STATEMENT OF WORK

NDI HW & SW

**Warning:**

The Statement of Work (SOW) paragraphs, Contract Data Requirements List (CDRL) items, and Data Item Descriptions (DIDs) identified for your type of acquisition are recommendations only. You are expected to modify or add SOW paragraphs, CDRLs, or DIDs to address the specific requirements of your program.

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# 1 Overview

This Statement of Work (SOW) defines the effort required for the design, development, fabrication, and test of the [*insert name of program or system*]. The [*insert name of program or system*] should be composed of commercial-off-the-shelf (COTS) and Non-Developmental Item (NDI) hardware and software components to the maximum extent practicable. The SOW includes provisions for program management, systems engineering, system test and evaluation, implementation and transition, training, integrated logistics support, and operational support.

# 2 Applicable Documents

The following specifications, handbooks, orders, standards, and drawings form a part of this SOW and are applicable to the extent specified herein. The latest version of these documents as of the contract date must apply. In the event of conflict between this SOW and any of the applicable documents cited below, the provisions of this SOW must apply.

* Copies of FAA specifications and interface documents may be obtained from the Federal Aviation Administration, Headquarters Public Inquiry Center APA-230, 800 Independence Avenue SW, Washington, DC 20591, 202-267-3484. Requests should fully identify material desired and cite the solicitation or contract number.
* Requests for copies of documents not covered in the preceding paragraph should be addressed to the Contracting Officer. Requests should fully identify material desired and cite the solicitation or contract number.
* Military Standards and Specifications can be ordered from the Department of Defense Single Stock Point (DODSSP), Building 4/Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5098. Information is available at their website, <http://www.dodssp.daps.mil>.
* Copies of ANSI/ASQC-Q-9001-1994 and ISO 9000-3 can be obtained from the following source: American Society for Quality Control 611 East Wisconsin Avenue P.O. Box 3005; Milwaukee, Wisconsin 53201-3005. Phones: (414) 272-8575 or (800) 248-1946. The Fax is: (414) 272-1734.
* Copies of the Acquisition Management System Test and Evaluation Process Guidelines are available in the FAA Acquisition System Toolset (FAST). The on-line internet address of FAST is: <http://FAST.faa.gov>

## 2.1 FAA Documents

FAA ORDER FAA Automated Information Systems Security Handbook

1600.54B

FAA ORDER General Maintenance Handbook for Airway Facilities (8/96)

6000.15B

FAA-STD-020B Transition Protection, Grounding, Bonding, and Shielding Requirements

For Electronic Equipment (5/11/92) [*being revised to reflect new requirements*]

FAA-STD-025D Preparation of Interface Documents (10/95)

FAA-STD-028B Contract Training Programs (5/1/93) [*canceled without replacement*]

FAA-HDBK-004 National Airspace System Internet Protocol Suite (1997)

FAA-D-2494B Technical Instruction Book Manuscript: Requirements for Electronic, Electrical, and Mechanical Equipment

## 2.2 Military Standards

MIL-STD-973 Configuration Management (1995) Notice 3

MIL-HDBK-881 Work Breakdown Structures (1/2/98)

## 2.3 Other Documents

ANSI/ASQC Quality Systems -- Model for Quality Assurance in Q9001 Design, development, Production, Installation, and Servicing

EIA/IS-649 National Consensus Standard for Configuration Management Practical Software Measurement, Version 2.1, March 27, 1996 State and Local Building Codes and Uniform Building Codes

NFPA-70 National Electrical Code (NEC) National Fire Protection Association

# 3 Requirements

The supplies and services required by this contract must be performed in accordance with Specification [*insert specification number(s)*], entitled "[*insert specification name(s)" and this Statement of Work (SOW). The Contractor must provide systems engineering, program management, integrated logistics support management, quality assurance, configuration management, training, operational support, material and support to test, deliver and install [insert name of program or system*] in accordance with this SOW.

Data items referenced by their Contract Data Requirements List (CDRL) titles are to be performed in accordance with (IAW) the CDRL of the same name, even when the CDRL number is not specified. All data deliverables must be prepared and delivered IAW the corresponding CDRL items specified under the SOW requirement.

The contractor must perform IAW all plans developed in response to this SOW and as approved by the Government. All reference to the "Government" in this SOW must mean by authority of the Contracting Officer or designee. Throughout this SOW, the requirements to "record" information or data must be interpreted IAW paragraph 1.2.4.4 of MIL-STD-498 unless specified otherwise. All CDRL items identified in this SOW must be delivered to the Government in digital media (Compact Disc Read Only Memory (CDROM) for more than 1.4 MB) compatible with the Microsoft Office suite of products, (unless otherwise specified), as well as hard copy.

NOTE: Paragraph 1.2.4.4 of MIL-STD-498 defines "record" as "... requirements to 'record' information are to be interpreted to mean 'set down in a manner that can be retrieved and viewed.' The result may take many forms, including, but not limited to, hand-written notes, hard-copy or electronic documents, and data recorded in CASE and project management tools."

## 3.1 Program Management

### 3.1.1 Program Management Organization

The Contractor must establish and maintain a formal organization to manage the contract and subcontracts. The Contractor must develop and implement a Management Program to efficiently and effectively execute the requirements of this contract to include: program control, quality assurance, configuration management, subcontract management, management of Government furnished resources, risk management, and security. The use of Integrated Product Teams (IPTs) is strongly encouraged in the management of this program.

CDRL A001 Master Program Management Plan

### 3.1.2 Program Control

The Contractor must assign a Program Manager to organize, plan, schedule, implement, control, analyze, and report on all elements of the contract. The Program Manager must have resources and authority to ensure efficient and timely program execution and must be the Contractor's focal point for all required program tasks. The Contractor's Program Manager must be prepared to present and discuss the status of contract activities at any time.

### 3.1.3 Risk Management

The Contractor must identify cost, schedule, and technical risks and describe how it will effectively manage these risks throughout the performance of this contract. The Contractor must identify its risk management techniques in the Master Program Management Plan (MPMP). Significant risks should be identified and discussed in the MPMP.

The Contractor must quantify risks with respect to the impact on integration, installation, performance, schedule, and cost. The Contractor must identify risks and assign a priority for developing a recommended course of action. The Contractor must develop and maintain a list identifying, analyzing, and classifying program risks. Program risks must be classified as low, medium, or high priority. The Contractor must develop risk mitigation plans for risks considered medium or high priority. The Contractor must provide the status and risk mitigation plans in the MPSR and Program Management Reviews.

CDRL A002 Monthly Program Status Report

### 3.1.4 Planning and Reporting

#### 3.1.4.1 Contract Work Breakdown Structure (CWBS)

The Contractor must prepare the Contract Work Breakdown Structure (CWBS) based on the preliminary Work Breakdown Structure (WBS), Attachment [*insert attachment number*], using MIL-HDBK-881 for guidance. The Contractor must maintain and update the CWBS to a minimum level 3 unless otherwise specified in the preliminary WBS, Attachment [*insert attachment number*]. The CWBS should be developed by the Contractor (a) to reflect the manner in which the work will be accomplished on the contract and, (b) to facilitate management, data collection, and reporting.

