AIR FORCE TECHNICAL APPLICATIONS CENTER (AFTAC)

COMMERCIAL SOLUTIONS OPENING (CSO)

NEW INITIATIVES FOR AFTAC

30 July 2026
AFTAC_CSO_2024

Table of Contents

1. INTRODUCTION AND BACKGROUND 3
2. PURPOSE 3
3. CSO APPROACH AND OVERVIEW 4
4. GENERAL INFORMATION 4
5. SUBMISSION INFORMATION 7
ATTACHMENT 1: QUAD CHART FORMAT 9
ATTACHMENT 2: PHASE I WHITE PAPER FORMAT 10
ATTACHMENT 3: PHASE II TECHNICAL PROPOSAL FORMAT 11
ATTACHMENT 4: PHASE II PRICE PROPOSAL FORMAT 13
ATTACHMENT 5: PHASE II STATEMENT OF WORK (SOW) FORMAT 14
ATTACHMENT 6: SOLICITATION TOPICS 16
TOPIC: AFTAC-001, GEOPHYSICS and SEISMOLOGY 16
TOPIC: AFTAC-002, ATMOSPHERE AND SPACE 17
TOPIC: AFTAC-003, DIRECTED ENEGRY WEAPON (DEW) 18
TOPIC: AFTAC-004, NUCLEAR AND NUCLEAR-RELATED MATERIALS ANALYSIS .. 18
TOPIC: AFTAC-005, MATERIALS MODELING AND ANALYSIS 18
TOPIC: AFTAC-006, ENTERPRISE-WIDE INTEGRATION AND ARCHITECTURE MODERNIZATION 18
TOPIC: AFTAC-007, ENTERPRISE ASSET AND LIFECYCLE MANAGEMENT IMPROVEMENTS 20
TOPIC: AFTAC-008, HIGH PERFORMANCE AND SECURE CLOUD COMPUTING AND DEV OPS SOLUTIONS FOR DATA INGESTION, EXPLOITATION, AND DISSEMINATION 20
ATTACHMENT 7: EVALUATION CRITERIA AND SELECTION PROCESS 21

1. INTRODUCTION AND BACKGROUND

1.1 The Air Force Technical Applications Center (AFTAC) provides the U.S Department of Defense's (DoD) time dominant scientific and technical information to the right person for decision advantage supporting international nuclear treaty compliance and strategic, operational, and tactical warfighters. Its mission is to detect nuclear explosions anywhere on earth, the atmosphere, or in space. AFTAC monitors for, collects, analyzes, characterizes, and exploits space, missile, atmospheric, subsurface, and hydrological events to identify violations to several nuclear and non-nuclear treaties worldwide. AFTAC provides 24/7 monitoring to support integrated tactical warning and attack assessment (ITW/AA) and Nuclear Force Management (NFM) for the United States command authorities, providing rapid reporting through USSTRATCOM. AFTAC operates the US National Data Center (US NDC), which is the US arm of the International Monitoring System (IMS) supporting the Comprehensive Test Ban Treaty Organization (CTBTO). The US NDC and the IMS support international efforts to limit nuclear testing and proliferation worldwide. AFTAC supports the International Atomic Energy Agency with material sample analysis capabilities, providing accurate measurements to support nonproliferation efforts. Finally, AFTAC supports consequence management and incident response for suspected or confirmed nuclear related incidents, supporting the National Technical Nuclear Forensics (NTNF) mission, and provides program management for Ballistic Missile Technical Collection (BMTC) radar platforms. AFTAC provides national authorities quality technical measurements to monitor nuclear treaty compliance and develops advanced proliferation monitoring technologies to preserve our nation's security. AFTAC also performs research and development of new proliferation detection technologies to enhance or assist treaty verification to limit the proliferation of weapons of mass destruction.

1.2 AFTAC is looking for new capabilities in nuclear treaty monitoring, advanced detection technologies to support the counter-proliferation of weapons of mass destruction and other applied technologies.

2. PURPOSE

2.1 This Commercial Solutions Opening (CSO), as contemplated in Federal Acquisition Regulation (FAR) Part 12, DFARS Subpart 212.70, and in accordance with 10 U.S.C. 3458, is a competitive solicitation of proposals focused on technologies to meet AFTAC's mission. AFTAC seeks the best approaches to meet the technology objectives within the capability areas listed below. Detailed topics associated with each capability area appear in Attachment 6.

