

STATEMENT OF WORK (SOW)

FOR

Air Traffic Control (ATC) Common Simulator (ACS)

**Prepared by
U.S. Army PEO Simulation, Training and Instrumentation (PEO STRI)
12350 Research Parkway
Orlando, FL 32826-3276**

27 November 2012

1.	SCOPE	1
1.1	Background.....	1
1.2	System Engineering Performance Responsibility	1
2.	APPLICABLE DOCUMENTS	3
2.1	Department of Defense Specifications.....	3
2.2	Availability of Department of Defense Specifications	3
2.3	Department of Defense Standards.....	3
2.4	Department of Defense Directives	3
2.5	Availability of Department of Defense Directives.....	3
2.6	Department of Defense Instructions	4
2.7	Other Government Documents, Drawings, and Publications.....	4
2.8	Non-Government Standards and Other Publications	4
2.9	Availability of Non-Government Standards and Other Publications.....	4
3.	REQUIREMENTS	4
3.1	System Design	5
3.1.1	Hardware Design	5
3.2	Design Stages and Reviews	5
3.2.1	System Definition Stage and SRR	6
3.2.2	Preliminary Design Stage and PDR	6
3.2.3	Detailed Design Stage and CDR	6
3.2.4	Product Definition Data (PDD)	7
3.2.5	Fabrication, Assembly, Integration and Test Stage	7
3.2.6	Software Design	7
3.2.6.1	Software Requirements and Architecture Development and Review.....	8
3.2.6.2	Software Design and Implementation.....	8
3.2.6.3	Software Development Test	8
3.2.6.4	Technical Data and Software.....	9
3.2.7	Hardware and Software Integration	9
3.3	Integrated Product and Process Management.....	9
3.3.1	Government Furnished Resources	Error! Bookmark not defined.
3.3.1.1	Government Furnished Equipment	Error! Bookmark not defined.
3.3.1.2	Control of GFE/GFI	Error! Bookmark not defined.
3.3.1.3	Technical Data.....	9
3.3.1.4	Government Furnished Information (GFI)	Error! Bookmark not defined.
3.3.2	Systems Engineering and Design	10
3.3.2.1	Secure Configuration	10
3.3.2.1.1	Software Integrity Certification.....	11
3.3.2.1.2	Information Assurance Vulnerability Management Program	11
3.3.2.1.3	Information Assurance Compliance.....	11
3.3.2.1.4	IA Artifacts	11

3.3.2.2	Software Engineering.....	13
3.3.2.2.1	Software Transition.....	13
3.3.2.2.2	Software Metrics	13
3.3.2.2.3	Software Defect Management	13
3.3.2.3	Supportability Engineering.....	13
3.3.2.3.1	Logistics Support.....	Error! Bookmark not defined.
3.3.2.3.2	Logistics Support Analysis	14
3.3.2.3.3	Supportability Analysis.....	14
3.3.2.3.4	Technical Publications	14
3.3.2.3.5	COTS Manuals	14
3.3.2.3.6	Operator Manual	15
3.3.2.3.7	Maintenance Manual.....	15
3.3.2.3.7.1	Publications In Process Review's (IPR 's).....	15
3.3.2.3.7.2	Validation	15
3.3.2.3.7.3	Verification.....	16
3.3.2.3.8	Item Unique Identification (IUID)	16
3.3.2.3.9	Life Cycle Support Transiion	18
3.3.2.4	Specialty Engineering	16
3.3.2.4.1	Reliability Engineering	17
3.3.2.4.2	Maintainability Engineering	17
3.3.2.4.3	Safety Engineering	17
3.3.2.4.3.1	Safety Assessment.....	18
3.3.2.4.3.2	Health Hazard Assessment	18
3.3.2.4.4	Human Factors Engineering	18
3.3.2.4.5	Electromagnetic Environmental Effects (E ³)	19
3.3.2.4.6	Contaminate and Corrosion Control	19
3.3.2.5	Packing, Storage, and Transportation	19
3.3.2.6	Quality Engineering	19
3.3.3	Program Management.....	19
3.3.3.1	Integrated Master Plan (IMP)	Error! Bookmark not defined.
3.3.3.2	Technical Interchange Meetings (TIMs)	20
3.3.3.3	Integrated Master Schedule (IMS)	20
3.3.3.4	Financial Management.....	20
3.3.3.5	Risk Management.....	20
3.3.3.5.1	Post Award Meeting.....	21
3.3.3.5.2	Program Management Reviews.....	21
3.3.3.6	Configuration Management	21
3.3.3.6.1	Configuration Verification and Audit.....	21
3.3.3.6.1.1	Government Sample Audit to verify Product Baseline	Error! Bookmark not defined.

3.3.3.6.2	Engineering Change Proposals (ECP) and Contract Change Proposals (CCP):	21
3.3.3.6.2.1	Engineering and Contract Change Proposal Review	22
3.3.3.6.2.2	Deviations	22
3.4	System Test and Evaluation (T&E)	22
3.4.1	Responsibility for Tests	Error! Bookmark not defined.
3.4.2	Test Authority	Error! Bookmark not defined.
3.4.3	T&E Program Planning	Error! Bookmark not defined.
3.4.4	Test Resources and Facilities	Error! Bookmark not defined.
3.4.5	Test Methods	Error! Bookmark not defined.
3.4.6	Test Criteria	Error! Bookmark not defined.
3.4.7	Tolerance Data.....	Error! Bookmark not defined.
3.4.8	Alignment	Error! Bookmark not defined.
3.4.9	Test Log	Error! Bookmark not defined.
3.4.10	Changes During Testing	Error! Bookmark not defined.
3.4.10.1	Software Changes During Government Testing.....	Error! Bookmark not defined.
3.4.11	Changes After Testing	Error! Bookmark not defined.
3.4.12	T&E Deficiency Reporting System	Error! Bookmark not defined.
3.4.13	T&E Program Components	Error! Bookmark not defined.
3.4.13.1	In-process Inspections.....	Error! Bookmark not defined.
3.4.13.2	Contractor Preliminary Inspection (CPI).....	Error! Bookmark not defined.
3.4.13.3	Test Readiness Review-1	Error! Bookmark not defined.
3.4.13.3.1	TRR-1 Entry Criteria	Error! Bookmark not defined.
3.4.13.3.2	TRR-1 Exit Criteria.....	Error! Bookmark not defined.
3.4.13.4	Conformance Inspections	Error! Bookmark not defined.
3.4.13.4.1	Government Preliminary Inspection	Error! Bookmark not defined.
3.4.13.4.2	GPI Exit Criteria.....	Error! Bookmark not defined.
3.4.13.4.3	On-site Inspection Contractor Final Inspection.....	Error! Bookmark not defined.
3.4.13.4.4	Test Readiness Review-2.....	Error! Bookmark not defined.
3.4.13.4.4.1	TRR-2 Entry Criteria	Error! Bookmark not defined.
3.4.13.4.4.2	TRR-2 Exit Criteria.....	Error! Bookmark not defined.
3.4.13.4.5	Government Final Inspection	Error! Bookmark not defined.
3.4.13.4.5.1	Government Final Inspection Exit Criteria.....	Error! Bookmark not defined.
3.5	Training Products	23
3.5.1	Operator Training.....	23
3.5.2	Test Personnel Training	23
3.5.3	User Training Requirements.....	24
3.5.3.1	Language.....	24
3.5.3.2	Class Size.....	24
3.5.3.3	Location of Training	24

3.5.3.4	Training Facility and Equipment.....	24
3.5.3.5	Recommended Timing of Training Delivery	24
3.5.3.6	Course Completion Criteria	24
3.5.3.7	Certificate of Completion	24
3.6	Peculiar Support Equipment	24
3.6.1	Test Measurement and Diagnostic Equipment	24
3.7	Site Activation	Error! Bookmark not defined.
3.7.1	Installation Program	25
3.7.2	Installation Tools and Test Equipment	25
3.7.3	Installation Spares	25
3.8	Contractor Logistics Support (CLS)	25
3.8.1	Software Support	26
3.9	Integrated Digital Environment (IDE)	26
Appendix A – Entrance and Exit Criteria		27
1.	System Requirements Review (SRR)	27
1.1	SRR Entrance Criteria.....	27
1.2	SRR Exit Criteria	27
2.	Preliminary Design Review (PDR).....	28
2.1	PDR Entrance Criteria	28
2.2	PDR Exit Criteria	28
3.	Critical Design Review (CDR).....	29
3.1	CDR Entrance Criteria.....	29
3.2	CDR Exit Criteria.....	29

**Statement of Work
For
Air Traffic Control (ATC) Common Simulator (ACS)**

1. SCOPE

This Statement of Work (SOW) when combined with the System Requirements Document (SRD) MIS-PRF-XXXXX and other program documents defines the performance and effort required for designing, developing, integrating, testing, managing, documenting, delivering and providing logistics support for the following training device: Air Traffic Control (ATC) Common Simulator (ACS).

