

Request for Solutions (RFS)
Cyber Electromagnetic Activity (CEMA) Hardware-in-the-Loop (HWIL)
with Intelligent Laboratory Electromagnetic Effects Emulator
(CHILEEE)

1 July 2022

1. Purpose and Authority

This Request for Solutions (RFS) is seeking vendors for an Other Transaction Authority (OTA) agreement, for the Cyber Electromagnetic Activity (CEMA) Hardware-in-the-Loop (HWIL) with Intelligent Laboratory Electromagnetic Effects Emulator (CHILEEE) Prototype Project. The Government will evaluate the solutions with the intent to competitively award one or multiple Other Transaction (OT) Agreements for prototype projects through the Training and Readiness Accelerator (TReX) vehicle, in accordance with 10 U.S. Code § 2371b.

2. Summary and Background

Cyber Electromagnetic Activities (CEMA), the synchronization and coordination of offensive, defensive, inform and enabling activities, across the electromagnetic environment and cyberspace, are increasingly jeopardizing the survivability and security of Department of Defense (DOD) assets and infrastructure. The U.S. Army Electronic Proving Ground (EPG), working with the Army's Redstone Test Center (RTC), is charged with providing developmental test (DT) capabilities that expose tactical assets being developed for our Warfighters against realistic hostile electromagnetic environments to include CEMA. The increase in CEMA hostile activities is being driven, in part, by the proliferation of software defined radio (SDR) technology and personal electronic devices making radio frequency (RF) development faster, cheaper, and easier. EPG lacks a capability that will enable better DT of tactical systems against CEMA attacks in a repeatable, agile, and adaptive environment.

The CHILEEE prototype project will develop, demonstrate, assess, and transition a HWIL test capability that puts a System Under Test (SUT) in an emulated electromagnetic environment. The environment is augmented with CEMA challenges developed using known SUT specific methodologies. The CHILEEE prototype project seeks to provide automated capabilities to plan, set-up, execute, and analyze DTs in realistic battlefield RF environments that also expose a system to SUT specific CEMA threats. Because CEMA attacks are often tailored to a specific system, CHILEEE will demonstrate a novel approach to automate CEMA attacks developed using automated routines based on known CEMA methodologies.

CHILEEE will also attempt to employ artificial intelligence (AI) / machine learning (ML) for the development of CEMA and electronic warfare (EW) threats. Successful utilization of AI/ML for this purpose would provide a game-changing capability in this area of DT. However, success in this part of CHILEEE is not required for this development to provide significant capability to EPG.

The CHILEEE prototype project will use state-of-the-art SDR technologies to provide a HWIL test capability that exposes a SUT to realistic RF environments. SUT types that will benefit from CHILEEE include, but are not necessarily limited too, command and control (C2) systems, tactical radios, information technology (IT), assured position, navigation, and timing (APNT), radars, and missile fire control systems. The RF environments will include RF signals emulating radios, Wi-Fi, cellular, global positioning systems (GPS), other country GPS signals, and other commonly occurring signals. The RF environment will include signals produced by Army, Joint, and Coalition systems such as radars, tactical radios, and jammers. Furthermore, the RF environment will include known common RF threat signals, integrated air, and missile defense (IADS) assets, and include any available threat waveforms developed by other organizations. Finally, the RF environment will be augmented by complex CEMA attacks some of which will include threats generated by machine learning (ML) algorithms. The Government anticipates this effort will be unclassified (UNCLASS).

The envisioned CHILEEE prototype solution is depicted in the figure below.

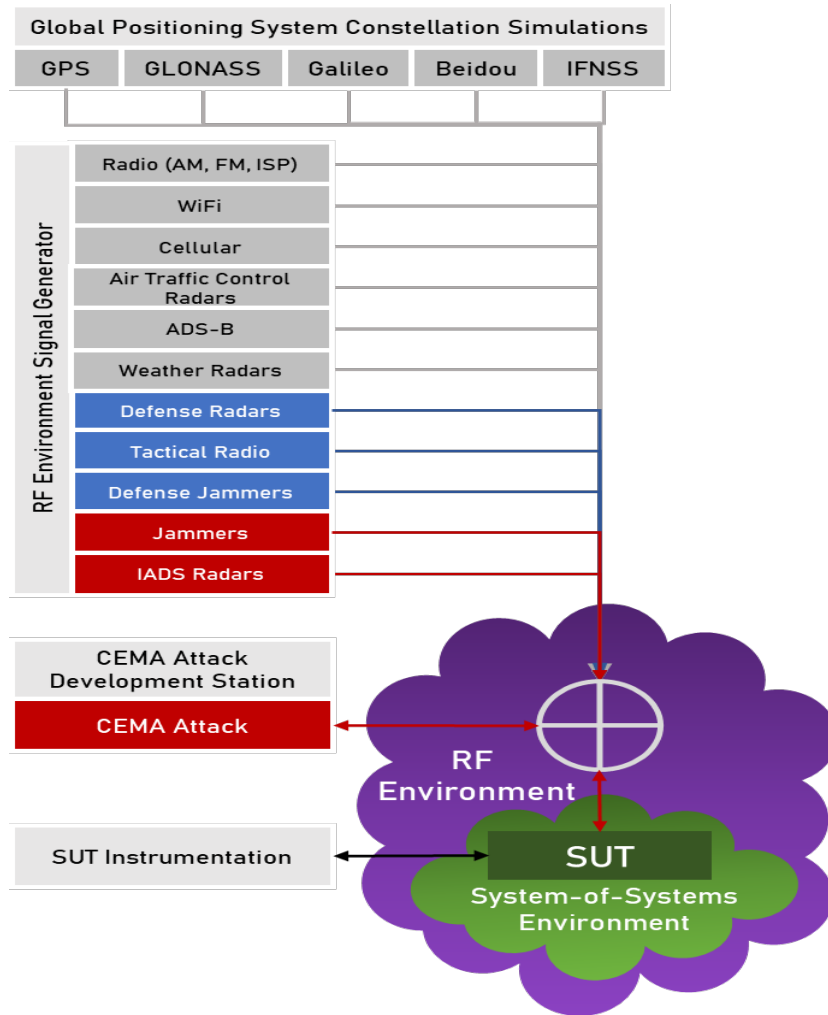


Figure 1. Hardware-in-the-Loop RF Environment CEMA Test Bed

3. General Information

3.1. Vendors interested in responding to this RFS must be members of the Training and Readiness Accelerator (TReX). Information about membership can be found at the following webpage: <https://nstxl.org/membership/>

3.2. The cost of preparing and submitting a response is not considered an allowable direct charge to any Government contract or agreement.