CDRL A003 Contract Work Breakdown Structure

#### 3.1.4.2 Earned Value Management

The Contractor must utilize an Earned Value Management System (EVMS) to facilitate:

* Thorough planning
* Timely baseline establishment and control
* Information broken down by product as well as by organization or function
* Objective measurement of accomplishment against the plan at levels where the work is being performed
* Summarized reporting to higher management for use in decision-making
* Reporting discipline
* Analysis of significant variances
  + - * The implementation of management actions to mitigate risk and manage cost and schedule performance

At a minimum, the Contractor's EVMS should provide for:

* Establishing the time-phased budgeted cost of work scheduled (including work authorization, budgeting, and scheduling), the budgeted cost for work performed, the actual cost of work performed, the budget at completion, the estimate at completion, and provisions for subcontractor performance measurement and reporting
* Applying all direct and indirect cost and provisions for use and control of management reserve and undistributed budget
* Incorporating changes to the contract budget base for both FAA directed changes and internal re-planning
* Establishing constraints to preclude subjective adjustment of data to ensure performance measurement remains realistic. Unless the Contracting Officer provides prior written approval, in no case must the total allocated budget exceed the contract budget base. For cost reimbursement contract line items, the contract budget base should not be adjusted to reflect cost growth increases
* Establishing the capacity to accurately identify and explain significant cost and schedule variances, both on a cumulative basis and projected at completion basis

The Contractor must prepare and submit Contract Funds Status Reports (CFSRs), and Cost/Schedule Status Reports (C/SSRs) utilizing the EVMS.

CDRL A004 Contract Funds Status Reports

CDRL A005 Cost/ Schedule Status Reports

#### 3.1.4.3 Network Logic Schedule

The Contractor must develop a Network Logic Schedule (NLS) based on the sequence of events required to accomplish the efforts required by this contract. The Contractor must ensure that the NLS portrays an integrated schedule plan to meet the milestones and delivery requirements of this contract. The NLS should be consistent with the EVMS and identify the program critical path. The Contractor must present the NLS at the PMR.

CDRL A006 Project Schedule

### 3.1.5 Human Factors Engineering

* Planning and execution - An adequately staffed Human Factors Engineering (HFE) effort must be dedicated to and be an integral part of the system's analysis, design, and test process. An HFE Program must be planned and implemented in accordance with MIL-HDBK-46855, as applicable to the system's COTS or NDI program objectives, human-in-the-loop performance requirements, characteristics and constraints.
* Objective - The objective of the HFE effort must be to assure that the system design is consistent with the capabilities and limitations of the user to operate and maintain it in its operational environment, consistent with performance requirements and logistics capabilities.
* Scope - To attain the above objective, the scope of the HFE analytic, design, and test activities must include compensation for the effects of workload and maintenance in extremes of natural environment as defined by system requirements and site specific contingencies. The impact of equipment, software, and procedures on personnel availability, skill levels, and proficiency, transfer of training, and operations and maintenance under stress must be assessed.
* Human Factors Engineering Program Emphasis Areas - Within the context of the above considerations, the human factors engineering program must include as a minimum, the following emphasis areas:
* Studies and Analyses - Human Factors Engineering studies, analyses and dynamic simulation of the system must be performed as applicable to the objectives of the contract in the areas outlined by MIL-HDBK-46855 (as tailored) in general and the following system functions and issues in particular:

1. Task Sequences. Capability of COTS or NDI hard-ware/ software/ personnel/ procedures to perform in accordance with system human-in-the-loop performance requirements
2. Maintainer Interface. Suitability of maintainer hardware/ software/ procedures to facilitate meeting system human-in-the-loop performance requirements including accomplishing maintenance involving fault isolation, manipulation, access, removal, replacement, and repair; manual operations involving pulling, pushing, lifting, or carrying; and compatibility of tools with tasks, hand wear, and environment
3. Critical Tasks. Analysis of critical tasks using the COTS or NDI system must include consideration of primary task performance and communications as well as secondary tasks that must be accomplished but may be deferred

* Computer Human Interface (CHI) and Software - For systems that have a reliance on software for the human interface, the Human Engineering Program Plan must specify the process by which the CHI will be evaluated to determine if critical tasks can be satisfactorily performed when using the system. CHI must include the workstation, computer hardware, and software aspects of the system. The impact of (and on) legacy systems, other software in the workstation, and transfer of training from predecessor systems must be addressed.
* Test and Evaluation - Human factors engineering requirements must be integrated into system test and evaluation to demonstrate the capability of the human-system interface to attain required system performance characteristics. Testing and evaluation must specifically include: reaction times, ability to perform visual search tasks, tracking and monitoring tasks, data insertion, adequacy of operating and maintenance procedures, and other tasks that the requirements documents and human engineering analyses have determined are critical. Testing must thoroughly assess human performance and human engineering design of each personnel position. HFE tests may be integrated into other system tests. However, dedicated HFE tests must be performed when validation of critical task accomplishments is necessary. Examples of such tasks are those where reaction time and accuracy requirements are primary determinants of mission accomplishment.
* Program Planning. An HFE program planning scheduled by the contractor must be undertaken no later than 30 days after contract (DAC). The purposes of this program planning meeting are to:

1. Insure mutual understanding of the proposed HFE Program Plan to be submitted
2. Insure consistency of HFE program planning with the objectives of the contract and applicable provisions of MIL-HDBK-46855
3. Discuss any human engineering guidelines or software style guides from which the contractor has significantly deviated during the development of the COTS or NDI system that may have an impact on system performance
4. Review general approach, assumptions, guidelines, schedules, and level of effort
5. Discuss problems and/or needs for access to technical information for requirements clarification or requirements compliance

CDRL A054 Human Engineering Program Plan

CDRL A055 Human Engineering Design Approach Doc-Operator

CDRL A056 Human Engineering Design Approach Doc-Maintainer

CDRL A057 Critical Task Analysis Report

CDRL A058 Human Engineering Simulation Concept

## 3.2 Quality Control

### 3.2.1 Quality Assurance

The Contractor must provide and maintain a documented quality system as a mean of assuring compliance with the hardware and software requirements of the contract. A Quality System Plan must be prepared and submitted (Ref. DID/CDRL Quality System Plan and ISO 9001/ISO 9000-3 required) as a separate bound volume and submitted with the technical proposal. All portions must be considered of equal importance. The Contractor must require of subtier suppliers a quality system achieving control of quality of the services and supplies provided. All spare parts must be inspected and tested in plant, using the same procedures as the primary equipment components.

Note: The Government intends to use these Quality Standards as it would any other quality standards. Third party registration of ISO standards is not required nor does such registration relieve the offeror of the requirement of submitting a Quality System Plan (QSP).

CDRL A053 Quality Assurance Plan

## 3.3 Configuration Management Program

CDRL A009 Meeting Agenda

### 3.3.1 Configuration Management

The Contractor must establish and implement a Configuration Management (CM) program using MIL-STD-973, "Configuration Management," for guidance. The CM program must provide an organizational structure with configuration identification and control methods, configuration audits, and configuration status accounting procedures for hardware and software. The Contractor must identify the single focal point, under the Program Manager, who will serve as the primary point of contact for all communication on CM-related issues. The CM program must be documented in the MPMP. The MPMP should include a description of how the Contractor will establish, implement, and maintain the CM program.