3. CSO APPROACH AND OVERVIEW

3.1 This CSO seeks the best commercial approaches to meet various technology objectives of AFTAC. All items, technologies, and services acquired using a CSO will be treated as commercial items. The Government encourages proposals that span a wide spectrum of possible technical and business solutions in response to the specific technology topics stated in Attachment 6. The Government reserves the right to award funding to any combination of proposals which offer the best overall value to the Government, and to oversee any and all processes and approaches once initiated. Awards of efforts as a result of this announcement will be in the form of contracts or other transactions (OT) as codified in 10 U.S.C. §4022.

3.2 Funding for participation in this program is highly competitive, and the price of proposed technologies should be considered. Awards resulting from this CSO will be made based on the evaluation results of a two-phased proposal process described in Section 5. The Government reserves the right to fund all, some, one, or none of the proposals submitted; may elect to fund only part of a submitted proposal; and may incrementally fund any or all awards under this CSO. All awards are subject to the availability of funds.

3.3 The acquisition team intends to manage communications in a manner best designed to facilitate the submittal of optimal proposals while not providing any unfair competitive advantages. Technical questions may be addressed up to the white paper submittal. Questions determined to provide a competitive advantage will be answered at www.sam.gov. Dialogue between prospective offerors and Government representatives is encouraged until submission of proposals. Discussions with any of the points of contact shall not constitute a commitment by the Government to subsequently fund or award any proposed effort. Only Contracting Officers are legally authorized to commit the Government. The points of contact associated with this CSO are specified in Section 4.1.

4. GENERAL INFORMATION

4.1 *POINT OF CONTACTS*. Questions regarding the administrative or technical content of this CSO must be addressed to both joshua.anderson.107@us.af.mil and aftac.cso.mailbox@us.af.mil.

4.2 *WITHIN SCOPE MODIFICATIONS*. Potential offerors are advised that awards resulting from this announcement may be modified during performance to make within scope changes, to include but not limited to, modifications which increase overall contract ceiling amount. The Government reserves the right to extend performance to all, some, or none of the selected solutions and decisions will be

made based on the availability of government funds. Only a Contracting Officer can legally bind a contract/agreement modification on behalf of the United Stated Government.

4.3 *NON-GOVERNMENT ADVISORS AND SOURCE SELECTION SENSITIVE INFORMATION.* Non-government Advisory and Assistance Services (A&AS) contractors may participate in the evaluation of white paper submissions, when necessary. This will be handled on a case-by-case basis and non-government A&AS contractors shall have a signed a non-disclosure agreement (NDA) with the Government. The Government understands that information provided in response to this Commercial Solutions Opening is presented in confidence and may contain trade secrets or commercial or financial information, and it agrees to protect such information from unauthorized disclosure to the maximum extent permitted or required by law. AFTAC/SDX will treat all submissions against this CSO as source selection information. During the evaluation process, submissions may be handled by non-government A&AS contractors for technical evaluation(s). All Government support contractors shall be bound by appropriate NDAs.

Notice of Artificial Intelligence (AI) Utilization in Evaluation
The Government may employ Artificial Intelligence (AI) and Machine Learning (ML) tools to provide administrative and analytical assistance during the evaluation of whitepapers and proposals. The application of these tools is strictly limited to data organization, document summarization, and initial compliance cross-referencing against solicitation requirements. AI tools will not be used to independently assign evaluation ratings, determine strengths or weaknesses, or make tradeoff and source selection decisions. Any preliminary insights generated by AI tools are treated exclusively as draft, advisory data, not as a conclusive evaluation finding. Duly appointed Government evaluators will independently read and review the offeror's original submission to verify all information. All final evaluation judgments, documented findings, and the ultimate source selection decision will be authored and made exclusively by Government personnel, who retain sole responsibility for this inherently governmental function.