The ATC Simulator requirement is for an air traffic control simulator system that provides realistic training for US Army air traffic controllers when not engaged with actual air traffic while operating in an ATC system. The ATC simulator will simulate a start to finish control effort, meaning Mobile Tower System (MOTS) simulation at the airfield for take-off/landing under Visual Flight Rules (VFR), Instrument Flight Rules (IFR), radar simulation for surveillance and precision approach (ATNAVICS), and Airspace Information Center / Enhanced Flight Traffic Management Services functions..

The Air Traffic Control (ATC) Common Simulator (ACS) will be a system that replicates the ATNAVICS, and MOTS/Tactical Terminla Control System (TTCS) systems. The ACS mission is to maintain operator proficiency and improve functional understanding of joint Air Traffic Services (ATS) doctrine and procedures. The ACS will provide virtual based training through the depiction of an electronic, visually controlled control tower, airport surveillance radar, and precision approach radar incorporating pseudo pilot to controller voice and audio interaction with and without the ATS system shelter in service. The ACS will conduct tactical ATS scenarios, recordings of voice, radar representation, and playback of the entire operation so Soldiers can review and hone their skills. The ACS will also allow the user to develop operator scenarios of emergency procedures, deployments, and other unique unit training requirements.

1.1 Background

The U.S. Army Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) Product Manager Air & Command Tactical Trainers (PM-ACTT) has a requirement from the Air Traffic Control Project Office located at Redstone Arsenal, Alabama, for the development of ACS Training Devices.

1.2 System Engineering Performance Responsibility

- A. As the ACS Systems designer, developer, and fabricator, the Contractor agrees to assume System Engineering Performance Responsibility (SEPR) in accordance with the terms and the performance requirements of this contract, and to furnish all necessary effort,

skills, and expertise within the estimated cost, schedule, and technical performance of this contract.

- 1) The Contractor's responsibilities for SEPR include but are not limited to:
 - i. Performing functional/procedural integration of all elements and maintenance of the interface control documents.
 - ii. Ensuring that the overall system requirements allocations and design satisfy all requirements specified in the Section Clause C-01 and SOW and the system requirements are verified through system simulation, test, and evaluation including performance of all necessary independent verification and validation.
 - iii. Ensuring that all Contractor-developed or provided elements comply with their allocated performance requirements.
 - 2) Providing timely insight into program status including ongoing risk assessment and risk management measures for all technical, cost, and schedule aspects of the program including insight into interface elements and other related Government and Contractor managed items.
 - 3) Providing assessments of and mitigation plans for Government funding shortfalls or changes in funding profiles.
 - 4) Identifying and mutually controlling external interfaces through establishing and maintaining memoranda of agreement and interface documents. The Contractor will ensure that interface definitions and documents are complete and adequate. The Contractor will assure that all Contractor-developed or provided elements comply with appropriate interface definitions and that the interface documents properly reflect elements provided by external agencies. The Contractor shall promptly notify the Program Manager if elements provided by other sources fail, or are projected to fail, to comply with interface documents and definitions. Such notice will include the Contractor's recommendations for minimizing adverse impact to the Program.
 - 5) Ensuring the successful integration
- B. The Contractor acknowledges that it has no right to any claims or demands against the Government, its officers, agents, or employees, with respect to the specifications listed in Section C of this contract based on impossibility of performance; defective, inaccurate, infeasible, insufficient or invalid specifications; or implied warranties of suitability of specifications. The Contractor waives any claims or demands that might otherwise arise or be derived from the specification
- C. Regardless of the Changes clause or any other clause of this contract, no specification changes proposed by the Contractor to achieve performance requirements of the specifications listed in Section C of this contract shall entitle the Contractor to any increase in the estimated cost or to any schedule extensions.
- D. The Government and Contractor agree that this contract is for the delivery of a complete working system and not for the delivery of individual components. Therefore, while

verifications will be performed as components are completed, acceptance will take place at the end of each CLIN. Nevertheless, and disregarding anything to the contrary in the "Inspection of Supplies – Fixed Price" clause of this contract, these acceptances do not diminish the Contractor's responsibility for the performance, end to end acceptance testing, and demonstration of a fully trained Government cadre capable of operating and maintaining the system.

- E. The Contractor agrees that the incorporation of any required GFP, GFE and Base Support as set forth in this contract does not provide relief to the SEPR requirement.
- F. The rights and remedies of the Government under this clause are in addition to any other rights and remedies provided by law or under this contract.

2. APPLICABLE DOCUMENTS

The following documents of issue shown on the document summary list form a part of this SOW to the extent specified herein. In the event of a conflict between documents referenced herein and the contents of this SOW, the contractor shall notify the government of the conflict during the Request for Proposal stage and ensure the deliverables meet the performance requirements.

2.1 Department of Defense Specifications

2.2 Availability of Department of Defense Specifications

Copies are available on the WWW at URL: <http://assist.daps.dla.mil/quicksearch>

2.3 Department of Defense Standards

MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-31000	Technical Data Packages
MIL-STD-40051-2	Preparation of Digital Technical Information
MIL-STD-882D	DEPARTMENT OF DEFENSE STANDARD PRACTICE: SYSTEM SAFETY (10 FEB 2000)
FCM-H1-2005	Surface Weather Observations and Reports
MIL-STD-810G	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1472	DOD Design Criteria Standard: Human Engineering

2.4 Department of Defense Directives

DODD 8570.01 Information Assurance (IA) Training, Certification, and Workforce Management

2.5 Availability of Department of Defense Directives

Copies are available on the WWW at URL: <http://www.dtic.mil/whs/directives/>

2.6 Department of Defense Instructions

DODI 8500.2 Information Assurance Implementation
DODI 8510.01 DOD Information Assurance Certification and Accreditation
Process (DIACAP)

2.7 Other Government Documents, Drawings, and Publications

DISR Department of Defense (DoD) Information Technology Standards Registry
Copies are available on the WWW at URL

<https://acc.dau.mil/CommunityBrowser.aspx?id=148577>

National Security Telecommunications and Information Systems Security
Policy (NSTISSP) No. 11, Subject: National Policy Governing the Acquisition of
Information Assurance (IA) and IA-Enabled Information Technology (IT) Products.

MIL-PRF-32216 Performance Specification Evaluation of COTS Manuals and
preparation of supplemental data
29 CFR 1910 Occupational Safety and Health Standards
Field Manual (FM) Air Traffic Services Operations
3-04.120
FAA Order JO 3120.4 Air Traffic Technical Training
FAA Order JO 7110.65 Air Traffic Control
FAA Order JO 7210.3 Facility Operation and Administration
Training Circular Air Traffic Control Facility Operations, Training, Maintenance,
(TC) 3-04.81 and Standardization
DA Form 3479-11, Commander's Task List (ATS)12, 13
MIS-PRF-XXXXX System Requirements Document (SRD)

2.8 Non-Government Standards and Other Publications

ANSI/ASQ Q9001-2000 Quality Management Systems - Requirements
ANSI/ASQ Q9004-2000 Quality Management Systems - Guidelines for Performance
Improvements

2.9 Availability of Non-Government Standards and Other Publications

Copies are available on the WWW at URL: <http://www.nssn.org/>

3. REQUIREMENTS

The contractor shall design, build, integrate and deliver a system that meets the requirements as defined in this SOW and **System Requirements Document (SRD) MIS-PRF-XXXXX**. The contractor shall provide all effort, resources, facilities, equipment, and personnel necessary to complete the tasks in this SOW. The contractor shall perform all activities to integrate and assemble the hardware and software to achieve a fully functional system, with all support systems, that performs and operates in accordance with the system specification and contractor generated specifications. The contractor shall verify the complete integration of the hardware and software of each hardware and software subsystem and the overall system through the utilization of formalized test procedures.

