-fee contracts. In such instances where the waiver stipulated at DFARS 215.403-1(4)(D) applies, proposers shall submit information other than cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and cost or pricing data from subcontractors that are not nonprofit organizations when the subcontractor’s proposal exceeds the cost and pricing data threshold at FAR 15.403-4(a)(1).

(d) Per Section 873 of the FY2016 National Defense Authorization Act (Pub L. 114-92), “Pilot Program For Streamlining Awards For Innovative Technology Projects,” as modified by Sections 896 of the NDAA for FY 2017 (Pub. L. 114-328) and 832 of the NDAA for FY 2021 (Pub. L. 116-283), small businesses and nontraditional defense contractors (as defined therein) are alleviated from submission of certified cost and pricing data for new contract awards valued at less than \$7,500,000. In such instances where this “waiver” applies, proposers seeking a FAR-based contract shall submit information other than certified cost or pricing data to the extent necessary for the Government to determine price reasonableness and cost realism; and certified cost or pricing data from subcontractors that are not small businesses or nontraditional defense contractors when such subcontract proposals exceed the cost and pricing data threshold at FAR 15.403-4(a)(1)

Note 2:

Proposers requesting an Other Transaction who meet the definition of “nontraditional defense contractor,” as defined at 10 U.S. Code § 3014 should submit information similar to “data other

than certified cost or pricing data,” as defined at FAR 2.101, to the maximum extent possible to allow for the Government to evaluate cost realism. Proposers (to include subcontractors) who do not meet the definition of a nontraditional defense contractor (who are, therefore, considered a traditional defense contractor) shall submit “data other than certified cost or pricing data.” It is incumbent on a proposer requesting an Other Transaction to provide an adequate amount of cost information needed in order for the Government to be able to evaluate cost realism. Failure to provide an adequate amount of cost information will result in the proposal being deemed non-conforming.

Note 3:

Proposers are required to provide the aforementioned cost breakdown as an editable MS Excel spreadsheet, inclusive of calculations formulae, with tabs (material, travel, ODC’s) provided as necessary. The Government also requests and recommends that the Cost Proposal include MS Excel file(s) that provide traceability between the Bases of Estimate (BOEs) and the proposed costs across all elements and phases. This includes the calculations and adjustments that are utilized to generate the Summary Costs from the source labor hours, labor costs, material costs, etc. input data. It is requested that the costs and Subcontractor proposals be readily traceable to the Prime Cost Proposal in the provided MS Excel file(s) – although this is not a requirement, providing information in this manner will assist the Government in understanding what is being proposed both technically and in terms of cost realism. NOTE: If the PDF submission differs from the Excel submission, the PDF will take precedence.

Note 4:

The Government requires that proposers* use the provided MS Excel™ DARPA Standard Cost Proposal Spreadsheet in the development of their cost proposals. A customized cost proposal spreadsheet may be an attachment to this solicitation. If not, the spreadsheet can be found on the DARPA website at <http://www.darpa.mil/work-with-us/contract-management> (under “Resources” on the right-hand side of the webpage). All tabs and tables in the cost proposal spreadsheet should be developed in an editable format with calculation formulas intact to allow traceability of the cost proposal. This cost proposal spreadsheet should be used by the prime organization and all subcontractors. In addition to using the cost proposal spreadsheet, the cost proposal still must include all other items required in this announcement that are not covered by the editable spreadsheet. Subcontractor cost proposal spreadsheets may be submitted directly to the Government by the proposed subcontractor via e-mail to the address in Part I of this solicitation. **Using the provided cost proposal spreadsheet will assist the Government in a rapid analysis of your proposed costs and, if your proposal is selected for a potential award, speed up the negotiation and award execution process.**

*University proposers requesting a cooperative agreement, or Other Transaction for Research do not need to use the MS Excel™ DARPA Standard Cost Proposal Spreadsheet. Instead, a proposed budget and justification may be provided using the SF-424 Research & Related Budget forms provided via <https://www.grants.gov>.

