Title: Reconfigurable Virtual Collective Trainer Statement of Need

Background
The Army's future training capability is the Synthetic Training Environment (STE). The STE enables tough, iterative, dynamic, and realistic multi-echelon/combined arms maneuver, mission rehearsal, and mission command collective training in support of multi-domain operations. The STE will provide units the repetitions necessary to accelerate individual through Unit skill and collective task proficiency resulting in achieving and sustaining training readiness. The STE provides complex operational environment representations anytime and anywhere in the world. The STE will deliver collective training, accessible at the Point of Need (PoN) in the operational, self-development, and institutional training domains.

The STE will achieve Initial Operational Capability (IOC) by September 2021 and Full Operational Capability (FOC) by September 2023. Initial capabilities will consist of the Common Synthetic Environment (composed of One World Terrain, Training Simulation Software, and Training Management Tools), Reconfigurable Virtual Collective Trainers (Air and Ground), and Soldier/Squad Virtual Trainer. Full Operational Capability (FOC) is outside the scope of this SoN, however, it is identified throughout this document as a “design consideration” in order to provide a holistic STE vision.

The focus of this Statement of Need (SoN) is Reconfigurable Virtual Collective Trainers (RVCT) that include aviation platforms (RVCT-A), ground platforms (RVCT-G), dismounted infantry collective maneuver training, collective gunnery training, and mission rehearsal capability. The RVCT is a mobile, transportable, modular, and scalable training capability with the minimum hardware necessary to represent form, fit, and function for the user to execute collective tasks.

RVCT enables the Army to train Brigade Combat Teams and below Combined Arms Training Strategy tasks needed to perform Warfighting Functions (Wffs) for air/ground operations during a geographically distributed, multi-echelon collective training event. The RVCT connects across networks to multiple RVCTs from collocated and dispersed locations to support scalability from a small Unit to a larger force as part of the same mounted and dismounted training exercise.

The STE Cross Functional Team (CFT) is developing RVCT in parallel with the Common Synthetic Environment (CSE) to provide a simulated, fully interactive/immersive, real-time battlefield. The STE CSE delivers the software, application(s), and services that will enable the RVCT. The RVCT delivers the hardware and software necessary to integrate with CSE and exploits emerging technologies to expand and enhance training efforts.

The RVCT will be delivered with the STE IOC capability. All capabilities described in this SoN will be achieved by IOC. At IOC, the RVCT provides the capability to train at echelons Platoon through Battalion in a virtual environment. IOC will include the delivery of 28 RVCT-G, 10 RVCT-A, 1 Non-Rated Crew Member Station, 4 Unmanned Aerial Systems and 168 RVCT-Solider (Semi-immersive Dismounted Infantry) to Ft. Hood, TX.

STE Architecture
Per the STE CSE Statement of Need (SoN), the architecture is a critical and fundamental capability of the STE. The vision is for an architecture that supports real-time situational awareness across all modules/components and provides modularity, scalability, cybersecurity, accessibility, interoperability, and extensibility. The STE CSE is built on a modular open systems approach (MOSA). The MOSA design includes highly cohesive, loosely coupled, and severable modules that can be competed separately, acquired from independent vendors, and allows the STE to evolve with future technologies and capabilities. The CSE’s open architecture will seamlessly integrate and maintain concurrency with the Common Operating Environment, Mission Command Information Systems (MCIS), and Operational Platforms. The architecture
provides flexible, extensible data models, and application programming interfaces (API) that foster interoperability among internal native components and external services. The architecture will support the integration / interface of external components of the STE, while maintaining synchronization of data across all components of the STE. The architecture is loosely-coupled to support the upgrade and, when necessary, the replacement of STE modules. The STE CSE will converge the Live, Virtual, Constructive, and Gaming training capabilities. Convergence addresses challenges across stove piped systems, multiple terrain database formats, and reduce costly hardware at fixed sites.

Figure 1 provides a high-level, conceptual CSE architecture overview. The figure depicts the three main components (TMT, TSS, and OWT) and notional external interfaces, including the RVCT interface.

