



Broad Agency Announcement

Multiobjective Engineering and Testing of ALloy Structures
(METALS)

Defense Sciences Office

HR001123S0029

March 15, 2023

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BAA Attachments:

- Attachment A: ABSTRACT SUMMARY SLIDE TEMPLATE
- Attachment B: ABSTRACT TEMPLATE
- Attachment C: PROPOSAL SUMMARY SLIDE TEMPLATE
- Attachment D: PROPOSAL TEMPLATE VOLUME 1: TECHNICAL & MANAGEMENT

- Attachment E: PROPOSAL TEMPLATE VOLUME 2: COST
- Attachment F: MS Excel™ DARPA COST PROPOSAL SPREADSHEET
- Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS
- Attachment H: CONTROLLED UNCLASSIFIED INFORMATION (CUI) GUIDE

PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title:** Multiobjective Engineering and Testing of ALloy Structures (METALS)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** HR001123S0029
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 12.910 Research and Technology Development
- **Dates** (All times listed herein are Eastern Time.)
 - Posting Date: March 15, 2023
 - Proposers Day: March 24, 2023. See Section VIII.A.
 - Abstract Due Date: April 14, 2023, 4:00 p.m.
 - FAQ Submission Deadline: June 2, 2023, 4:00 p.m. See Section VIII.B.
 - Full Proposal Due Date: June 9, 2023, 4:00 p.m.
- **Anticipated Individual Awards:** DARPA anticipates multiple awards
- **Types of Instruments that May be Awarded:** Procurement contracts, cooperative agreements or Other Transaction for Prototype agreements. Award instruments will be limited to procurement contracts and Other Transactions for Proposers whose proposed solution includes Controlled Unclassified Information (CUI).
- **Agency contacts**
 - **Technical Point of Contact (POC):** Andrew Detor, Program Manager, DARPA/DSO
 - **BAA Email:** METALS@darpa.mil
 - **BAA Mailing Address:**

DARPA/DSO
ATTN: HR001123S0029
675 North Randolph Street
Arlington, VA 22203-2114
 - **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>
- **Teaming Information:** See Section VIII.C for information on teaming opportunities.
- **Frequently Asked Questions (FAQ):** FAQs for this solicitation may be viewed on the DARPA/DSO Opportunities Website. See Section VIII.B for further information.
- **Security:** The METALS program will be an unclassified research program with potential components that are CUI. METALS will demonstrate system performance and generate

test articles that may be considered CUI. For further details, please see Sections IV.B.4 and IV.B.5.

PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

This Broad Agency Announcement (BAA) constitutes a public notice of a competitive funding opportunity as described in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 as well as 2 C.F.R. § 200.203. Any resultant negotiations and/or awards will follow all laws and regulations applicable to the specific award instrument(s) available under this BAA, e.g., FAR 15.4 for procurement contracts.

A. Introduction

The Defense Sciences Office (DSO) at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the area of material testing and design optimization. The Multiobjective Engineering and Testing of ALloy Structures (METALS) program will develop foundational technologies enabling *material as an explicit, continuous variable in structural design*. Such foundational technologies include new material test methods to rapidly generate relevant properties and optimization frameworks that leverage materials informatics to represent complex material behavior. Proposed research should investigate innovative approaches that enable revolutionary advances. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

B. Background

The METALS program aims to disrupt two significant barriers at the intersection of materials science and engineering design: (1) design-relevant material property measurements rely on century-old testing techniques that are inefficient and costly; and (2) material is treated as a discrete input in design instead of a variable to be optimized. These barriers fundamentally prevent concurrent optimization of design and material together. As a result, materials scientists lack clear direction on new property combinations that would unlock significant system performance gains, and designers are limited to a legacy palette of materials. Furthermore, material itself is currently treated as a discrete variable in design, preventing local optimization of material within engineered components. This “one part-one material” constraint limits performance and reliability, while also affecting sustainability in situations where critical raw materials are consumed in locations within a part where they may not be required. Removing this traditional constraint in favor of a “continuum material” approach will open new degrees of freedom in design. While continuum material approaches have been explored to some degree in the past (also referred to as functionally graded materials, hybrid materials, or multi-materials), efforts have generally focused on limited combinations of discrete materials, variations in only 1 or 2 dimensions, and designs driven by intuition. DARPA believes that recent advances in full-field characterization techniques and the maturing field of materials informatics will enable combined breakthroughs in experimental material testing and material-integrated design optimization for revolutionary improvements in system performance, reliability, and sustainability.

C. Program Description/Scope

METALS aims to enable continuum material structures by leveraging recent advances in material testing and materials informatics. Novel full-field characterization methods now exist

that can track test specimen behavior (e.g., deformation) with precise temporospatial detail. Applying these methods to non-conventional test specimens will enable the simultaneous extraction of multiple properties aided by inverse analysis techniques. In this approach, material properties are learned based on observed specimen response rather than attempting to model response based on traditional curated material property curves. METALS aims to demonstrate *rapid acquisition of design-relevant properties* through the combination of novel specimen designs, state-of-the-art full-field characterization techniques, and inverse analysis. In parallel, METALS will explore fundamentally new design optimization methods that include material explicitly. Today, material is treated as an input in design because no surrogate model exists that can adequately capture the complexity of material behavior (e.g., how composition and processing details affect a broad range of properties). Materials informatics (applying data-driven methods, including machine learning, to material development) has matured significantly over the past decade to the point where tools that can accurately and efficiently capture material behavior with quantified uncertainty now exist. METALS will explore the application of *materials informatics as a conduit into design optimization* frameworks, providing a direct, explicit link between the two disciplines. METALS will leverage ongoing industrial advances in multi-material manufacturing to fabricate continuum material demonstration parts and establish proof of concept.

Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. This includes brute-force approaches to automate existing test procedures (e.g., using robotics to load/unload conventional test specimens) and novel analyses applied to currently available test platforms (e.g., instrumented indentation). Efforts that primarily advance computational material modeling and simulation to predict material behavior are also excluded, as METALS seeks to advance *experimental* property testing. Proposals that focus significantly on material microstructure will also be considered non-conforming, as METALS aims to derive material properties *directly from testing* without requiring microstructure information. Additionally, discrete material optimization approaches are excluded where design-of-experiments or related methods are introduced as a wrapper around existing shape optimization frameworks: METALS seeks novel approaches to integrate material into the design process *explicitly* and in a continuous manner. Finally, as the program acronym implies, proposed efforts must encompass metallic alloys with a focus on thermostructural design as detailed in Section E.

D. Program Structure

METALS is a four-year, three-phase program that will use a phased acquisition approach. Proposals must be structured as a 24-month Phase I base with an option for a 12-month Phase II effort. Proposers must also provide a draft Statement of Work (SOW) and Rough Order of Magnitude (ROM) cost estimate for a 12-month Phase III. Proposals that do not include a Phase III draft SOW and ROM will be deemed non-conforming. Near the end of Phase II, DARPA may issue proposal instructions to Phase II performers requesting final SOWs and revised cost proposals for Phase III. Competition for Phase III will be limited to Phase II performers only. Evaluation of Phase III proposals will be based on criteria to be specified in the Phase III proposal requests. The Phase III evaluation criteria will be consistent with the evaluation criteria in this solicitation, but may be tailored in the Phase III requests for updated proposals. Phase III proposal evaluations will be conducted through a scientific and technical review process in accordance with Section V.A. and V.B. The Government reserves the right to issue a new

solicitation for Phase III with a new award instrument if programmatic circumstances dictate. Participation in Phase II does not guarantee funding in Phase III. Progression to the next phase will be contingent on evaluation of Phase III proposals and availability of funds.