Any questions pertaining to use of the DARPA Standard Cost Proposal Spreadsheet, to include permitted changes and prohibited changes thereto, should be directed to costproposal@darpa.mil. Please read the instructions provided within the DARPA Standard Cost Proposal Spreadsheet, "General" tab, to include the General Spreadsheet Instruction

document embedded therein. It is very important that proposers not make changes to the format of the spreadsheet where specifically instructed not to do so.

Section III. Other Transaction Request, if applicable

All proposers requesting an Other Transaction (OT) must include a detailed list of payment milestones (Milestone Plan). Each milestone must include the following:

- Milestone description
- Completion/Exit criteria (to include identifying all associated data deliverables excluding those specifically providing project status)
- Due date
- Payment/funding schedule (to include, if cost share is proposed, awardee and Government share amounts)
- For each data deliverable, identify the proposed Government data rights (keeping in mind how each data deliverable will need to be used by the Government given the goals and objectives of the proposed project)

It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the BAA and/or the proposer's proposal. Agreement type, expenditure or fixed-price based, will be subject to negotiation by the Agreements Officer. Do not include proprietary data.

Section IV. Other Cost Information

Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates.

The cost proposal should include identification of pricing assumptions of which may require incorporation into the resulting award instrument (i.e., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Experts, etc.).

The proposer should include supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates and should include a description of the method used to estimate costs and supporting documentation.

Cost proposals submitted by FFRDC's (prime or subcontractor) will be forwarded, if selected for negotiation, to their sponsoring organization contracting officer for review to confirm that all required forward pricing rates and factors have been used.

3. Proprietary Information

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary." Note, "Confidential" is a classification marking used to control the dissemination of U.S. Government

National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

4. Security Information

a. Program Security Information

Proposers should include with their proposal any proposed solution(s) to program security requirements unique to this program. Common program security requirements include but are not limited to: operational security (OPSEC) contracting/sub-contracting plans; foreign participation or materials utilization plans; program protection plans (which may entail the following) manufacturing and integration plans; range utilization and support plans (air, sea, land, space, and cyber); data dissemination plans; asset transportation plans; classified test activity plans; disaster recovery plans; classified material / asset disposition plans and public affairs / communications plans.

b. Controlled Unclassified Information (CUI)

For Unclassified proposals containing controlled unclassified information (CUI), applicants will ensure personnel and information systems processing CUI security requirements are in place.

i. CUI Proposal Markings

If an unclassified submission contains CUI or the suspicion of such, as defined by Executive Order 13556 and 32 CFR Part 2002, the information must be appropriately and conspicuously marked CUI in accordance with DoDI 5200.48. Identification of what is CUI about this DARPA program will be detailed in the General MTO Controlled Unclassified Information Guide (CUIG) and is provided as Attachment 3 to the BAA.

ii. CUI Submission Requirements

Unclassified submissions containing CUI may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>) in accordance with Section IV.C.3. of this BAA.

Proposers submitting proposals involving the pursuit and protection of DARPA information designated as CUI must have, or be able to acquire prior to contract award, an information system authorized to process CUI information IAW NIST SP 800-171 and DoDI 8582.01.

c. Unclassified Submissions

DARPA anticipates that submissions received under this BAA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent to the BAA mailbox notifying the Technical Office PSO of the submission and the below guidance must be followed.

Security classification guidance and direction via a Security Classification Guide (SCG) and/or DD Form 254, “DoD Contract Security Classification Specification,” will not be provided at this time. If a determination is made that the award instrument may result in access to classified information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

5. Disclosure of Information and Compliance with Safeguarding Covered Defense Information Controls

The following provisions and clause apply to all solicitations and contracts; however, the definition of “controlled technical information” clearly exempts work considered fundamental research and therefore, even though included in the contract, will not apply if the work is fundamental research.

DFARS 252.204-7000, “Disclosure of Information”

DFARS 252.204-7008, “Compliance with Safeguarding Covered Defense Information Controls”

DFARS 252.204-7012, “Safeguarding Covered Defense Information and Cyber Incident Reporting”

The full text of the above solicitation provision and contract clauses can be found at

<http://www.darpa.mil/work-with-us/additional-baa#NPRPAC>.

Compliance with the above requirements includes the mandate for proposers to implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, “Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations” (see

<https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-171r2.pdf>) and DoDI

8582.01 that are in effect at the time the solicitation is issued.