The Contractor must maintain configuration control of hardware, software, firmware, and developmental/commercial documentation. The Contractor must maintain configuration control of the hardware to the LRU Level and software to the version level.

### 3.3.2 Configuration Identification (CI)

The Contractor must develop and maintain a Program Document Library that retains all documentation for identification, control and status accounting of all Configuration Items (CI) throughout the program life cycle. Any item subject to replacement in the site, used without modification from a subordinate vendor, or as a serialized end items for tracking or Government acceptance purposes, must be designated a CI. The Contractor must assign a discrete part number or item identification number to each Configuration Item.

The Contractor must assign a discrete part/identification number to each software medium, (e.g., magnetic disk, tape) containing release or build type software executables. The medium thus identified must be inclusive and contain all software segments, thereby providing easy identification of software releases after the product baseline is established.

### 3.3.3 Configuration Baselines

The Contractor must maintain the configuration baseline and the required documentation to support this baseline. The approved Product Baseline must be established after successful completion of the Functional Configuration Audit/Physical Configuration Audit (FCA/PCA).

### 3.3.4 Configuration Control

The Contractor must apply configuration control measures to each baseline CI, and its configuration documentation. The configuration control program must provide effective means, as applicable, for proposing changes to CIs and ensuring implementation of the approved change.

### 3.3.5 Configuration Audits

The Contractor must support configuration audits using MIL-STD-973 as guidance. The Contractor must prepare and submit a Configuration Audit Plan for FCA/PCA. The Contractor must be responsible for ensuring that subcontractors, vendors, and suppliers participate in the configuration audits, as proposed and approved via the Configuration Audit Plan. The Contractor must prepare and submit a Configuration Audit Summary Report documenting the findings of the FCA/PCA.

CDRL A007 Configuration Audit Plan

CDRL A008 Configuration Audit Summary Report

### 3.3.6 Functional Configuration Audit (FCA)

The Contractor must support a Functional Configuration Audit (FCA) at the Contractor's facility using MIL-STD-973 as guidance. The FCA must be conducted on the first production article and individual requirement (i.e. MUST Statement) irrespective of the test guidance provided from any requirements or verification test matrix, must be audited. The intent must be to audit the attainment of all functional requirements and to validate their attainment during the FCA.

### 3.3.7 Physical Configuration Audit (PCA)

The Contractor must support a Physical Configuration Audit (PCA) of a first production article [*insert system name*] system prior to the start of OT&E. Subcontractor, vendor, and supplier PCAs must be performed for CIs developed for the [*insert system name*] procurement or modified for use by other than the [*insert system name*] prime Contractor. Successful completion of the PCA must include, but not be limited to, successful conclusion of FCA and Government approval of the Contractor's final submission of the associated CDRL items. [*List required CDRL items*]

### 3.3.8 Configuration Status Accounting (CSA) Information

The Contractor must maintain a Configuration Status Accounting (CSA) Information System to assure accurate identification of each CI. The Contractor must ensure that the CSA information is available for review by the FAA, as requested.

### 3.3.9 Engineering Change Proposals (ECP)

The Contractor must implement an effective engineering change control program. The Contractor must seek Contracting Officer concurrence prior to submitting major engineering changes. Upon receiving concurrence from the Contracting Officer, the Contractor must formally submit an ECP for Integrated Product Team review and approval.

CDRL A024 Engineering Change Proposals

## 3.4 Meeting Agendas and Minutes

The Contractor must conduct meetings and reviews IAW the Government approved PMP and this SOW. At each management review or audit, the Contractor must provide backup data regarding assumptions made and methodologies used in arriving at specific recommendations or conclusions. The Contractor must prepare and submit a Meeting Agenda, Meeting Minutes, and Presentation Materials for all meetings. Management and formal reviews and audits must not be considered complete until approval by the Government is granted in writing. The Contractor must propose an overall strategy for conducting each set of reviews.

Support provided by the Contractor must include, but is not limited to, facilities, materials, office equipment, clerical personnel, mockups, technical data, and subcontractor participation (when requested by the Government). The Contractor must provide an agenda for each management and formal meeting. The minutes, accompanied by a summary of action items and all presentation materials used must be provided by the Contractor for Government approval.

CDRL A010 Meeting Minutes

CDRL A011 Presentation Materials

### 3.4.1 Program Management Reviews

The Contractor must conduct Program Management Reviews (PMRs) on a monthly basis to present program status to the Integrated Product Team (IPT). The Contractor must present cost and schedule status, provide performance measurement information, and must present current and anticipated technical and implementation problems. The Government may identify entry and exit criteria for evaluating the content and quality of the PMRs. The Contractor must provide evidence that all identified criteria are satisfied before the Government will approve the PMR.

The review location must alternate between the FAA and the Contractor's facility. The Contractor's PMRs must be targeted for no more than one day in length. Attendance will generally be limited to 10-15 key FAA personnel and 10-15 Contractor personnel.

### 3.4.2 Technical Exchange Meetings (TEM)

The Contractor must conduct and administratively support periodic Technical Exchange Meetings (TEMs) at the Contractor's facility. If requested, TEMs may also be scheduled in Washington, DC, Atlantic City, NJ, or at another location approved by the FAA. During the TEMs, the Contractor and the Government will discuss specific technical activities, including studies, test plans, test results, design issues, technical decisions, and implementation concerns to ensure continuing FAA visibility into the technical progress of the contract.

### 3.4.3 System Engineering Reviews (SER)

The Contractor must conduct periodic Systems Engineering reviews (not to exceed four per year) that address all systems engineering efforts performed under the contract. At a minimum, the Contractor must ensure SERs are scheduled to support major program activities for Initial Operational Capability (IOC) and Full Operational Capability (FOC). The Contractor must present status, progress, problems, and issues related to Systems Engineering tasks. In addition, the Contractor must identify and explain any deviations between the current schedule and the baseline NLS, and the status of all critical path activities.

### 3.4.4 Document Library

The Contractor must maintain a document library with all documents developed by the Contractor and subcontractors as well as any Government Furnished Information (GFI). The list of documents included in the library must be available upon Government request. At a minimum, the Contractor's Document Library should contain:

* Copies of all correspondence between the Contractor and the FAA
* Documentation providing traceability and rationale for the Contractor's program decisions (Decision Database)
* The latest internally controlled version of all specifications, drawings, databases and software that define or implement the system
* All tools used to generate documents in the database
* Copies of all briefings to the FAA
* All configuration management documentation
* Program Trouble Report (PTR) Database
* Site Hardware and Software Inventory Lists
* All CDRL documentation

The Contractor must place documents in the Contractor's library within fifteen (15) days of its availability to Contractor personnel. The Document Library must be easily accessible to authorized FAA personnel. For electronic media, the Contractor must provide on-line access for reviewing documents to authorized FAA personnel (read only mode). As a subset of the Document Library, the Contractor must maintain a decision database on media of the Contractor's choice. The decision database must be the collection of data that provide a clear history and audit trail sufficient to reconstruct program decisions and rationale.