The METALS program comprises two Focus Areas (FAs): FA1 - New material test capabilities and FA2 - Novel material-integrated design optimization techniques. Proposers are required to propose to both FA1 and FA2 in a single proposal for Phase I; any proposal that addresses only one FA will be deemed non-conforming. This is intended to bring experts in materials and design together to accomplish the METALS program goals. FA1 and FA2 will be integrated during Phase II to demonstrate a coupled materials testing platform and design optimization loop. Prototype components will be manufactured in Phase III to show proof-of-concept, and the tools and methods developed on METALS will be transitioned to Independent Verification and Validation (IV&V) teams or other U.S. Government stakeholders. An additional challenge problem will also be included in Phase III to test the generalizability of performer approaches.

METALS is structured around two exemplary challenge problems that will be carried through the entire program: a *bladed disk (blisk)* as commonly found in turbomachinery (including jet and rocket engines) and an *impeller* as found in pumps and watercraft. Proposals must select one of the two challenge problems and focus on the design-relevant material properties detailed in Section E. Blisk or impeller designs available in the open literature for purchase, or proposer developed proprietary designs can be used. In all cases the maximum outer diameter of the blisk or impeller must be scaled in the range of 15-50 cm. The Government will not supply any specific component models or drawings.

Figure 1 provides a high-level overview of the program schedule, including the alignment of phases, FAs, system demonstrations/capability challenges, and involvement of IV&V teams.

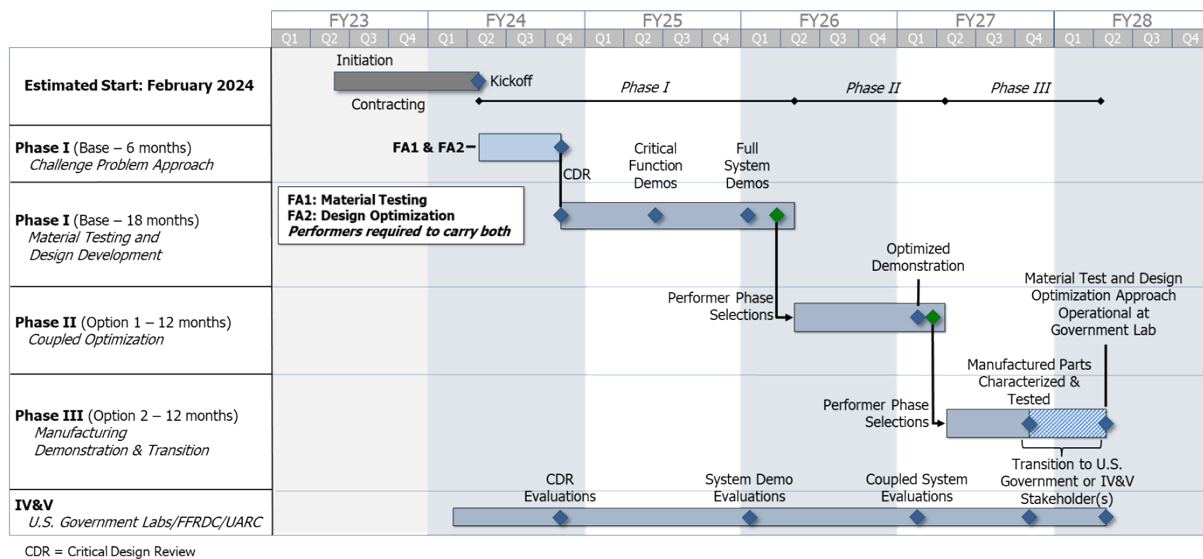


Figure 1. METALS program schedule.

Phase I is a base period to develop and demonstrate proposed approaches for FA1 and FA2. Performers will work closely with DARPA and IV&V teams during the initial six (6) months of Phase I to detail a plan that (1) defines the selected challenge problem design variables, objectives, and constraints; (2) provides a detailed design of the material test platform(s); and (3)

specifies the design optimization architecture and software development plan. A data strategy must also be outlined describing, in detail, how material properties will be collected, organized, stored, and queried with integration into the design optimization platform. Following a 6-month critical design review (CDR), the remaining 18 months of Phase I will focus on building and demonstrating both the material tests platform and design optimization software. Near the end of Phase I (month 21), performers will conduct full system demonstrations establishing independent proof-of-concept for both FAs.

Phase II (12 months) is an option period to demonstrate coupled high-throughput testing and material-integrated design optimization. Performers will demonstrate that they can (1) screen new materials driven by design optimization needs, (2) incorporate newly measured material properties in the design optimization process in near real time, and (3) connect processing to properties to develop a part manufacturing plan in preparation for Phase III. By the end of month 34, performers must demonstrate and quantify the benefits of a continuum material approach achieved by coupling the test and design platforms. Performers will also present to DARPA their manufacturing process plan that connects local process variables to the final component shape.

Phase III (12 months) is a second option period for performers to establish proof-of-concept for a continuous material shape-optimized component. Performers will complete manufacturing demonstrations followed by characterization and proof-testing for the challenge part selected in Phase I and optimized in Phase II.

An additional challenge problem will also be worked in Phase III. The intent of the additional challenge problem is to test the generalizability of the performer-developed material test and design platforms. The additional challenge problem will be a design exercise only; no demonstration hardware will need to be manufactured. The additional challenge problem may be performer proposed or suggested by DARPA or IV&V teams; a final decision will be made by DARPA prior to the beginning of Phase III and included in the Phase III proposal instructions.

Finally, performers will work with DARPA in Phase III to transition developed test methods and design software to interested IV&V laboratories, or other U.S. Government stakeholders, and assist in training personnel to operate the new capabilities. Performers are also encouraged to publish test method standards through internationally recognized organizations (e.g., American Society for Testing and Materials International (ASTM), International Organization for Standardization (ISO), etc.), as appropriate.

Subject matter experts at U.S. Government laboratories and a University Applied Research Center (UARC) will serve as technical advisors and IV&V partners throughout the program, providing DARPA an assessment of performer capabilities and validating experimental data and/or system performance. Performers will be expected to work openly and regularly with DARPA and designated IV&V teams throughout the program. Performers will be required to provide details of their systems, including but not limited to engineering drawings, operating methods and instructions, software, datasets, and samples to DARPA and/or any designated IV&V organizations upon request. Proposals must include a task to reflect interaction with DARPA and IV&V teams and delivery of requested information, data, hardware, software, and materials. This BAA does *not* solicit IV&V participation. U.S. Government, Federally Funded Research and Development Center (FFRDC), or UARC personnel interested in learning more about METALS or potentially participating in program activities should contact DARPA at METALS@darpa.mil.

E. Focus Area Descriptions

The METALS program consists of two FAs organized around one of two challenge problems as introduced above. Proposers are required to propose to both FAs in a single proposal. While the challenge parts (blisk and impeller) share some similarity (e.g., both are rotating components used in propulsion applications), they operate in very different environments. Because of this, the material properties driving performance are distinct and together cover a broad range of behaviors common to structural design. Importantly, the intent of METALS is not specifically to develop better blisks or impellers; rather, METALS is a foundational program designed to disrupt the way material testing and design optimization are conducted. The challenge problems serve to focus performer efforts and provide clear example targets for development. Table 1 provides general guidance on selected material properties pertinent to the blisk and impeller challenge problems. Note that this table is not intended to be an exhaustive list. Other properties not listed here are encouraged; however, if introduced, proposals must clearly articulate their importance.

