

STATEMENT OF OBJECTIVES
Rapid Airfield Damage Repair
(RADR) Command and Control (C2)
Simulator

28 Feb 17

1. Objective

- 1.1. This statement of objectives describes the requirements for creating a Rapid Airfield Damage Repair (RADR) Command and Control (C2) virtual reality simulator.
- 1.2. Specific objectives include:
 - Create a virtual reality simulator to provide an immersive training environment for the management of the airfield recovery activities (Rapid Damage Assessment (RDA), Rapid Explosive Hazard Mitigation (REHM), and Rapid Damage Repair (RDR)).
 - Provide all associated hardware (i.e., computers, switches, projectors, etc.).
 - Provide on-site training, to include operator use, instructor (facilitator) use, and system maintenance.
 - Provide technical support for twenty-four (24) months after final delivery.

2. Key Personnel Requirements

- 2.1. The following positions are identified as Key Personnel: Project Manager, Technical Lead, Senior Software Engineer, and 3D Modeler.
- 2.2. Resumes for these four (4) designated “Key Personnel” shall be submitted for evaluation as Attachment 1 to the offeror’s proposal. Resumes shall detail education, applicable expertise, experience, and relevant past performance in similar roles.
- 2.3. The Contractor agrees Key Personnel shall not be removed from the contract work or replaced without the concurrence of the Contracting Officer or an authorized representative.
- 2.4. All requests for approval of substitutions for Key Personnel must be in writing and provide a detailed explanation of the circumstances necessitating the proposed substitutions. The request must contain a resume for the proposed substitute, and any other information requested by the Contracting Officer. The Contracting Officer shall promptly notify the Contractor of approval or disapproval in writing.

3. Technical Requirements

- 3.1. Contractor shall have strong knowledge and relevant past performance in related application development for the United States Air Force Civil Engineering community; specifically in geospatial and enhanced visualization.
- 3.2. Contractor shall have documented past experience developing Air Force Civil Engineering Tools to include the Geospatial Expeditionary Planning Tool (GeoExPT), Installation Recovery After Attack (IRAA) and GeoExPT ADR Synchronization (GAS).

- 3.3. Contractor shall have experience with the AF Civil Engineer command structure; namely the Civil Engineer Unit Control Center (CE-UCC) and the Emergency Operations Center (EOC).
- 3.4. Contractor shall have documented experience and knowledge of the Air Force Airfield Damage Repair (ADR) business process. This includes an intimate knowledge of the following documents:
 - AFMAN 91-201, Explosives Safety Standards
 - AFMAN 10-100, Airman's Manual
 - AFPAM 10-219, v1, Contingency and Disaster Planning
 - AFPAM 10-219, v2, CE Disaster and Attack Preparations
 - AFPAM 10-219, v3, CE Disaster and Attack Recovery Procedures
 - AFPAM 10-219, v4, Airfield Damage Repair Operations
 - AFTTP 3-32.11, Airfield Damage Assessment
 - AFTTP 3-32.12, MAOS Selection
 - AFTTP 3-32.13, Airfield Marking After Attack
 - AFTTP 3-32.14, Airfield Lighting After Attack
 - AFTTP 3-32.15, AAS Installation After Attack
 - Draft ADR Tactics, Techniques, and Procedures (TTPs)
 - Technical Order 35E2-4-1, Repair Quality Criteria System for Rapid Runway Repair
 - UFC 3-270-07, O&M, Airfield Damage Repair
- 3.5. Contractor shall implement an agile software development process similar to the Scrum method. This provides an iterative and incremental development path enabling more interaction between the development staff and the government between defined software release candidates.
- 3.6. Contractor shall perform a market study of available software development tools prior to commencement of software development activities. Study results will be utilized by the government to guide development activities. Information about potential solutions include, but are not limited to: yearly license/sustainment cost, extensibility of product, integration with existing AF software portfolio, pros, cons, and associated technical and or programmatic risks.
- 3.7. Contractor shall create a Software Design Document (SDD) to describe the architecture of the simulator. It shall include, but not be limited to, the purpose and overview of the simulator, the design considerations and constraints, the system design, and the data structures.
- 3.8. Contractor shall create a Software Requirements Specification (SRS) to describe the functional and non-functional requirements as the user interactions of the simulator. The SRS shall also be utilized to produce use cases for testing protocols.
- 3.9. Contractor shall create applicable Department of Defense Architecture Framework (DoDAF) documents. DoDAFs provide visualization infrastructure for specific stakeholders concerns through viewpoints organized by various views. These views are artifacts for visualizing, understanding, and assimilating the broad scope and complexities of an architecture description through tabular, structural, behavioral, ontological, pictorial, temporal, graphical, probabilistic, or alternative conceptual means. Sufficient views shall be created to support development of Risk Management Framework (RMF) package to simulator accreditation.
- 3.10. Contractor shall support the development of RMF documents to support Certification and Accreditation (C&A) to achieve an Authority to Operate (ATO).
- 3.11. Contractor shall develop an embedded Help File for all tools and capabilities included with the simulator. Help File shall be searchable and printable.