## 3.5 System Design

The Contractor must maximize the use of COTS hardware and software to meet the contract requirements. The use of commercial item hardware does not exempt the Contractor from complying with the contract requirements. The Contractor must propose and obtain approval from the FAA for the use of any non-commercial items or modified COTS hardware. The Contractor must ensure that all hardware, software, and documentation required for the operation and support of [*insert system name*] is provided as part of the supplies and services provided herein.

### 3.5.1 System Architecture

The system architecture must satisfy all the requirements provided in the [*insert system name*] System Requirements Document, Attachment [*insert attachment number*]. The Contractor must submit revisions and updates to the System Architecture Description as required. The Contractor must ensure that the System Architecture Description depicts the System hardware and software architecture at the national (system) level, the site (AFSS) level, and at the workstation level. The Contractor must update the System Segment Specification (B-Level Specification), to document and maintain the current functional baseline. The Contractor must obtain approval from the CO before amending the baseline. The Contractor must ensure that all critical components to the system are protected against power loss or fluctuations.

CDRL A012 Architecture Description

CDRL A013 System Segment Specification (B-Level Specs)

#### 3.5.1.1 Console

The Contractor must modify the existing [*insert quantity*] consoles to accommodate the [*insert system name*]. The Contractor must ensure that modifications to existing consoles do not interfere with or affect other equipment not being replaced by the [*insert system name*].

The Contractor must provide detailed drawings of the modified consoles in the As Built Engineering Drawings.

CDRL A014 As Built Engineering Drawings

#### 3.5.1.2 Workstations

The Contractor must install and integrate hardware in the operational facilities identified in Attachment [*insert attachment number*]. The Contractor must ensure that the [*insert system name*] does not degrade the performance, reliability maintainability, availability, and safety of any collocated system or equipment listed in Attachment [*insert attachment number*].

#### 3.5.1.3 Engineering Drawings

The Contractor must develop Engineering Drawings for each [*insert system name*] System site. The Engineering Drawings must be used in the [*insert system name*] System installation planning effort and to identify the final as-installed configuration at each site.

CDRL A015 Engineering Drawings

### 3.5.2 Software Development

#### 3.5.2.1 Initial Operational Capability (IOC) Software

The Contractor must acquire or develop all software required for the System IOC deployment, as defined in Attachment [*insert attachment number*]. This must include software necessary to resolve outstanding Program Trouble Reports (PTRs) identified during the Operational Capabilities Test (OCT). The Contractor must provide the software necessary to implement all interfaces required for initial system deployment. The Contractor must integrate this software into the existing system software baseline.

#### 3.5.2.2 Full Operational Capability (FOC) Software

The Contractor must acquire or develop all additional software required to provide the System FOC, as defined in Attachment [*insert attachment number*] and applicable IRDs. The Contractor must integrate this software into the existing system IOC software baseline, such that all requirements stated in the approved B-Level Specification and applicable IRD's are satisfied.

## 3.6 System Engineering

The Contractor must develop and implement a System Engineering Management program for the definition, development, verification, integration, and testing of the [*insert system name*] System requirements as allocated to the Computer Software Configuration Items (CSCI) and Hardware Configuration Item (HWCI). System engineering efforts must include all aspects of performance, quality, life cycle costs, maintainability, reliability, schedule, data processing reserves, and future growth requirements.

The Contractor must maintain effective control over the system engineering and design development process, including subcontract items and services, to ensure cost, performance, and schedule requirements are met, to provide early detection and resolution of problems, and to reduce risk. The Contractor must specify a single authority that will serve as the point of contact for system engineering issues.

### 3.6.1 Software Engineering

The Contractor must describe in the MPMP its plans for acquiring and developing the required software to meet contract requirements. The MPMP must identify the single point of contact for software engineering issues.

The Contractor must acquire/develop, document, test, and manage all system software provided or developed under this contract. The Contractor must employ best commercial practices as guidance for all software engineering requirements.

The Contractor must permit authorized FAA personnel or designees to inspect all software documentation. The Contractor must make available to the FAA for review, the information, practices, procedures, or documentation developed or purchased by the Contractor or its subcontractors in connection with the [*insert system name*] software program, and allows the FAA to witness any test associated with the software development or integration.

#### 3.6.1.1 Software Metrics

The Contractor must select, and upon receiving Government approval, utilize a software application to measure and track the status of the following software metrics:

* Software Requirements and Design Stability
* Software Development Progress
* Software Size
* Computer Resource Utilization
* Software Personnel
* Software Development Tools
* Requirements and Design Progress
* Program Trouble Reports (PTRs)
* Defect Discovery Rate (defects/month)
* Module Status
* Project Quality

The Contractor must discuss the status of these metrics at each PMR.

#### 3.6.1.2 Software Program Trouble Report (PTR)

The Contractor must develop and implement internal procedures to identify, report, monitor, and resolve all software and/or software-related problems. All such software-related plans must be documented in Program Trouble Reports. The Contractor must include software-related problems identified by both the Contractor and the FAA, and those identified by other users that have an impact on the [*insert system name*] System functionality. The Contractor must establish and maintain a PTR database. The PTR database must contain the master copy of all PTRs. The Contractor must provide the PTR database as a part of electronic on-line access to authorized FAA personnel (read only mode). The Contractor's PTR procedures must be documented in the MPMP.

## 3.7 System Refresh and Upgrade

The Contractor must provide routine updates, upgrades, design modifications, and corrective performance improvements. The Contractor must notify the FAA before incorporating any adaptation, update or upgrade of commercially available hardware, software or firmware. The Contractor must conduct a risk benefits analysis to include life cycle and transition planning prior to the notification to the FAA. A summary of the risk analysis must be provided as part of the Monthly Program Status Report. The Contractor must notify the CO 30 days in advance of implementing any changes. The FAA will advise the Contractor of its approval of the change or if testing is required prior to the Contractor implementing the change at all sites.

CDRL A002 Monthly Program Status Report

## 3.8 System Technology Infusion

The FAA may solicit, and the Contractor is encouraged to independently propose, engineering changes to the equipment and software specifications or other requirements of this contract for technology enhancements. These enhancements may be proposed to save money or energy, improve performance, satisfy increased data processing requirements, or for the replacement of equipment and software due to technological advancement.

The Contractor may propose system hardware and software changes, by submitting no-cost ECPs to the FAA for approval. Contractor initiated changes, if accepted by the FAA, will be implemented at no additional cost to the FAA. If the FAA requests upgrades to the Contractor's system, the Contractor must submit an ECP with a price proposal for evaluation. Approved changes must be incorporated into the contract via a contract modification pursuant to the "Changes" clause.

The Contractor must provide written notification to the Contracting Officer in advance of any proposed replacement of hardware or software used in the operation of the system. Those technical enhancements that are acceptable to the FAA will be processed as modifications to the contract. The format for the Contractor's written notification to the Contracting Officer must be provided using MIL-STD-973, Section 5.4.6, as guidance. As a minimum, the Contractor must submit the following information:

* Description of the differences between the existing contract's requirement and the proposed changes, and the comparative advantage and disadvantage of each
* Itemized requirements of the contract that must be changed if the proposed enhancements are adopted, and the proposed revision to the contract for each change
* Estimate of the proposed enhancements in performance and cost, if any

## 3.9 Service Requirements Support

### 3.9.1 Contractor Service Support Systems Requirements

The Contractor must maintain a laboratory at its facility to provide operational support for [*insert name of program or system*] throughout the period of performance of this contract. The Contractor's laboratory must be used for problem resolution, development, test, and evaluation of changes. The Contractor's laboratory must be capable of simulating the largest system configuration and fully stressing the [*insert name of program or system*] in a typical operational environment. The Contractor must configure and maintain the laboratory system to interface with the FAATC systems for purposes of T&E.