3.1 System Design

The Contractor shall use the ACS **SRD MIS-PRF-XXXXX** as the basis for the development of all lower level specifications. The Contractor shall perform trade off studies and then finalize the system design. The Contractor shall define, document, and follow an open systems approach for using modular design, standards-based interfaces, and widely-supported consensus-based standards. The design concept shall incorporate an open systems approach adopted by industry standards bodies or de facto standards (set by the market place) for selected system interfaces, products, practices and tools. The Contractor shall use a modular open systems approach to evaluate the appropriateness of implementing a modular design strategy for the system. A modular open systems approach and analysis of long term supportability, interoperability, and growth of future modifications shall be major factors in the final selection of equipment and integration approach. All system components shall facilitate future upgrades and permit incremental technology insertion to allow for incorporation of additional or higher performance elements with minimal impact on the existing systems. The architectural approach shall provide a viable technology insertion methodology and refresh strategy that supports application of modular open systems approach. Selected designs and specifications shall be based on performance, cost, Information Assurance (IA), industry acceptance, long term availability and supportability, and upgrade potential.

3.1.1 Hardware Design

The Contractor shall integrate and assemble the system hardware that satisfies the performance and IA requirements stated in the developed specifications. The Contractor shall conduct market surveillance and market investigations in order to maximize the use of commercial and non-developmental items. The Contractor shall apply the systems engineering process during each level of system development (system, subsystem, and component) to add value (additional detail) to the products defined in the prior application of the process.

3.2 Design Stages and Reviews

The Contractor shall provide designs and conduct reviews, to include the following design reviews (system, subsystem, component, life cycle processes, test readiness, production

approval) and audits (functional and design configuration), for the purpose of assessing technical progress. As a minimum these reviews should include a System Requirements Review (SRR), a Preliminary Design Review (PDR), a Critical Design Review (CDR) and a Test Readiness Review (TRR). The Contractor shall document the results of the reviews, including any resulting action items. The entrance and exit criterion for each review is defined in Appendix A.

3.2.1 System Definition Stage and SRR

The Contractor shall define the system with a focus on system products required to satisfy operational requirements. The Contractor shall complete the system, product, and subsystem interface requirements and verification definition, system and product requirements and verification definition, and preliminary subsystem requirement and verification definition; establish a system baseline; and complete technical reviews. The documentation generated during system definition shall be used to guide subsystem development.

(DI-IPSC-81431A) System/Subsystem Specification (SSS)

3.2.2 Preliminary Design Stage and PDR

The Contractor shall initiate subsystem design and create subsystem-level definition and design-to baselines to guide component development. The Contractor shall ensure that functional design considerations integrate IA functional requirements and that these requirements are included throughout the development process. The Contractor shall decompose identified subsystem functions into lower-level functions and allocate functional and performance requirements to component-level functional and physical architectures. Each preliminary subsystem requirement and verification definition and preliminary design-to baseline shall be evolved into a subsystem requirement and verification definition and design-to baseline. Preliminary component requirements and verification definition and build-to baselines shall be defined for the components and the subsystems being developed. Final subsystem definition shall include identification of recommended components and interfaces; resolution of subsystem-level risks; assessment of component risks; and design for quality factors to include producibility, verifiability, usability, IA, supportability, trainability and disposability for each subsystem. Subsystem reviews shall be conducted for each subsystem at the completion of its preliminary design stage (see Appendix A).

3.2.3 Detailed Design Stage and CDR

The Contractor shall complete subsystem design down to the lowest component level, and create a component requirements and verification definition and build-to component baseline for each component. Final component definition shall include identification of recommended parts and interfaces; resolution of component-level risks for each component, down to the lowest sub-component, the design for quality factors to include producibility, verifiability, usability, IA, supportability, trainability and disposability. Component reviews shall be completed for each

component at the completion of the detailed design stage (see Appendix A). The results of the evaluation shall be documented.

3.2.4 Product Definition Data (PDD)

During the systems engineering and design, and in accordance with MIL-STD-31000, the Contractor shall develop, produce, and maintain product definition data (PDD) that accurately depicts the final product. The PDD is the technical description of items adequate for supporting an acquisition strategy, production, engineering, IA and logistics support. The PDD shall disclose complete design, IA, logistics, manufacturing requirements, and the means of measuring compliance with the requirements. Piece part information (drawings, computer aided design files and Meta data) and associated lists shall provide the design, engineering, IA, manufacturing, and quality assurance requirements information necessary to enable the procurement or manufacturing of an interchangeable item.

(DI-SESS-81003B) Commercial Drawings and Associated List
(DI-SESS-81000D) Product Drawings and Associated List

3.2.5 Fabrication, Assembly, Integration and Test Stage

The Contractor shall design, develop, fabricate, integrate, deliver, install, and test the ACS training device in accordance with the SRD.

The Contractor shall resolve product deficiencies when specifications for the system, product, subsystem, assembly, or component are not met, as determined by inspection, analysis, demonstration, or test. The Contractor shall verify that the products designed satisfy specifications. 1 Physical configuration audits shall be completed to verify that products have achieved requirements; that they satisfy the characteristics as specified in specifications, interface specifications, and other baseline documentation; and that test plans and procedures were complied with. The results of the audit shall be documented.

3.2.6 Software Design

The Contractor shall develop the system software and firmware and shall follow the Contractor's organizational software development practices that are compliant with at least Level 3 of the Software Engineering Institute's Capability Maturity Model Integration for Software (CMMI). The Contractor shall provide sufficient evidence that the producing software development organizations are compliant with CMMI Level 3 or higher. The design process shall incorporate features that promote ease of operation, incorporation of applicable IA requirements, ease of software maintenance, ease of future updates and modifications, data void work around Computer programs and computer data systems shall be fully integrated in accordance with the system specification. The Contractor shall conduct market surveillance and market investigations, in order to maximize the use of commercial software and non-developmental software. The Contractor shall maintain a software Controlled Development Environment that complies with the NIST SP 800-53 Revision 3.

3.2.6.1 Software Requirements and Architecture Development and Review

The Contractor shall develop software requirements and architecture in accordance with the Contractor's software development process plan. As part of this activity, the Contractor shall work within the IPT to iterate the system and System-of-System (SoS) software requirements and architecture for the ACS training devices that are interfacing and integrating with external systems. The Contractor shall define and record the operational concept for the system, and define and record the architectural design of the system (identifying the components of the system, their interfaces, and a concept of execution among them) and the traceability between the system components and system requirements. Based upon analysis of system requirements, system design, and other considerations, the Contractor shall define and record the software requirements to be met by each software item, the methods to be used to ensure that each requirement has been met, and the traceability between the software item requirements and system requirements.

- (DI-CMAN-81248A) Interface Control Document (ICD)**
- (DI-IPSC-81432A) System/Subsystem Design Description (SSDD)**
- (DI-IPSC-81433A) Software Requirements Specification (SRS)**

3.2.6.2 Software Design and Implementation

The Contractor shall design software, develop executable code, perform unit testing, and integrate software components (with each other and with hardware components) to meet system requirements. Software design includes not only design to requirements, but selection of existing software products to meet system requirements, and iterating the requirements to allow use of existing products. Products that perform information assurance functions shall be Army approved.

- (DI-IPSC-81431A) System/Subsystem Specification (SSS)**
- (DI-IPSC-81435A) Software Design Description (SDD)**
- (DI-IPSC-81436A) Interface Design Description (IDD)**

- (DI-IPSC-81441A) Software Product Specification (SPS)**
- (DI-IPSC-81442A) Software Version Description (SVD)**

3.2.6.3 Software Development Test

The Contractor shall establish and execute a software item qualification test program consisting of program or module and cycle or system levels of testing. The Contractor shall document the life cycle activities for each software item subject to verification, the required verification tasks for each life cycle activity, and related resources, responsibilities, and schedule. The Contractor shall establish test cases (in terms of inputs, expected results, and evaluation criteria) and establish traceability between the test case and the system requirements, detailed procedures for conducting the test, and test data for testing the software corresponding to each software item. The Contractor shall test the software corresponding to each software item. The testing shall be

in accordance with the unit test cases and procedures. The Contractor shall analyze the results of item testing and shall record the test and analysis results.