Table 1: Selected material properties relevant to challenge problem parts.

| Property Category | Blisk | Impeller |
|-----------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Performance | Yield strength, creep, low cycle fatigue, crack growth, hot corrosion, oxidation, impact tolerance | Yield strength, modulus, fracture toughness, high cycle fatigue, corrosion resistance, cavitation erosion |
| Material Criticality | Supply chain risk, cost, sustainability | |

The first row in Table 1 lists some of the important properties that are critical to blisk and impeller performance. In FA1, performers will develop novel test methods to rapidly acquire design-relevant material property data. While solutions that can capture all design-relevant properties are desired, proposed test approaches must address the following three points:

- Tensile behavior as a function of temperature (e.g., must include elastic modulus, yield strength, strain hardening behavior, ultimate tensile strength, and a measure of ductility)
- One *time-dependent* property (e.g., creep, fatigue, etc.) as a function of temperature
- One *environmental* property (e.g., corrosion, oxidation, etc.) as a function of temperature

Proposals that include credible approaches to capture more properties will be viewed favorably over those proposing fewer. However, attention must be paid to the realism, accuracy, and speed of proposed approaches to meet the metrics outlined below. More properties will not automatically improve selection chances if capturing those properties is deemed unrealistic; in this case, focused approaches on fewer properties meeting the minimums outlined above are preferred. Proposers will need to strike the right balance in their proposals. Properties that are relevant for challenge part design but not included in proposed experimental measurement efforts can be approximated using available literature data, general trends, or stated assumptions.

Proposers may use modeling and simulation methods to supplement required design properties only in situations where proven, readily available modeling techniques exist. As mentioned earlier, material modeling and simulation development efforts are explicitly excluded from the METALS program.

Metrics related to material criticality are also included in Table 1: supply chain risk, cost, and sustainability. These properties are not intended to be measured, but must be included in design optimization. Performers should use existing metrics available in the open literature or company proprietary information to estimate these values for a given material composition. DARPA highly encourages novel approaches compatible with design optimization to quantify material criticality.

For the selected challenge problem, Phase I performers will develop material testing and design optimization platforms. Metrics for Phase I are given in Table 2 and are discussed in detail below.

Table 2: Phase I metrics.

| | |
|-----|-------------------------------------------------------------------------------------------------------|
| 1.1 | <1 week turnaround time from new material definition to design-relevant properties |
| 1.2 | ±10% material testing accuracy (vs. traditional methods) on specimens <10 cm in all dimensions |
| 1.3 | >150 alloy variants tested from at least 15 unique compositions |
| 1.4 | <12 hour convergence to a challenge problem continuum material solution on an engineering workstation |

Phase I : Testing and Design Platform Development

Phase I, FA1: Material Testing

FA1 performers will develop the processes and hardware for experimental test platforms capable of timely property measurement for design. Proposers should not be constrained by current practices in material testing. Unconventional equipment and/or approaches that offer improved efficiency are encouraged. DARPA is not specifying the type of equipment to be included in the system; rather, proposers should determine what is most broadly applicable to be efficient and effective at achieving the METALS vision.

Metric 1.1: From the conception of a new material (composition and process) performers must demonstrate <1 week turnaround time to measured properties for design. This encompasses initial specimen production, any required machining, testing, and post-test analysis. In this rapid, high-throughput testing scenario the accuracy of measured results must be balanced against the benefits of an accelerated timeline.

Metric 1.2: Accuracy does not need to match established (slow) traditional methods, but must be demonstrated within 10% of established test protocol results. For example, if the average yield strength of an alloy is measured at 200 MPa at a particular temperature using conventional tensile testing, the new test platform should produce an average yield

strength between 180-220 MPa at that temperature. Uncertainty on the measured property must also be quantified and minimized to the extent possible, but will not be considered as a primary program metric. Uncertainty can be derived through direct specimen repeat testing, a test campaign involving multiple unique geometries, measurement of the same property at different locations on the test sample, or some combination of these. Test specimens should be <10 cm in all dimensions to enable easy handling and limit material usage.

Metric 1.3: Successful performers will demonstrate a full suite of design-relevant property measurements on >150 alloy variants from at least 15 unique compositions over the duration of Phase I. For example, this could be 15 unique alloy compositions processed using 10 different conditions, 150 unique compositions manufactured using an identical process, or any combination in between.

The combination of <1 week turnaround time to properties at 10% accuracy over 150+ alloy variants is aggressive relative to conventional material testing practices. Proposed solutions must leverage unconventional specimen designs along with advanced characterization and analysis to achieve these targets. Extraction of multiple properties in a single test will be a key enabler.

Phase I, FA2: Design Optimization

Metric 1.4: Performers must demonstrate convergence time of <12 hours to a continuum material solution using a ‘typical’ engineering workstation. A typical workstation is defined here as a desktop computer designed for technical engineering analysis that can be readily purchased off-the-shelf. For example, a typical engineering workstation may have a 10-core processor, running at 3-5 GHz, with 16 GB of RAM. The exact numbers are less important; the key point is that solutions should not require extensive supercomputer capabilities. Successful design optimization solutions must be accessible. A convergence time of <12 hours is specified so that design iterations can be done daily and updated with new material test data as it becomes available. Proposals must specify a convergence criteria and acceptable threshold to indicate that a steady result has been achieved.

The design optimization FA is intentionally broad to accommodate a range of potential solutions. DARPA is not specifying the optimization framework performers should use. Proposals may include multidisciplinary design optimization (MDO), topology optimization, shape optimization, or any number of other approaches. Proposed approaches, however, must include material *explicitly* in the optimization loop itself. Approaches that consider material outside the loop – a discrete optimization approach, for example – will be non-conforming. Proposers are encouraged to include novel approaches to material representation in the design framework. Alternatives to traditional individual property curves and lookup tables could, for example, be replaced using a modern materials informatics approach. Material must also be allowed to vary continuously throughout the challenge problem component as a degree of freedom in the optimization routine. As an extreme example, every element in a part (considering a finite element-based approach) could be allowed to vary in material properties. In practice, performers must consider constraints on minimum achievable volume element (voxel) along with other manufacturing constraints and material compatibility concerns. Proposals must detail an approach to prevent the formation of deleterious phases or other undesirable discontinuities as

material varies throughout the component. Manufacturing process, total service lifetime, and operating temperature should be considered in these calculations.

Finally, FA2 is intended to advance the state-of-the-art in material integration, and *not* fluid-structure interaction. While blade shape is critical to the overall performance of the blisk and impeller, significant compute time must not be spent optimizing detailed blade contour. Minor shape changes to accommodate new materials are allowed, but those shape changes should not vary significantly from the baseline part configuration. Simplifying assumptions to account for fluid interaction may be proposed, but detailed considerations of fluid interaction are out of scope on the METALS program. Internal structure variations and modification of the base/hub sections of the blisk or impeller are acceptable and may be beneficial to take advantage of a continuous material approach. Performers will need to set boundary conditions and specify simplifying assumptions appropriate for their specific designs.

System demonstrations at months 14 and 21 will provide critical assessment points for DARPA and the IV&V teams (see Section I.F below). Approaches will be evaluated relative to Phase I metrics (Table 2) and factors such as reproducibility, ease of implementation, and time and material savings relative to tests commonly employed within the materials research community. DARPA may modify the parameters of the demonstration during the course of the program in response to either technical progress or performer requirements.

Phase II: Coupled Optimization

Upon successful completion of Phase I, performers will have demonstrated fully capable material test platforms and continuum material design optimization frameworks meeting or exceeding the metrics outlined in Table 2. In Phase II, these capabilities will be brought together to iterate on challenge part designs. Metrics associated with Phase II are presented in Table 3.