**Figure 1 CSE Architecture Overview**

**RVCT Architecture**

The RVCT challenges today’s form, fit, and function training capability platform representations, providing vendors the ability innovate. The RVCT architecture applies a user centered design approach to provide a system that is intuitive enough for a Soldier to operate and sustain and is designed to maximize trainability (e.g., skill retention, plug-and-play). The RVCT architecture supports reconfigurable Immersive and Semi-immersive representations of U.S. Army Air and Ground platforms, including crew stations. RVCT provides physical and digital representations of Air and Ground platform systems, sub-systems, and components including but not limited to: weapon systems, survivability equipment, communications, controls, panels, indicators, dashboards, displays, and platform-specific equipment. The RVCT architecture will support input and output devices such as headsets, audio, gauges / display feedback, software controllers,
hardware controllers, locomotion controllers, haptics, visual displays (e.g., virtual / augmented / mixed reality devices), body motion input, and weapon controller input.

The RVCT architecture supports Semi-Immersive representations of Unmanned Aircraft Systems (UAS) and dismounted Soldiers. The RVCT-A UAS trainer includes the operator and payload operator stations. The RVCT-G Soldier trainer provides users a semi-immersive interface to the digital representations of the Stryker dismounted Platoons, subordinate Squads, and combat loads. The RVCT-G Soldier and RVCT-A UAS trainers will support input and output devices such as software controllers, hardware controllers, visual displays, audio, and headsets.

Figure 2 below provides an initial, illustrative RVCT Reference Architecture of the main RVCT components and notional external interfaces.
RVCT and CSE Vendor Collaboration

RVCT and CSE vendors will support continuous collaboration, cooperation, and information exchanges to ensure a complete, integrated STE architecture. The CSE vendor and RVCT vendor(s), as part of the STE DEVOPS, will collaborate to develop an Application Programming Interface (API) to exchange information that enables RVCT. RVCT and CSE collaboration concepts are depicted in Figure 3 and Figure 4 below.
Collaboration areas include hardware control inputs, 3D models/animations, behaviors, animations, flight models, parametric data, audio, etc. The RVCT architecture focuses on the hardware, firmware, drivers, and synthetic platform interior representations. The RVCT architecture integrates with the CSE using an API that controls the synthetic platform external representations. The RVCT will integrate/bi-communicate with the CSE-provided simulation which includes with the operational flight program (OFP), Abrams Common Software Library (ACSL), Bradley Common Software Library (BCSL), and other platform / tactical software. The RVCT and CSE shall provide a digital representation and simulate the primary weapon systems, secondary weapon systems (coaxial and pintle-mounted), sensors (e.g., radar, infrared, acoustic, thermal, NVG), smoke grenade launchers, platform survivability equipment, munitions, unmanned capabilities, and weapon system effects specific to each rotary wing, ground track, and ground wheeled vehicle variant. See the CSE SoN Annex for additional information.

**Figure 3 CSE and RVCT Concept**

**Figure 4 CSE and RVCT OTA Collaboration Concept**

**Critical Technology Elements**

Throughout the performance of the RVCT effort, the vendor will identify and support continuous evaluation of critical technology elements that are needed for the IOC. These critical technology elements introduce risk to the STE. The RVCT vendors will also support the integration, evaluation, and documentation of other critical technology elements during user assessments or integration events at the STE CFT Technical Innovation Facility (TIF) or at the vendors’ integration lab. This will help enable the STE
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CFT to track and document (e.g., Technology Readiness Assessments [TRA], Technology Readiness Levels [TRL], Integration Readiness Levels [IRL]) the maturation of the critical technology elements across the STE.