(DI-IPSC-81439A) Software Test Description (STD)

3.2.6.4 Technical Data and Software

All technical data and software associated with the system shall be provided with a minimum of Government Purpose Rights (GPR) for the life of the system. Any software or products from the prime Contractor shall also be provided with a minimum of GPR however if software cannot be provided with GPR it shall be provided with a license at no cost and allow distribution and use for any ACS purpose for the life of the system. Any third party contractor's technical data and software associated with all efforts defined by this SOW shall also be provided with a minimum of GPR however if software cannot be provided with GPR it shall be provided with a license at no cost and allow distribution and use for any ACS purpose for the life of the system. Any 3rd party licensed software shall be provided with a transferable license that allows distribution at no cost and use for any ACS purpose by any DoD Contractor for the life of the system.

3.2.7 Hardware and Software Integration

The Contractor shall perform all activities to integrate and assemble the hardware and software to achieve a fully functional certified and accredited system, with all support systems, that performs and operates in accordance with the system SRD and Contractor generated specifications. The Contractor shall verify the complete integration of the hardware and software of each hardware and software subsystem and the overall system through the utilization of formalized test procedures.

3.3 Integrated Product and Process Management (IPPM)

The Contractor shall establish and maintain a management technique that simultaneously integrates all essential acquisition activities through the use of multidisciplinary teams to optimize the design, manufacturing, and supportability processes. The Contractor shall utilize systems engineering tools and overlay a management concept that encourages the use of IPTs. The Contractor's integrated product and process development (IPPD) process shall interact with PEO STRI and PM ATC representatives in its role as a customer and as the IPPM manager which involve establishing performance requirements, monitoring and managing total program progress and evaluating product quality.

3.3.1.1 Technical Data

The Contractor shall be responsible for acquiring all technical data, software, performance data, and drawings necessary for the execution of all tasks in this SOW.

3.3.2 Systems Engineering and Design

The Contractor shall implement a system engineering process that will transform all system and IA requirements into a set of lower level performance requirements that define the system. The process shall accomplish planning, identify and allocate functional requirements, identify participation in trade studies, provide inputs to documentation, and include design reviews. The system engineering effort shall integrate all elements of a multifunctional engineering effort to meet system requirements. The Contractor shall insure the timely integration of engineering specialties such as reliability, maintainability, security engineering, logistics engineering, human factors engineering, safety, value engineering, standardization, and transportability into design and development.

3.3.2.1 Secure Configuration

All IA and IA enabled products shall be securely configured IAW DoD-approved security configuration guidelines. The Contractor shall obtain Security Technical Implementation Guides (STIGs) (<http://iase.disa.mil/stigs/stig/index.html>) and implement each STIG into the design. Prior to Critical Design Review, the Contractor shall verify that the latest STIG has been utilized.

The Contractor shall conduct an assessment of the system environment and the supporting infrastructure for security vulnerabilities and weaknesses. The Contractor shall continually evaluate the security of the system, both physical and logical, identifying exposures and providing protective options for reducing security risk. The Contractor shall identify assets to be protected, identify vulnerabilities, and develop a set of recommendations to eliminate or mitigate those threats.

The Contractor shall develop and maintain an IA process to guide management and design actions, document decisions, specify and track IA requirements, document certification tailoring and level of effort, identify possible solutions, and maintain operational systems security as defined by DoDI 8510.01 and DoDI 8500.02 . The process shall be predicated upon three overarching concepts: coordination, information exchange, and negotiation with other organizations to set organic requirements. The Contractor shall establish or adopt standards for managing IA requirements and capabilities and an information system security engineering approach that emphasizes purposeful design or configuration of security solutions. The process shall provide security engineering and a level of information assurance sufficient for certification and accreditation.

The Contractor shall select IA validated products from the Common Criteria Evaluation and Validation Scheme (CCEVS) validated product list (<http://www.niap-ccevs.org/cc-scheme/vpl/>). Exemption(s) to the CCEVS must be approved by the Government. The system shall also be in compliance with the National Information Assurance Acquisition Policy (NIAAP) for COTS/GOTS/IA-enabled products.

All software (including, but not limited to, operating systems, databases, web servers, etc.) and hardware (including, but not limited to, network switches, firewalls, intrusion detection systems, etc.) must comply with the appropriate DISA Security Technical Implementation Guide (STIG).

3.3.2.1.1 Software Integrity Certification

The Contractor shall verify and certify that the system application software functions are designed in a properly secured operating system environment and are free of elements that might be detrimental to the secure operation of the resource operating system, as described in DODI 8500.2. Except for DOD, and Army approved Commercial off the Shelf software, the Contractor shall provide Vendor Integrity Statements for each system software application.

3.3.2.1.2 Information Assurance Vulnerability Management Program

As part of the Information Assurance Vulnerability Management Program (IAVMP), the Contractor shall document the incorporated and unincorporated Information Assurance Vulnerability Alerts (IAVAs), Information Assurance Vulnerability Bulletins (IAVBs), and Information Assurance Vulnerability Technical Advisories (IAVTAs). The Contractor shall incorporate all applicable DOD Information Assurance Vulnerability Management messages issued on behalf of the CIO/G6 and Joint Task Force-Global Network Operations. The Contractor shall provide justification for each unincorporated IAVMP message (i.e., describe the specific negative impact the IAVMP message incorporation would have on the system operation).

3.3.2.1.3 Information Assurance Compliance

The Contractor shall test, verify, and document that the security architecture of the system (both hardware and software) is in compliance with the security requirements as identified in the system specification. The Contractor shall use DOD approved assessment tools to assess the system prior to the Government's performance of the Certification Test and Evaluation (CT&E) or the System Test & Evaluation (ST&E). The pre-assessment shall be completed no less than two weeks prior to the government conducted CT&E/ST&E.

3.3.2.1.4 IA Artifacts

For any system that supports an external network connection the Contractor shall prepare a certification and accreditation package in accordance with the appropriate IA processes defined in DoDI 8510.01 (DIACAP) and DoDI 8500.02 (IA Implementation) as applicable. This package shall include all required documentation and support of necessary events related to IA.

The Contractor shall document decisions and maintain a description of the system mission, target environment, target architecture, security requirements, and applicable data access policies. The process shall:

- a. Maintain descriptions of the operating environment and threat.

- b. Maintain descriptions of the system security architecture.
- c. Establish the Certification and Accreditation (C&A) boundary of the system to be accredited.
- d. Maintain copies of formal agreements among the Designated Approving Authority (DAA), Certification Authority (CA), program manager, and representative.
- e. Document all requirements and information necessary for accreditation.
- f. Document information required by the definition, verification, and validation phase of the certification and accreditation process as defined by DoDI 8510.01.
- g. Document test plans and procedures, certification results, and residual risk.
- h. The Contractor shall support the Army Certification and Accreditation activities.
- i. The Contractor shall employ NSA-approved boundary protection devices as necessary.
- j. The Contractor shall present authority to procure NSA-approved encryption documentation as a part of the certification and accreditation package.
- k. The Contractor shall develop and support a Key Management Plan (KMP) for those devices that support NSA-approved encryption.
- l. The Contractor shall provide UNCLASSIFIED and CLASSIFIED data flow diagrams and data definition where applicable.
- m. The Contractor shall develop and maintain a Certification and Accreditation schedule that has been harmonized as part of the Integrated Master Schedule.
- n. The Contractor shall assist the program office and site personnel in the development and maintenance of a Site Security Plan (SSP).
- o. The Contractor shall include appropriate program and site personnel in the CCB process to advise upon issues surrounding the introduction of new system software, firmware, and hardware.
- p. The Contractor shall respond to any CAT I / II security findings within 24 hours with POA&M for review.
- q. The Contractor shall respond to any CAT III / IV / V security findings within 5 working days with POA&M for review.
- r. The Contractor shall incorporate and maintain mechanisms to detect and minimize inadvertent modification, or destruction of data supported within the accredited boundary.
- s. The Contractor shall incorporate and maintain mechanisms to detect introduction of new software and malicious destruction of data within the accredited boundary.
- t. The Contractor shall perform a vulnerability analysis on a Monthly basis.
- u. The Contractor shall accomplish a vulnerability scan on a Quarterly basis.