Table 3: Phase II metrics.

| | |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 | Automated <1 hour transfer from material test output to design platform input |
| | <i>Demonstrated benefit of continuum vs. single material approach</i> |
| 2.2 | <u>Performance</u> |
| | <ul style="list-style-type: none"> ○ Blisk: >100°C increase in max operating temperature ○ Impeller: >50% weight reduction |
| | <u>Material Criticality</u> |
| | <ul style="list-style-type: none"> ○ Blisk & Impeller: 50% reduction in alloy criticality index |

Metric 2.1: Performers must demonstrate automated transfer of data from the material test platform (immediately after a test is completed) into the design optimization software in under 1 hour. All data analysis and reduction must be completed as part of this transfer resulting in a format that can be read directly by the design platform. Limited manual intervention to complete the handoff will be allowable (e.g., loading material data files into the design software) but must be routine and require minimal effort. This connection between material testing and design is historically fragile and informal; the METALS program seeks novel approaches to systematize this connection. As mentioned earlier, new representations for material properties are encouraged to enable this quantitative link.

Metric 2.2: The benefits of a continuum material design in terms of both performance and material criticality will be quantified against state-of-the-art single-material approaches. Performers will be required to quantify the maximum allowable operating temperature of the blisk, or the weight of the impeller, using a typical/traditional single material and compare the values to those enabled by a continuum material design. The METALS program aims for >100°C improvement in the maximum operating temperature of a blisk and at least 50% reduction in the weight of an impeller. Additionally, the METALS program is targeting a 50% reduction in alloy criticality for both the blisk and impeller. Performers should propose their preferred alloy criticality index from those discussed in the literature or derive appropriate expressions that combine elements of cost, supply chain risk, and sustainability.

Phase III: Manufacturing Demonstration and Transition

This description of Phase III is provided to facilitate the inclusion of a draft SOW and ROM cost with the submitted proposals. The draft SOW and ROM are for planning purposes and will not be evaluated at this time. Per Section I.D, DARPA anticipates requesting revised SOWs and cost proposals for Phase III from Phase II performers during Phase II. Specifics on Phase III activities will be included in the request for Phase III proposals and may differ from the description included here.

DARPA envisions Phase III of the METALS program as a demonstration and manufacturing proof-of-concept for continuum material challenge parts and a transition of developed technologies to U.S. Government and/or IV&V stakeholders. Metrics associated with the envisioned Phase III goals are presented in Table 4.

Table 4: Phase III metrics.

| | |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 | Manufacture 3+ continuum material challenge parts (>15cm in diameter) |
| 3.2 | Demonstrate material placement accuracy within 1% of major part dimension |
| 3.3 | <i>Proof test continuum material part vs. single material baseline</i> <u>Blisk</u> : Spin test demonstrating increased burst speed <u>Impeller</u> : Cavitation test demonstrating extended part life |

Metric 3.1: Performers will work with existing multi-material manufacturing platforms to produce at least three (3) identical parts that are >15 cm in outer diameter, using an optimized continuum material challenge part configuration identified in Phase II. Performers will need to work within existing state-of-the-art multi-material manufacturing capabilities.

Metric 3.2: Performers must characterize at least one manufactured part to ensure both overall shape and material placement are consistent with design intent. Spatial deviation of material placement is allowed up to 1% of the major part dimension. For example, if the selected challenge part is 20 cm in diameter, material placement must be shown accurate within 2 mm. Performers must specify an appropriate spatial pattern matching

technique either from the literature or derived for the purposes described here. At least three (3) unique cross-sections will be required, and specific planes will be agreed upon between performer, DARPA, and IV&V teams prior to characterization.

Metric 3.3: At least one manufactured challenge part will be subject to proof testing. Blisks will be run through a spin test to measure burst speed, and impellers will be subject to cavitation testing. Testing will be conducted at IV&V team laboratories, or organized by DARPA through an outside source. Performers may be required to modify hub designs for the blisk and impeller to accommodate the specific test infrastructure. Details will be finalized near the end of Phase II to assist in preparing a Phase III SOW.

Performers will also complete an additional challenge problem in Phase III. As noted earlier, performers will not be required to manufacture additional hardware; the new challenge problem will be limited to a design exercise only. Challenge problems may be proposed by performers or assigned by DARPA or the IV&V team; a final decision will be made by DARPA prior to the beginning of Phase III and included in the Phase III proposal instructions.

Finally, Phase III will include a dedicated effort to transition performer-developed test platforms and/or design optimization software to interested U.S. Government or IV&V partners. It is anticipated that during the course of the program certain capabilities will be desirable for transition. Performers will be expected to fully document their methods and train personnel on the operation of any transitioned hardware/software. Performers are encouraged to publish newly developed test method standards through internationally recognized organizations (e.g., ASTM, ISO, etc.), as appropriate.

F. Schedule/Milestones

Proposers must provide a technical and programmatic strategy that conforms to the entire program schedule for Phases I and II and a draft SOW and ROM cost for an anticipated Phase III. Proposals must present aggressive plans to fully address program goals, metrics, milestones, and deliverables. The task structure must be consistent across the proposed schedule, SOW, and cost volume. Schedules will be synchronized across performers, as required, and monitored/revised as necessary throughout the program. Other pertinent schedule/milestone details are as follows:

- A start date of February 1, 2024 may be assumed for planning purposes.
- 6 months following contract award (FCA): Performers will participate in a critical design review (CDR) with DARPA and IV&V teams detailing specific plans for material test platform construction and a software development plan for continuum material design optimization; performers must include their own unique milestones and deliverables as part of the CDR.
- 14 months FCA: Performers will demonstrate critical function of key subcomponents in their material test and design platforms.
- 21 months FCA: Performers will run full demonstrations of their material test and design platforms meeting the metrics and specifications for each FA (see Section E above).

- 34 months FCA: Performers will complete a comprehensive coupled demonstration meeting the metrics and specifications for Phase II (see Section E above).
- 42 months FCA (anticipated in Phase III): Performers will manufacture demonstration parts followed by characterization and testing to establish continuum material proof-of-concept.
- 47 months FCA (anticipated in Phase III): Performers will deliver test platforms and/or design software to interested IV&V or U.S. Government partner labs.

Table 5: Important dates relevant to the METALS schedule and milestones (reported in months following contract award (FCA))

| | |
|------------------------------------------------------------------------------------------------------------------------------|-----------|
| Phase I: Project kick-off | 0 months |
| Phase I: Critical design review (CDR) | 6 months |
| Phase I: Critical function demonstrations | 14 months |
| Phase I: Full FA1 and FA2 system demonstrations | 21 months |
| Phase II: Anticipated start | 24 months |
| Phase II: Coupled system demonstration | 34 months |
| Phase III: Start date (notional) | 36 months |
| Phase III: Manufacturing, characterization, and testing complete establishing continuum material proof-of-concept (notional) | 42 months |
| Phase III: Transition of test platforms and design software to U.S. Government or IV&V partner laboratories (notional) | 47 months |

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

- A one-day project kickoff meeting to be held in Arlington, VA.
- A two-day Principal Investigator (PI) meeting to be held approximately every six months in Arlington, VA. For budgeting purposes, plan for six two-day meetings over the course of 48 months. The CDR will be conducted during the first PI meeting.
- Monthly teleconference meetings will be scheduled with DARPA and the IV&V teams for progress reporting as well as identification and mitigation of technical and programmatic challenges. Proposers should also anticipate at least one site visit per phase by the DARPA Program Manager and/or IV&V team during which performers should provide laboratory tours and demonstrations that illustrate progress toward agreed-upon milestones and metrics.

G. Deliverables

Performers will be expected to provide at a minimum the following deliverables:

- Comprehensive quarterly technical reports due within ten days of the end of the given

quarter, describing progress made on the specific milestones as required in the SOW.