3.3. An individual vendor may not submit more than one solution in response to this RFS as a Prime. A vendor may participate as a subcontractor to multiple responses. Additionally, the Government will consider and accept partial solutions for this requirement.

3.4. Non-compliance with the submission instructions provided herein may preclude the vendor from being considered for award.

3.5. Government participants and advisors in the evaluation process will be required to sign non-disclosure agreements (NDAs), as well as ensuring the procedures are in accordance with 41 U.S.C. Chapter 21, Procurement Integrity Act. Note: only Government personnel will be participating in the evaluation.

4. Government Furnished Information (GFI)/ Government Furnished Property (GFP)

4.1. The Government will make available, Security Classification Guide as necessary to those vendors who have been vetted and cleared to receive Distribution C GFI, for use during Solution preparation. In order to obtain the documentation, the vendor shall submit a request in writing to INITIATIVES@NSTXL.ORG, with "CHILEEE Prototype" used in the subject line along with the required documents detailed in Section 4.2 below.

4.2. The vendor is required to complete the Vendor Self Vetting Form (Attachment 10) along with completing and signing the GFI Tech Data Distribution Agreement (Attachment 9) which includes further guidance regarding the handling of the GFI. Upon approval, the vendor will be provided any necessary GFI.

4.3. All hardware and associated technical information provided to the vendor as GFI/Government Furnished Equipment (GFE) is anticipated to be Controlled Unclassified Information (CUI).

4.4. Security Vetting

All vendors who want to compete, bid, or team with others for this effort must be willing to comply with the PEO STRI Security Process for Vetting. All vendors (Prime and Subs) and/or vendors must be vetted for eligibility, suitability, national status e.g., Foreign or USA Foreign Owned, Controlled and Influenced (FOCI) prior to the receipt of any award instrument.

4.4.1. For the RFS and accompanying solutions, the Government anticipates the distribution of Controlled Unclassified Information (CUI) at the classification level of Distribution C. The Government anticipates this effort along with the capabilities it researches, develops, prototypes, demonstrates, and validates will be UNCLASSIFIED and CLASSIFIED based on Security Classification Guide (SCG) 10-040. However, in order to develop the CHILEEE prototype, the vendor(s) will need to have access to non-public export controlled information. Therefore, any vendor with an intent to prime this effort must possess an approved FOCI mitigation and SECRET Facility Security Clearance (FCL).

All hardware and associated technical information provided to the vendor as GFI/Government Furnished Equipment (GFE) is anticipated to be Controlled Unclassified Information (CUI).

The Government will provide existing data and information to vetted vendors, as part of the request for solutions (RFS) process, to complete the CHILEEE prototype effort. The Government will also provide the performer(s) access to fielded systems and subject matter experts (SMEs) on a non-interference basis to support design, development, and testing efforts.

The Government will provide the vendor with Security Classification Guides (SCGs) related to the technology developed under the CHILEEE effort, to ensure that classified information is not inadvertently created by the vendor during execution of the project.

Please refer to the following link for more information on SCGs:

https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/520001m_vol1.pdf?ver=2020-08-04-092500-203

4.5. Vendors must provide a list of all Government Furnished Information (GFI) / Government Furnished Equipment (GFE) that the vendor believes is necessary to enable development and demonstration of prototype. Upon review of the requested GFI/GFE, if approved by the Government, the GFI/GFE will be provided to the awardee within a specified timeframe as agreed upon during SOW collaboration, after award. The Government cannot guarantee that all GFI / GFE requests can/will be accommodated.

5. Solutions Paper Responses

5.1. Solution Paper responses shall consist of one volume to include an Administrative, Technical, and Price section. Responses shall be submitted in an editable/executable (not scanned) Adobe PDF format. The Technical section is limited to no more than 6 standard size (8 ½" X 11") pages per Focus Area:

- CEMA and EW
- RF Environmental Signal Generation
- GPS Constellation Simulation
- Threat Simulation
- SUT Instrumentation and/ or Integrated Suite of C2 Instrumentation
- Data Collection, Processing Analysis, and Visualization

Vendors shall use standard 12-point Arial font for their responses. Vendors responding to all Focus Areas will be subjected to a 36-page limit for the Technical Section of the submission. Additionally, submission packages shall be limited to 10MB per proposal. No more than 3 foldouts are allowed with a page size of 11"x17" and will be counted towards the 6-page limit for each Focus Area (not to exceed 36 total pages). Please note, each one-sided page will count towards the page count limit. Charts or figures are not bound by the 12-point font requirement but shall be clearly legible. If the solution

exceeds the page limitation, the Government may choose not to read any information exceeding the 6-page limit per Focus Area and the information may not be included in the solution evaluation.