- 3.12. Contractor shall include a library of all reference material within the simulator and the user shall be able to search internally to each document. This material shall be accessible to users during use of the simulator.
- 3.13. Contractor shall develop a database of assets that can be placed within the virtual reality scene. The user shall be able to place an unlimited number of assets within each session (barring technical issues that may be addressed by the Contractor). The Contractor shall develop 3D models to represent the varying levels of user interaction (equipment, materials, personnel, and vehicles) within the simulator. 3D models shall be proofed and approved by the Contractor Officer prior to implementation within the simulator.
 - 3.13.1. The Material assets include, but are not limited to: 20' CONEX, 10' CONEX, 5' CONEX, asphalt (bucket), asphalt (super sack), asphalt (pile), asphalt row), citric acid (bucket), citric acid (bag), flowable fill (bucket), flowable fill (super sack), rapid set concrete (bucket), rapid set concrete (super sack), ¾" crushed stone (pile), 2" choke stone (pile), curing compound (bucket), release agent (bucket), sand (pile), geotextile fabric (roll), paint (spray can), paint (bucket), paint (barrel), glass bead (bag), fiber reinforced mat (FFM), AM-2 matt, fiber reinforced panel, plastic sheeting (roll), Powers bolts (ea), tri-talon anchors (ea).
 - 3.13.2. The Equipment assets include, but are not limited to: compact track loader (CTL) 4/1 bucket, CTL bucket, CTL 45" rock saw, CTL 60" rock saw, CTL breaker, CTL broom, CTL cold planner, CTL fork, CTL miller, CTL roller, CTL asphalt burner, CTL backhoe, CTL grappling hook, CTL push blade, CTL magnet, excavator 24" bucket, excavator 48" bucket, excavator thumb, excavator breaker, excavator plate compactor, telehandler forks, telehandler bucket, telehandler work platform, walk behind saw, dump truck water skid, front end loader (FEL) forks, FEL boom, FEL bucket, FEL 4/1 bucket, FEL push blade, FEL magnet, walk behind plate tamper, walk behind jumping jack compactor, air compressor, light all, generator, hydraulic power head, jackhammer, paint striper, mobile aircraft arresting system, mobile runway edge sheave, EALS, traffic cones, and MAOS Marking Kit, 4-pax ATV/RTV, inclement weather kit, FRP tool kit, AM-2 tool kit, and ADR tool trailer.
 - 3.13.3. The Vehicle assets include, but are not limited to: asphalt recycler, CTL, bull dozer, 5-ton dump truck, 10-ton dump truck, wheeled excavator, tracked excavator, FEL, telehandler, A/T fork lift, warehouse forklift, water distribution truck, motor grader, industrial tractor with rotary broom, vibratory roller, pneumatic roller, vacuum sweeper, volumetric mixer, 5-ton tractor trailer, 10-ton tractor trailer, 40ft flatbed trailer, ADR tool trailer, 22-ton tilt trailer, 50-ton low boy trailer, water trailer, 3-pax pickup truck, 6-pax pickup truck, stake-bed truck, passenger van, 30-pax school bus, 60-pax school bus, HMMWV, LMTV, fuel truck, mobile mechanic truck, and MRAP.
 - 3.13.4. Contractor shall utilize specified manufacturer information for dimensional representation of drawn assets, but will not include it in the rendering. For example, the CTL will be drawn to the specification of a Caterpillar 279D and can be drawn yellow, but neither Cat nor 279D shall be included. The specific manufacture make and model and performance specifications will be managed within the simulator only for performance tracking.
 - 3.13.5. The assets developed for use within the simulator shall have, but not be limited to the following minimum configurable attributes:
 - Personnel. Accountability, Last Name, Frist Name, Rank, Personnel ID, Occupational Code, Team, and qualification (i.e. driver's license).