4.4 *SUPPLIER PERFORMANCE RISK SYSTEM (SPRS)*. To receive a DoD contract, every contractor will be required to perform a Basic NIST SP 800-171 DoD Assessment. Offerors should be aware of the provision DFARS 252.204-7019, Notice of NIST SP 800-171 DoD Assessment Requirements, and clause DFARS 252.204-7020, NIST SP 800-171 DoD Assessment Requirements. The offeror shall have a current assessment (i.e., not more than 3 years old) for each covered contractor information system that is relevant to the offer, contract, task order, or delivery order. DoD Assessments are described in the NIST SP 800-171 DoD Assessment Methodology located at https://dodcio.defense.gov/CMMC/Model/. Once the Basic NIST SP 800-171 DoD Assessment is complete, each contractor will need to follow the instructions at https://piee.eb.mil/sprs/ to enter the results into SPRS.

4.5 *DATA RIGHTS IN TECHNICAL DATA, COMPUTER SOFTWARE AND COMPUTER SOFTWARE DOCUMENTATION*.

The Government's rights in technical data and computer software are based on the DFARS. All data rights assertions will be evaluated in accordance with DFARS clauses.

A. Noncommercial Technical Data and Computer Software:

Rights in noncommercial technical data and noncommercial computer software (NCS) are governed by 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.

Developed Exclusively with Government Funds: The Government shall receive unlimited rights in all non-commercial technical data and computer software developed exclusively with Government funds.

Developed with Mixed Funding: The Government shall receive Government Purpose Rights in all non-commercial technical data and computer software developed with mixed funding. Offerors proposing delivery of items, components, or processes developed with mixed funding must explain how a portion was developed at private expense.

Developed Exclusively at Private Expense: The Government may accept noncommercial technical data with Limited Rights, NCS with Restricted Rights, or NCS documentation with Limited Rights.

B. Commercial Computer Software:

Rights in commercial computer software are governed by DFARS 252.227-7015, Technical Data–Commercial Products and Commercial Services, and DFARS Subpart 227.72, Rights in Commercial Computer Software and Commercial Computer Software Documentation. All commercial computer software licenses must be consistent with Federal law and the DFARS.

C. Assertions and Markings:

Assertions: Offerors must submit a data rights assertion list at the time of proposal in accordance with DFARS 252.227-7017, Identification and Assertion of Use, Release, or Disclosure Restrictions. Each assertion must identify the technical data or computer software and the associated item, component, or process to which it pertains.

Markings: The contractor is responsible for marking all technical data and computer software with the appropriate restrictive legends as prescribed in the relevant DFARS clauses.

Third-Party Software: The contractor shall not, without the written approval of the

Contracting Officer, incorporate any third-party copyrighted computer software or documentation into a deliverable unless the contractor is the copyright owner or has obtained for the Government the license rights required by the contract.

The Contractor shall provide documentation to clearly correlate or map any commercial computer software to be delivered to:

a) Contract Line-Item Numbers (CLINS);

b) Contract Deliverables (CDRLS);

c) Paragraphs in the statement of work (SOW); and

d) Portions of any functional block diagrams and/or system architecture diagrams, so that it can be readily determined where certain commercial computer software corresponding to certain software license agreement(s) are physically located on the system to be delivered under the contract.

5. SUBMISSION INFORMATION

5.1 *SUBMISSION OVERVIEW*. Phase I submissions shall include both the Quad Charts and White Papers prepared in accordance with the formats at Attachments 1 and 2 respectively. Phase I submissions can be submitted until the posted closing date of this notice as posted on www.sam.gov and offerors are encouraged to monitor www.sam.gov for any specific calls or amendments to the CSO that may have updated information. AFTAC will invite select Offerors to submit full proposals based on favorable evaluation results of Phase I submissions. Phase II submissions will be requested ONLY by the Contracting Officer and will contain separate submission instructions and timelines within the Request for Proposal (RFP) letter.

5.2 *TWO-PHASED SUBMISSION*. This CSO will be conducted in two phases as follows:

5.2.1 *Phase I*. Interested offerors must submit Quad Charts and White Papers in accordance with the instructions provided in this CSO. Phase I submissions will be evaluated against criteria as described in Attachment 7 of this CSO.

5.2.1.1 All Quad Charts should include the information indicated on the sample template in Attachment 1.

5.2.1.2 The White Paper narrative expands on the Quad Chart presentation. Instructions for format and content are in Attachment 2. Each offeror shall include in the white paper a preliminary Technology Readiness Level (TRL) assessment of the proposed technology that conforms to the technology objectives and an expected TRL at the conclusion of the effort. The offeror shall perform a TRL assessment according to the Department of Defense Technology Readiness Assessment Guidance.