### 3.9.2 Contractor Support to FAATC Service Support System Requirements

The Contractor must provide one Support System for use by the FAATC. The support system must include equipment room equipment, operational software and [*insert quantity*] workstations. The support system must be identical to those used by the AFSS Specialists and Site Supervisor at the [*identify the key site*]. Subsequent hardware and software changes incorporated in the systems at the AFSS sites must also be incorporated in the support systems at the FAATC as directed by the FAA.

### 3.9.3 Contractor Support to Remote Workstation Requirements

The Contractor must provide remote workstations to provide service as requested by the Contracting Officer by issuance of individual delivery orders (SF 347). If ordered, the Contractor must:

* Deliver the remote workstation equipment and set it up for operational use at the designated site within seven (7) days after notification by the FAA
* Dismantle and remove the remote workstation equipment from the site at the specified time

Each individual delivery order must provide the Contractor with the following:

* Request the remote workstations a minimum of seven (7) days prior to the start of remote workstation operations
* Identify the quantity of remote workstations required and the designated site
* Provide the dates for the start and end of the remote workstation requirements at the designated sites

The FAA will:

* Ensure the designated site is ready to receive the remote workstation equipment and assist the Contractor's operational test of the remote workstations
* Perform first-level maintenance on the remote workstations

### 3.10 Interface Requirements Baseline

### 3.10.1 Interface Requirements

The [*insert name of system*] system must interface with the following National Airspace System (NAS) subsystems for IOC/FOC:

* List interface requirements
* Etc.

In support of deployment, the [*insert name of system*] system must interface with the following NAS legacy systems:

* List interface requirements

The Contractor must interface with the following external agency subsystems, in accordance with NAS-IR-23040001, dated January 1997, and:

* List interface requirements

### 3.10.2 Interface Control Document (ICD)

The Contractor must develop ICDs for all interface requirements identified in Attachment [*insert attachment number*] using FAA-STD-025D as guidance. In lieu of a preliminary CDRL delivery, the Contractor must prepare and present, via TEMs, detailed technical information on the system and sub-system interfaces required for IOC and FOC. Upon FAA approval, the Contractor must use this technical information to support the interface design required for completion of First Article Test and Evaluation. The Contractor must prepare and submit ICDs for IOC and FOC.

CDRL A018 Operational Data Management System (ODMS) ICD

CDRL A019 Host Computer System (HCS) ICD

CDRL A020 Model 1 Full Capacity (M1FC) ICD

CDRL A021 Direct User Access Terminal Service

CDRL A022 NAS Infrastructure Management System (NIMS) ICD

CDRL A023 External Users--ICD

### 3.10.3 NADIN PSN Interface Certification

The Contractor's hardware and software platform, including the ISO compliant X.25 interface, must be baselined at the conclusion of NAS Integration T&E, in accordance with ISO-8882-2 and ISO-8882-3.

FAATC certification of the NADIN PSN/ [*insert system name*] System interface is a prerequisite to establishing an operational connection between the Contractor's platform and the NAS. After the Contractor's platform has been certified by the FAA, the Contractor must not make any changes to the [*insert system name*] System platform that affects the X.25 interface without completing re-certification of the modified baseline. The Contractor's baseline must undergo certification tests, which must include parametric optimization of the NADIN PSN/ [*insert system name*] System interface, as deemed appropriate by the FAA. For these tests the Contractor will be required to use GFP CODEX 3600 modem(s) to interface with the FAATC NADIN PSN node.

The Contractor must submit an ECP to the FAA if the modification to the interface includes replacement or alteration of the ISO compliant X.25 interface. The Contractor must indicate in the ECP how ISO compliance will be maintained. At a minimum, the Contractor must demonstrate through test and evaluation, that the integrity of the NAS will not be adversely impacted by the proposed change.

### 3.10.4 Interface Design and Development

The Contractor must design and develop all required interfaces specified in the [*insert system name*] System specification and related Interface Requirements Documents.

The Contractor's NADIN PSN X.25 interface must be National Institute of Standards and Technology (NIST) certified for the 1984 version of the Consultative Committee for International Telegraphy and Telephony (CCITT) X.25 and ISO 8882-2 and ISO 8882-3 test suite. The Contractor must maintain a NIST X.25 interface and NADIN PSN certification throughout the contract.

The Contractor must support the FAA in establishing and maintaining an interface management program, which includes Contractor participation in interface working groups not more than four times a year. The Contractor must address interface issues during PMRs.

## 3.11 Engineering Change Proposals (ECPs)

The Contractor must implement an effective engineering change control program. The Contractor must seek CO concurrence prior to submitting major Engineering Change Proposals (ECPs). Upon receiving concurrence from the CO, the Contractor must formally submit an ECP for FAA review and approval prior to implementing any changes to the system baseline.

CDRL A024 Engineering Change Proposals (ECPs)

## 3.12 Test and Evaluation (T&E)

### 3.12.1 T&E Program

The Contractor must plan, conduct Contractor testing and support the FAA T&E program. The T&E program will be conducted through-out the life cycle of the [*insert name of program or system*] program and is comprised of the five (5) following areas:

* Overall T&E Program
* T&E Program Development
* System/IOC T&E
* FOC T&E
* Production/Installation T&E

Overall T&E Program - Under this area, the Contractor must:

* Be responsible for conducting and/or supporting those T&E program activities as described within this SOW
* Advices the FAA at least seven (7) days prior to commencement of all formal Contractors conducted T&E, and permit the FAA to witness conduct of the formal T&E procedures
* Within seven (7) days provide the FAA with copies of all original data collected during the Contractor-conducted T&E activities
* Perform all data reduction, and furnish analysis methods and results to support claims of T&E success
* Provide and maintain a single point of contact for the T&E program

T&E Program Development - Under this area, the Contractor must develop and deliver the plans, procedures and reporting process used in the T&E program. This will include the following:

* First Article T&E plans, procedures and reports for the IOC, and FOC T&E efforts.
* Factory Acceptance Test T&E plans and procedures for the [*insert name of system*] System. The plans and procedures may change as capabilities and configurations, driven by IOC and FOC upgrades, change
* Site Acceptance Test T&E plans and procedures for the [*insert name of system*] System. The plans and procedures will also change as capabilities and configurations, driven by IOC and FOC upgrades, change

System/IOC T&E - Under this area, the Contractor must conduct testing and support the FAA NAS Integration and NAS Operational T&E efforts. This will include the following:

* Conduct First Article System/IOC T&E and reporting on the results.
* Support the FAA Test Readiness Reviews, and NAS Integration and NAS Operational T&E efforts

FOC T&E - Under this area, the Contractor must conduct testing and support the FAA FOC T&E efforts. This will include the following:

* Conduct First Article FOC T&E and reporting the results
* Support FAA Test Readiness Reviews and FOC T&E efforts

Production/Installation T&E - Under this area, the Contractor must conduct testing. This includes the following:

* Conduct Factory Acceptance Tests prior to shipping to the sites for installation and report the results
* Conduct Site Acceptance Tests after installation is complete and report the results
* Conduct Site Acceptance Tests on FOC driven modifications or other major modifications after installation is complete and report the results

### 3.12.2 T&E Planning

The Contractor must plan for Contractor conducted T&E activity and plan to support all FAA-conducted test activities described in this SOW. The Contractor must include the use of the FAA approved [*insert name of system*] System B-Level Specification Verification Requirements Traceability Matrix (VRTM) when seeking FAA concurrence on T&E results.