For awards where the work is considered fundamental research, the contractor will not have to implement the aforementioned requirements and safeguards. However, should the nature of the work change during performance of the award, work not considered fundamental research will be subject to these requirements.

6. Human Subjects Research (HSR)/Animal Use

Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed at <http://www.darpa.mil/work-with-us/additional-baa>, to include providing the information specified therein as required for proposal submission.

7. Approved Cost Accounting System Documentation

Proposers that do not have a Cost Accounting Standards (CAS) compliant accounting system considered adequate for determining accurate costs that are negotiating a cost-type procurement contract must complete an SF 1408. For more information on CAS compliance, see <http://www.dcaa.mil/cas.html>. To facilitate this process, proposers should complete the SF 1408 found at <http://www.gsa.gov/portal/forms/download/115778> and submit the completed form with the proposal. To complete the form, check the boxes on the second page, then provide a narrative

explanation of your accounting system to supplement the checklist on page one. For more information, see (http://www.dcaa.mil/preaward_accounting_system_adequacy_checklist.html).

8. Section 508 of the Rehabilitation Act (29 U.S.C. § 749d)/FAR 39.2

All electronic and information technology acquired or created through this BAA must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C § 794d)/FAR 39.2.

9. Small Business Subcontracting Plan

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)) and FAR 19.702(a)(1), each proposer who is a large business concern and seeking a procurement contract that has subcontracting possibilities is required to submit a subcontracting plan with their proposal. The plan format is outlined in FAR 19.704. As of the date of publication of this BAA, per FAR 19.702, the threshold for submission of a small business subcontracting plan is \$750,000 (total contract amount including options).

10. Intellectual Property

All proposers must provide a good faith representation that the proposer either owns or possesses the appropriate licensing rights to all intellectual property that will be utilized under the proposed effort.

a. For Procurement Contracts

Proposers responding to this BAA requesting procurement contracts will need to complete the certifications at DFARS 252.227-7017. See www.darpa.mil/work-with-us/additional-baa for further information. If no restrictions are intended, the proposer should state “none.” The table below captures the requested information:

Technical Data Computer Software To be Furnished With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

b. For All Non-Procurement Contracts

Proposers responding to this BAA requesting a Cooperative Agreement, Other Transaction for Research, or Other Transaction for Prototypes shall follow the applicable rules and regulations governing these various award instruments, but, in all cases, should appropriately identify any potential restrictions on the Government’s use of any Intellectual Property contemplated under the award instrument in question. This includes both Noncommercial Items and Commercial Items. Proposers are encouraged use a format similar to that described in Paragraph a. above. If no restrictions are intended, then the proposer should state “NONE.”

11. Patents

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: (1) a representation that you own the invention, or (2) proof of possession of appropriate licensing rights in the invention.

12. System for Award Management (SAM) and Universal Identifier Requirements

All proposers must be registered in SAM unless exempt per FAR 4.1102. FAR 52.204-7, “System for Award Management” and FAR 52.204-13, “System for Award Management Maintenance” are incorporated into this solicitation. See <http://www.darpa.mil/work-with-us/additional-baa> for further information.

International entities can register in SAM by following the instructions in this link: https://www.fsd.gov/sys_attachment.do?sys_id=c08b64ab1b4434109ac5ddb6bc4bcbb8.

C. Submission Information

DARPA will acknowledge receipt of all submissions and assign an identifying control number that should be used in all further correspondence regarding the submission. DARPA intends to use electronic mail correspondence regarding HR001123S0047. Submissions may not be submitted by fax or e-mail; any so sent will be disregarded.

Submissions will not be returned. An electronic copy of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested, provided the formal request is received by DARPA within 5 days after notification that a proposal was not selected.

All administrative correspondence and questions on this solicitation, including requests for clarifying information on how to submit an abstract or full proposal to this BAA should be directed to HR001123S0047@darpa.mil. DARPA intends to use electronic mail for correspondence regarding HR001123S0047. Proposals and abstracts may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the BAA and any other related information that may subsequently be provided.