(DI-MISC-80711A) Scientific and Technical Reports (DIACAP Artifacts)

3.3.2.2 Software Engineering

The Contractor shall use systematic, documented methods for all software development activities and establish and apply standards and practices for representing requirements, design, code, test cases, test procedures, and test results. Traceability shall be maintained between levels of requirements, between requirements and design, between design and the software that implements it, between requirements and qualification test information, and between computer hardware resource utilization requirements and measured computer hardware resource utilization. The Contractor shall ensure the software design is based upon a common infrastructure and common infrastructure services as defined in the Department of Defense (DoD) Information Technology Standards Registry (DISR); that interoperability and security are built-in, and that information made available is trusted and interoperable.

3.3.2.2.1 Software Transition

The Contractor shall develop a software transition plan which will identify all of the resources required to maintain, upgrade and support the delivered software for the life of the system.. The Contractor shall work with the IPT to understand the characteristics of the system environment, and suggest cost-effective approaches to transition and training requirements.

(DI-IPSC-81429A) Software Transition Plan (STrP)

3.3.2.2.2 Software Metrics

The Contractor shall establish, maintain, and use software management indicators to aid in managing the software development process and communicating status. The Contractor shall identify a set of software management indicators, including the data to be collected, the methods to be used to interpret and apply the data, and the planned reporting mechanism. The Contractor shall record this information in a software development process plan and collect, interpret, apply, and report on those indicators as described in the plan.

3.3.2.2.3 Software Defect Management

The Contractor shall establish and maintain a closed-loop defect management process. The Contractor shall document each problem detected in software products. The Contractor shall implement a corrective action system for handling each problem detected. Software item deliveries, including incremental deliveries, shall include defect history and open problems against the software item.

3.3.2.3 Supportability Engineering

The Contractor shall conduct engineering analyses to establish quantitative and qualitative supportability design guidelines. The Contractor shall conduct trade studies, evaluate design and support alternatives, and establish system supportability preliminary design configurations consistent with system readiness and availability and life cycle cost goals.

3.3.2.3.1 Logistics Support Analysis

The Contractor shall ensure the supportability of the system through planning, implementation and verification of materiel and services to meet the operational requirements. Readiness, availability and supportability shall be the primary design factors.

The Contractor shall identify support resources and infrastructure necessary for test and evaluation activities. The Contractor shall analyze existing support structures and develop and define an optimized support infrastructure for production and deployment. The recommended support resources shall be sufficient to allow another Contractor with comparable skills to assume operation, maintenance, and support of the system and sustain the system availability requirement. The Contractor shall only use the form, fit, function, and interface requirements in the performance specifications for provisioning, training and maintenance planning.

3.3.2.3.2 Supportability Analysis

The Contractor shall ensure the supportability of the system through planning, implementation and verification of materiel and services to meet the operational requirements. Readiness, availability and supportability shall be the primary design factors. The Contractor shall conduct repair level analyses, develop diagnostic, preventative maintenance and repair procedures, conduct facilities analyses, refine hardware and software maintenance and support concepts, and identify support resource requirements including required spares and support equipment. The Contractor shall develop a listing of which items should be repaired and which should be discarded and the level of maintenance at which the repair should be performed with the associated cost.

3.3.2.3.3 Technical Publications

The Contractor shall describe each operation and maintenance task in detail and in logical, systematic steps for the work to be accomplished. The operations and maintenance instructions shall accurately provide the technician with all the information needed to keep the equipment operational. It shall provide system and subsystem oriented instructions for installation, operation, maintenance, and testing. All tools, test equipment and consumable items required to accomplish any maintenance or installation shall be identified just prior to and as part of the task. Government furnished material, government technical manuals or government-approved commercial operation and maintenance manuals shall be used as references for system and subsystem maintenance. All government technical manuals and COTS manuals shall be reviewed to ensure changes, updates, revisions, or supplementation are not required to reflect the components actually being installed. All publications shall reflect the configuration of fielded hardware as documented in the product baseline.

3.3.2.3.4 COTS Manuals

The Contractor shall provide COTS manual(s) for all equipment used in the system that is Commercial Off-The-Shelf. MIL-PRF-32216 will be used in the evaluation of submitted COTS

manuals. The Contractor shall provide an index of all the COTS manuals for identification and inventory purposes.

(DI-TMSS-80527B) Commercial Off-The-Shelf (COTS) Manual and Associated Supplemental Data

3.3.2.3.5 Operator Manual

An operator manual shall be prepared detailing operational use of the ACS associated with this effort.

(See Annex to Exhibit C) Technical Publications (MIL STD 40051-2, Operator Manual)

3.3.2.3.6 Maintenance Manual

A maintenance manual shall be prepared detailing installation, fault isolation, functional checkout procedures and maintenance procedures for the training system. The Maintenance Manual shall include instructor notes.

(See Annex to Exhibit C) Technical Publications (MIL STD 40051-2, Maintenance Manual)

3.3.2.3.6.1 Publications In Process Reviews (IPRs)

The Contractor shall host and co-chair publication reviews to ensure the technical publications are being prepared according to contracts as required. Each IPR shall be scheduled to coincide with a system level program reviews. The Contractor shall act on reported decisions and discrepancies resulting from or associated with each IPR. Each review shall include a review of incorporated corrections or comments from previous IPR's prior to proceeding with the current IPR. If any IPT member identifies previous IPR comments that are not included in the technical publications, the IPR shall be considered incomplete.

3.3.2.3.6.2 Validation

Contractor validation shall be accomplished on all technical publications, changes, supplemental data, and revisions thereto. Publications shall be validated prior to start of system testing. A technical publication shall not be ready for validation or verification until (at a minimum) the following conditions have been fulfilled:

- a. Information, illustrations and parts lists reflect correct configurations of the system and equipment, to include all engineering changes.
- b. Procedural instructions are readily understandable by the intended user and adequate to perform all operations and maintenance functions.

- c. All procedures have been performed to assure accuracy and performance requirements.
- d. Adequacy of data is checked to ensure that it supports the approved maintenance and support plan.
- e. Hardware of the proper configuration is available for the validation and verification effort.
- f. All safety hazards identified in the safety assessment report are resolved and identified within the text as cautions or warnings necessary to protect the equipment or personnel as appropriate.
- g. The use of any hazardous material has been identified.

3.3.2.3.6.3 Verification

The Contractor shall assist PEO STRI IPT members to verify that the operator and maintenance manuals are accurate. The IPT may choose to perform verification concurrently with the validation effort. Correction of discrepancies and changes resulting from training, testing, and reviews shall be incorporated into the manuals. The Contractor shall provide system equipment, technical and engineering support and facilities as required to aid in the performance of verification effort. The Contractor shall incorporate all comments from compliance-reviews, technical accuracy reviews and verification reviews into final submission of manuals.

3.3.2.3.7 Item Unique Identification (IUID)

The Contractor shall coordinate among the IPT members to determine items requiring unique identification including embedded subassemblies, components and parts, and identify the IUID to be used for each item. The Contractor shall provide Unique Item Identification (UII), or a DoD recognized unique identification equivalent, for all identified items delivered and mark the UIIs on the appropriate component.. IUID marking design for each item shall be both machine readable and human readable in accordance with MIL-STD-130. The Contractor shall enter the appropriate data into the IUID Registry.

(DI-MGMT-81858) Unique Identification (IID) Marking and Verification Report

3.3.2.3.8 Life Cycle Support Transition.

The contractor shall identify the hardware, software, and other resources needed for the life cycle support of deliverable software. The contractor shall plan for the transition of support to a separate support agency and identify the items and procedures that are needed to perform life cycle software support of the deliverable application software. Using Appendix B and Appendix C of MIL-HDBK 1467 as a guide, the contractor shall describe and document the methods to be used to ensure the existence of a complete life cycle support capability. The contractor shall plan for and implement the transfer of support of the deliverable items to the life cycle support organization. This effort should be designed to ensure a phased transfer without loss or

degradation of the support of the delivered application software or to other tasks currently performed. The contractor shall identify the need to use any government resources during the transfer phase. The contractor shall plan lead-time to ensure completion of the transfer prior to the planned assumption of support responsibilities by the life cycle support organization. The contractor shall ensure that the procedures for operation of the Life Cycle Support completely describe all methods necessary to evaluate, generate, install, integrate, test, modify, and operate the deliverable application software. The contractor shall make assistance available to support the resolution of any problems encountered by the life cycle support organization personnel during the transfer period.