RVCT Common

RVCT systems are required for air, ground, and dismounted collective training. The RVCT will participate as part of the STE to portray the complexities of multi-domain operations without impacting positive training transfer. The RVCT and CSE will stimulate sight, sound, and touch modalities without inducing simulator sickness. Sight provides the Soldiers a natural field-of-view and allows the Soldiers to see the synthetic environment from a first-person perspective. Sound allows the Soldier to hear and provide voice input into the CSE. Touch allows the Soldier to use physical and tactile controls of systems, subsystems, components, and MCIS interfaces to interact with the CSE. Where the Government has identified a physical control is required in the Annex D Fidelity Analysis, the Government is open to the vendor demonstrating virtual representations of the control – if the vendor can demonstrate that the virtual control promotes positive training transfer, does not promote negative training transfer, and does not distract from the training environment.

The RVCT:

1) Replicates current physical and functional fidelity of unaided and aided visual systems, subsystems, components, ancillary devices, and peripherals currently utilized in fielded aircraft and ground platforms.

2) Provides multiple depths of view, at an acceptable visual acuity for near (eye point), mid (dashboard), and far (out the window) views.

3) Provides the visual, tactile, and natural field of view for crew stations, instrumentation, and communications capabilities (e.g., voice and Digital Mission Management).

4) Provides the user the minimum hardware necessary to conduct collective training.

5) Provides virtual representations except when physical representations are required by the functional analysis.

6) Represents each air and ground platform form, fit, and function fidelity (e.g., Visual Cues, Tactile Cues, Functional, Physical).
   a) Form refers to the shape, size, dimensions, mass, weight, location, resistance, and other parameters of a component.
   b) Fit refers to the ability to manipulate the controls.
   c) Function refers to the extent to which the RVCT component functions like real components:
      i) Visual Cue or Wallpaper/Graphic components are represented by pictures or virtual images that do not function or have tactile stimulation.
      ii) Tactile Cue components are represented by physical objects that provide tactile stimulation but do not function.
      iii) Functional components are represented by physical or virtual objects that function as the component does in the platform.
      iv) Virtual/Non-functional replicates the actual item in 2D (e.g., LCD touchscreen or HMD) and does not perform functionality (does not include tactile/haptic sensation)
      v) Virtual/Function replicates the actual item in 2D (e.g., LCD touchscreen or HMD) and performs functionality (may include tactile/haptic sensation).
      vi) Physical components are physical replicas of a component (exact match) that functions as the component does in the platform.
      vii) Physical/Functional replicates the actual item and performs functionality (to include
161 tactile/haptic sensation).
162 vii) Physical/Non-functional replicates the actual item and does not perform function (includes
tactile/haptic sensation).
164 7) Provides the human machine interfaces that enables training audiences to interact with the CSE and
digital MCIS representations.
166 8) Maintains concurrency with the current fleet of U.S. Army Aviation rotary wing aircraft, U.S. Army
wheeled, and track ground platforms. Design considerations include U.S. Marine Corps rotary wing
aircraft and ground/amphibious wheeled and track platforms.
169 9) Is designed around a modular physical structure to enable efficient transportation, with minimal
ground handling equipment (GHE) requirements, to any part of the world. The RVCT design shall
comply with all applicable safety and health requirements so as to not present any uncontrolled safety
and health hazards to the operator or maintenance personnel throughout its life cycle. The weight
limit must adhere to a two person lift capability at a maximum height of three feet IAW MIL-STD-
170 1472G per case. A suite of RVCT cases will support fork lift operations.
172 10) Is available and completely functional at the PoN and is designed to connect to shore power or
portable generators.
175 11) Reconfigures and re-initializes within 30 minutes of exercise completion.
177 12) Enables the crew to utilize physical platform controls and virtual platform controls.
179 13) Provide the user radio and intercom hardware and software necessary to exchange communications
traffic with the CSE. Intercommunications system (aka intercom) traffic is internal platform
communications. Radio traffic is external to the platform, and can be impacted by the environment
(e.g., interference, jamming). The CSE TSS will route messages and apply environmental impacts. The
CSE TMT will collect radio and intercom traffic for replay during AAR.
181 14) Enables the user to operate using MCIS (e.g., digital messages) within the Common Operating
Environment (COE) Command Post Computing Environment (CP CE).