1. Submission Dates and Times

a. Abstract Due Date

Abstracts must be submitted to DARPA/MTO on or before 4:00 PM, Eastern Time, 04 August 2023. Abstracts received after this time and date may not be reviewed.

b. Full Proposal Date

Full proposals must be submitted to DARPA/MTO on or before 4:00 PM, Eastern Time, 15 September 2023, in order to be considered during the single round of selections. Proposals received after this deadline will not be reviewed.

c. Frequently Asked Questions (FAQ)

DARPA will post a consolidated Question and Answer (FAQ) document on a regular basis. To access the posting go to: <http://www.darpa.mil/work-with-us/opportunities>. Under the HR001123S0047 summary will be a link to the FAQ. Submit your question/s by e-mail to HR001123S0047@darpa.mil. In order to receive a response sufficiently in advance of the proposal due date, send your question/s on or before 4:00 PM, Eastern Time, 31 August 2023.

2. Abstract Submission Information

Proposers are strongly encouraged to submit an abstract in advance of a full proposal in order to provide potential proposers with a rapid response and to minimize unnecessary effort in proposal preparation and review. DARPA will acknowledge receipt of the submission and assign a control number that should be used in all further correspondence regarding the abstract.

All abstracts sent in response to HR001123S0047 shall be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the abstract. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

All abstracts submitted electronically through the DARPA BAA Submission website must be uploaded as zip files (.zip or .zipx extension). The final zip file should only contain the document(s) requested herein and must not exceed 100 MB in size. Only one zip file will be accepted per abstract; abstracts not uploaded as zip files will be rejected by DARPA.

NOTE: YOU MUST CLICK THE 'FINALIZE PROPOSAL ABSTRACT' BUTTON AT THE BOTTOM OF THE CREATE PROPOSAL ABSTRACT PAGE. FAILURE TO DO SO WILL RESULT IN YOUR ABSTRACT NOT BEING OFFICIALLY SUBMITTED TO THIS BAA AND THEREFORE NOT BEING REVIEWED.

Please note that the DoD-issued certificate associated with the BAA website is not recognized by all commercial certificate authorities, resulting in untrusted connection errors/messages. You can either bypass the warning (possibly by adding <https://baa.darpa.mil> to your listed of trusted sites, or [darpa.mil](https://baa.darpa.mil) as a trusted domain), or visit DISA's site to download the Root Certificate Authority (CA): <https://public.cyber.mil/from-iase/>.

Technical support for DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours, (9:00 AM - 5:00 PM EST Monday - Friday).

Note: DO NOT SUBMIT ABSTRACTS TO GRANTS.GOV.

3. Proposal Submission Information

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal. Proposals not meeting the format described in the BAA may not be reviewed.

a. For Proposers Requesting Cooperative Agreements:

Proposers requesting cooperative agreements must submit proposals through one of the following methods: (1) electronic upload per the instructions at <https://www.grants.gov/applicants/apply-for-grants.html> (DARPA-preferred); or (2) hard-copy mailed directly to DARPA. If proposers intend to use Grants.gov as their means of submission, then they must submit their entire proposal through Grants.gov; applications cannot be submitted in part to Grants.gov and in part as a hard-copy. Proposers using Grants.gov do not submit hard-copy proposals in addition to the Grants.gov electronic submission.

Submissions: In addition to the volumes and corresponding attachments requested elsewhere in this solicitation, proposers must also submit the three forms listed below.

Form 1: SF 424 Research and Related (R&R) Application for Federal Assistance, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf. *This form must be completed and submitted.*

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et seq.), the Department of Defense (DoD) is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering or mathematics disciplines. In addition, the National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the two forms below to collect the necessary information to satisfy these requirements. Detailed instructions for each form are available on Grants.gov.

Form 2: The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.pdf, will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
 - Education and Training.
 - Research and Professional Experience.
 - Collaborations and Affiliations (for conflict of interest).
 - Publications and Synergistic Activities.
- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
 - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
 - Title and objectives of the other research projects.
 - The percentage per year to be devoted to the other projects.
 - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
 - Name and address of the agencies and/or other parties supporting the other research projects
 - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the “Next Person” button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

Form 3: Research and Related Personal Data, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_PersonalData_1_2-V1.2.pdf. *Each applicant must complete the name field of this form, however, provision of the demographic information is voluntary. Regardless of whether the demographic fields are completed or not, this form must be submitted with at least the applicant’s name completed.*

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks. For more information about registering for Grants.gov, see www.darpa.mil/work-with-us/additional-baa. See the Grants.gov registration checklist at <http://www.grants.gov/web/grants/register.html> for registration requirements and instructions.