- Monthly technical and financial reports (monthly technical report can be delivered via a slide presentation).
- A phase completion report submitted within 30 calendar days of the end of each phase, summarizing the research done.
- Hardware and software, as requested, that may include engineering drawings, operating methods and instructions, software, datasets, material samples, and/or entire developed experimental capabilities.
- 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.
- Reporting as outlined in Section VI.C.

H. Government-furnished Property/Equipment/Information

No Government-furnished property, equipment, or information will be provided. This is subject to change as the program progresses, if warranted.

I. Other Program Objectives and Considerations

1. Collaboration

Throughout the course of the program, performers will be required to share detailed information about their project with DARPA and the IV&V teams. To facilitate collaboration, performer contracts will include an Associate Contractor Agreement (ACA) clause for portions of the contracts requiring joint participation in the accomplishment of the program requirements. This provision will become a material requirement for any contracts awarded as a result of this BAA. The ACA clause will include the basis for sharing information, data, technical knowledge, expertise, and/or resources essential to the integration of the program focus areas and components. This clause will ensure appropriate coordination and integration of work by program contractors; ensure complete compatibility between data, tools and services; and prevent unnecessary duplication of efforts and maximize commonality. Without exception, all ACAs must be in place within three months of contract award. See Section VIII.D for a sample ACA clause.

2. Intellectual Property

The goal of METALS is to create material test and design tools that can be readily used by U.S. Government or commercial partners. These tools must be capable of integrating with other existing experimental systems and/or software platforms and, potentially, those being developed by other performers. This includes the ability to easily add, remove, substitute, and modify software and hardware components. Therefore, DARPA anticipates that all non-commercial software (including source code), software documentation, hardware designs and documentation, experimental hardware, and technical data generated by the program will be requested as deliverables to the U.S. 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

DARPA anticipates multiple awards. The level of funding for individual awards made under this BAA will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers¹ whose proposals are determined to be the most advantageous to the Government, all evaluation factors considered. See Section V for further information.

The Government reserves the right to:

- select for negotiation all, some, one, or none of the proposals received in response to this solicitation;
- make awards without discussions with proposers;
- conduct discussions with proposers if it is later determined to be necessary;
- segregate portions of resulting awards into pre-priced options;
- accept proposals in their entirety or select only portions of proposals for award;
- fund awards in increments with options for continued work at the end of one or more phases;
- request additional documentation once the award instrument has been determined (e.g., representations and certifications); and
- remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals identified for negotiation may result in a procurement contract, cooperative agreement, or Other Transaction (OT), depending upon the nature of the work proposed, the required degree of interaction between parties, 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

¹ As used throughout this BAA, “proposer” refers to the lead organization on a submission to this BAA. The proposer is responsible for ensuring that all information required by a BAA--from all team members--is submitted in accordance with the BAA. “Awardee” refers to anyone who might receive a prime award from the Government, including recipients of procurement contracts, cooperative agreements, or Other Transactions. “Subawardee” refers to anyone who might receive a subaward from a prime awardee (e.g., subawardee, consultant, etc.).

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 grants and 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/092021DARPA CFIP Rubric.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/collegeforeigngift)
 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)

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, with specific details, that the proposed work, expertise, and facilities are not otherwise available from the private sector, and (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. **FFRDC proposals that do not include these elements may be deemed non-conforming and removed from consideration.**

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.

Include any OCIs affirmations and disclosures in Attachment G: VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS.

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 (e.g., OTs under the authority of 10 U.S.C. § 4021). 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#OtherTransactions>.

D. Ability to Support Classified Development

DARPA anticipates that efforts in METALS will be unclassified. As such, proposers are not required to hold or obtain security clearances prior to proposal submission.

IV. Application and Submission Information

Prior to submitting a full proposal, proposers are *strongly encouraged* to first submit an abstract as described below. This process allows a proposer to ascertain whether the proposed concept is (1) applicable to the METALS BAA and (2) currently of interest. For the purposes of this BAA, applicability is defined as follows:

- The proposed concept is applicable to the technical areas described herein.
- The proposed concept is important to DSO's current investment portfolio.
- The proposed concept investigates an innovative approach that enables revolutionary advances, i.e., will not primarily result in evolutionary improvements to the existing state of practice.
- The proposed work has not already been completed (i.e., the research element is complete but manufacturing/fabrication funds are required).
- The proposer has not already received funding or a positive funding decision for the proposed concept (whether from DARPA or another Government agency).

Abstracts and full proposals that are not found to be applicable to the METALS BAA as defined above may be deemed non-conforming² and removed from consideration. All abstracts and full proposals must provide sufficient information to assess the validity/feasibility of their claims as well as comply with the requirements outlined herein for submission formatting, content, and transmission to DARPA. Abstracts and full proposals that fail to do so may be deemed non-conforming and removed from consideration. Proposers will be notified of non-conforming determinations via letter.

A. Address to Request Application Package

This document contains all information required to submit a response to this solicitation. No additional forms, kits, or other materials are needed except as referenced herein. No request for proposal or additional solicitation regarding this opportunity will be issued, nor is additional information available except as provided at the SAM.gov website (<https://sam.gov/>), the Grants.gov website (<http://www.grants.gov/>), or referenced herein.

² "Conforming" is defined as having been submitted in accordance with the requirements outlined herein

B. Content and Form of Application Submission

1. Abstract Information and Formatting

As stated above, proposers are strongly encouraged to submit an abstract of no more than 5 pages in advance of a full proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal. All proposers are required to use Attachment A: ABSTRACT SUMMARY SLIDE TEMPLATE and Attachment B: ABSTRACT TEMPLATE provided with this solicitation on <https://sam.gov/> and <http://www.grants.gov>. Attachment A: ABSTRACT SUMMARY SLIDE TEMPLATE described herein must be in .ppt, .pptx or .pdf format and should be attached as a separate file to this document.

The abstract provides a synopsis of the proposed project by including the following information:

- The proposed technical approach
- The technical rationale supporting the ability to achieve the metrics
- The technical and programmatic risks
- The makeup of the technical team (including the facilities and any proposed subcontractors)
- High level cost and schedule
- Availability of proposed staff

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.

Proposers should note that a favorable response to an abstract is not a guarantee that a proposal based on the abstract will ultimately be selected for award negotiation.

While it is DARPA policy to attempt to reply to abstracts within thirty calendar days, proposers to this solicitation may anticipate a response within approximately two weeks. These official notifications will be sent via email to the Technical POC and/or Administrative POC identified on the abstract coversheet.

2. Full Proposal Information and Formatting

a. Proposal Volumes

Full proposals must consist of all 3 volumes described below. To assist in proposal development, templates for these volumes are posted as attachments to this solicitation on <https://sam.gov/>. The templates are specific to each volume, as outlined below.

Full proposals requesting a procurement contract or Other Transaction (OT) must use the following attachments in each volume:

- **Volume 1**

- Attachment C: PROPOSAL SUMMARY SLIDE TEMPLATE
- Attachment D: PROPOSAL TEMPLATE VOLUME 1: TECHNICAL & MANAGEMENT
- **Volume 2**
 - Attachment E: PROPOSAL TEMPLATE VOLUME 2: COST³
 - Attachment F: MS Excel™ DARPA COST PROPOSAL SPREADSHEET
- **Volume 3**
 - Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS

Full proposals requesting cooperative agreement must use the following attachments in addition to the Grants.gov application package:

- **Volume 1**
 - Attachment C: PROPOSAL SUMMARY SLIDE TEMPLATE
 - Attachment D: PROPOSAL TEMPLATE VOLUME 1: TECHNICAL & MANAGEMENT
- **Volume 2**
 - Attachment F: MS Excel™ DARPA COST PROPOSAL SPREADSHEET⁴
- **Volume 3**
 - Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS

* Full proposals requesting a cooperative agreement do not need to include Attachment E. Instead, Budget Justification should be provided as Section L of the SF 424 Research & Related Budget form provided via <http://www.grants.gov> (see section IV.E.1.c for additional details). The Budget Justification should include the following information for the recipient and all subawardees:

- **Direct Labor (sections A and B)** - Detail the total number of persons and their level of commitment for each position listed as well as which specific tasks (as described in the SOW) they will support.
- **Equipment (section C)** - Provide an explanation for listed requested equipment exceeding \$5,000, properly justifying why it is required to meet the objectives of the program.
- **Travel (section D)** - Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc. Only travel required to

³ All costs included in Volume 2 Attachments E and F must be expressed in US Dollars (USD).