RVCT Air
The RVCT-A provides crewmembers a collective training capability that reconfigures into every U.S. Army,
Army National Guard, and Army Reserves fleet of reconnaissance & attack (AH), cargo (CH), and utility (UH)
rotary wing aircraft (see the Platform List Annex). The RVCT-A provides a synthetic collective aviation
trainer that is scalable from Platoon to Combat Aviation Brigades. The RVCT-A, will initially represent the
following six air platforms for IOC:

1. AH-64E Base (Understand 4.0 is current version but will change soon)
2. AH-64E FCR (Understand 4.0 is current version but will change soon)
3. AH-64E U/R (Understand 4.0 is current version but will change soon)
4. RQ-7Bv2 Shadow (NOTE: Current OFP 2.6.8-3954; next update TBD)
5. UH-60M (NOTE: Current OFP 5.0. 6.0 due fall of 2020).
6. CH-47F (OFP 9.2.2 DAFCS 3.3).

Crew members are broken down into two main categories:

2. Non-Rated Crew Members (NRCM): UAS Operator, UAS Payload Operator, Crew Chief (UH-60, UH-
72, CH-47), and Flight Engineer (CH-47).

The overall design concept behind the RVCT-A is shown in Figure 5. The RVCT-A will provide three key
interfaces that enable crewmembers to execute their appropriate individual skills in context of a collective
training event within the STE: Crew Visual Capability, Flight/Weapon Controls, and Weapon & Flight Systems Interface via Operational Flight Programs (OFP). The Crew Visual Capability provides Aviators and NRCMs an appropriate level of visual acuity. The NVG heads up display (HUD) capability provides aviators additional flight information and cueing. The Flight/Weapon controls include traditional controls (e.g., cyclic, collective, pedals, hoist, weapon) essential to support collective task execution. The Flight/Weapon controls provide accurate tactile control and switch options relative to the aircraft and capability (e.g., M240) and are correctly located relative to where the crew member is sitting (e.g., collective is always on the left side, cyclic between the legs). The Weapon & Flight Systems Interface provides aircrews a digital cockpit that supports flight and digital mission management operations and platform unique weapon interfaces that allow proper weapon use.

Figure 5 Overall STE RVCT-A Design Concept

- The CSE and RVCT exchange information to support the mission. CSE will provide accurate flight models to the RVCT. The RVCT will provide control inputs to the CSE. The CSE and RVCT vendors will collaborate to ensure correlated and proper handling/control characteristics. The RVCT-A and CSE incorporates a simulation-ready version of the actual aircraft OFP and achieves concurrency with fielded aircraft within 90 days after fielding.
- The aircrew will use the CSE TMT and capabilities of current and future Aviation Mission Planning System (AMPS) to perform mission planning. Crewmen will provide the aircraft unique (e.g., communications plan, weapons load, navigation) OFP AMPS inputs to the CSE. RVCT will be responsible to provide a capability for the soldier to access the CSE TMT tools for Mission Planning. CSE OFP generated Multi-Function Display (MFD)/Multi-Purpose Display (MPD) functionality is a critical requirement.

1) RVCT-A Aircraft Configurations
   a) Aviator Cockpit Configurations.
i) The RVCT-A enables an aviator to operate the aircraft in a standard configuration (See Figure 6).

ii) The RVCT-A provides Aviators access to correlated, primary flight controls (cyclic, collective, pedals).

iii) The RVCT-A provides higher fidelity physical flight controls, weapon interfaces, and select cockpit management controls with accurate tactile buttons and functions. See Annex D Fidelity Analysis.

iv) RVCT-A virtual interfaces cannot distract from mission execution, task standards, or lead to negative habit transfer.

v) The RVCT-A “Dash” contains the MFD/MPD system, various data displays, controls, buttons, and knobs (e.g., modern touch screen technology, minimal panel overlays).