Once Grants.gov has received a proposal submission, Grants.gov will send two email messages to advise proposers as to whether or not their proposals have been validated or rejected by the system; IT MAY TAKE UP TO TWO DAYS TO RECEIVE THESE EMAILS. The first email will confirm receipt of the proposal by the Grants.gov system; this email only confirms receipt, not acceptance, of the proposal. The second will indicate that the application has been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the proposal must be corrected and resubmitted before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, the proposer will receive a third email from Grants.gov. To avoid missing deadlines, proposers should submit their proposals in advance of the final proposal due date with sufficient time to receive confirmations and correct any errors in the submission process through Grants.gov. For more information on submitting proposals to Grants.gov, visit the Grants.gov submissions page at: <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>.

Proposers electing to submit cooperative agreement proposals as hard copies must complete the same forms as indicated above.

b. For Proposers Requesting Other Transaction for Research Agreements

Proposers requesting an Other Transaction for Research (OT-R) awarded under 10 U.S.C. § 4021 must include the completed form indicated below. This requirement only applies only to those who expect to receive an OT-R as their ultimate award instrument.

The National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the form below to collect the necessary information to satisfy these requirements.

The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.pdf, will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree

Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
 - Education and Training.
 - Research and Professional Experience.
 - Collaborations and Affiliations (for conflict of interest).
 - Publications and Synergistic Activities.
- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
 - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
 - Title and objectives of the other research projects.
 - The percentage per year to be devoted to the other projects.
 - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
 - Name and address of the agencies and/or other parties supporting the other research projects
 - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the “Next Person” button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

c. For Proposers Requesting Procurement Contracts or Other Transaction Agreements and submitting to a DARPA-approved Proposal Submissions Website

Unclassified full proposals sent in response to this BAA may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Note: If an account has recently been created for the DARPA BAA Website, this account may be reused. Accounts are typically disabled and eventually deleted following 75-90 days of inactivity – if you are unsure when the account was last used, it is recommended that you create a new account. If no account currently exists for the DARPA BAA Website, visit the website to complete the two-step registration process. Submitters will

need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. The “Password Reset” option at the URL listed above can be used if the password is not received in a timely fashion. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the proposal. Note: Even if a submitter’s organization has an existing registration, each user submitting a proposal must create their own Organization Registration.

All unclassified concepts submitted electronically through DARPA’s BAA Website must be uploaded as zip archives (i.e., files with a .zip or .zipx extension). The final zip archive should be no greater than 100 MB in size. Only one zip archive will be accepted per submission – subsequent uploads for the same submission will overwrite previous uploads, and submissions not uploaded as zip archives will be rejected by DARPA.

Classified submissions and proposals requesting cooperative agreements should NOT be submitted through DARPA's BAA Website (<https://baa.darpa.mil>), though proposers will likely still need to visit <https://baa.darpa.mil> to register their organization (or verify an existing registration) to ensure the BAA office can verify and finalize their submission. **Proposal abstracts will not be accepted if submitted via Grants.gov.**

Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; proposers should start this process as early as possible. Technical support for DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours (9:00 AM – 5:00 PM Eastern Time).

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the following criteria, listed in descending order of importance:

1. Overall Scientific and Technical Merit

The proposed technical approach is innovative, feasible, achievable, and complete. The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

2. Potential Contribution and Relevance to the DARPA Mission

The potential contributions of the proposed effort are relevant to the national technology base. Specifically, DARPA’s mission is to make pivotal early technology investments that create or prevent strategic surprise for U.S. National Security.