⁴ All costs submitted in Attachment F and Section L of the SF 424 Research & Related Budget form via Grants.gov must be expressed in US Dollars (USD).

achieve the program goals and metrics will be allowed.

- **Participant/Trainee Support Costs (section E)** - Provide details on Tuition/ Fees/ Health Insurance, Stipends, Travel and Subsistence costs.
- **Other Direct Costs (section F)** - Provide a justification for the items requested and an explanation of how the estimates were obtained.

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 grant, 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>.

All proposers are required to use the appropriate templates based on the type of award requested. Templates are provided as attachments to this solicitation on <https://sam.gov> and <http://www.grants.gov>. Full Proposals that do not include the appropriate attachments as detailed here may be deemed non-conforming and may not be evaluated.

b. DARPA Embedded Entrepreneur 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 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.

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

Proposers and awardees are subject to the DoD requirements related to protection of CUI and CTI IAW Executive Order 13556, *Controlled Unclassified Information*, DFARS 252.204-7000, *Disclosure of Information*, DFARS 252.204-7012, *Safeguarding Covered Defense Information and Cyber Incident Reporting*, DoD Instruction 5200.48, *Controlled Unclassified Information*, DoD Instruction 8582.01, *Security of Non-DoD Information Systems Processing Unclassified Nonpublic DoD Information*. See <http://www.darpa.mil/work-with-us/additional-baa> for additional guidance on protecting CUI on Non-DoD Information Systems.

CUI is defined as unclassified information that requires safeguarding or dissemination controls, pursuant to and consistent with applicable law, regulations, and Government-wide policies.

Controlled Technical Information (CTI) is defined as technical information with military or space application that is subject to controls on its access, use, reproduction, modification, performance, display, release, disclosure, or dissemination. The term CTI does not include information that is lawfully publicly available without restrictions.

DoD considers “technical information” to be technical data or computer software, as those terms are defined in Defense Federal Acquisition Regulation Supplement clause 252.227-7013, "Rights in Technical Data - Noncommercial Items" (48 CFR 252.227-7013). Examples of technical information include research and engineering data; engineering drawings and associated lists; specifications, standards, process sheets, manuals, technical reports, technical orders, catalog-item identifications, data sets, studies and analyses and related information; and computer software code. Note that such technical information may or may not be controlled (i.e., CTI), depending on whether it has military or space application.

Proposers should indicate in their proposal if their proposed solution includes CUI. All proposals indicating CUI requirements must include a draft CUI protection plan in Attachment G, PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS detailing how CUI will be protected at performance sites as well as sub-contractor locations. The draft CUI protection plan is not a source selection criterion, and there is no page limit. During selection and negotiation, DARPA will determine additional requirements and clarification required of the CUI protection plan. DARPA has generated and provided an Unclassified CUI Guide and included it with this BAA as Attachment H: CONTROLLED UNCLASSIFIED INFORMATION (CUI) GUIDE to assist in proposal and CUI protection plan preparation. Potential award instruments for proposals containing CUI will be limited to contracts or Other Transactions.

As part of Attachment D: PROPOSAL TEMPLATE VOLUME 1: TECHNICAL &

MANAGEMENT, the proposer should include a Statement of Work with a breakdown of all research tasks and subtasks and indicate the proposed classification for each. For all tasks and subtasks proposed to be unclassified, proposers should distinguish between work proposed to be Fundamental Research versus work proposed to be CUI. Proposers will provide a short explanation for why each subtask should be categorized as Fundamental Research or CUI.

If CUI tasks are proposed in the Statement of Work, proposers must provide a plan for protecting Controlled Unclassified Information as part of Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS, Section 8.

CTI is to be marked “DISTRIBUTION C. Distribution authorized to U.S. Government agencies and their contractors; Critical Technology; [current date]. Other requests for this document shall be referred to DARPA, DSO” in accordance with Department of Defense Instruction 5203.24, “Distribution of Statements on Technical Documents.”

5. Security Information

DARPA anticipates that submissions received under this BAA will be unclassified.

a. Program Security Information

i. Program Security

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 a DARPA CUI Guide and will be provided as an attachment to the BAA or may be provided at a later date.

ii. CUI Submission Requirements

Unclassified submissions containing CUI may be submitted via DARPA’s BAA Website (<https://baa.darpa.mil>) in accordance with Part II Section VIII of this BAA.

iii. CUI Authorized Systems

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.

Additional information on the subjects discussed in this section may be found at <https://www.dcsa.mil/>.

C. Submission Dates and Times

Proposers are warned that submission deadlines as outlined herein are in Eastern Time and will be strictly enforced. When planning a response to this solicitation, proposers should take into account that some parts of the submission process may take from one (1) business day to one month to complete (e.g., registering for a SAM.gov Unique Entity Identifier (UEI) number or Taxpayer Identification Number (TIN)).

DARPA will acknowledge receipt of *complete* submissions via email and assign identifying numbers that should be used in all further correspondence regarding those submissions. If no confirmation is received within two (2) business days, please contact the BAA Administrator at METALS@darpa.mil to verify receipt.

1. Abstracts

Abstracts must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Abstracts received after this time and date may not be reviewed.

2. Full Proposals

Full proposal packages as detailed in Section IV.B.2 above, and, as applicable, proprietary subawardee cost proposals and classified appendices to unclassified proposals, must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Proposals received after this time and date may not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

1. Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. Email submissions will not be accepted. Failure to comply with the submission procedures outlined herein may result in the submission being deemed non-conforming and withdrawn from consideration.

a. Abstracts

DARPA/DSO will employ an electronic upload submission system (<https://baa.darpa.mil/>) for all UNCLASSIFIED abstracts sent in response to this solicitation. *Abstracts must not be submitted via Grants.gov or email.* 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 (by clicking “Create New Account” 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 proposal. Note: Even if a submitter’s organization has an existing registration, each user submitting a proposal must create their own Organization Registration.

All abstracts 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.

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 the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to METALS@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to METALS@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

b. Proposals Requesting a Procurement Contract or Other Transaction

Proposers requesting procurement contracts or Other Transactions may submit full proposals through ONE of the following methods: (1) electronic upload (DARPA-preferred); or (2) direct mail/hand-carry.

i. Electronic Upload

DARPA/DSO encourages proposers to submit UNCLASSIFIED proposals via the DARPA BAA Submission website at <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 (by clicking “Create New Account” 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 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 proposals 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.

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 the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to METALS@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to METALS@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

ii. Direct Mail/Hand-carry

Proposers electing to submit procurement contract or Other Transaction proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. All parts of the proposal package must be mailed or hand-carried in a single delivery per the instructions noted in Section VII below.

a. Proposals Requesting a Cooperative Agreement

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.

i. Electronic Upload

DARPA encourages cooperative agreement proposers to submit their proposals via electronic upload at <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>. Proposers electing to use this method must complete a one-time registration process on Grants.gov before a proposal can be electronically submitted. *If proposers have not previously registered, this process can take up to four weeks* so registration should be done in sufficient time to ensure it does not impact a proposer's ability to meet required submission deadlines. Registration requirements and instructions are outlined at <http://www.grants.gov/web/grants/register.html>.