The VRTM must delineate requirements traceability to the [*insert name of system*] System Requirements Document (RD), to specific requirements of this SOW and to the [*insert name of system*] System B-Level Specification. The VRTM must allocate test requirements to appropriate, specific test procedures. The VRTM must include [*insert name of system*] System B-Level Specification paragraph reference(s), qualification method(s), and verification level for each requirement.

The Contractor must provide for FAA access, a database that details the status of outstanding test PTRs, and the status of unmet system requirements, as related to the VRTM. The database media and format must be compatible with common personal computer, and Microsoft Windows type products.

#### 3.12.2.1 Contractor Test and Evaluation

The Contractor must ensure the test plans and procedures are capable of being repeated with substantially similar results.

##### 3.12.2.1.1 First Article Test and Evaluation (FA T&E) Plan

The Contractor must update the First Article Test and Evaluation (FA T&E) Plan to include detailed planning information and test strategy for conduct of FA T&E activities. This document must be delivered as the First Article Test and Evaluation Plan. The Contractor must ensure that the test plan objectives indicate traceable paths to the approved VRTM.

CDRL A025 First Article Test and Evaluation Plan

##### 3.12.2.1.2 First Article Test and Evaluation (FA T&E) Procedures

The Contractor must update the First Article Test and Evaluation (FA T&E) Procedures to include detailed step-by-step procedures for conduct of the FA T&E activities. The Contractor must ensure that the test procedures indicate traceable paths to the approved VRTM.

CDRL A026 First Article Test and Evaluation Procedures

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##### 3.12.2.1.3 First Article Test and Evaluation (FA T&E) Report

The Contractor must submit a First Article Test and Evaluation (FA T&E) Report documenting the results of the Contractor conducted First Article T&E procedures.

CDRL A027 First Article Test and Evaluation Report

##### 3.12.2.1.4 Factory Acceptance Test (FAT) Plan

The Contractor must submit a Factory Acceptance Test (FAT) Plan that describes the methodology for testing, evaluating, and accepting each production system before it leaves the factory. The FAT plan must relate test objectives to requirements of this SOW, the RD, and the approved VRTM.

CDRL A027 Delta/First Article Test and Evaluation Report

##### 3.12.2.1.5 Factory Acceptance Test (FAT) Procedures

The Contractor must prepare and submit Factory Acceptance Test (FAT) Procedures. The Contractor must use the FAT Procedures for each FAT. The Contractor must ensure that the test procedures indicate traceable paths to the approved VRTM.

CDRL A029 Factory Acceptance Test (FAT) Procedures

##### 3.12.2.1.6 Site Acceptance Test (SAT) Plan

The Contractor must prepare and submit a Site Acceptance Test (SAT) Plan that describes methods for testing, evaluating, and accepting the [*insert name of system*] System at each site. The Contractor's SAT plan must define the range of tests, system initialization requirements, input data, expected output, and the criteria for evaluating test results. The Contractor must identify all test and evaluation resources required, including personnel, equipment, facility support, and schedules.

CDRL A030 Site Acceptance Test (SAT) Plan

##### 3.12.2.1.7 Site Acceptance Test (SAT) Procedures

The Contractor must prepare and submit Site Acceptance Test (SAT) Procedures that detail the step-by-step test process to be conducted during each SAT. In an addendum to the SAT procedures, the Contractor must provide procedure updates necessary to address site unique configurations and capabilities. The Contractor must ensure the test procedures indicate traceable paths to the approved VRTM.

CDRL A031 Site Acceptance Test (SAT) Procedures

### 3.12.3 System Test (IOC) Phase

#### 3.12.3.1 General Test Requirements

The Contractor must, at a minimum, verify each of the [*insert system name*] System B-Level Specification requirements in at least one test procedure. Prior to commencing test and evaluation, the Contractor must identify the configuration of the system to be tested. The configuration must not be changed or modified during test and evaluation without concurrence from the Government. The Contractor must ensure that each test procedure is considered complete only when the test executes without aborts or errors (unless attributable to a procedure that has been acknowledged as faulty by the FAA). All tests must be verified and in compliance with applicable requirements. The Contractor must conduct test and evaluation (T&E) using Contractor developed and FAA approved test plans and procedures. Any change to Contractor T&E procedures must be approved by the FAA prior to implementation.

The Contractor must maintain a Program Trouble Report (PTR) database in which each failure or problem (hardware and software) discovered is fully documented.

The Contractor must record all inputs, outputs, anomalies, test deviations, test equipment substitutions, and all other events and the respective start and stop time for each test procedure.

The Contractor must provide the necessary test equipment and must ensure its availability, proper calibration, full operational status, and operation as documented by the manufacturer. The Contractor must obtain prior written approval from the Government before using unique or modified commercial test equipment not specified in the approved test plans and procedures. In the event of test equipment failure, test equipment damage, or faulty operation, the FAA may require the Contractor to verify calibration of any test equipment provided by the Contractor.

#### 3.12.3.2 Test Readiness Review (TRR)

The Contractor must support the FAA's Test Readiness Review (TRR) prior to conduct of all testing.

#### 3.12.3.3 First Article Test & Evaluation (FA T&E)

The Contractor must conduct First Article Test and Evaluation at its facility. The Contractor must demonstrate satisfactory implementation of the system IOC requirements that were not successfully tested during FA T&E. First Article T&E must also include validation of the FAT and SAT procedures proposed for application during each pre-site/site delivery.

#### 3.12.3.4 Factory Acceptance Test (FAT)

The Contractor must conduct a Factory Acceptance Test (FAT), at the Contractor's facility, on each subsystem using Government approved test procedures. The FAT must verify, prior to site delivery, that each subsystem conforms to applicable specifications and requirements, is free from manufacturing defects, and is representative of the qualified First Article.

#### 3.12.3.5 Site Acceptance Test (SAT)

The Contractor must integrate and configure each system for SAT. The Contractor must conduct a SAT, witnessed by the FAA, at every delivery site location identified in Attachment [*insert attachment number*]. The Contractor must conduct SAT using Government approved test procedures. The SAT must confirm that the [*insert name of system*] System is properly installed and operationally configured, is undamaged and free from manufacturing defects, and remains in compliance with contractual requirements.

The Contractor's SAT must include the following conditions:

* Operational conditions, including both normal and peak flow conditions
* Normal FSS Specialist data entry scenarios, including erroneous data input

#### 3.12.3.6 Full Operational Capability Test and Evaluation

Full Operational Capability (FOC) T&E must be conducted to ensure the changes to the IOC system meet FOC requirements, that IOC system integrity is maintained, and that no degradation of performance or capability has been introduced into the existing NAS. FAA conducted FOC T&E will be comprised of an appropriate subset of System Test activities, and will occur at the FAATC and the FAA designated site.