The proposer clearly demonstrates its plans and capabilities to contribute to U.S. national security and U.S. technological capabilities. The evaluation will consider the proposer's plans and capabilities to transition proposed technologies to U.S. national security applications and to U.S. industry. The evaluation will consider the proposer's description of how the proposed sources will be integrated into the microelectronic design and development process to disruptively shorten the time required to test and qualify radiation-hardened components. The evaluation may consider the proposer's history of transitioning or plans to transition technologies to foreign governments or to companies that are foreign owned, controlled, or influenced. The evaluation will also consider the proposer's plans and capabilities to assist its employees and agents to be eligible to participate in the U.S. national security environment. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property (IP) rights structure will potentially impact the Government's ability to transition the technology.

3. Cost and Schedule Realism

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Statement of Work and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed subawardees are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs and the basis for the estimates).

It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

The proposed schedule aggressively pursues performance metrics in the shortest timeframe and accurately accounts for that timeframe. The proposed schedule identifies and mitigates any potential schedule risk.

B. Review and Selection Process

1. Review Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed in Section V.A, and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this solicitation; proposals that fail to do so may be deemed non-conforming and may be removed from consideration. Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

2. Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104), and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements.

Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

3. Federal Awardee Performance and Integrity Information (FAPIS)

Per 41 U.S.C. 2313, as implemented by FAR 9.103 and 2 CFR § 200.205, prior to making an award above the simplified acquisition threshold, DARPA is required to review and consider any information available through the designated integrity and performance system (currently FAPIS). Awardees have the opportunity to comment on any information about themselves entered in the database, and DARPA will consider any comments, along with other information in FAPIS or other systems prior to making an award.

4. Countering Foreign Influence Program (CFIP)

DARPA's CFIP is an adaptive risk management security program designed to help protect the critical technology and performer intellectual property associated with DARPA's research

projects by identifying the possible vectors of undue foreign influence. The CFIP team will create risk assessments of all proposed Senior/Key Personnel selected for negotiation of a fundamental research cooperative agreement award. The CFIP risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award.

VI. Award Administration Information

A. Selection Notices

1. Abstracts

DARPA will respond to abstracts with a statement as to whether DARPA is interested in the idea. If DARPA does not recommend the proposer submit a full proposal, DARPA will provide feedback to the proposer regarding the rationale for this decision. Regardless of DARPA's response to an abstract, proposers may submit a full proposal. DARPA will review all conforming full proposals using the published evaluation criteria and without regard to any comments resulting from the review of an abstract.

2. Proposals

As soon as the evaluation of a proposal is complete, the proposer will be notified that (1) the proposal has been selected for funding pending contract negotiations, in whole or in part, or (2) the proposal has not been selected. These official notifications will be sent via email to the Technical POC identified on the proposal coversheet.

B. Administrative and National Policy Requirements

1. Meeting and Travel Requirements

All key participants are required to attend the program kickoff meeting. Performers should also anticipate regular program-wide PI Meetings and periodic site visits at the Program Manager's discretion.

2. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation clauses in the FAR and DFARS relevant to procurement contracts and FAR and DFARS clauses that may be included in any resultant procurement contracts are incorporated herein and can be found at www.darpa.mil/work-with-us/additional-baa.

Controlled Unclassified Information (CUI) and Controlled Technical Information (CTI) on Non-DoD Information Systems

Further information on Controlled Unclassified Information identification, marking, protecting and control, to include processing on Non-DoD Information Systems, is incorporated herein and can be found at www.darpa.mil/work-with-us/additional-baa.

3. Representations and Certifications

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at <https://www.sam.gov/>.

In addition, all proposers are required to submit for all award instrument types supplementary DARPA-specific representations and certifications at the time of proposal submission. See <http://www.darpa.mil/work-with-us/rep-cert> for further information on required representation and certification depending on your requested award instrument.

A small business joint venture offeror must submit, with its offer, the representation required in paragraph (c) of FAR solicitation provision 52.212-3, Offeror Representations and Certifications-Commercial Products and Commercial Services, and paragraph (c) of FAR solicitation provision 52.219-1, Small Business Program Representations, in accordance with 52.204-8(d) and 52.212-3(b) for the following categories: (A) Small business; (B) Service-disabled veteran-owned small business; (C) Women-owned small business (WOSB) under the WOSB Program; (D) Economically disadvantaged women-owned small business under the WOSB Program; or (E) Historically underutilized business zone small business.