- Materials. Type and Unit of Measure.
 - Equipment/vehicles. Type, Make, Model, License Number, Status, Connection Type, Attachment Type, Fuel Rate, and Fuel Capacity.
- 3.14. Contractor shall develop distinct symbology to represent the various states of damage repair. The states shall include, but not be limited to upheaval marked, cut with walk behind saw, cut with rock saw, broken, excavated, backfilled with sand, backfilled with crushed stone, backfilled with choke ballast, backfilled with flowable fill (dry placement), backfilled with flowable fill (wet placement), flowable fill cap (initial set), flowable fill cap (final set), rapid set concrete (initial set), rapid set concrete (final set), asphalt (placed), asphalt (cooled), FFM, FRP, and AM2.
- 3.15. The simulator functionality is described in terms of an “Instructor” and a “Student”. The Contractor shall determine the appropriate tools and visualization capabilities resident within each user environment in order to provide the necessary feedback to properly exercise Command and Control. Typically these functions are performed as a single Instructor controlling one or more Students; the long term design of the simulator shall support a single person acting as both Instructor and Student as well multi-user environment.
- 3.15.1. The major duties of the Instructor are:
- Set up the virtual training environment (configure the map interface (i.e., load the virtual environment, customize the symbology, set the environment conditions); layout damage and UXO; determine allowable equipment, materials, manpower, and vehicle sets).
 - Actively manage the training sessions (provide exercise injects, provide responses to Student input (White Cell capability); and manage exercise time.
 - Provide post exercise analysis and critique.
- 3.15.2. The major duties of the Student are:
- Determine requirement/quantities, configuration, and deploy equipment, materials, manpower, and vehicles.
 - React to instructor provided injects.
 - Query Instructor (White Cell).
 - Look up pertinent reference materials (i.e., TTPs, user manuals, technical orders, etc.).
- 3.15.3. Students can represent various personnel and roles within a session. The role shall be established at the time of Student login
- RADR Officer in Charge (OIC). The RADR OIC is the primary facilitator between the CE-UCC Commander, Logistics Chief, Crater Chief, and the Support Chief. The OIC assists RADR team Chiefs by addressing problems they cannot resolve themselves. The OIC does this by requesting support from other RADR team Chiefs, or through the CE UCC Commander when support is required from sources external to CE. The RADR OIC must work closely with Operations Personnel (3E6X1) to track personnel, vehicles, equipment, and materials (materials will be tracked by the Logistics Chief and updates reported to the RADR OIC) and ensure resupply actions happen in a timely manner to support future requirements.
 - Logistics Chief. The Logistics Chief manages operations of the warehouses and batch plants. The Logistics Chief’s primary responsibility is to make certain logistics teams (i.e., warehouse and batch teams) are completing their assigned tasks as efficiently as possible and to help remove obstacles that negatively impact their operations. He or she directly contacts the Crater or Support Chiefs when logistics teams require their assistance. The

Logistics Chief contacts the RADR OIC when support is needed from external organizations (e.g., fuels, vehicle maintenance, etc.). In addition to tracking repair materials (e.g., backfill material, capping material, FOD covers, etc.), the Logistics Chief also manages asphalt production including rap stockpiles, batch start times, batched hot mix quantities, hot mix maximum hold times, and delivery schedules. Finally, the Logistics Chief notifies the RADR OIC when logistics teams have completed their primary tasks and are available to assist elsewhere.