Section	Subsection	Format**	Counted towards page limit		Page Limit*
			Yes	No	
Administrative	Cover Page	MS Word/PDF		X	No Page Limit
	Nontraditional Status	MS Word/PDF		X	
	FOCI Status	MS Word/PDF		X	
	OCI & Mitigation Plan	MS Word/PDF		X	
Technical	Sub-Vendor List	MS Word/PDF		X	6-Page Limit per Focus Area
	Vendor Experience	MS Word/PDF	X		
	Project Management	MS Word/PDF	X		
	Solution Approach	MS Word/PDF	X		
	Technical Approach	MS Word/PDF	X		
	Govt Desired Rights in Tech Data & Computer SW	MS Word/PDF		X	
	Anticipated Delivery Schedule	MS Word/PDF		X	
	Integrated Master Schedule (IMS)	MS Project/PDF		X	
Price	Pricing Breakout	Excel		X	No Page Limit
	Rough Order of Magnitude (ROM)	Excel		X	
	Basis of Estimate (BOE)	Excel		X	

***The Administrative and Pricing Sections along with the cover pages, Sub-Vendor List, Government Desired Rights in Technical Data and Computer Software, List of Figures, Integrated Master Schedule (IMS), Delivery Schedule, GFI List, and Acronym Definitions do not count towards the page count limit.**

****All PDF's will be editable (not locked).**

5.2. Administrative Section (unlimited page count)

The following shall be included in the Administrative Section:

- Cover Page
- Nontraditional status

- Foreign Owned, Controlled or Influenced (FOCI) status
- Organizational Conflicts of Interest and Mitigation Plans

5.2.1. Cover Page

The cover page shall include the vendor's name, Commercial and Government Entity (CAGE) Code (if available), NAICS Code, Business Size, Traditional or Non-Traditional status, address, primary point of contact, which Focus Areas the offeree is responding to and status of U.S. ownership. NAICS code for this effort is 541330.

5.2.2 Nontraditional Status

The vendor shall provide its nontraditional business status or its ability to meet the eligibility requirements of 10 U.S.C. §2371b. The vendor shall clearly identify and support one of the following award eligibility requirements – with appropriate justification, as applicable.

- There is at least one nontraditional defense contractor or nonprofit research institution participation to a significant extent in the project. (Ref: 10 U.S. Code § 2371b(a)(d)(1)(A))
- All significant participants in the transaction other than the Federal Government are small businesses or nontraditional defense contractors. (Ref: 10 U.S. Code § 2371b(a)(d)(1)(B))
- At least one third of the total cost of the project is to be provided by sources other than the Federal Government. (Ref: 10 U.S. Code § 2371b(a)(d)(1)(C))

If the vendor is not a nontraditional defense contractor (NDC) additional information is needed. Vendor shall provide the name and CAGE code information for the NDC participating in the prototype project. Additionally, the vendor shall provide what portion of the work the NDC is performing and an explanation of the significance of the NDC's contribution to the prototype project.

5.2.2.1 Definition of Nontraditional Defense Contractor – an entity that is not currently performing and has not performed, for at least one-year period preceding the solicitation of sources by the Department of Defense (DoD) for the procurement or transaction, any contract or subcontract for the DoD that is subject to full coverage under the cost accounting standards prescribed pursuant to 41 U.S.C §1502 and the regulations implementing such section.

5.2.3 Foreign Ownership, Control, or Interest (FOCI) Status

In accordance with RFS Attachment 4, Security Process for Vetting Contractors, the vendor must include certification that the vendor (and subcontractor(s)) are not Foreign Owned or under USA FOCI status (and are not in merger or purchasing discussions for

a Foreign company or USA FOCI Company). Should a prospective vendor be unable to so certify, they will be ineligible for award unless the mitigating circumstances in Attachment 4 Security Process for Vetting Contractors are met. In such a case, these mitigating circumstances shall be detailed in an appendix to the Administrative Section.

5.2.4 Organizational Conflicts of Interest and Mitigation Plan

Vendors will submit an Organizational Conflict of Interest (OCI) Mitigation Plan via an appendix to the Administrative Section. In the event there are no real or perceived OCIs, simply state so and annotate what actions would be taken in the event that one is realized.

5.3. Technical Section (6-page count per Focus Area)

The following shall be included within the Technical Section:

- Sub-Vendor List
- Vendor Experience
- Project Management
- Solution Approach
- Technical Approach
- Government Desired Rights in Technical Data and Computer Software
- Anticipated Delivery Schedule
- Integrated Master Schedule (IMS)

5.3.1. Sub-Vendor List

Vendor shall provide a list of all sub-vendors involved and their role within the performance of your submission as an appendix to the Technical Section (which will not count towards the page count). The list shall include FOCI status and OCI, Commercial and Government Entity (CAGE) Code, Business Size and Type (Traditional/ Non-Traditional).

5.3.2. Vendor Experience

Vendor shall describe their company or team's recent and relevant previous experience with developmental testing. This experience should also include supporting test, evaluation, and assessment that is similar to the required work of this prototype project. Projects worked in the last three years are considered recent.

5.3.3. Project Management

Vendor shall describe their company's methodologies, organizational structure, quality assurance processes, and staffing they intend to use to manage this prototype project.

5.3.4. Solution Approach

Solution Approach responses shall include the vendor's proposed technical solution clearly describing the approach, feasibility and technical risks and mitigation solutions identified in fulfilling the Project Technical Objectives and associated deliverables identified below. The approach shall clearly address planned documentation deliverables (including format and content) and any planned demonstrations, design reviews (including product line quality factors such as agility and reuse), feasibility of implementation, total project risk, and management reviews.

5.3.5. Technical Approach

CHILEEE seeks to address current shortcomings in the Army's ability to test CEMA effects on military systems by developing and demonstrating a CEMA test capability that can inform US Army Futures Command (AFC) [and other Department of Defense (DOD) key decision makers] with reliable and actionable test information in a timely and cost-effective manner. This may include the novel application of commercial technologies for defense purposes and the demonstration of NDI technologies and capabilities.