Proposers requesting an Other Transaction are required to complete the Other Transaction Certifications document provided as Attachment 4 to the BAA.

4. Terms and Conditions

For terms and conditions specific to cooperative agreements, see the DoD General Research Terms and Conditions (latest version) at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions> and the supplemental DARPA-specific terms and conditions at <http://www.darpa.mil/work-with-us/contract-management#GrantsCooperativeAgreements>.

C. Reporting

The number and types of reports will be specified in the award document, but will include as a minimum monthly technical and financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

D. Electronic Systems

1. Wide Area Work Flow (WAWF)

Unless using another means of invoicing, performers will be required to submit invoices for payment directly via to <https://wawf.eb.mil>. Registration in WAWF will be required prior to any award under this BAA.

2. i-Edison

The award document for each proposal selected for funding will contain a mandatory requirement for invention disclosures (and associated elections, confirmatory instruments, etc.) and patent reports to be submitted electronically through i-Edison (<https://public.era.nih.gov/iedison>).

3. Vault

The award document for each proposal selected for funding will contain a mandatory requirement for technical and status reports to be submitted electronically through DARPA's Vault (or similar) web-based tool.

4. DARPA Embedded Entrepreneurship Initiative (EEI)

Awardees pursuant to this solicitation may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the award's period of performance. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI

effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 18-24 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market strategy aimed at delivering new capabilities for national defense.

Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

VII. Agency Contacts

Administrative, technical or contractual questions should be sent via e-mail to HR001123S0047@darpa.mil. All requests must include the name, email address, and phone number of a point of contact.

The technical POC for this effort is:

Dr. David K. Abe, Program Manager
DARPA/MTO
ATTN: HR001123S0047
675 North Randolph Street

Arlington, VA 22203-2114
BAA Email: HR001123S0047@darpa.mil

For information concerning agency level protests see <http://www.darpa.mil/work-with-us/additional-baa#NPRPAC>.

VIII. Other Information

A. Proposers Day

The ASSERT Proposers Day will be held on July 13, 2023 in Arlington, VA. Advanced registration is required. See DARPA-SN-23-78 posted at <https://sam.gov> for all details. Attendance at the ASSERT Proposers Day is not required to propose to this solicitation.

B. University Student and Researcher Funding

In order to ensure that U.S. scientific and engineering students will be able to continue to make strategic technological advances, DARPA is committed to supporting the work and study of Ph.D. students and post-doctoral researchers that began work under a DARPA-funded program awarded through an assistance instrument. Stable and predictable federal funding enables these students to continue their scientific and engineering careers.

To that end, should a DARPA funded program awarded through a grant or cooperative agreement with a university or a Research Other Transaction pursuant to 10 U.S.C. § 4021 where the university is a participant end (due to termination or down-select) before the planned program completion, DARPA may continue to fund, for no more than two semesters (or equivalent), the documented costs to employ or sponsor Ph.D. students and/or post-doctoral researchers. Should such a circumstance arise, the following will take place:

- 1) The Government will provide appropriate notification to the University participant by the Agreements Office or through the prime performer.
- 2) The University must make reasonable efforts to find alternative research or employment opportunities for these students and researchers.
- 3) Before any costs will be paid, the University must submit documentation describing their due diligence efforts in finding alternative arrangements that is certified by a University official.
- 4) In addition to this documentation, the affected students and researchers must submit statements of work describing what research activities they will pursue during the period of funding and the final deliverable they will submit when the funding is complete.
- 5) In determining these costs, DARPA will rely on information from the University's original proposal unless specific circumstances warrant requesting updated proposals. In no circumstances will this funding be provided when the program is ended because of suspected or actual fraud or negligence.

DARPA Down-Select Definition:

DARPA often structures programs in phases or options that include specific objectives and a designated period of performance. This may result in potentially issuing multiple awards to maximize the number of innovative approaches. This approach allows the Government to

monitor progress and enables programmatic decision points based, at a minimum, against stated evaluation criteria, metrics, funding availability, and program goals and objectives. As a result, select performers may advance via award of a subsequent phase or through exercise of a planned option period.