- Support Team Chief. The Support Chief manages the five support teams' operations (i.e., FOD, Marking, Striping, EALS, aircraft arresting system [AAS], and WaFERS) and informs them when they should proceed to the airfield to begin work. The Support Chief's primary responsibility is to make certain the support teams complete their assigned tasks as efficiently as possible and to help remove obstacles that negatively impact their operations. He or she directly contacts the Crater Chief or Logistics Chief when support teams require their assistance. The Support Chief contacts the RADR OIC when support is needed from external organizations (e.g., fuels, vehicle maintenance, etc.). Finally, the Support Chief notifies the RADR OIC when support teams have completed their primary tasks and are available to assist elsewhere.
 - Crater Chief. The Crater Chief actively manages all MAOS crater repair operations. The Chief's primary responsibility is ensuring the crater repair teams are progressing in a timely manner and addressing disruptions such as equipment break-downs, material shortages, or personnel problems. This Chief communicates with the Logistics Chief and Support Chief when support is required from, or needed by, logistics and support teams. He or she has direct communications with the Warehouse Team Leads supporting the Crater Repair Teams. The Crater Chief communicates with the Logistics Chief when support is needed from the Batch Plants. The Crater Chief contacts the RADR OIC when support may be needed from external organizations (e.g., fuels, vehicle maintenance). Also, the Crater Chief informs the RADR OIC when crews have completed their primary task and are available to assist elsewhere.
 - Team Lead. Team leads actively manage all equipment, material, personnel, and vehicles associated with a defined capability. Teams are aircraft arresting system (AAS), emergency airfield lighting system (EALS), marking, striping, crater repair, warehouse, haul, batch plant, FOD prevention, and Explosive Hazard Mitigation.
- 3.16. Contractor shall determine the optimum hardware configuration for each Instructor and Student workstation, as well as the entire simulator package. Examples of hardware is laptops, monitors, switches, projectors, speakers, etc. The system shall be optimally packaged to support movement without dollies (i.e., packaged in ruggedized plastic carrying cases). The goal is to limit hardware choices to items available thru standard AF information technology (IT) procurement channels.
- 3.17. Each workstation shall be able to perform all Instructor and Student rolls, and be controlled by the user signing in as either an Instructor or Student. Each workstation shall be able to link with other workstations for a collaborative environment.
- 3.18. The development is described in spiral development. Each spiral is intended to be a building block of the entire development effort. Each subsequent spiral shall build on the capabilities of the previous spiral. The Contractor shall notify the government prior to deleting or changing capabilities between spirals. For example, when

implementing a multi-user environment, all capabilities to perform as a single-user must be retained. The Contractor shall draft release notes at the time of fielding of all spirals and service patches.

3.18.1. Spiral 1

- The Contractor shall deliver 2 (two) complete systems with all associated hardware, cabling and cases. Hardware shall be a single device configured to support 1 (one) Instructor and 1 (one) student.
- Single-user is defined as one Instructor interacting with one Student on a single workstation. The only option for the Student shall be a Crater Repair Team Lead.
- The Contractor shall provide the ability to start a new session or open an existing session.
- The Contractor shall provide the ability to save all configuration settings within a session to be imported to a new session.
- The Contractor shall provide an instant message capability between the Instructor and all Students. The capability shall enable text and pictures. Where an instance is the Instructor and Student operate on a single computer, all text will go to a chat log and now work across multiple computers.
- The Contractor shall prepare a computer generated, three-dimensional representation of the Flag Training Site, Tyndall AFB, FL. The environment and all associated assets represented within it, shall be viewable in both two- and three-dimensions. The environment shall support first, third person, and top-down exploration. The two-dimension representation shall mirror as closely as possible the AF GeoBase mapping standard.
- Navigation tools. The user shall be able to navigate around both the 2D and 3D with either the keyboard arrow controls, the mouse, via a touch screen, or joystick (if provided by the vendor). These controls include dynamic pan and zoom in/out capabilities. The user shall also be able to zoom to a specified (typed coordinate or picked from map interface) location. The user shall have the ability to freely rotate the map (by defined input or dynamically as navigating) or confine the view to North always up.
- Session view. The view shall be presented as third-person view. The Instructor or Student shall be able to change the overall view perspective (first or second person, or overhead perspective) and view area (elevation of the camera) of the active session; this specifically relates to how the session is being recorded for replay.
- Screen captures. The Instructor and Students shall have the ability to take screen captures to be stored in a standard image format (i.e., .jpg, .png, .gif, etc.) in a system folder created with the name of the session. Metadata captured with the picture shall contain, but not be limited to date, time, session name, session time, environmental conditions, coordinate (MGRS) of the scene center.
- Screen Video. The Instructor and Students shall have the ability to record the current view, stored in a standard format (i.e., mpeg) in a system folder created with the name of the session. Metadata captured with the picture shall contain, but not be limited to date, time, session name, session time, environmental conditions, coordinate (MGRS) of the scene center.
- Layer Controls. To the maximum amount possible, the user shall have the ability to turn features on or off within the virtual environment.
- Grids. The Pavement Reference Marking System (PRMS) shall be