5.2.1.3 White paper and quad chart submissions shall be sent to both joshua.anderson.107@us.af.mil and aftac.cso.mailbox@us.af.mil for review.

5.2.2 *Notification of Selection*. All offerors providing Phase I submissions will be contacted by the Government, either with an email informing them that the effort proposed is not of interest to the Government at this time or with a request for a formal price and technical proposal by a specific date.

5.2.3 *Phase II*. Phase II proposals will only be accepted from Offerors who upon review of Phase I submissions are invited by the Contracting Officer to submit a full proposal. In order to be considered for award under Phase II, offerors must be registered in the System for Award Management (SAM) at www.sam.gov, be considered responsible within the meaning of FAR Part 9.1, Responsible Prospective Contractors, have a satisfactory performance record, and otherwise be eligible for award based on federal law and regulation.

5.2.3.1 *Proposal Submission*. Upon notification of a proposal by the Contracting Officer, offerors have 30 calendar days to prepare and submit a proposal in accordance with the format and instructions at Attachments 3-5. Each proposal shall include a Statement of Work (SOW) and detailed pricing. All pages shall be numbered.

5.2.3.2 *Proposal Review, Evaluation and Selection Process*. Each proposal will be evaluated by the Government and the proposal must stand on its own technical merit. Proposals will be evaluated in accordance with the evaluation criteria and process specified in Attachment 7. To provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

5.3 *Rights in Technical Data, Computer Software and Computer Software Documentation.* Offerors shall mark each page of its white paper that contains proprietary information. Refer to paragraph 4.5 for additional information.

ATTACHMENT 1: QUAD CHART FORMAT

The following information must be included in the Phase I Quad Chart. Quad Charts shall not exceed 1-page in landscape view. Quad Charts must follow the formatting guidelines on the slide template below.

CSO FA702224SC001
Project Title:
Date:

Objective: Clear concise (1-2 sentence) description of the goal of the effort (≥ 12-pt font)

Description of Effort: Brief description of the technology proposed for investigations and methods to be used during the course of investigation (≥12-pt font).

Photograph or graphic illustration of concept or technology. Any text must be ≥ 12-pt font.

Benefits: Brief statement that identifies the net advantages of the proposed technology over current practices and competing technologies (≥ 12-pt font)

Challenges:

- Bulleted list of technical or scientific challenges (≥ 12-pt font)

Maturity of Technology: Description of the current maturity of the proposed technology with respect to the Technology Readiness Level (≥12-pt font).

Major Goals and Milestones by Fiscal Year (FY):

- Bulleted list (≥ 12-pt font)
- Deliverables: (e.g., study, written reports, prototype device, or proof of prototype testing)

Proposed Funding (SK):

Year 1	Year 2	Total
$000	$000	$000

Period of Performance: (≥12-pt font).

Contact Info: Name, email, phone (≥12-pt font).

ATTACHMENT 2: PHASE I WHITE PAPER FORMAT

The White Paper narrative expands on the Quad Chart presentation and must be 8.5 x 11 inches with one-inch margins, no longer than five pages, single-spaced, with text in Times New Roman, no smaller than 12-point font. All white papers must specify a project title, the Offeror's organization, date submitted, and the specific topic number associated with the proposal (see Attachment 6). Pages in excess of the page limitation will not be read or evaluated. White Papers must not exceed a file size of 10 MB.

The White Paper must be limited only to further explanation of the information conveyed in the Quad Chart, as deemed necessary by the Offeror. The information should provide sufficient information on the research being proposed (e.g. the hypothesis, theories, concept, approaches, data measurements, and analysis, etc.) to allow for an assessment by a technical expert. Expand as deemed necessary on the following sections of the Quad Chart: Objective; Description of the Effort; Benefits of the Proposed Technology; Technical Challenges; Technology Readiness Level (TRL) of the technology at project start and planned TRL at project completion; Major Goals/Milestones by Government fiscal year. Do not include corporate or personnel qualifications, past experience or any supplemental information not requested in the Quad Chart.