CHILEEE will demonstrate new and innovative test and assessment technologies, methodologies, and processes that address the agility, adaptability, and resilience necessary to meet the growing technological and operational needs and demands of the Warfighter. Specifically, CHILEEE will target the development, prototyping, testing, and integration of innovative and unique CEMA, EW and AI/ML test technology solutions and capabilities in the following focus areas:

- Focus Area 1: CEMA and EW
 - Overview: Cyber Electromagnetic Activities (CEMA) and Electronic Warfare (EW) are capabilities within the US Army to defend communication networks and provide offensive non-kinetic weapons to deny or disrupt enemy communications.
 - Technical Objective: The ability to analyze and define the effectiveness of either a system-of-systems defensive capability against CEMA or EW attack OR the effectiveness of a system's offensive capability to produce the anticipated reaction to a system.
 - Desired Outcome: The capability to provide a replicative communication network(s) (wired and open air) as a target/victim for future adversarial or friendly CEMA or EW techniques. Also, the resources to create adversarial or friendly CEMA or EW effects.
- Focus Area 2: RF Environment Signal Generation
 - Overview: In order to test the performance of Signal Intelligence (SIGINT), Communication Intelligence (COMINT), Electronic Intelligence (ELINT) and EW systems, RF communications and signals need to be produced to represent a realistic battlefield or urban environment.
 - Technical Objective: The ability to record (or develop) and transmit signals that have the exact characteristics of real world tactical, commercial, or

public communication and detection devices. Characteristics would include modulation, frequency, multiplexing, power, pulse, scan, etc. These RF signals will be replicative of all RF standards worldwide.

- Desired Outcome: Multiple mobile substantiations of the technical objective that can be deployed to DoD test ranges and programmed and controlled from a central site.
- Focus Area 3: GPS Constellation Simulation
 - Overview: An indoor GPS Test Range enabling realistic and dynamic performance, reliability, and vulnerability testing of GPS receivers and anti-jamming technology. The indoor range addresses the inherent shortfalls of lab testing and mitigate the limited test windows for outdoor testing. This range requires a GPS Constellation Antenna Array and GPS Wavefront simulator. These systems simulate the orbital movement of GPS satellites creating a realistic GPS RF environment and greatly reducing the need for a significant portion of outdoor testing.
 - Technical Objective: This GPS Constellation Simulation bridges the gap between laboratory and outdoor GPS performance, electronic attack (EA) and threat testing. Multi-GPS signal generators, jammers, and discrete antenna outputs will provide and enable the most realistic test environment that enhances test rigor by increasing the ability to rapidly identify and address GPS system failures from contested and congested environments in the most physics-accurate, E-field reception environment.
 - Desired Outcome: The GPS Constellation Simulation capability should provide a comprehensive indoor GPS test capability that realistically simulates the real-world GPS signal environment to allow characterization of emerging GPS-based navigation systems.
- Focus Area 4: AI/ML Threat Simulation
 - Overview: In order to defend against evolving CEMA threats, the AI/ML threat simulation laboratory should generate realistic AI/ML threat simulations. The AI/ML laboratory designs, develops, and deploys software and the associated hardware that can be applied in the testing laboratory and on ranges to simulate existing and future AI/ML enabled CEMA systems. These systems are unique in that they learn and adjust their threat behavior based on AI/ML 10 algorithms which can modify behavior and adapt to the environment. This capability requires the identification of potentially vulnerable systems in a highly congested RF environment. Software and hardware are then developed to autonomously identify the threat vector and deploy the payload against the vulnerable systems.
 - Technical Objective: The AI/ML threat simulation laboratory identifies a range of vulnerable domains vulnerable systems to AI/ML enabled CEMA, and then the identifies, develops, trains, and deploys the models which will be executed over time through simulation platforms. This effort requires

mathematical rigor and awareness of both the vulnerable environments, highly technical specifications, and the dynamic state of the art of AI/ML in order to produce realistic simulations.

- Desired Outcome: The AI/ML threat simulation development effort should result in a variety of CEMA AI/ML models that can be deployed against vulnerable RF and networked environments. These simulations should be dynamically tunable in terms of AI/ML model choice, model hyperparameters and target domains, to include communications systems, imagery systems and other electronic devices that may be vulnerable
- Focus Area 5: SUT Instrumentation
 - Overview: Develop appended and embedded data collection instrumentation to collect various types of data in both dismounted and mounted configurations.
 - Technical Objective: Ability to collect large volumes of data. Ability to collect different types of data – audio, video, screen capture, sensor, network capture, spectrum, etc. Reduced Shared Wireless Access Protocol (SWAP) for the intended application. Reduced Electromagnetic Interference (EMI). MIL-STD 461/464/810 compliant.
 - Desired Outcome: Data collection solutions will address interface standards, required timing resolution, storage speeds, radio waveforms, and reduced EMI via a comprehensive hardware and software architecture and test kit.
- Focus Area 6: Integrated Suite of C2, Instrumentation, Data Collection, Processing, Analysis, and Visualization
 - Technical Objective: Develop instrumentation to collect and process large volumes of data. Ability to collect and process different data types. Provides an end-to-end solution that addresses six functional areas: 1) test planning; 2) status and control; 3) data collection and stimulation; 4) data management; 5) data processing and analysis; and 6) data visualization and reporting. The instrumentation is flexible, scalable, and easily extensible.
 - Desired Outcome: The instrumentation will optimize the end-to-end testing process creating efficiencies and automation of the processes resulting in reduced test time and cost, increased accuracy, and near real time analysis.

Each of these focus areas will be required to comply with the following:

- Test and Training Enabling Architecture (TENA) Compliance - all prototypes must be able to be commanded/controlled over the TENA network as well as exchange data across the network. Additional details on TENA have been included in Attachment 2.