3.3.2.4 Specialty Engineering

3.3.2.4.1 Reliability Engineering

The Contractor shall develop, implement and manage a system reliability process satisfying all reliability objectives and be completely integrated within the systems engineering process. The reliability process shall support economical achievement of overall program objectives and ensure sustained product integrity, personal safety, and logistics support information is derived from early reliability engineering analysis such that reliability engineering can be applied to influence the design effort.

3.3.2.4.2 Maintainability Engineering

The Contractor shall develop, implement and maintain a system maintainability process satisfying all maintainability and related objectives and be completely integrated within the systems engineering process. The maintainability process shall form the basis of concurrent and subsequent life cycle planning. The maintainability effort shall measure complexity, accessibility, and testability to enhance servicing, preventive maintenance, corrective maintenance, and diagnostic capabilities. Specific design and verification criteria shall be established through performance specifications, of qualitative and quantitative factors to be expressed as measures of maintainability achievement, for system, segment, subsystem, and equipment levels.

3.3.2.4.3 Safety Engineering

The Contractor shall develop and implement a safety process to identify, evaluate, and eliminate or control hazards throughout the systems life cycle. The safety process shall impose design requirements and establish management controls in order to eliminate any hazards or reduce the associated risk of a system or equipment hazard to a level that is acceptable to the Government. The Contractor shall ensure the safety of the system's design, operation, transportation, maintenance, support, and disposal. The Contractor shall provide qualified personnel to accomplish the required safety tasks, establish the authority for resolution of identified hazards, implement safety tasks through all levels of management, allocate appropriate resources, and establish lines of communication between system safety and other functional elements of the

program. The Contractor shall use MIL-STD-882D as a guide when implementing the safety program.

(DI-SAFT-80102B) Safety Assessment Report (SAR)

3.3.2.4.3.1 Safety Assessment

The Contractor shall conduct safety analyses and identify and classification hazards as an integral part of the system design effort. The Contractor shall develop a hazard risk index including hazard severity and hazard probability levels for all hazards. The Contractor shall document information about each hazard in the integrated database. The Contractor shall ensure that safety of the design is achieved and that all system specific safety requirements are met. This shall include verifying any changes due to redesign. Once complete, the Contractor shall verify the safe design of the system and to determine the safety risk assumed prior to test or operation. The Contractor shall identify those software items or portions thereof whose failure could lead to violation of critical requirements and develop a strategy, including both test and analysis, to assure that the requirements, design, implementation, and operating procedures for the identified software minimize or eliminate the potential for such violations.

3.3.2.4.3.2 Health Hazard Assessment

The Contractor shall identify potential health hazards and recommend engineering controls, equipment and protective procedures to reduce the associated risk to an acceptable level. The Contractor shall assess system, facility, and personnel protective equipment design requirements to allow safe operation and maintenance. When feasible engineering designs are not available to reduce hazards to acceptable levels, the Contractor shall develop alternative protective measures. The Contractor shall address the hazardous materials listed in the Environmental Protection Agency's (EPA) toxics release inventory (available at <http://www.epa.gov/tri/chemical/index.htm>) and the list of Class I and Class II stratospheric ozone depleting substances (ODSs), as listed 29CFR1910.1200.

3.3.2.4.4 Human Factors Engineering

The Contractor shall plan and implement a human factors engineering program to insure the satisfaction of system objectives and personnel safety of the operator and maintainer. Identify and eliminate program risk associated with critical human factors that have a significant impact on readiness, life cycle cost, schedule, performance, or safety. Ensure manpower, personnel, training, and logistics support information is derived from early human engineering analyses such that human factors engineering can be applied to influence the design effort. Verify through test and evaluation that trained personnel can safely and effectively operate, maintain and control the system in its intended operational environment.

3.3.2.4.5 Electromagnetic Environmental Effects (E³)

The Contractor shall determine the criteria and verification method to ensure that the system electronic or electrical hardware configuration is not a source of electromagnetic interference (EMI) or a victim of E³ in the intended operational environment in which it is installed or at its operational locations. The Contractor shall establish and maintain a process to verify and assure that the system operations functionality is not affected by E³.

3.3.2.4.6 Contaminate and Corrosion Control

The Contractor shall incorporate the latest state-of-the-art corrosion control technology as determined by logistic support analysis into the system design process, into the manufacturing process, in all levels of maintenance, in supply, and in the storage processes. The objective is to minimize corrosion by using design and manufacturing practices that address selection of materials; coatings and surface treatments; production processes; process specifications; system geometry; material limitations; environmental extremes; storage and ready conditions; preservation and packaging requirements; and repairs, overhaul, and spare parts requirements. Design concepts shall reflect realistic environments and resource availability as determined by logistic support analysis.

3.3.2.5 Packing, Storage, and Transportation

The contractor shall pack, handle, and transport the trainer and related components in accordance with best commercial practices.

3.3.2.6 Quality Engineering

The Contractor shall establish measurement points that will provide maximum visibility into new and prior processes to assure contractual requirements are being met. The Contractor shall select the proper methods to analyze these processes to continuously improve the system. Metrics shall be developed to assist management visibility into an adequate process control system. The Contractor shall establish and maintain a computerized discrepancy tracking system within the Integrated Development Environment (IDE) with the ability to produce complete permanent records of all discrepancy or database listing. The Contractor shall establish a suspense system to ensure timeliness of analysis and corrective action for discrepancies and risk reduction items. All discrepancy correction shall be documented and entered in the integrated database.

3.3.3 Program Management

The Contractor shall provide the overall management and administrative effort necessary to ensure that the requirements of this contract are accomplished. The Contractor shall track program progress utilizing metrics. The Contractor shall plan, implement, and maintain a life cycle cost (LCC) management process to minimize the system cost and use LCC to conduct trade studies, evaluate design and support alternatives, and select the resource support requirements. The Contractor shall define and monitor metrics and technical performance

measures (TPMs) to evaluate the performance of each critical technical and management process and conformance of the evolving products with contract requirements and objectives including cost requirements and objectives.

(DI-MGMT-80227) Contractor's Progress, Status and Management Report

3.3.3.1 Technical Interchange Meetings (TIMs)

The Contractor shall support TIMs. A TIM shall address specific topics or issues, address status of development or test activities between management reviews, address the functions of an established working group, or coordinate and provide guidance for engineering data or technical publications.

3.3.3.2 Integrated Master Schedule (IMS)

The Contractor shall develop, implement, manage to, update, and maintain the contract IMS. All contract schedule information delivered or presented at program reviews shall originate from the IMS and shall contain all critical events and exit criteria, accomplishments, predecessors and successors events, and their dependencies. The IMS shall address total program activities including activities performed by major subcontractors. The Contractor shall develop the logic resource loaded network that accurately portrays the sequence and relationship of activities defining the total development and production program. The Contractor shall conduct critical path analysis of the tasks and identify problem areas and corrective actions required to eliminate or reduce schedule impacts.

(DI-MISC-81650) Integrated Master Schedule (IMS)

3.3.3.3 Financial Management

The Contractor shall plan, budget, schedule, and control the resources allocated to meet the requirements of the contract. The Contractor shall document and track the status of all appropriated funds associated with the contract to include payments, cancellations and invoices against each contract line item and subline item.

3.3.3.4 Risk Management.

The Contractor shall prepare, implement, and maintain a cost, technical and schedule risk management process which includes risk detection and identification, assignment of risk categories, corrective action, tracking of compliance, reporting of status and planning for risk abatement. The IA risk shall be addressed across the risk management process and can be addressed in multiple areas.

3.3.3.4.1 Post Award Meeting

A post award Meeting shall be held at the Contractor's facility at a mutually agreed upon date after the start-of-work meeting. The meeting shall introduce the key IPT participants, identify points of contact and discuss both parties' understanding of the scope of work and other contract issues.

3.3.3.4.2 Program Management Reviews

The Contractor shall conduct formal program management reviews on an average of once every quarter. The location of the reviews shall be mutually agreed upon. The program management review shall provide a program overview and a detailed discussion of pre-selected topics. Status and information at the review shall reflect currency since the previous review.