established for each take off/landing surface and Military Grid Reference System (MGRS) shall be established for the bounds of the virtual environment. To maximum amount possible, these grids shall be viewable in both two- and three-dimensions. These grids shall be drawn as layers so the user may toggle them on or off.

- The user interface shall report the coordinate (X and Y) of the cursor location within the map interface.
- Manual damage items. This Instructor shall have the ability to add and remove unlimited damage, repair zones, and MAOS items to a session. Items include craters and UXO. Each feature shall be rotatable, sizable, and where appropriate classed (UXO to the sub-feature class (A1-A4, B1-B2, C1-C13, D1-D7, E1-E13, F1-F7).
- Environmental conditions. The Instructor shall have the ability to set and control the time of day, percentage of overcast/cloud coverage, moon/starlight at night, temperature, wind speed and direction, precipitation type and amount, fog density, and smoke density.
- Session Assets. Instructor shall be able to develop initial list of assets (equipment, material, personnel, and vehicles) available to the Students by session. Where appropriate, the assets shall be managed by the applicable Unit Type Code (UTC). The Instructor shall have the ability to adjust the amount and status of all assets during the session.
- Performance parameters. The Instructor shall have the ability to set the performance parameters for all assets utilized in a session. These include but are not limited to, production rates (i.e., walk behind saw cuts 1 linear foot per minute) and material properties (i.e., initial cure of rapid set concrete is 45 minutes).
- The Contractor shall develop the capability to import equipment, material, personnel, and vehicle data from IRAA. The Instructor shall have the ability to adjust the amount and status of all performance parameters during the session.
- Session Control. The Instructor shall have the ability to control the start, end and major milestones of the established sessions. Sessions shall follow the standard USAF Alarms Standards of ALARM GREEN (attack is not probable), ALARM YELLOW (attack is probable in less than 30 minutes), ALARM RED (air or ground attack is imminent or in progress), ALARM BLACK (attack is over, CBRN and explosive hazards are suspected or present).
- Session time. Instructor shall have the ability to control the time (play speed of the session). Time control ranges shall be start, stop, pause, and ½X, real time, 2X, 4X, 8X. Instructor shall also be able to pause time and jump to a specified time. In cases where the Instructor jumps forward in time, the session shall proceed with current settings and assets shall be moved and/or expended accordingly at the current configuration settings.
- Instructor set up. The Instructor shall determine the Minimum Operating Strip (MOS) (manually entered or selected from the map) and Minimum Airfield Operating Surface (MAOS) (selected from the map).
- Student session setup. The student shall be determine what available assets or UTCs will be used in the session. They shall be provided the ability to determine staging locations (selected from the map) and configuration, and when prompted what convoy routes (selected from the map) will be utilized. They also are able to set the asset order of the convoy. Once identified, the

Student will determine (selected from the map) what direction the repairs are performed within the identified repair zone.

- The simulator shall run in automatic mode based on the setup parameters. This means assets will automatically convoy from the staging areas to the designated repair zone. Each sub crew will automatically travel from repair to repair based on the documented vehicle specification. Once tasks are completed, the Student will be asked to either have the assets to stay at the designated repair zone for additional taskings, proceed to another repair zone, or return to the staging area. The only control the Instructor or Student shall have is to change the performance characteristics of the assets.
- Contractor shall develop tools and products to capture data to support post-training reviews (referred to as Hot Washes). Tools include, but are not limited to ability to recall screen shots, ability to search stored video by time, graphic timeline of key milestones, replay of chat sessions, list of Instructor issued commands, list of Student responses and key actions taken, and a summary report of all process times.