vi) The RVCT-A CH-47 and UH-60 provides the aviator cockpit management controls that are essential to collective task execution (i.e., CH-47 Multi-function Control Unit, UH-60 Multifunctional Slew Controller).

b) AH Aircraft (See Figure 7).

i) The RVCT-A AH crews account for the augmented flight and weapon visual data displayed by the Integrated Helmet and Display Sight System (IHADSS).

ii) The RVCT-A AH will provide platform unique weapon interfaces for the copilot/gunner (i.e., Target Acquisition and Display Sight (TADS) Electronic Display and Control (TEDAC)

iii) The RVCT-A AH provides dashes containing displays/panels on the left and right side of the Aviators that support various data displays, controls, buttons, and knobs.

iv) The RVCT-A AH-64 is a tandem seated aircraft where the seats are configured differently than Figure 7.
c) UH and CH Aircraft (See Figure 8).

i) The RVCT-A UH and CH provides crewmembers (i.e., aviators and NRCMs) a Head-Mounted Display (HMD) that enables the crewmembers to view the CSE in night vision mode (e.g., NVG).

ii) The RVCT-A provides both aviators equal access to the center dash (see Figure 8) that includes the essential communication & navigation interface boxes.
d) UAS GCS Configuration (See Figure 9).

i) The RVCT-A UAS GCS provides a workstation for the UAS Operator and UAS Payload Operator.

ii) The RVCT-A UAS GCS workstation provides a display and control panel to fly (Operators Flight Control Interface [e.g., Shadow, Grey Eagle]) and perform payload operations (Operators Flight Control Interface [e.g., Shadow, Grey Eagle]).

![Figure 9 UAS GCS](image)

Figure 9 UAS GCS

e) NRCM positions. UH and CH aircraft are operated by one or more NRCMs serving in various flight and maintenance support roles (e.g., door gunners, hoist, and sling load operators). The RVCT-A (UH-60, UH-72 and CH-47) represent the form, fit, function, and performance of current crew member weapons systems and ballistics, hoists, sling load, and mission equipment (e.g., communications panel, countermeasure switches, pendants). (See Figure 10)

i) The RVCT-A UH-72 provides search light hand control unit and XM151 hand control unit.

ii) The RVCT-A UH-60 and CH provides a cargo hook view space at a level of visual feedback that ensures the NRCM is aware of proper operations.

iii) The RVCT-A UH, CH, UAS provides the NRCMs the ability to communicate with the Aviators via the aircraft’s Internal Communication System (ICS) and handheld push to talk capabilities.

iv) The RVCT-A CH and UH (except for the UH-72) provides the NRCM the ability to man, operate, and employ platform unique weapon interfaces for the platform’s current door gun system (i.e., M240) that reflects the impact of airstream resistance on the system, weapon recoil, and allows immediate action / emergency procedure drills.

v) The RVCT-A enables the NRCM to visually and physically operate the hoist cargo pendent controls.

vi) The RVCT-A CH and UH (except the UH-72) provides a capability for the NRCM to visually observe sling load operations for the center cargo hook.

vii) The RVCT-A UH-60, CH-47, and UH-72 cabins represents the functional and physical fidelity that enables NRCM to lean out windows and doors to view the sides of and underneath aircraft.
f) CH-47 (See Figure 11)
i) The RVCT-A CH-47 provides a flight engineer maintenance panel.
RVCT Ground

The RVCT-Ground is reconfigurable into every ground platform in the Army inventory as outlined in the Platform List Annex. The RVCT-G provides a synthetic collective trainer that is scalable from Platoon to Armor, Infantry, and Stryker Brigade Combat Teams. The following nine ground platforms are represented at IOC:

1. M1A2 SEPv2 / M1A1 SA
2. M2A3/M2A2 ODS SA
3. M1126 Stryker Infantry Carrier Vehicle (ICV)
4. M1151 Up Armored
5. M915 Line Haul Tractor
6. M1120 Load Handling System
7. M1075 Palatized Load System (PLS)
8. M1278 JLTV General Purpose (GP)
9. M977 Cargo Truck

1) Platform and Tactical Software. The RVCT-G will interface with the CSE to interact with the ACSL, BCSL and other platform / tactical software.