Carefully follow the DARPA submission instructions provided with the solicitation application package on Grants.gov. Only the required forms listed therein (e.g., SF-424 and Attachments form) should be included in the submission. *NOTE: Grants.gov does not accept zipped or encrypted proposals.*

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) the proposal has been received by Grants.gov; and (2) the proposal has been either validated or rejected by the system. *It may take up to two (2) business days to receive these emails.* If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the submission must be corrected, resubmitted and revalidated 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, Grants.gov will send a third email to notify the proposer. DARPA will send a final confirmation email as described in Section IV.C.

To avoid missing deadlines, Grants.gov recommends that proposers submit their proposals to Grants.gov 24-48 hours in advance of the proposal due date to provide sufficient time to complete the registration and submission process, receive email notifications, and correct errors, as applicable.

Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or support@grants.gov.

ii. Direct Mail/Hand-carry

Proposers electing to submit cooperative agreement proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. Proposers must complete the SF 424 R&R form (Application for Federal Assistance, Research and Related) provided at Grants.gov as part of the opportunity application package for this BAA and include it in the proposal submission. All parts of the proposal package must be mailed or hand-carried per the instructions noted in Section VII below.

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the following criteria listed in descending order of importance: Overall Scientific and Technical Merit; Potential Contribution and Relevance to the DARPA Mission; and Cost and Schedule Realism.

- **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.

- **Potential Contribution and Relevance to the DARPA Mission**

The potential contributions of the proposed effort bolster the national security technology base and support DARPA's mission to make pivotal early technology investments that create or prevent technological surprise. The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology.

- **Cost and Schedule Realism**

The proposed costs and schedule are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. All proposed labor, material, and travel costs are necessary to achieve the program metrics, 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).

The proposed schedule aggressively pursues performance metrics in an efficient time frame that accurately accounts for the anticipated workload. The proposed schedule identifies and mitigates any potential schedule risk.

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 proposals that contain cost share, the proposer has provided sufficient rationale as to the appropriateness of the cost share arrangement relative to the objectives of the proposed solution (e.g., high likelihood of commercial application, etc.).

B. Review and Selection Process

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.

The review process identifies proposals that meet the evaluation criteria described above and are, therefore, selectable for negotiation of awards by the Government. DARPA policy is to ensure impartial, equitable, comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals. Proposals that are determined selectable will not necessarily receive awards (see Section II). Selections may be made at any time during the period of solicitation. For evaluation purposes, a proposal is defined to be the document and supporting materials as described in Section IV.

1. Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (FAR 2.101 and 3.104), and to only disclose their contents to authorized personnel. Restrictive notices notwithstanding, 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), DARPA may also request input on technical aspects of the proposals from other non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

Submissions will not be returned. The original of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested via email to the BAA mailbox, provided the formal request is received within five (5) days after being notified of submission status.

C. 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 grant or cooperative agreement award. The CFIP risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award.

See Section II.B(a) – (c) for additional information on the CFIP process.

D. Federal Awardee Performance and Integrity Information (FAPIS)

Following the review and selection process described above, but prior to making an award above the simplified acquisition threshold (FAR 2.101), DARPA is required⁵ to review and consider any information available through the designated integrity and performance system (currently FAPIS). Selectees have the opportunity to comment on any information about themselves entered in the database. DARPA will consider any comments and other information in FAPIS or

⁵ Per 41 U.S.C. § 2313, as implemented by FAR 9.103 and 2 CFR § 200.205.

other systems prior to making an award.

VI. Award Administration Information

A. Selection Notices

After proposal evaluations are complete, proposers will be notified as to whether their proposal was selected for award negotiation as a result of the review process. Notification will be sent by email to the Technical and Administrative POCs identified on the proposal cover sheet. If a proposal has been selected for award negotiation, the Government will initiate those negotiations following the notification.

B. Administrative and National Policy Requirements

1. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation provisions relevant to DARPA BAAs are listed on the Additional BAA Content page on DARPA's website at www.darpa.mil/work-with-us/additional-baa. This page also lists award clauses that, depending on their applicability, may be included in the terms and conditions of awards resultant from DARPA solicitations. This list is not exhaustive and the clauses, terms and conditions included in a resultant award will depend on the nature of the research effort, the specific award instrument, the type of awardee, and any applicable security or publication restrictions.

For terms and conditions specific to grants and/or 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>.

The above information serves to put potential proposers and awardees on notice of proposal requirements and award terms and conditions to which they may have to adhere.

2. 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.

NOTE: New registrations can take an average of 7-10 business days to process in SAM. SAM registration requires the following information:

- SAM Unique Entity Identifier (UEI)
- TIN
- Commercial and Government Entity (CAGE) Code. If a proposer does not already have a CAGE code, one will be assigned during SAM registration.

- Electronic Funds Transfer information (e.g., proposer's bank account number, routing number, and bank phone or fax number).

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/reprs-certs> 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.

4. Intellectual Property

Proposers should note that the Government does not own the intellectual property or technical data/computer software developed under Government contracts. The Government acquires the right to use the technical data/computer software. Regardless of the scope of the Government's rights, awardees may freely use their same data/software for their own commercial purposes (unless restricted by U.S. export control laws or security classification). Therefore, technical data and computer software developed under this solicitation will remain the property of the awardees, though DARPA will have, at a minimum, Government Purpose Rights (GPR) to technical data and computer software developed through DARPA sponsorship.

If proposers desire to use proprietary computer software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution. Proposers expecting to use, but not to deliver, commercial open-source tools or other materials in implementing their approach may be required to indemnify the Government against legal liability arising from such use.

All references to "Unlimited Rights" or "Government Purpose Rights" are intended to refer to the definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) 227.

a. Intellectual Property Representations

All proposers must provide a good faith representation of either ownership or possession of

appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research. See Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS, Section 4.

b. Patents

All proposers must include documentation proving ownership or possession of appropriate licensing rights to all patented inventions to be used for the proposed project. If a patent application has been filed for an invention, but it includes proprietary information and is not publicly available, a proposer must provide documentation that includes: the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and summary of the patent title, with either: (1) a representation of invention ownership; or (2) proof of possession of appropriate licensing rights in the invention (i.e., an agreement from the owner of the patent granting license to the proposer).

c. Procurement Contracts

i. Noncommercial Items (Technical Data and Computer Software)

Proposers requesting a procurement contract must list all noncommercial technical data and computer software that it plans to generate, develop, and/or deliver, in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event a proposer does not submit the list, the Government will assume that it has unlimited rights to all noncommercial technical data and computer software generated, developed, and/or delivered, unless it is substantiated that development of the noncommercial technical data and computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and computer software generated, developed, and/or delivered, proposers should identify the data and software in question as subject to GPR. In accordance with DFARS 252.227-7013, "Rights in Technical Data - Noncommercial Items," and DFARS 252.227-7014, "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation," the Government will automatically assume that any such GPR restriction is limited to a period of 5 years, at which time the Government will acquire unlimited rights unless the parties agree otherwise. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS, Section 4.

ii. Commercial Items (Technical Data and Computer Software)

Proposers requesting a procurement contract must list all commercial technical data and commercial computer software that may be included in any noncommercial deliverables contemplated under the research project and assert any applicable restrictions on the Government's use of such commercial technical data and/or computer software. In the event a proposer does not submit the list, the Government will assume there are no restrictions on the

Government's use of such commercial items. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS, Section 4.

d. Other Types of Awards

Proposers requesting an award instrument other than a procurement contract shall follow the applicable rules and regulations governing those award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any intellectual property contemplated under those award instruments. This includes both noncommercial items and commercial items. The Government may use the list as part of the evaluation process to assess the impact of any identified restrictions and may request additional information from the proposer, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Attachment G: PROPOSAL TEMPLATE VOLUME 3: ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS, Section 4.