3.18.2. Spiral 2

- The contractor shall deliver 7 (seven) complete systems with all associated hardware, cabling and cases.
- The contractor shall update the systems delivered in spiral one with current hardware and software.
- Contractor shall expand capability to one Instructor and up to 9 (nine) students; enabling ADR OIC, Crater Chief and 7 (seven) Repair Team Leads.
- The contractor shall prepare virtual environments representing the Construction and Training Site (CTS) at Ramstein AB, GE and the Pacific Regional Training Center (PRTC) at Andersen AFB, Guam.
- The Contractor shall add people to asset database. The people do not need to actually perform assigned mission (i.e., actually be shown digging), but shall be located spatially correct at worksite.
- Dashboards. The contractor shall develop customized dashboards for the identified Student roles to display the current status and key performance indicators for the managed tasks.
- Damage items. Contractor shall expand the damage items to include debris, debris fields, camouflets, crater fields, spall, spall fields, UXO, and unspecified damage. Each feature shall be rotatable, scalable, and where appropriate classed. During a session, when appropriate, additional damage shall be automatically added if warranted by a Student action (i.e., mitigating a UXO may result in a spall).
- Contractor shall develop capability to show material accumulation during times of precipitation, appropriate materials shall be placed within the surface features (i.e., snow shall accumulate, and rain shall produce puddles and runoff if appropriate).
- Performance parameters. The contractor shall extend the performance parameters to include asset capacities (i.e., truck 1 has a 2" ball, can carry 6 passengers, and gets 20 miles per gallon of fuel).
- Attack Tool. Contractor shall develop a tool to enable the Instructor to create an attack scenario. Instructor shall provide number, impact coordinates (manually entered or selected from the map) and dispersal area (manually entered or selected from the map) of inbound objects; coupled with expected damage (percentage of each damage type, sizes for camouflets craters and

spalls, type of UXO, percentage of above and below grade UXO)). The tool then auto creates and renders damage. Instructor will also provide options for damage intersecting available assets (item hitting a vehicle may destroy it limited some of its capability). Instructor may also kill or injure personnel. Tool will then generate list of damage/destroy assets and injured/killed personnel.

- Contractor shall develop matching equipment and vehicle assets representing assets damaged by attack.
- Contractor shall develop ability to interact with the GAS server.
- Contractor shall enable two –way communication with IRAA – desktop via GAS. The IRAA operator is considered another Student and can act as several of the defined roles. Information shared between IRAA and the simulator include, but are not limited to information and characteristics of personnel, equipment, material, vehicles, team configurations, and process times.
- Contractor shall develop tools that either mimic the Dead, Injured, Missing, Extra (DIME) business process or emulate the DIME process performed by IRAA – mobile.
- Contractor shall enable two-way communication with GeoExPT via GAS. The GeoExPT operator is considered another Student and act as several of the defined roles. Information shared between GeoExPT and the simulator include, but are not limited to the MAOS candidates, the published MAOS, damage features, repair zones, repair quality criteria (RQC), and repair status.
- Contractor shall implement ability to import CIP or GeoExPT data elements to create a virtual environment. It is understood this may not be implementable within the 3D environment or can result in features being extruded from 2D information via being fully rendered.
- Contractor shall implement the Tasks business process controlled by GAS.
- Instructor shall have the ability to provide injects to a session. Injects include, but are not limited to request for personnel (transfer between teams), injure or kill personnel, inject additional damage (i.e., inject a UXO during excavation operations), break equipment or vehicles (i.e., out of fuel, hydraulic issues, flat tire, thrown track, in-operational without an apparent reason, material hardened in chute, broken saw teeth, material not usable, etc.).
- Instructor shall have the ability to change the condition of damaged or repaired features (i.e., dowels present in pavement, water present in, damage parent slabs during breaking or excavating, RQC out of tolerance, etc.)
- Student shall have the ability to determine direction of FOD, debris removal and delivery of materials at repair zones.
- Session view. Contractor shall develop first-person perspective from any asset utilized within the session.
- Student shall have the capability to take manual control of any asset managed by their position. This includes, but is not limited to the ability to view the session from that point of view, manually move the asset with keyboard arrow keys, mouse, or joystick if provided, provide a point-to-point task and have the asset self-navigate while missing other assets, damage items, or published constraints (i.e., explosive arcs, haul lanes, etc.).
- Contractor shall extend Hot Wash capabilities to incorporate data generated

during this spiral.