2) Crew / Weapons Systems Interface and Controls.

   a) The RVCT-G will represent all ground platform personnel stations (i.e., Commander, Driver, Gunner, Loader and Non-crew Dismounts).

   b) The RVCT-G accurately represents physical tactile controls and virtual dashboards that are in the correct location relative to where the crew member is located. Below is an initial list of RVCT-G crew positions and controls. See Annex. D Fidelity Analysis for delineation between other required physical and virtual controls.

   i) Vehicle Commander: Weapon system control, hand stations, switches, optics/display, triggers, CROWS handle (e.g., M1A2 SEPv2, M1151, M1075, M915, M977, M1126, M1278), radios.

   ii) Driver capabilities: Steer vehicle, change gear (e.g., forward, reverse), accelerate vehicle, brake vehicle, and control/view dashboard, switches, radios.

   iii) Gunner (combat vehicle): Weapon system control, sensor controls, hand stations, sight/fire control panels, switches, optics/display, CROWS handle (e.g., Stryker, JLTV), manual drivers, manual firing devices, triggers, chest guard, radios.

   iv) Loader: Loader’s periscope, loading main weapons systems, loader’s weapons systems, radios.

   v) Gunner/Air Guard (wheeled vehicle): Grip, aim, fire, and reload weapon.

3) Vehicle Configurations. The following vehicle configurations provide the crew compartments.

   a) M1A2 SEPv2 / M1A1 SA (Figure 12)
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RVCT – Ground

M1

Driver
- Instrument Panel
- Pedals
- Yoke
- Seat

Commander
- Hatch
- Sight
- Controls
- Seat

Gunner
- Controls
- Sight
- Seat

Loader
- Hatch
- Breach
- Seat
- Ammo Storage

Figure 12 M1A2 SEPv2 / M1A1 SA

b) M2A3/M2A2 ODS SA (Figure 13)

RVCT – Ground

M2

Driver
- Instrument Panel
- Pedals
- Yoke
- Seat

Commander
- Hatch
- Sight
- Controls
- Seat

Gunner
- Controls
- Sight
- Controls
- Seat

Dismounts
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount

Figure 13 M2A3/M2A2 ODS SA

c) Stryker Infantry Carrier Vehicle (ICV) (Figure 14)

RVCT – Ground

Stryker

Driver
- Instrument Panel
- Pedals
- Yoke
- Seat

Commander
- Hatch
- Video Display
- Electronic Terminal
- Seat

Gunner
- Controls
- Sight
- Controls
- Seat

Dismounts
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount
- SI Dismount

Figure 14 Stryker Infantry Carrier Vehicle (ICV)
d) Up Armored M1151 (Figure 15)
e) M915 Line Haul Tractor/ M1120 Load Handling System/ Palletized Load System (PLS)/ M977 Cargo Truck (Figure 16)

**PLS, LHS, M915, and M977 CONFIGURATION**

**DRIVER**

- Panel
- Steering Wheel
- Pedals
- Seat

**TC**

- Radio Sys
- JBC-P (MCIS)
- Seat

Figure 16 PLS, LHS, M915, and M977

f) JLTV General Purpose (GP) (Figures 17 and 18)