##### 3.12.3.6.1 FOC First Article Test and Evaluation

The Contractor must conduct FOC First Article Test and Evaluation at its facility. The Contractor must update and submit the FOC First Article Test plans and procedures for the FOC First Article Test. The First Article T&E plans must also include validation of the FOC FAT and FOC SAT procedures proposed for application during each FOC subsystem pre-site/site delivery.

##### 3.12.3.6.2 FOC Factory Acceptance Test (FAT)

The Contractor must conduct a FOC FAT, at the Contractor's facility, on each FOC subsystem using Government approved test procedures. The Contractor must provide FOC FAT procedures by updating the IOC FAT procedures. The Contractor's FOC FAT must verify, prior to site delivery, that each FOC subsystem conforms to applicable specifications and requirements, is free from manufacturing defects, and is representative of the qualified First Article.

##### 3.12.3.6.3 FOC Site Acceptance Test (SAT)

The Contractor must integrate and configure each subsystem for FOC SAT. The Contractor must conduct a FOC SAT, witnessed by the FAA, at every delivery site as specified in Section F. The Contractor must provide FOC SAT procedures by updating the IOC SAT procedures. The FOC SAT must confirm that the FOC System has been installed and operationally configured, undamaged and free from manufacturing defects, and remains in compliance with contractual requirements. The Contractor must conduct FOC SAT using Government approved test procedures.

The Contractor's system performance test and evaluation for the FOC SAT must be conducted to include the following conditions:

* Operational conditions, including both normal and peak data flow conditions
* Normal FSS Specialist data entry scenarios, including erroneous data input

### 3.12.4 Contractor Support during FAA Test and Evaluation

The Contractor must provide on-site support, as requested by the FAA, during all FAA conducted T&E activities. FAA conducted test activities for IOC and FOC are:

* NAS Integration T&E (NITE)
* NAS Operational T&E (NOTE)

#### 3.12.4.1 NAS Integration Test and Evaluation (NITE)

The NAS Integration Test and Evaluation (NITE) tests will be conducted to ensure that the [*insert system name*] System and subsystems integrate with the NAS. Any NAS Integration deficiencies identified by the Government as attributed to the implementation of [*insert system name*] System hardware, software, human performance factors or operational concepts must be corrected by the Contractor. NITE encompasses an interactive and iterative process of risk reduction, demonstration and analysis, and assures that NAS functionality and performance (as it existed prior to installation of the [*insert system name*] System) is not degraded, and that applicable [*insert system name*] System NAS Integration issues are addressed.

#### 3.12.4.2 NAS Operational Test and Evaluation (NOTE)

The NAS Operational Test and Evaluation (NOTE) will provide an assessment of the operational effectiveness, performance, reliability, maintainability, availability, security and safety of the [*insert system name*] System. NAS Operational Test also provides a measure of effectiveness of the training, documentation, and logistics planned to support the [*insert system name*] System throughout its life cycle.

## 3.13 Integrated Logistics Support (ILS) Management

The Contractor must designate an ILS Manager to serve as the focal point for coordination with the Government on all matters relating to the management of the ILS program. The Contractor must establish and maintain an ILS organization to ensure the [*insert system name*] System is fully supported throughout its life cycle.

### 3.13.1 ILS Program Planning

The Contractor must submit an Integrated Support Plan (ISP) for approval. The ISP must provide a detailed description of the plans, procedures, actions, events (including schedules), and organization that the Contractor intends to employ to accomplish the life cycle ILS program under this contract.

The Contractor must maintain the ISP to reflect the current program status and must update the plan to reflect changes emanating from program changes, reviews and other actions affecting the logistics support aspects of the program. Upon approval, the ISP must be the controlling document for the Contractor's ILS program.

CDRL A032 Integrated Support Plan (ISP)

### 3.13.2 Technical Manuals

The Contractor must develop and deliver two [*insert system name*] System Technical Manuals to support the [*insert system name*]: an Operations Manual to support Flight Service operations and a Maintenance Manual to support First level maintenance performed by FAA maintenance technicians at the System sites.

The technical manuals will use COTS/CAS products to the maximum extent possible. Supplemental data to augment the COTS/CAS data must be developed as required and provided to make the technical manuals fully acceptable for use in the [*insert system name*] System environment. The supplemental data development must use FAA-D-2494/B, Appendix I, and Commercial Instruction Books, as a guide. Although the FAA will not be actively performing network management and remote monitoring and control, the Maintenance Manual must include a section that describes operation and maintenance of the Contractor's network management and remote monitoring and control system functions and procedures. The FAA will provide the Contractor with [*insert system name*] System certification procedures as identified in FAA Order 6000.15B, which must be included in the Maintenance Manual.

Technical Exchange Meetings (TEMs) will be required to support the technical manual development effort. It is estimated that up to four (4) TEMs, held at the Contractor's facility, will be required: one within thirty (30) days of contract award, two subsequent, and one to observe the Contractor's technical manual validation effort.

The Contractor must validate the technical manuals prior to delivery of the technical manuals. The Contractor must provide Validation Completion Reports. The Contractor must provide engineering and technical support to the Government during FAA verification of the technical manuals at the FAATC. The Contractor must provide digital access to the Operations Manual and the Maintenance Manual at each site. The Contractor must develop and validate any required revisions to the two technical manuals caused by changes in hardware, software or procedures.

CDRL A033 Operations Manual

CDRL A034 Maintenance Manual

CDRL A035 Validation Completion Reports

## 3.14 Site Implementation and Activation

The Contractor must submit the [*insert system name*] System National Installation Strategy Study Report. The study must present the Contractor's recommended installation approach. The Contractor's installation strategy study must also recommend site cut-over processes for AFSS, FSDPS, and AWP sites and recommend actions required to recover from [*insert system name*] System equipment failures during cut-over at AFSS, FSDPS, and AWP sites.

The [*insert system name*] System National Installation Strategy Study must address the approach to identify and resolve any potential electromagnetic interference/compatibility (EMC) impact on [*insert system name*] System or caused by [*insert system name*] System which impacts performance of systems or equipment currently in the AFSSs.

CDRL A036 National Installation Strategy Study Report

### 3.14.1 Site Surveys and Site Preparation

The Contractor must provide a Site Survey Plan describing the approach to conducting site surveys prior to the conduct of site surveys.

The Contractor must conduct a survey of each site to determine the preparation required for system installation and test. The Contractor must prepare and submit a Site Preparation Requirements and Installation Plan (SPRIP) for each site. The Contractor must ensure that the SPRIP is consistent with the National Installation Strategy Study Report recommendations. The Contractor must also ensure that the SPRIP satisfies the following site implementation requirements:

* Installation complies with NEC NFPA-70
* Equipment grounding, bonding, shielding, and transient protection must comply with FAA-STD-020B Section 3.8.5
* Mounting of cabinets and installation of equipment complies with state and local building codes
* Seismic requirements as specified in the Uniform Building Code, Section 2312 and Table 23-J

The Contractor must coordinate with the COR concerning access to [*insert system name*] System installation sites at least thirty (30) days prior to performing the required site surveys.