- Integration and Interoperability - all prototypes must maximize the use of a modular, open system approach to enable all end items to be integrated into a common test and evaluation platform. Additional details on this matter available in Attachment 3 (Modular Open Systems Approach Reference Frameworks in Defense Acquisition Programs).
- Cybersecurity compliance - all prototypes must be capable of meeting cybersecurity compliance requirements outlined in DODI 8510.01, Risk Management Framework (RFM) for DoD Information Technology (IT). Additional details on this matter are available in Attachment 1.
- Validation and Verification (V&V) - all prototypes will possess a validation and verification pedigree that will facilitate rapid accreditation of use in system performance assessments.

5.3.5.2 Agile Development

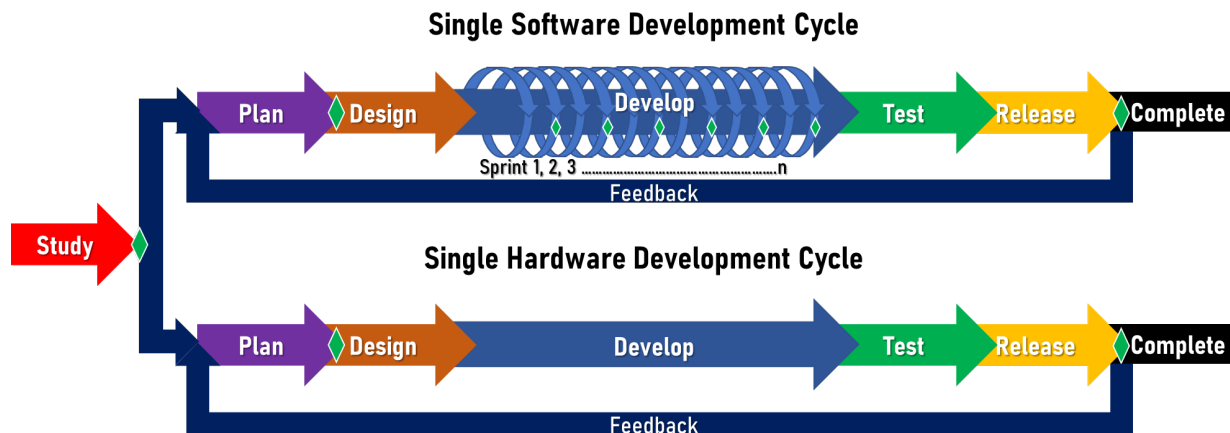
CHILEEE will be developed using an Agile process where each cycle of the process results in more functionality in CHILEEE. Specifically, each cycle (sometimes referred to as iterations) include six (6) steps:

- Plan – During this phase of the process, the project team comes together to identify and prioritize the requirements and ensures those requirements are quantifiable, relevant, and detailed. The project team also determines how many development cycles are needed, the duration of those cycles, and the requirements that will be addressed in each development cycle.
- Design – The list of requirements that is developed in the planning phase are used to make design choices. In the design phase, one or more designs are developed that will achieve the desired project result. Depending on the project, the products of the design phase can include dioramas, sketches, flow charts, site trees, design drawings, prototypes, photo impressions, Unified Modeling Language (UML) schemas, etc. The project team will review the designs and choose the best design that will be produced in the project.
- Develop – During the development phase, everything that will be needed to implement the project is arranged. Potential suppliers or subcontractors are brought in, a schedule is made, materials and tools are ordered, instructions are given to the personnel, etc. The project takes shape during the development phase. This phase involves the construction of the actual product. Programmers are coding, designers are involved in developing graphic material, developers are building, etc. The development phase results in a software release or prototype product.
- Test – This phase involves testing the prototype and/or code against the requirements to make sure the product is meeting the requirements and solving the user's needs. This phase includes unit testing, integration testing, system testing, and acceptance testing.

- Release – During this phase, the prototype and/or software is delivered to the government so that the government can start using the product in test and provide feedback to the development team. During this phase, the government will evaluate whether the product meets its initial operating capability (IOC).
- Feedback – During this phase, the government provides feedback to the project team on the product’s performance and suitability; and whether the product meets its IOC.

During each cycle, each of the identified steps will have decision points defined as exit and entrance criteria allowing the team to move to the next step. At the end of each cycle, there will be an additional decision point where the Government will determine if IOC has been met or a new cycle will begin using the feedback from the previous cycle as the starting point for the new cycle. EPG anticipates conducting the CEMA, EW, and RF Signal Generation cycles first and concurrently. Future cycles of the program may be conducted simultaneously or separately.

Software (SW) development and hardware (HW) development will follow the same cycle process except for during the development step. For software, the development step will include multiple sprints to iteratively prototype capabilities and adhere to Agile development best practices. The figure below depicts the SW and HW development cycle approach.



Each SW cycle will be scheduled for 6 months, and each HW cycle will be scheduled for 12 months. There will be no more than 10 SW cycles, and no more than 5 HW cycles with the goal to reach IOC on or before 5 years. During the first cycle, the plan step will be informed by the research and development the government has already conducted in each of the focus areas identified above. For each of the next cycles, the plan step will be informed by the feedback, priorities and requirements provided by the government with input from the performer and feedback from the previous cycle. SW and HW cycles will be executed in parallel. A completed plan step will result in a milestone payment to mobilize the development team.

SW and HW cycles will be executed in parallel whereas each completed step will result in a milestone payment. For example, a completed plan step will result in a milestone payment to mobilize the development team. The development team will then complete the design step and enter into the development step. These cycles will be defined in the vendor's milestone schedule. Upon vendor selection and during SOW and milestone collaboration, these cycles and milestones may be further refined.

For SW, the development step within each cycle will operate as its own agile process, using much shorter iterations referred to as sprints. Sprints will be a defined length of two to four weeks (the performer will propose sprint lengths for Government consideration and approval). Milestone payments will be aligned with every other sprint completion.