ATTACHMENT 3: PHASE II TECHNICAL PROPOSAL FORMAT

The Technical Proposal portion of the Phase II submission shall not exceed 25 pages, excluding cover page and table of contents. Any pages submitted in excess of the 25-page limit will not be considered or evaluated.

Suggested page limitations for individual sections are listed below; however, these are guidelines not strict limits.

I. ABSTRACT. *[1 page suggested.]*

II. SCOPE. This proposal is submitted in response to the Air Force Technical Applications Center (AFTAC) Commercial Solutions Opening (CSO) on…. *[Cite the Project Title. 8 pages suggested.]*

a. Objective. *[A clear and concise description of the objective of the proposed project.]*

b. Background. *[Provide the necessary technical and scientific background to support the scientific and technical merits of the proposed project.]*

c. Programmatics. This effort will support the AFTAC initiative *[topic number]* aimed at developing *[capability area or topic title]* technologies or methodologies. *[Describe the Offeror's management plan for the proposed project; list supporting and collaborating organizations and subcontractors; clearly identify roles and responsibilities of each organization and subcontractor supporting the project].*

d. Relevance. *[Describe the relevance of the proposed project in terms of AFTAC mission, end-user needs and the technology maturity of the proposed project.]*

III. CREDENTIALS. *[Describe the Offeror's qualifications to perform the proposed work. Summarize the relevant credentials of the primary performing center and supporting academic and industrial partners. Describe specific examples of similar work performed, and equipment and/or facilities available to perform the proposed work. List summary of the Key Personnel qualifications. Focus on information directly relevant to the proposed work. 4 pages suggested.]*

a. Summary of Credentials.
b. Summary of Qualifications for Key Personnel.
c. Summary of Facilities to Perform the Proposed Work.

IV. WORK TO BE PERFORMED. *[Provide details of the work to be performed by task and subtask. 9 pages suggested.]*

a. General. *[Provide an overview.]*

b. Detailed Tasks. *[Describe the details of all tasks needed to perform the proposed work. Clearly distinguish base period tasks and option tasks as appropriate.]*

i. BASE PERIOD (YEAR 1)

1. Task 1: Task Title 1 *[Describe what will be accomplished, how the task will be performed, the resources allocated to the task (personnel, hours, materials, etc.), appropriate metrics to measure progress, and deliverables from the task. Describe applicable subtasks. Ensure task description clearly identifies why the task is necessary to accomplish project objectives. Do not include pricing details here.]*

2. Task 2: Task Title 2

3. Task N: Task Title N *[Define as many tasks as necessary to achieve the stated objective(s).]*

ii. OPTION 1 (YEAR 2) *[Define as many Option Periods as necessary to achieve the state objective(s). Proposed work shall not exceed 5 years.]*

1. Task N+1: Task Title N+1

2. Task N+2: Task Title N+2

3. Task N+M: Task Title N+M

V. PERFORMANCE SCHEDULE. *[Depict the tasks and sub-tasks and the duration of performance of each in a Gantt chart or other suitable chart. Briefly describe the proposed period of performance. 2 pages suggested.]*

VI. REFERENCES. *[List any relevant documents used to develop the technical approach. 1 page suggested]*

ATTACHMENT 4: PHASE II PRICE PROPOSAL FORMAT

The price proposal must include pricing information sufficiently detailed for a meaningful evaluation of the proposal. Since the CSO is limited to commercial solutions, detailed costs will not be required. For pricing purposes, Offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal.

Since all proposals must offer commercial items, technologies, or services, the requirements of the Truth in Negotiations Act (TINA) are not applicable. However, if the Contracting Officer determines it is necessary to support a determination of a fair and reasonable price, other than certified cost and pricing data may be requested.

The responsibility for providing adequate supporting data and attachments lies solely with the Offeror. Further, the Offeror must also bear the burden of proof in establishing reasonableness of proposed prices; therefore, it is in the Offeror's best interest to submit a fully supportable and well-prepared price proposal.