3.18.3. Spiral 3

- The Contractor shall deliver 9 (nine) complete systems with all associated hardware, cabling and cases.
- The contractor shall update the systems delivered in spirals 1 and 2 with current hardware and software.
- Contractor shall expand the capability to one Instructor and up to 9 (nine) students; enabling ADR OIC, Crater Chief, Logistics Chief, 7 (seven) Repair Team Leads, 7 (seven) Warehouse Leads, 7 (seven) Haul Team Leads, 4 (four) Batch Plant Team Leads, and 1 (one) Foreign Object Debris (FOD) Removal Team Lead.
- Students shall have the ability task people assets to walk from location to location.
- Students shall have the capability to configure the repair material loads on the tractor trailers.
- Students shall have the capability to determine the drop location of materials at each repair zone.
- Students shall have the capability to move materials from drop off locations to adjacent to designed repairs.
- Students have the ability to manage asphalt production, storage, and delivery.
- Students shall have the ability to utilize crushed stone and FOD covers.
- Students shall have the ability to control FOD Removal Team Assets.
- Contractor shall expand vehicle asset control to other vendor provided Operator Control Unit (OCU). This capability most likely is executed thru GAS and enable an OCU to actually drive an asset around the virtual environment.
- Contractor shall extend Hot Wash capabilities to incorporate data generated during this spiral.

3.18.4. Spiral 4

- The Contractor shall deliver 9 (nine) complete systems with all associated hardware, cabling and cases.
- The contractor shall update the systems delivered in spirals 1, 2, and 3 with current hardware and software.
- Contractor shall expand the capability to one Instructor and up to 16 (sixteen) students; enabling ADR OIC, Crater Chief, Logistics Chief, 7 (seven) Repair Team Leads, 7 (seven) Warehouse Team Leads, 7 (seven) Haul Team Leads, 4 (four) Batch Plant Team Leads, 1 (one) Foreign Object Debris (FOD) Removal Team Lead, 1 (one) AAS Team Lead, 1 (one) EALS Team Lead, 1 (one) Marking Team lead, 1 (one) Striping team Lead, and 7 (seven) Explosive Hazard Mitigation Team Leads.
- Contractor shall extend capability of people assets to actually perform asked task (i.e., people assigned a digging role, should actually dig).
- Student shall be able to deploy all assets associated with the AAS.
- Student shall be able to deploy all assets associated with the EALS.
- Student shall be able to deploy all assets associated with the MAOS Marking Kit.
- Student shall be able to deploy all assets associated with explosive hazard mitigation
- Student shall be able to perform all airfield striping task to include blackout operations.

- The Instructor shall have the ability to roll back a scenario to a specified time. This shall maintain all Instructor and session settings, Student decisions, chats, and tasks to the designated time. This will enable the session to continue new from the roll back time.
- Contractor shall develop tools and products to capture data to support post-training reviews (referred to as Hot Washes). Tools include, but are not limited to ability to recall screen shots, ability to search stored video by time or geospatial location, graphic timeline of key milestones, replay of chat sessions, list of Instructor issued commands, list of Student responses and key actions taken, and a summary report of all process times.
-
- Extend the capabilities to operate on the AF GIG and enable participation from disparate training locations.
- The Contractor shall implement all required DISA mandated Security Technical Implementation Guides (STIG).

3.19. Training.

- 3.19.1. Contractor shall develop all materials necessary to support on-site training. Materials include, but are not limited to training guides, lesson plans, and PowerPoint slides. The government retains the rights to reproduce all materials developed as part of this development effort.
- 3.19.2. Contractor shall deliver on-site training. Training duration shall be a minimum of 24 hours of instruction. Training shall include, but not be limited to system set up and configuration, Instructor tools and workflows, Student tools and workflows, hot wash tools and workflows, and culminate in a full end-to-end exercise.
- 3.19.3. Training is intended and shall be formatted as train-the-trainer.
- 3.19.4. Contractor shall correct all bugs identified during training prior to issuing final release candidate.