5. Program-generated Data

Data are increasingly the key product of research and engineering endeavors. To ensure the reproducibility of results and access to source data for future research, awardees will be required to maintain and deliver any data generated during award performance ("program-generated data") that is needed to accomplish these goals. Awardees shall be expected to document both the proprietary and non-proprietary products of their research to ensure the retention and potential reusability of this information. This may include:

- Raw unprocessed data, software source code and executables, build scripts, process sequence, programmatic communication and other collaboration activities
- Data sets: rarified, experimental, test and measurement data
- Design of experiments and simulations
- Models or simulations (computational or mathematical)
- Recordings of various physical phenomena (including images, videos, sensor data, etc.)
- Access to and use of institutional, organizational or scientific community repositories and archives

When possible, DARPA may share some or all of the program-generated data with the broader research community as open data (with permission to access, reuse, and redistribute under appropriate licensing terms where required) to the extent permitted by applicable law and regulations (e.g., privacy, security, rights in data, and export control). DARPA plans to enable reproducibility of results through data sharing and to establish (or contribute to) digital collections that can advance this and other scientific fields.

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. Electronic Invoicing and Payments

Awardees will be required to submit invoices for payment electronically via Wide Area Work Flow (WAWF), accessed through the Procurement Integrated Enterprise Environment at <https://piee.eb.mil/>, unless an exception applies. Registration in WAWF is required prior to any award under this BAA.

8. Electronic and Information Technology

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. § 749d) and FAR 39.2.

9. 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.

C. Reporting

1. Technical and Financial Reports

The number and types of technical and financial reports required under the award will be specified in the award document and may include monthly financial reports, monthly technical

reports and/or a yearly status summary. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award. The reports shall be prepared and submitted in accordance with the procedures contained in the award document.

2. Patent Reports and Notifications

All resultant awards will contain a mandatory requirement for patent reports and notifications to be submitted electronically through i-Edison (<https://www.nist.gov/iedison>).

VII. Agency Contacts

DARPA will use email for all technical and administrative correspondence regarding this solicitation.

- **Technical POC:** Andrew Detor, Program Manager, DARPA/DSO
- **BAA Email:** METALS@darpa.mil
- **BAA Mailing Address:**

DARPA/DSO
ATTN: HR001123S0029
675 North Randolph Street
Arlington, VA 22203-2114

- Proposers wishing to hand-carry proposals to DARPA must deliver all parts of the proposal in a single package to this address. Proposers should proceed to the Visitor Welcome Center (VWC) upon arrival and inform the VWC that they are hand-carrying a proposal for a Defense Sciences Office Broad Agency Announcement. Proposers should request a receipt from the VWC showing the date and time the package was received.
- **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>

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

VIII. Other Information

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 before the negotiated period of performance, DARPA will continue to fund, for no more than two semesters (or equivalent), stipend costs to Ph.D students and/or post-doctoral researchers. The stipend amount will be determined at the time of award based on the costs included for such participants in the University's original proposal.

Universities are expected to make reasonable efforts to find alternative research opportunities for

these participants before stipend funding is provided in this situation. This additional funding will not be provided in cases where an assistance award option is not exercised or any other scenario in which the University was aware at the time of award that the period of performance might not continue after a designated programmatic decision (i.e. a down-selection or inclusion of a subsequent programmatic phase).

A. Proposers Day

The METALS Proposers Day will be held on March 24, 2023 in Arlington, VA. The event will be webcast for those who would like to participate remotely. Advance registration is required for both the physical meeting and the webcast. See DARPA-SN-23-45 posted at <https://sam.gov/> for all details. Participation in the METALS Proposers Day or viewing the webcast is voluntary and is not required to propose to this solicitation.

B. Frequently Asked Questions (FAQs)

Administrative, technical, and contractual questions should be emailed to METALS@darpa.mil. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 10 calendar days of the proposal due date may not be answered. DARPA will post an FAQ list at: <http://www.darpa.mil/work-with-us/opportunities>. The list will be updated on an ongoing basis until the BAA expiration date as stated in Part I.

C. Collaborative Efforts/Teaming

DARPA highly encourages teaming before proposal submission and, as such, will facilitate the formation of teams with the necessary expertise. Interested parties should submit a one-page profile including the following information:

- Contact information to include name, organization, email, telephone number, mailing address, organization website (if applicable).
- A brief description of the proposer's technical competencies.
- Desired expertise from other teams, if applicable.

All profiles must be emailed to METALS@darpa.mil no later than 4:00 p.m. on March 31, 2023. Following the deadline, the consolidated teaming profiles will be sent via email to the proposers who submitted a valid profile. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the DoD endorses the information and organizations contained in the consolidated teaming profile document, nor does DARPA or the DoD exercise any responsibility for improper dissemination of the teaming profiles. Teams need not be finalized at the time of abstract submission.

D. Sample ACA Clause

(a) It is recognized that success of the *[List brief description of research effort]* research effort depends in part upon the open exchange of information between the various Associate Contractors involved in the effort. This requirement is intended to ensure that there will be appropriate coordination and integration of work by the Associate Contractors to achieve

complete compatibility and to prevent unnecessary duplication of effort. By executing this contract, the Contractor assumes the responsibilities of an Associate Contractor. For the purpose of this requirement, the term Contractor includes subsidiaries, affiliates, and organizations under the control of the contractor (e.g. subcontractors).

(b) Work under this contract may involve access to proprietary or confidential data from an Associate Contractor. To the extent that such data is received by the Contractor from any Associate Contractor for the performance of this contract, the Contractor hereby agrees that any proprietary information received shall remain the property of the Associate Contractor and shall be used solely for the purpose of the *[List brief description of research effort]* research effort. Only that information which is received from another contractor in writing and which is clearly identified as proprietary or confidential shall be protected in accordance with this requirement. The obligation to retain such information in confidence will be satisfied if the Contractor receiving such information utilizes the same controls as it employs to avoid disclosure, publication, or dissemination of its own proprietary information. The receiving Contractor agrees to hold such information in confidence as provided herein so long as such information is of a proprietary/confidential or limited rights nature.

(c) The Contractor hereby agrees to closely cooperate as an Associate Contractor with the other Associate Contractors on this research effort. This involves as a minimum:

- (1) maintenance of a close liaison and working relationship;
- (2) maintenance of a free and open information network with all Government-identified associate Contractors;
- (3) delineation of detailed interface responsibilities;
- (4) entering into a written agreement with the other Associate Contractors setting forth the substance and procedures relating to the foregoing, and promptly providing the Contracting Officer with a copy of same; and,
- (5) receipt of proprietary information from the Associate Contractor and transmittal of Contractor proprietary information to the Associate Contractors subject to any applicable proprietary information exchange agreements between associate contractors when, in either case, those actions are necessary for the performance of either.

(d) In the event that the Contractor and the Associate Contractor are unable to agree upon any such interface matter of substance, or if the technical data identified is not provided as scheduled, the Contractor shall promptly notify the DARPA DSO Program Manager. The Government will determine the appropriate corrective action and will issue guidance to the affected Contractor.

(e) The Contractor agrees to insert in all subcontracts which require access to proprietary information belonging to the Associate Contractor, a requirement which shall conform substantially to the language of this requirement, including this paragraph (e).

(f) Associate Contractors for this research effort include:

Contractor

Technical Area

[List Name of Contractor]

[List Technical Area]