At the end of the cycle's development step, a test step followed by a release step will be accomplished. The release will result in a milestone payment. As stated previously, if after release CHILEEE is at IOC, then the project will be deemed complete. If the project is not complete and the Government desires to continue development, the feedback step will begin leading back into another agile cycle until IOC is gained.

The Government anticipates reaching IOC NLT 5 years from the start of the project. The figure below depicts the development concept and timeline.

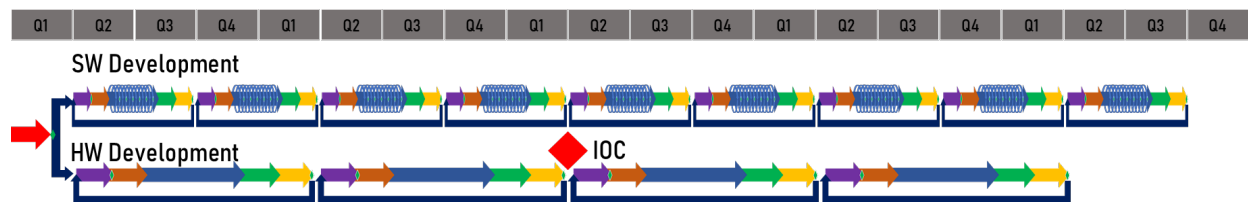


Figure 2. Conceptual Development Concept and Timeline

5.3.6 Government Desired Rights in Technical Data and Computer Software

The Government requires Government Purpose Rights (GPR) for a five-year period which shall commence upon execution of this transaction agreement. Upon expiration of the five-year period, the Government shall have unlimited rights. Printed deliverable (e.g., printed hardcopies, .doc, web-based html, etc.) will be labeled Distribution C and contain all appropriate markings associated with the distribution classification. All technical data, intellectual property and non-commercial off the shelf (COTS) software are desired to be provided with a minimum of GPR; however, if any non-COTS software cannot be provided with GPR, vendors will be requested to provide a perpetual enterprise license agreement that allows unlimited distribution, modification, and full use of the software without additional fees beyond the cost contracted for the original license agreement.

Any commercial or COTS shall be provided with a transferable license that allows distribution of the software and transfer of the license to any government agency or DOD

vendor for any CHILEEE prototype project related purpose. All software licensing shall include a minimum term of five years of use. All software shall be provided with any available major upgrades, minor updates, security patches and technical support for the entire period of performance. When the addition of new software or hardware is proposed for the system or developed under this solicitation with government funding or partial government funding, the vendor shall ensure that sufficient rights in technical data (software and hardware) are procured to enable the government to maintain and modify the system using government personnel and/or third-party vendors. Government approval is required for exceptions to GPR.

Vendors will be requested to provide pricing to acquire any portion of their solution which is delivered with limited or restricted rights. The Government may choose to license or purchase the rights to these proprietary data upon successful delivery of the prototype.

All technical data and information developed under this effort should be marked with the appropriate marking in accordance with DoDI 5320.24, Distribution Statements on Technical Documents. This generally should be marked with "DISTRIBUTION STATEMENT C." Distribution authorized to the Department of Defense and U.S. DoD contractors only (export controlled) (21 March 2022). Other requests shall be referred to PEO STRI."

The vendor shall describe the rights being provided to the Government in terms of technical data, both in software and hardware, so that the Government can maintain and modify the system(s) using Government personnel and third-party contractors. The vendor shall analyze feasible non-proprietary solutions and incorporate them when applicable to the effort. This includes, but is not limited to, software rights, technical data, source code, drawings and other product definition data, manuals, warranties, and integration efforts.

5.3.6.1 For the purposes of this RFS and final award document, the Government will use the data rights and computer software related terms defined in Attachment 7, Data Rights License Terms Definitions.

5.3.6.2 Vendor shall complete the Data Rights Assertions Tables using the format provided in Attachment 6, Data Rights Assertions Tables. The vendor's assertions, including any assertions of its subcontractors or suppliers must be submitted as an appendix to the Technical Section. The tables must be completed in the format set forth in the attachment, dated and signed by an official authorized to contractually obligate the vendor. If additional space is necessary, additional pages may be included. There is no page limit for the Data Rights Assertions Tables, and they do not count against the proposed technical solution page limitation.

5.3.7 Anticipated Delivery Schedule

The vendor shall include the anticipated delivery dates with their solution that includes all CHILEEE Prototype capabilities and completion dates for all tasks and task phases as described in the RFS.

5.3.8 Integrated Master Schedule (IMS)

An IMS shall be provided, using Microsoft Project. The IMS should be resource loaded with each task including a predecessor (if applicable). The IMS may be attached as an appendix file to the Technical Section. The IMS is not included in the total page count and page count is unlimited.

5.4 Pricing Section (unlimited page count)

The following shall be included within the Pricing Section:

- Pricing Breakout
- Rough Order of Magnitude (ROM)
- Basis of Estimate

5.4.1. Pricing Breakout

Vendors shall submit a fixed price amount price for its solution, further divided into severable milestones. The Government is not dictating a specific price mechanism. However, proposed payments should be linked to clearly definable, detailed milestones in each phase. It should be clear, with sufficient detail, what is being delivered at each milestone. The vendor's pricing milestones may vary from the defined decision points, depending on the proposed solution. Milestones should be established and priced in a manner that prohibits milestone efforts from being worked concurrently. Each milestone price should reflect the anticipated value the Government will receive toward accomplishment of the OTA goals and objectives at the time the milestone is completed. The price section has no page number limitation.

The prototype project will be incrementally funded as funding becomes available. The government may not fund the full value of this agreement based on the outcome of the various demonstrations conducted throughout the period of performance.