3.20. Technical Support

- 3.20.1. The vendor shall provide technical support for bug fixes (an error, flaw, failure, or fault in a computer program or system that causes it to produce an incorrect or unexpected result, or to behave in unintended ways) for 24 months after acceptance of the final release candidate.
- 3.20.2. The vendor shall maintain a log of reported bugs and assigned levels of severity.
- 3.20.3. The vendor shall coordinate with the government to determine the best course of action for remedying bugs. It is anticipated critical bugs are fielded immediately as Service Patches, and all other will be grouped and released at specified time intervals as part of an iterative spiral release.
- 3.20.4. The Contractor shall maintain and publish the Help file as needed.

4. Quality Control

- 4.1. Not later than ten (10) calendar days after award, the Contractor shall provide a Quality Control Plan (QCP) that contains, as a minimum, the items listed below, to the Contracting Officer (CO) for acceptance. The CO will notify the Contractor of acceptance or required modifications to the plan. The Contractor shall make the appropriate modifications and obtain acceptance of the plan within thirty (30) calendar days from the date of award. The QCP shall include the following minimum requirements:

- 4.1.1. Description of how projects are managed, based on industry standards and best practices, to ensure a quality product.
 - 4.1.2. Description of the methods to be used for identifying and preventing defects in the quality of services performed.
 - 4.1.3. Description of the records to be kept to document inspections and corrective or preventative actions taken.
- 4.2. The Contractor shall have documented experience with, and actively use, Application Lifecycle Management (ALM) tools for software development to provide the following capabilities:
 - 4.2.1. Software configuration management database to maintain source code and configuration management.
 - 4.2.2. Software requirements management database to document the system requirements and change requests.
 - 4.2.3. Software test case management database to document test cases, defects, and issues.
 - 4.2.4. Provide access to requirements and defect tracking management systems, via Internet, to the Government Project Manager as required.

5. Target Deliverables

- 5.1. Descriptions of software components used for development.
- 5.2. User Interface (UI) Concept. Consists of a graphic version of the UI concept will be delivered. The graphic may contain sample content only and not necessarily actual content from the simulator.
- 5.3. All asset models fully rendered in 2- and 3D.
- 5.4. Department of Defense Architecture Framework (DoDAF) Documents
- 5.5. Alpha and Beta simulator version releases.
- 5.6. Release Candidate simulator version releases.
- 5.7. Final simulator version release.
- 5.8. All documentation shall be delivered in an approved Microsoft application (Excel, PowerPoint, Word, or Visio) as appropriate, via a CD or DVD.
- 5.9. All photos shall be delivered as .jpeg, .png, or .tiff as appropriate, via CD or DVD.
- 5.10. All videos shall be delivered as .mpeg or .avi as appropriate, via CD or DVD.
- 5.11. All hardware described in this SOO. Including computers, monitors, switches, etc.
- 5.12. On-site training at Tyndall AFB, FL.

6. Schedule

- 6.1. The total Period of Performance for Spiral X shall be XXXXXX. Make it least 30 days after the training has occurred
- 6.2. The Government will have fourteen (14) calendar days to review all submitted materials. The Beta Version shall be completed and ready for Government review, to be conducted at Contractor's location, within XXX (XXX) calendar days after contract award.
- 6.3. Contractor shall submit a list of applications available to support the simulator development no later than 30 days after contract award.
- 6.4. Intermediate software release candidates shall be determined during the course of the development. The 95% submission shall be no later than 21 days prior to the end

of the contract performance period.

6.5. Training shall be conducted on the 95% submission, and adjustments will be made based on approved upon request from AFCEC for the Final Release Candidate.

7. Government Furnished Resources

7.1. Various data elements for inclusion in application (i.e., ADR equipment, manpower, vehicles, vehicle performance data, personnel training requirements, user's manuals, etc.).

7.2. Common Installation Picture (CIP) data for Silver Flag Training Sites.

7.3. IRAA, GeoExPT, and GAS documentation.