The Offeror shall prepare the Price Proposal (with the exception of the narrative information described below) using Microsoft Excel format but shall merge all Price Proposal documents into one Adobe PDF file for ultimate proposal submission. Include the Topic Number and the Project Title on all pages. The Offeror shall retain the Excel version of all Price Proposal documents for subsequent submission to the Government should the Offeror's proposal be selected for award.

a. Format. Price proposals shall be formatted as follows.
   (1) Paper Size – 8.5 X 11-inch paper
   (2) Margins 1-inch
   (3) Spacing – single
   (4) Font – Times New Roman, 12 Point
   (5) Electronic Software: Microsoft Word, Excel, or Adobe Acrobat

b. Additional Information: The following information should be contained in a cover sheet attached to the price proposal:

   (1) Full company name and address
   (2) CSO number submitting proposal against (FA702224SC001)
   (3) Point of contact, name, title, and phone and fax number
   (4) CAGE code
   (5) UEI number (formerly known as DUNS number)
   (6) Will you require the use of any Government property in the performance of this work? If yes, identify.
   (7) Travel: Travel costs must be justified and related to the needs of the project. Identify the number of trips, the destination, and purpose. Travel costs should be broken out by trip with number of travelers, airfare, per diem, lodging, etc.

NOTE: If an Offeror takes exceptions to the requirements called out in the announcement, the exceptions should be clearly stated in the price proposal.

ATTACHMENT 5: PHASE II STATEMENT OF WORK (SOW) FORMAT

A SOW must be included with the full proposal as part of the Phase II submission. The SOW does not have a page limit but should be approximately 3–5 pages in length and must be a separate and distinct document suitable for incorporation into the procurement instrument. Do not include proprietary data or markings in the SOW. Pages should be numbered, and the initial page should have a date (document date) shown under the title.

The proposed SOW must accurately describe the work to be performed. The proposed SOW must also contain a summary description of the technical methodology as well as the task description, but not in so much detail as to make the SOW inflexible. The SOW template should include the following sections and specifically respond to the Statement of Objectives (SOO) the Government provided with the Request for Proposal (RFP):

1. *OBJECTIVE*. This section is intended to give a brief overview of the project and should describe why the work is being pursued and what the Offeror intends to accomplish.

2. *SCOPE*. This section includes a statement of what the SOW covers. This should describe the capability area (CSO topic) to be investigated, goals, and milestones for the effort.

3. *BACKGROUND*. The Offeror must identify appropriate documents that are applicable to the effort to be performed. This section includes any information, explanations, or constraints that are necessary to understand the project tasks and requirements. This section should describe the relationship between efforts and previous and ongoing efforts.

4. *TASKS AND TECHNICAL REQUIREMENTS*. This section contains a detailed description of tasks that are necessary to perform the proposed work. These tasks will represent the work to be performed in any potential contract award, and, thus, shall be considered contractually binding. This section should be developed in an orderly progression and presented in sufficient detail to establish the feasibility of accomplishing the overall program goals. This section should clearly distinguish base period tasks from option tasks. The sequence of performance must be presented by fiscal year and task order, as in Section IV of the Technical Proposal. The SOW must contain every task to be accomplished. Note that the Government reserves the right to modify and negotiate the language in the SOW prior to any potential contract award.

   4.1. Task descriptions must be definite, realistic, and clearly stated. Use the phrase "the contractor shall" whenever the work statement expresses a provision that is binding. Use "should" or "may" whenever it is necessary to express a declaration of purpose. Use "will" in cases where no Offeror requirement is involved (e.g., power will be supplied by the Government. Use active voice in describing work to be performed.

4.2. Do not use acronyms or abbreviations without first defining them. Place abbreviations and acronyms in parentheses following the first usage of the spelled- out phrase.

4.3. If presentations and meetings are identified in the Offeror's schedule, the Offeror must include the following statement in the SOW: "Conduct presentations and meetings at times and places specified in the contract schedule."

4.4. The desired project structure consists of base period tasks, focused on demonstrating the feasibility of the technology, and option tasks, which cover design, fabrication, testing, and evaluation of the final product. Execution of optional tasks will be dependent upon and determined by the contractor's performance during and the results produced from the base period tasks.

ATTACHMENT 6: SOLICITATION TOPICS

The AFTAC Systems Development Directorate (AFTAC/SD) is interested in innovative technologies and services related to the areas of mission or technical interest listed below. Submissions should identify innovative solutions that fill capability needs related to the development of AFTAC capabilities for nuclear treaty monitoring, advanced detection technologies to support the counter-proliferation of weapons of mass destruction (WMD), and other applied technologies for both nuclear and non-nuclear event detection. The items, technologies, or services can also directly improve the effectiveness or efficiency of operating and/or maintaining current AFTAC capabilities related to the topics listed below. The level of detail provided for each topic or the order in which they appear is not intended to convey any information regarding relative priority.