5.4.2 Rough Order of Magnitude (ROM)

Vendors shall provide a ROM for potential follow-on production activities as described in Section 9: Follow-on Activities to include the following:

Describe your licensing/pricing model(s) and include a high-level ROM for your described solution's recurring and non-recurring costs (e.g., installation/set-up, initial training, sustainment costs, upgrade costs and other associated/ add-on services) for a Production/Maintenance environment. (Must provide an expected quantity to support the ROM)

Vendors shall clearly identify any anticipated sustainment/maintenance costs and risks for its solution. In the Technical Section, Vendors should identify technical approaches and rationale within its proposed solution that will result in sustainment cost savings for the government. Sustainment cost savings from the technical approaches shall be quantified and provided.

Please note, the Follow-On Production ROM, as well as the follow-on sustainment costs, will assist in future planning efforts for potential follow-on efforts and will **NOT** be part of the evaluation.

5.4.3 Basis of Estimate

Proposing vendors are requested to provide a Basis of Estimate (BOE) for the entire effort. Pricing should be broken out by cycles and technology area. Pricing should assume no more than 10 cycles for software and no more than 5 cycles for hardware, as described in Section 5.

6. RFS Response Instructions

6.1 The Government intends to make a single OT award as a result of this RFS. However, more than one award may be made if determined to be in the Government's best interest. The Government also reserves the right to award to respondents that provide attributes or partial solutions of value to the Government.

6.2 All questions related to this RFS shall be submitted utilizing the Vendor Questions Form provided in Attachment 5. Questions must be submitted via email to initiatives@nstxl.org, with "CHILEEE Prototype Vendor Questions" in the subject line.

6.3 **Questions must be submitted no later than 12:00 PM EDT on 23 June 2022.** Questions received after the deadline may not be answered. Questions shall not include proprietary data as the Government reserves the right to post submitted questions and answers, as necessary (and appropriate) to facilitate vendor solution responses.

6.3.1 The Government reserves the right to post submitted questions and answers, as necessary (and appropriate) to facilitate vendor Solution Paper responses. Submitted questions will be posted without identifying company names.

6.4 **Solution Responses shall be submitted no later than 12:00 PM EDT on 21 July 2022.** Solution Responses shall be submitted electronically to initiatives@nstxl.org, with "CHILEEE Prototype Solution" used in the subject line. Any submissions received after this time on this date may be rejected as late and not considered.

6.4.1 Vendors must clearly state assumptions made within their response. Vendors are encouraged to challenge any Government assumptions or restrictive requirements in its individual solution and should articulate any major discrepancies between the RFS and its technical solution. Should a vendor's solution require a change in policy and/or statute, the vendor shall outline within their technical section, and describe why the change is needed to realize the benefit of the vendor's prototype (and potential production).

6.4.2 Vendor's solutions shall be valid for at least 180 days after submission.

7. Evaluation and Selection Process

7.1 Solution papers will be evaluated with consideration given to the vendor's ability to provide a clear description of the proposed solution, technical merit of the response, feasibility of implementation, vendor's experience, and total project risk. The proposed project price, delivery schedule, and data rights assertions will be considered as aspects of the entire response when weighing risk.

7.2 The Government will evaluate the degree to which the submission provides a thorough, flexible, and sound approach in response to the ability to fulfill the requirements. The Government will evaluate the following:

- **Technical Merit**– The performer's technical approach will be evaluated for thoroughness, technical merit, innovation, clarity, and soundness of the proposed approaches in meeting the requirements of the Pilot prototypes.
- **Interoperability Approach** – The performer's approach to hardware and software interoperability in the test environment will be evaluated for thoroughness, innovation, clarity, and soundness of proposed approaches in meeting the interoperability requirements of the Pilot prototypes. Scalability and extensibility will also be significant factors to assessing interoperability.
- **Technical Feasibility** – The performer's solution to the Pilot prototype will be evaluated for logistical planning to include the capability to staff and support the prototype project (personnel and equipment) to effectively carry out the project requirements.
- **Vendor Experience** – Recent experience and quality of past experiences in providing technical solutions similar to those required by this solicitation. Ideally, past performance should also indicate an understanding of developmental testing. "Recent experience" is defined as experience within the last three (3) years.
 - The performing vendor's experience designing, developing, prototyping, and producing platform architecture domain solutions that

are flexible, interoperable, and capable of both human and machine reading/ingestion.

- The performing vendor's experience supporting the test, evaluation, and assessment of platform architecture domain solutions that are flexible, interoperable, and capable of both human and machine reading/ingestion.
 - The performing vendor's experience working with the Government in an agile and adaptable manner through collaboration and iteration.
 - The vendor's capability to handle simultaneous development and production efforts for multiple platforms and locations.
- **Schedule** – The performer's Integrated Master Schedule (IMS) for the entire effort.

7.3. In addition, interested vendors are required to provide the following:

- Fixed price amount further divided into severable milestones (RFS Section 5.4.1).
- An IMS for the entire effort with identified deliveries throughout the development of the prototype. (RFS Section 5.3.8).
- Data Rights Assertions Table, Attachment 6: The technical response is expected to clearly outline the appropriate assertion rights in technical data, computer software and software documentation that will be delivered with the solution.
- The vendor's approach to provide life cycle maintenance to sustain capabilities during the duration of the CHILEEE effort (60 months).
- Follow-on Production Rough Order of Magnitude (ROM) pricing should include vendor's approach for handling follow-on activities described in (RFS Section 5.4.2). The Government will not evaluate vendor submissions related to sustainment and follow-on activities; however, the Government will seek a pricing estimate (ROM) for future planning purposes.

7.4 Cost and Pricing Breakdown

It is important to note, the entire 5-year prototype project has a maximum ceiling budget of \$36,000,000. The government anticipates up to \$8,000,000 of available funding for the first year of this project, beginning in Fiscal Year (FY) 2022. Funding for FY 22 includes \$15K of funding available immediately to start the Phase One assessment needed at the beginning of the project. The Government will evaluate the vendors pricing solution to determine if the solution price is within budget. This will support determining the level of associated risk.