(DI-ADMIN-81505) Report, Record of Meeting Minutes

3.3.3.5 Configuration Management

The Contractor shall establish processes and tools to establish and maintain consistency between system requirements, system configuration information, and all relevant information about the system. The consistency established through the CM process shall ensure that the system conforms to the requirements and are identified and documented in sufficient detail to support its life cycle, to ensure component interchangeability, and to ensure accurate system information and safety of system operation and maintenance. The Contractor shall define the performance, functional, and physical attributes in configuration documentation. As the configuration information becomes more detailed and definitive throughout the life cycle, the Contractor shall define configuration baselines. The Contractor shall archive the defined attributes in the baseline in the integrated database. Both the system and its information shall be verified for consistency. The Contractor shall identify and evaluate the impact of all proposed changes through the configuration change management process, including the verification that the system and all associated component information have been updated and continue to be consistent.

3.3.3.5.1 Configuration Verification and Audit

The Government will verify and audit the system configuration information to ensure that requirement attributes are met and accurately documented through a Physical Configuration Audit (PCA). The Contractor shall support the Government during the PCA. The Contractor shall record the results of the audit in a Configuration Audit Summary Report.

(DI-CMAN-81022C) Configuration Audit Summary Report

3.3.3.5.2 Engineering Change Proposals (ECP) and Contract Change Proposals (CCP):

The Contractor shall document and the IPT shall review all proposed changes to established baselines and all changes to the requirements (other than the functional baseline), including

changes to the statement of work, contract data requirements list (CDRL), the contract schedule, and the general provisions of the contract.

(DI-CMAN-80639C) Engineering Change Proposal (ECP)

3.3.3.5.2.1 Engineering and Contract Change Proposal Review

In coordination with the government, the Contractor shall hold a requirements review on all proposed routine changes prior to the submittal of the engineering or contract change proposal in order to clarify requirements, format and content. Depending upon the criticality of the proposed changes, this review may take the form of a teleconference, a video-teleconference, a formal meeting at PEO STRI, or a formal meeting at the Contractor's facility. All appropriate parties shall be in attendance in order to conduct a thorough, effective review. Minutes shall be a historical record to allay any miscommunications. The contractor shall record and provide the minutes.

3.3.3.5.2.2 Deviations

The Contractor shall document the rationale and obtain approval before deviating from any government-controlled baseline.

(DI-CMAN-80640C) Request for Deviation (RFD)

3.4 System Test and Evaluation (T&E)

3.4.1 Integrated Testing.

The Contractor shall follow the established Test and Evaluation (T&E) processes to include the execution of Software Test Descriptions and Test Procedures. You shall develop step-by-step testing operations to be performed on items undergoing testing. You shall identify items to be tested, the test equipment and support required, the test conditions to be imposed, the parameters to be measured, and the pass and fail criteria against which the test results will be measured. The entrance and exit criteria for testing under this are defined in Appendix A. Exit criteria for one phase of testing must be accomplished before entrance into the next phase of testing. In addition to satisfying all other requirements in this SOW, the DD250 shall be signed when the software developed under this effort is integrated into a fielded software release.

(DI-NDTI-80603A) Test Procedures (TPs)

3.4.2 Test Readiness Review (TRR).

The Contractor shall conduct a TRR that follows an established TRR format, prior to the start of formal Test Procedure execution. The IPT will agree to the time and location of the TRR. The

entrance criteria for TRR will be in accordance with the criteria defined in Appendix A for a Formal System Test. All exit criteria for Hardware Software Integration (HSI) and Informal System Test shall be met prior to initiation of a TRR.

3.4.4 Site Acceptance Testing.

You shall plan, perform, and record acceptance testing of each fielded system in accordance with the specification and the approved procedures. Testing shall include testing of each module and workstation individually and testing of the integrated suite.

3.5 Training Products

The Contractor shall develop and provide system operator training through a combination of classroom, written instructions, and hands-on operation. The Contractor shall analyze, and prepare all training courseware including program of instruction, lesson plans, practical exercises, and a train-the-trainer package to accommodate new equipment training. The Contractor shall have available draft training materials for each design increment prior to starting the system level T&E. The Contractor shall conduct training for key test personnel prior to starting Test and Evaluations.

3.5.1 Operator Training

The Contractor shall plan, develop, conduct, and document the completion of the initial instructor and operator course for the initial cadre instructors. The course shall provide comprehensive training for instructors in the concepts, skills, and aptitude to efficiently operate the system. The course shall provide familiarization with simulator operating techniques and shall emphasize the utilization of the instructor facility, its functions, and controls. The course shall address the physical and functional descriptions and operation of the equipment including features, advantages, and configurations.

(DI-ILSS-80872) Training Materials (Operator Training Course)

3.5.2 Test Personnel Training

The Contractor shall conduct familiarization training for test personnel prior to the start of Government acceptance testing. This training shall be conducted at the facility where the testing will be conducted. This training shall familiarize Government test personnel with operation of the trainer and any trainer unique test equipment at the level necessary to properly evaluate all of the functionality of the trainer. It shall include the processes and procedures of opening, tracking and closing deficiency reports in accordance with the Contractor's test management system.

3.5.3 User Training Requirements

3.5.3.1 Language

The Contractor shall provide all instruction, training materials and system documentation in the English language.

3.5.3.2 Class Size

For each student to receive the greatest benefit from the training, maximum class size shall be 12 trainees. Class size for training will be dependent on available classroom size. The Contractor will publish a schedule of classes with the maximum number of students it can handle at any given time.

3.5.3.3 Location of Training

The Contractor shall conduct the training courses on location at the government site where the system is to be installed.

3.5.3.4 Training Facility and Equipment

The Contractor shall provide all required classroom equipment and training equipment for courses conducted at the Government's facility. Training shall include classroom and practical exercises and shall total no more than eight hours per day.

3.5.3.5 Timing of Training Delivery

The Contractor shall conduct training on an incremental basis and scheduled in accordance with the incremental delivery of each system capability and Government acceptance.

3.5.3.6 Course Completion Criteria

The Contractor shall develop a criterion-referenced performance test to measure the students' ability to perform all job-related competencies.

3.5.3.7 Certificate of Completion

Upon successful completion of the training, the Contractor shall provide the participants with a personalized certificate recognizing their achievement and satisfactory completion of the course. The Contractor shall maintain a record of students attending the class, their test results and the completed student course evaluations.

3.6 Peculiar Support Equipment

3.6.1 Test Measurement and Diagnostic Equipment

The Contractor shall develop alternative test procedures utilizing commercially available test equipment if special inspection equipment is developed and used for production.

3.7 Site Installations

3.7.1 Installation Program

The Contractor shall perform all installation preparatory work; including advising and assisting on-site personnel in any modifications they may be performing.

3.7.2 Installation Tools and Test Equipment

The contractor shall provide all the standard and any special tools, test equipment, and support equipment (including support equipment for training) required for system installation. All special tools and test equipment shall remain at each site.

3.7.3 Installation Spares

The contractor shall perform the logistics analysis to determine the complete range and depth of spares and repair parts required both at the sites and in central and/or regional depots. The contractor shall acquire Government concurrence with the range and depth of spares prior to procurement. The contractor shall provide spare parts to support the system during the CLS period. The Contractor shall replace all site spares used during the installation. .

(DI-ILSS-80134A) Spare Parts List

3.8 Contractor Logistics Support (CLS)

The contractor shall provide follow-on maintenance and support including coverage for all system hardware/software and technical support from initial fielding through one year beyond the completion of the last production ACS. This support program will provide coverage to the software and hardware to ensure that the equipment operates within the requirements listed in the SRD. It shall apply to the correction of faults in the system software and include upgrades or enhancements of the software or to the addition/modification of hardware or software interfaces.

The contractor shall provide a 1-800 Help line and a 3-day fix time to provide flexibility in mission requirements and operate on a standard system hardware configuration. ACS shall be designed so that system expansion or future enhancements can be easily incorporated without reengineering the hardware. Hardware shall be open-system architecture. The contractor shall provide for the complete supply support of the ACS. . . The contractor is responsible to replenish the initial spares so that a complete set is available to provide to the follow-on contractor when system life cycle support transitions.