There are no specific Technology Readiness Level (TRL) requirements for proposed projects. However, proposed prototypes or solutions should be at a high enough TRL to enable the assessment of the viability, technical feasibility, application, or military utility of the proposed solution and support a rapid transition into operations.

AFTAC intends to fund successful efforts between Fiscal Year 2024 and 2029 (FY24-FY29) with periods of performance in the range of 0-9 years. Exceptions may be considered for individual projects based on technological maturity or operational need. Individual contracts are expected to be funded based upon complexity and length of performance. Higher value proposals will only be accepted if they demonstrate the ability to deliver capable, innovative solutions that directly impact the AFTAC mission and offer cost savings or improved efficiencies in current processes or procedures. The Government reserves the right to fund all, some, one or none of the proposals submitted; may elect to fund only part of a submitted proposal; and may incrementally fund any or all awards under this CSO. All awards are subject to the availability of funds.

Topics for each capability area are detailed below.

TOPIC: AFTAC-001, GEOPHYSICS and SEISMOLOGY

AFTAC seeks innovative solutions for analytical techniques in seismology, hydro-acoustics, and infrasonic phenomenology. This topic includes:

- Application of the use of lidar, digital imagery and cartographic products, such as geology maps, into event analysis.
- Application of the use of infrasound data for treaty monitoring purposes.
    - Modeling signal propagation through realistic atmospheres
    - Event location estimation with low uncertainty
    - Yield estimation with low uncertainty
    - Event discrimination
    - Evaluation of techniques for wind noise suppression with existing and experimental sensor technologies
- Modeling of seismic, infrasound and hydroacoustic signal-source scaling for a variety of

sources or source conditions.

  - Fully contained explosions, underground or underwater
  - Partially contained explosions, underground or underwater
  - Surface explosions, over ground or water
  - Atmospheric explosions, over ground or water
  - Frequency modulated sources or Doppler signals from air or ground vehicles
- Wave propagation and attenuation modeling with Full Waveform Earth Models
  - Improve the prediction of waveforms and amplitudes at local and regional distances
  - Use of cepstral analysis for event depth, multiple event identification
- Managing ingestion and flow of multiple data sources for increased capabilities
  - Handle secure ingestion of data from multiple external sources
  - Handle movement of data across a guard to higher level networks
  - Including auditing of data flows
  - Data conversion between data formats
- Application of new innovative sensors, improve qualification methods for new and existing sensors
- Innovative hardware and software solutions for modern, flexible, and sustainable geophysical data acquisition systems and data processing; this can include (but is not limited to) new technologies to improve workstation processing, video display capabilities, and long-term data storage and retrieval

TOPIC: AFTAC-002, ATMOSPHERE AND SPACE

AFTAC seeks innovative and novel solutions for the collection and analysis of signal observables from space, atmospheric and surface nuclear detonations (NUDET) that directly leads to operational technology. This topic includes:

- Modeling of any and all phenomenologies and processes between and including the NUDET or surrogate source and the recorded signal produced by the sensor detecting front end.
  - Modeling of the NUDET or surrogate signal generation, including interaction with its environment that results in a transmitted and detectable signal. Any and all phenomenologies are of interest (e.g., optical, RF, neutron, gamma-ray, x-ray).
  - Signal transport from the transmitted signal(s) to the signal arrival at the detecting sensor element. All intervening media are of interest (e.g., atmosphere, clouds, ionosphere, and space environment).
  - Conversion of the detectable signal at the sensor's front end into a data signal that can be processed (e.g., sensing element design, physics and engineering).
- Development and demonstration of computing environments and computational techniques for optimal NUDET signal analysis that are or can be used in an operational environment (e.g., High Performance Computing (HPC) applications, physics-based algorithms, and artificial intelligence (AI) tools to assist operational analysis).
- Translation of analysis algorithms and techniques into executable code.
- Implementation of sustainable, common ground architecture to rapidly integrate new detection platforms.

- Development, demonstration and implementation of technologies that can be used to extend the mission life of on-orbit payloads and their host space vehicles.