**JLTV CONFIGURATION (W/ GUNNER)**

**DRIVER**

- Panel
- Steering Wheel
- Pedals
- Seat

**TC**

- Radio Sys
- JBC-P (MCIS)
- Seat

**GUNNER**

- Weapon System (M2/MK19/M203/M249)
- Controls (Radio Sys/Turret)
- Turret

Figure 17 JLTV (W/Gunner)
The RVCT Soldier will include a semi-immersive capability that supports mounted and dismounted Soldier training. While the capabilities for this will be captured and expanded over time within CSE, the IOC RVCT solution is seen as an interim step to the desired future common solution set with Soldier/Squad Virtual Trainer (S/SVT) across all Army Soldiers. The Bradley Fighting vehicle requires up to six Soldier dismounted capability; Company set is 86 dismounted semi-immersive trainers. The Stryker vehicles require up to nine Soldier dismounted capability (variant dependent); Company set is 126 dismounted semi-immersive trainers. The RVCT Soldier includes: Weapons; Ammunition; Chemical, Biological, Radiological, Nuclear, and High Explosive (CBRNE) Equipment; Navigation Equipment; Optics Equipment; Communications Equipment; and Medical Equipment. Stryker Platoon Weapons/Optics:

- M4A1 Rifle
- M320 Grenadier
- M249 Squad Automatic Weapon
- M240L
- M9/M17
- AN/PVS 14
- AN/PSQ 20
- Night Vision Goggles
- CLU-JAVELIN
- Radio Set

Cybersecurity

The STE requires a secure design to directly connect to DoD infrastructure and systems. The RVCT needs to comply with Risk Management Framework (RMF) (DoDI 8510.01) to achieve authorization for secure operations. To do this the vendor will follow the guidance as outlined by Army Regulation 25-2. The RVCT will be included in the same RMF boundary as the CSE.

Risk Management Framework

The vendor will need to plan and resource RMF support from the beginning of the prototype. The vendor will need to work with the Government to develop the RMF Implementation Plan to determine applicability of security controls in support of the Government Cybersecurity Strategy. The vendor needs to develop the Systems Security Plan (SSP) that details how the vendor will comply with security controls. As part of the SSP the vendor will need to use National Information Assurance Partnership validated components and to develop a patch management plan that includes Information Assurance Vulnerability...
Alert (IAVA) and DISA Security Technical Implementation Guides. The vendor needs to document all security control non-compliance or mitigations in the Plan of Action and Milestones.

**IATT / ATO Documentation**

This effort does not require a standalone Interim Authority to Test or Authority to Operate (ATO), as the RVCT and CSE will be covered under the same ATO.

**Development Environment**

The development environment will also need to comply with certification requirements for development, management, and storage of data. This will include Self Assessments as well as RMF certification. Refer to latest NECTOM Tactics, Techniques, and Procedures for the current certification requirements.

**Cybersecurity Incident Reporting**

For response and reporting of any cybersecurity related incidents the contractor will comply with the program’s Incident Response Plan.

**Cybersecurity Training**

The vendor needs to ensure that Cybersecurity, System Administrators, or Network Administrators personnel meet the minimum requirements for technical category Level II and workforce management category Level I with minimum certification as defined by DoD 8570.01-M, Information Assurance Workforce Improvement Program including:

- DoD-approved information assurance workforce certifications appropriate for each category and level as listed in the current version of DoD 8570.01-M; and
- Appropriate operating system certification or training for information assurance technical positions as required by DoD 8570.01-M.

Upon request by the Government, the contractor shall provide documentation supporting the information assurance certification status of personnel performing information assurance functions. The Government will deny contractor personnel from performing information assurance functions on DoD information systems if they do not have proper and current certifications.

**Hardware Considerations**

The RVCT shall have a defined hardware configuration which at a minimum satisfies Government-identified requirements. Hardware configurations should illustrate the trade space between visual realism; simulation fidelity (e.g., communications, crew interfaces); tactile fidelity; scenario size and type; available hardware; and other considerations that impact the training capability. Identification of Commercial Off-the-Shelf (COTS) components should include factors related to Diminishing Manufacturing Sources and Material Shortages and focus on the extension of the COTS lifecycle and reduction of technology refresh requirements due to increased capability drops.

**ANNEXES.**

- Annex A: Glossary
- Annex B: Documents/References
- Annex C: RVCT Use Case
- Annex D: Physical Fidelity Analysis (to-be-supplied after award due to ITAR restrictions)
- Annex E: Test Strategy
- Annex F: Platform List
- Annex G: Product Support
Annex H: CSE Statement of Need dated 29-Mar