3.8.1 Software Support

The Contractor shall provide services to maintain and update system software for the duration of the CLS effort. At the end of the CLS effort, the Contractor shall deliver, install, and check-out for proper operation a subset of the development software support environment to serve as the sole means to sustainment for the system software. The software support environment shall include all commercial, government-funded, and Contractor proprietary software, all necessary documentation/specifications, plus executing hardware with all applicable licenses necessary to enable the government to fully support all system software.

The Contractor shall ensure that the software support environment and the computer hardware and software are compatible, and that the software support system will facilitate the changing and upgrading of the software modules.

(DI-MISC-80711A) Scientific & Technical Reports

3.9 Integrated Digital Environment (IDE)

The Contractor shall establish, maintain and manage an interactive, online, protected, and access controlled IDE, such that the IPT members can contribute their ideas, comments and suggestions, exchange program information and collaborate in a distributed environment. The Contractor shall include software applications and data base services for the generation, integration, storage, indexing, distribution, simultaneous on-line sharing of digital data among all government and Contractor team members, and delivery of technical data products with associated Contractors, subcontractors and Government organizations. Specifically, integrated automated databases are required which shall allow technical data sharing at the data base lever, rather than at the physical file level, with multiple formats of the same data from a common, configuration-controlled source available to different users. The IDE shall provide program personnel complete visibility into the system at every stage of development, regardless of data location.

Appendix A – Entrance and Exit Criteria

1. System Requirements Review (SRR).

1.1 SRR Entrance Criteria

- A preliminary agenda has been submitted 30 days prior to this event and accepted by the Government
- The Requirements Traceability Matrix (RTM) has been delivered and accepted with stated and derived requirements
- Deliverables that were scheduled to be delivered prior to this event have been delivered and accepted by the Government IAW CDRL requirements
- Updated risk assessment is provided
- The Contractor has staffed the technical requirements team including applicable Subject Matter Experts (SMEs).
- The Integrated Master Schedule (IMS) (CWBS) provided

1.2 SRR Exit Criteria

- SRR Meeting Minutes are submitted by the Contractor and approved by the Government
- SRR Contractor Action Items are written and under configuration control with an approved action/implementation plan or the proper disposition was agreed to by the Government
- Functional configuration baseline is established and agreed to by the Government prior to proceeding to the preliminary design phase
- Deliverables associated with this event were reviewed and approved by the Government, or a mutually (Government and Contractor) agreed plan exists for those deliverables that were not fully approved
- Cost, schedule, and performance risks with their associated mitigation plans are considered acceptable by the Government prior to proceeding to preliminary design phase
- The Integrated Master Schedule (IMS) has been approved by the Government
- All stated and derived requirements in the RTM have been accepted and are ready for functional allocations
- Submission to the Government of all SRR presentation material

2. Preliminary Design Review (PDR).

2.1 PDR Entrance Criteria

- A preliminary agenda has been submitted 30 days prior to this event and accepted by the Government
- The updated RTM is made available for review and discussion by the Government
- Deliverables that were scheduled to be delivered prior to this event have been delivered and accepted by the Government IAW CDRL requirements
- Updated risk assessment is provided
- A Preliminary Design is submitted to the Government that provides a solution approach for satisfying all of the requirements of this contract
- An SRR event has been successfully completed and concurred by the Government
- All SRR actions resolved or a closure plan presented and approved by the Government for the items that were not closed
- Updated schedule submitted highlighting the critical path through CDR

2.2 PDR Exit Criteria

- PDR Meeting Minutes are submitted by the Contractor and approved by the Government
- PDR Contractor Action Items are written and under configuration control with an approved action/implementation plan or the proper disposition was agreed to by the Government
- Deliverables associated with this event were reviewed and approved by the Government, or a mutually (Government and Contractor) agreed plan exists for those deliverables that were not fully approved
- Cost, schedule, and performance risks with their associated mitigation plans are considered acceptable by the Government prior to proceeding to the Critical Design phase
- The IMS is approved by the Government
- All training system requirements have been allocated with a baseline RTM to enable detailed design to proceed with proper configuration management, and the RTM is accepted by the Government
- Government determines that the preliminary design is sufficiently mature and stable to begin critical design.
- Submission to the Government of all PDR presentation material.

3. Critical Design Review (CDR).

3.1 CDR Entrance Criteria.

- A preliminary agenda has been submitted 30 days prior to this event and accepted by the Government
- The updated RTM is available for review and discussion by the Government
- Deliverables that were scheduled to be delivered prior to this event have been delivered and accepted by the Government IAW CDRL requirements
- Updated risk assessment provided
- A final design is submitted to the Government that satisfies all of the requirements of the contract
- A PDR has been successfully completed and concurred by the Government
- All PDR actions are resolved
- An updated schedule is submitted highlighting the next critical tasks
- The design is mature and stable
- A high percentage (80%) of the drawings are completed and meets the requirements of the contract
- Logistics analysis has been completed and plans have been established and coordinated with the Government
- A documented system/subsystem Design approach is completed

3.2 CDR Exit Criteria.

The CDR is considered complete when:

- CDR Meeting Minutes are approved by the Government
- CDR Contractor Action Items are written and under configuration control with an approved action/implementation plan or the proper disposition was agreed by the Government
- Deliverables associated with this event were reviewed and approved by the Government, or a mutually (Government and Contractor) agreed plan exists for those deliverables that were not fully approved
- The RTM shows traceability amongst requirements, design, and test methodologies forwards and backwards
- Cost, schedule, and performance risks with their associated mitigation plans are considered acceptable by the Government prior to proceeding to design implementation
- The IMS is approved by the Government
- Government determines that the detailed design is sufficiently mature and stable
- Submission to the Government of all CDR presentation material.

3.3 System Test Phase:

The System Test phase and its specific entrance and exit criteria are described below. The System Test phase is comprised of three sub-phases. The first sub-phase involves the Engineering Dry Run of the Test Procedures (TPs). The second sub-phase is the contractor QA run of the TPs. The third sub-phase is the Formal Government execution of Test Procedures.

System Test

This phase of System focuses on an Engineering dry run followed by a contractor QA run of the TPs. The intent of the Engineering dry run is to identify defects in the TPs and provide early identification of DRs. The intent of the contractor QA run of the TPs is to provide final verification of system operation prior to Government formal execution.

Formal System Test

A formal Government Acceptance Test will be conducted at the end of the effort. This test focuses on the SSS requirements associated with the configurations and the Training Environment functionality implemented during that DO. The tests will be conducted by the Government, with support from contractor personnel, using the approved Test Procedures developed for the DO. A TRR will be held prior to the start of the Formal Government System Test Event to identify the status of the system under test, and to verify the entrance criteria has been met.

System Test Entrance Criteria:

- a. All STDs have been completed successfully.
- b. All TP sections have been run by contractor QA.
- c. All Internal DRs found during Engineering TP Dry Runs and contractor QA Runs are documented and reviewed with the Government as part of TRR.
- d. All Formal DRs documented, Corrective Action Plan(s) developed and reviewed with the Government as part of TRR.
- e. All formal priority one and two DRs closed or approved to proceed with corrective action plan.
- f. All formal priority three DRs closed or have approved workaround solutions.

- g. All formal priority four and five DRs documented and reviewed as part of the TRR.

The PEO STRI Test Director or appointed representative and Government SMEs, supported by the contractor Test Director or his representative and contractor SMEs as required, execute the TPs. During the conduct of the TPs, TP Discrepancy Reports (TP DR) are generated, as appropriate. DRs are assigned priorities by the Discrepancy Review Board (DRB) comprised of contractor and Government personnel. DRs are tracked using a CM tool established during the DO. Status reports are posted weekly and made available to the Government.

The System Test is complete when the following exit criteria have been satisfied.

System Test Exit Criteria:

- a. All TP sections have been run successfully signifying the system meets the Delivery Order requirements.
- b. All DRs documented and Corrective Action Plan(s) developed.
- c. All priority one and two DRs closed or approved to proceed with corrective action plan.
- d. All priority three DRs closed or have approved workaround solution.
- e. All priority four and five DRs documented.
- f. Test Procedures submitted as FINAL in accordance with the DD FORM 1423-1, FEB 2001.