TOPIC: AFTAC-003, DIRECTED ENEGRY WEAPON (DEW)

AFTAC seeks innovative solutions for emerging DEW technologies in all domains. This topic includes:

- Advanced imaging and sensing, pointing and tracking systems, data collection and analysis, and modeling and simulation of RF and laser technologies.
- Develop methods and tools to enable and improve the analysis of multi-phenomena data sets.
- Enhanced tools and methods for clutter suppression, coherent processing and for extracting low level signals of interest.

TOPIC: AFTAC-004, NUCLEAR AND NUCLEAR-RELATED MATERIALS ANALYSIS

AFTAC seeks innovative solutions to support trace-level to high-activity analyses of environmental samples for radionuclides. This topic includes:

- Operational laboratory and field methods to monitor potential radionuclide releases of "zero yield" events in order to confirm that nuclear fission did not occur during a foreign weapon test
- Detection of lower concentrations of radionuclides
- Nuclear debris collection

TOPIC: AFTAC-005, MATERIALS MODELING AND ANALYSIS

AFTAC seeks innovative solutions to support advanced meteorological and environmental modeling efforts. This topic includes:

- Advanced meteorological modeling tools and techniques, transport and dispersion modeling techniques, uncertainty estimation, and high-performance computing
- Meteorological model development, advanced weather data assimilation techniques, ensemble modeling and uncertainty estimation techniques, transport and dispersion modeling, and high-performance computational techniques
- Advanced simulation and modeling techniques, environmental fate of compounds of interest, the identification of environmental constituents that may have an impact on US personnel or the performance of equipment and issues related to homeland defense.
- Transport and dispersion modeling, computational chemistry, and process engineering.

TOPIC: AFTAC-006, ENTERPRISE-WIDE INTEGRATION AND ARCHITECTURE MODERNIZATION

AFTAC seeks innovative solutions to support the integration of data across disparate monitoring phenomenologies and modernization of hardware/software architectures. This topic includes:

- New solutions to integrate data access and discoverability across varying monitoring phenomenologies to lower detection thresholds and/or increase efficiency of current operations.
- Technologies to modernize hardware/software architectures or implement improved software design and accrediting processes to more flexibly meet mission needs.

TOPIC: AFTAC-007, ENTERPRISE ASSET AND LIFECYCLE MANAGEMENT IMPROVEMENTS

AFTAC seeks innovative solutions that can provide enterprise-wide asset management visibility as well as improve our lifecycle management capabilities.

- Increase accuracy of forecasting of requirements and scheduling of procurements through the use and exploitation of supply chain demand data
- Supply chain management, specifically: Automated systems to reduce/eliminate inefficiency, improve asset control, decrease touchpoints and minimize inventory.
- Automated identification and reporting of components and systems with substandard reliability

TOPIC: AFTAC-008, HIGH PERFORMANCE AND SECURE CLOUD COMPUTING AND DEV OPS SOLUTIONS FOR DATA INGESTION, EXPLOITATION, AND DISSEMINATION

- Offer the ability to process data and perform complex calculations at high speeds, addressing the three critical HPC components (Computation, Network, and Storage).
- Utilize parallel processing to perform modeling, simulation, and other scientific computing tasks.
- In a secure connection and networking environment, cloud computing that delivers the following hosted services over the Internet: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS).
- Software architecture and applications that can be utilized in the continuous development, continuous integration, and continuous delivery of software products that are being developed in an Agile software development environment.
- Machine Learning (ML) and Artificial Intelligence (AI) Solutions.

ATTACHMENT 7: EVALUATION CRITERIA AND SELECTION PROCESS

The Government will review each Quad Chart/White Paper (Phase I) and select the offerors that have the greatest potential to meet the needs of AFTAC technology requirements based on the topic areas stated in Attachment 6. Initially, a determination will be made if each offeror is technically qualified and has a comprehensive understanding to undertake the development of the technology based on the information stated in the Quad Chart/White Paper. The Government will determine the most technically competent and capable of qualified offerors using the criteria below.

- Criteria (Factors) for Selecting Quad Chart/White Paper for Full Proposal Submission:
    - Technical merit/applicability,
    - Importance to agency programs, and
    - Funding availability
- Relative Importance: All Factors are of equal importance
- Method of Evaluation: Peer or scientific review