7.5 Selection Process

7.5.1 The Government will review each vendor's submittal against the criteria as described in Sections 7.2 and 7.3, with major consideration given in no specific order of importance to the technical merit, feasibility of implementation, and total project risk. The proposed project price, delivery schedule, and data rights assertions will also be considered as aspects of the entire response when weighing risk and reward. Further, the Government will evaluate the degree to which the proposed concept provides an innovative, unique – yet realistic and sustainable - approach to meeting the CHILEEE Prototype technical capabilities and objectives.

7.5.2 Assessment of risk is subjective. If the risk is obvious or the schedule seems overly aggressive, the Government will consider that in the total risk assessment. Vendors are responsible for identifying risks within their submissions, as well as providing specific mitigation solutions. If sufficient validation of the proposed information is not provided, the Government may reject the submission.

7.5.3 Unsupported assertions will be discounted by the evaluators. Technology and Manufacturing Readiness Levels will be considered when weighing the benefit of the proposal.

7.5.4 The Government anticipates awarding to the vendor(s) whose response best satisfies the Government's objectives, referenced in Section 5.3.5, and will be most advantageous to the Government with price and other factors considered.

7.5.5 The Government reserves the right to award to a vendor that does not meet all of the requirements but provides attributes or partial solutions of value.

7.5.6 In making the final decision it may become necessary to compare the proposals of each vendor against the other, but the Government anticipates that its decision is more likely to be made based on each vendor's submittal as evaluated against the criteria described above and a determination of which solution(s) is/are determined to be the most advantageous to the Government.

8. Additional Information

8.1 Export Controls

Research findings and technology developments arising from the resulting proposed solution may constitute a significant enhancement to the national defense and to the economic vitality of the United States. As such, in the conduct of all work related to this effort, the recipient will comply strictly with the International Traffic in Arms Regulation (22 C.F.R. §§ 120-130), the National Industrial Security Program Operating Manual (DoD 5220.22-M) and the Department of Commerce Export Regulation (15 C.F.R. §§ 730-774).

8.2 Interaction and/or Disclosure with Foreign Country/Foreign National Personnel
The Vendor should comply with foreign disclosure processes described in US Army Regulation (AR) 380-10, Foreign Disclosure and Contacts with Foreign Representatives; Department of Defense Directive (DoDD) 5230.11, Disclosure of Classified Military Information to Foreign Governments and International Organizations; and DoDD 5230.20, Visits and Assignments of Foreign Nationals.

8.3 Cyber Incident Reporting: The awardee will properly protect data and comply with specific Government reporting procedures in the event Government data is compromised.

8.4 By submitting a response, respondents shall certify whether covered telecommunications equipment or services **will or will not** be included as a part of its offered products or services to the Government in the performance of this effort.

All respondents are required to submit applicable documentation to www.sam.gov concerning Section 889 (Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment). Submissions from vendors with delinquent, incomplete, or missing information related to Section 889 shall be deemed non-compliant.

8.5 All submissions will be unclassified. Submissions containing data that is not to be disclosed to the public for any purpose or used by the Government except for evaluation purposes will include the following sentences on the cover page:

“This submission includes data that will not be disclosed outside the Government, except to non-Government personnel for evaluation purposes, and will not be duplicated, used, or disclosed -- in whole or in part -- for any purpose other than to evaluate this submission. If, however, an agreement is awarded to this Company as a result of -- or in connection with -- the submission of this data, the Government will have the right to duplicate, use, or disclose the data to the extent agreed upon by both parties in the resulting agreement. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]”

8.6 Each restricted data sheet should be marked as follows:

“Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this submission.”

9. Follow-On Activities

Pursuant to 10 U.S.C. 2371b(f), if competitive procedures were used for the selection of parties for participation in the transaction for a prototype pilot and the participants in the transaction successfully completed the prototype project, production OTs are authorized and offer a streamlined method for transitioning into follow-on production without competition. Potential follow-on production contracts may be either sole source, based on successful completion of the prototype project within the scope of this document, or competed at the discretion of the Government. Follow-on activities could include system and software updates to address obsolescence, concurrency, evolving training requirements, and technology insertion.

If the CHILEEE prototype project is successfully completed [feasibility and utility of the prototype(s) are demonstrated and assessed, and IOC is gained], the Government anticipates transitioning into production. A Rough Order of Magnitude (ROM) for follow-on activity may be required and will be determined during the development of each RFS. The Government anticipates that CEMA and EW will be the first RFS. The Government requires a follow-on ROM for this RFS.

Prior to issuing a sole source Follow-On continuation of prototyping or a production agreement or contract, the Government will enter negotiations with the awarded vendor. The negotiations may include evaluation of all potential cost element categories applicable to the effort and may also use price realism analysis. The Government will utilize the most applicable method in determining cost elements and prices are fair and reasonable.

10. Attachments

To support the CHILEEE prototype project RFS, the following documents will be provided. Each document will be marked and protected accordingly to support distribution and storage. This may include the vetting of vendors, in accordance with establish Government policy and procedures, prior to distribution.

Attachment 1, DODI 8510.01, Risk Management Framework (RFM) for DoD Information Technology (IT)

Attachment 2, TENA ARD 2016-11, The Test and Training Enabling Architecture (TENA) – Architecture Reference Document (ARD), <https://www.tena-sda.org/display/TENAintro/Home>

Attachment 3, Modular Open Systems Approach Reference Frameworks in Defense Acquisition Programs

Attachment 4, Security Process for Vetting Contractors

Attachment 5, Questions Form

Attachment 6, Data Rights Assertions Tables

Attachment 7, Data Rights License Terms and Definitions

Attachment 8, Terms and Conditions and EULA

Attachment 9, GFI Tech Data Distribution Agreement

Attachment 10, Vendor Self Vetting Form