After Government approval of the SPRIP, the Contractor must perform site preparations in accordance with the plan. The Contractor must conduct Site Readiness Reviews twenty (20) working days prior to equipment installation to ensure that the site has been prepared in accordance with the SPRIP for equipment installation and checkout. At the conclusion of the SRR, the Contractor must submit a Site Readiness Review (SRR) Report documenting remaining and new action items that need to be completed before system installation.

The Contractor must not commence installation and check out of equipment until completion of the SRRs and correction, by the actionees, of the remaining site deficiencies. The Contractor must remove all debris from the site following site preparation and installation activities.

CDRL A037 Site Survey Plan

CDRL A038 Site Preparation Req. and Installation Plan

CDRL A039 Site Readiness Review (SRR) Report

### 3.14.2 Delivery, Installation, and Check-Out

The Contractor must perform all activities necessary to package, ship, deliver, install and checkout the [*insert system name*] System in accordance with the SPRIP, the Site Acceptance Test Plans, Site Acceptance Test Procedures, and the [*insert system name*] System IRDs. In addition, the Contractor must ensure that the installation activities are coordinated, prior to installation, with the sites to minimize the impact on day-to-day operation of the sites and its related systems.

The Contractor must submit an Implementation Progress Report for the FAA key site only. The Contractor must notify the COTR of installation problems that cannot be quickly corrected on-site.

CDRL A030 Site Acceptance Test Plans

CDRL A031 Site Acceptance Test Procedures

CDRL A040 Implementation Progress Report

### 3.14.3 Equipment Removal

The Contractor must inventory, pack, and perform all activities associated with the preparation for shipping of the removed hardware identified in Attachment [*insert attachment number*] from the sites. The Contractor must remove all debris on the site resulting from installation.

### 3.14.4 Site Completion Report

The Contractor must prepare and submit an Implementation Site Completion Report for each site summarizing the implementation schedule and any deviations or issues associated with the site implementation process.

CDRL A041 Implementation Site Completion Report

## 3.15 Security

The Contractor must implement and follow security requirements outlined in FAA-Order 1600.54B and FAA-HDBK-004. The Contractor must document through the Physical and Communications Security Breach/Incident Report all incidents and telephonically report any of the following incidents to the:

* Actual or suspected unauthorized attempts to penetrate the NAS through the [*insert system name*] System specialist, DUAT or remote workstation functions
* Actual or suspected unauthorized attempts to penetrate the NAS through the Contractors Remote Maintenance Monitoring Facility or Contractor's support facility
* Actual or suspected attempt to subvert the [*insert system name*] System
* Actual or suspected unauthorized penetration of the Contractor’s [*insert system name*] System support facility or Remote Maintenance Monitoring facility(s)
* Specific or implied bomb threats to the Contractor's or any FAA facility

CDRL A042 Physical and Comms Security Breach/Incident Report

### 3.15.1 Data Security

The Contractor must provide security requirements in the [*insert system name*] System B-Level Specification. At a minimum, the [*insert system name*] System must prevent unauthorized and disruptive access to the system by:

* Authorized user access verification
* User password control
* Restriction of access to system/operating system (OS) files/data
* Denying access to direct OS functions/commands
* Logging of unauthorized system access attempts
* Denying any access to [*insert system name*] System after a default number of unsuccessful log-on attempts
* Limiting access to specific functions based on job category

The requirements must include functional requirements for appropriate "fire-wall" capabilities that protect against data compromise to the [*insert system name*] System or access to other NAS systems by DUAT users. The requirements must also include functional requirements for appropriate authentication of remote workstation users. Remote workstation users must not be permitted access to Operating System (OS), Supervisory, LAN Administration and AF Diagnostic functions.

### 3.15.2 Physical Security

The Contractor must coordinate visits to the FAA facilities through the COR.

## 3.16 Training

The Contractor must develop and conduct training for NAS Integration Test and Evaluation, NAS Operational Test and Evaluation, FAA Second-Level Engineering Support, FAA Airway Facilities (AF) First Level Maintenance, and support the FAA in development of two Air Traffic (AT) Training Courses for AFSS Specialists and Site Supervisors.

### 3.16.1 Training Guidance Conference

The Contractor must conduct a Training Guidance Conference at its facility. The training guidance conference will begin within [*insert number of days/months*] days after contract award. The purpose of the Training Guidance Conference is to review the Contractor's approach to training with the FAA participants and provide any additional guidance or information to the Contractor at that time.

### 3.16.2 NAS Integration Test and Evaluation and NAS Operational Test and Evaluation (NITE/NOTE) Training

The Contractor must develop and conduct training for FAA personnel participating in the NAS Integration Test and NAS Operational Test.

#### 3.16.2.1 Test and Evaluation NITE/NOTE Training Program Requirements

The Contractor must ensure that NITE/NOTE training provides hands-on experience and theory training required to support all test activities, site support activities, and second-level engineering support activities. Personnel attending these training sessions must be experienced AFSS operators, test engineers, technicians, and automation personnel.

#### 3.16.2.2 Test and Evaluation (NITE/NOTE) Training Program Development

The Contractor must use draft training materials, draft technical manuals, and other draft documentation as required and approved by the FAA for NITE/NOTE training activities. The Contractor must conduct this training by making use of seminar/familiarization type training sessions to the maximum extent possible.

#### 3.16.2.3 NAS NITE/NOTE Training Course Conduct

The Contractor must conduct a NITE/NOTE training course at the FAATC using existing COTS and/or draft training materials from the AF maintenance course and some material provided for the AT courses. Training for FAA personnel assigned to perform NITE/NOTE test activities must be completed before commencement of NITE/NOTE.

The Contractor must develop training to support NITE/NOTE activities in accordance with best commercial practices as described in FAA-STD-028B. The Contractor must also ensure the following:

* Outcome. The training provides the skills necessary to operate, maintain and support the [*insert system name*] System during all NITE/NOTE test activities;
* Content. NITE/NOTE training must provide the hands on experience and theory required to support all test activities. Personnel receiving NITE/NOTE training must be experienced FSS operators and automation personnel, test engineers, and technicians.
* Implementation. The training must include approximately [*insert quantity*] FAA personnel, comprised of [*insert quantity*] students in each of [*insert quantity*] classes.

### 3.16.3 FAA Second-Level Engineering Support Training

The Contractor must develop and conduct training for FAA personnel responsible to provide FAA Second-Level Engineering Support. The FAATC will be assisting the COR by providing technical oversight of the Contractor's performance and may provide Government Furnished Information (GFI) for the FAA unique data contained in the [*insert system name*] System data base. FAATC will require a working knowledge of the [*insert system name*] System to allow them to perform FAA Second-Level Engineering Support in accordance with its oversight responsibilities.

#### 3.16.3.1 FAA Second-Level Training Requirements

The Contractor must ensure the course provides all the knowledge and skills required to perform the following FAA Second-Level Engineering Support responsibilities:

* Technically monitor, evaluate and provide technical comments on the Contractor's proposed changes
* Test proposed [*insert system name*] System changes at the FAATC and provide recommendations /approval for field release
* Ensure inter-facility compatibility
* Perform data insertions, retrievals, and modifications, on the [*insert system name*] System database
* Demonstrate proficiency in the use of tools used to analyze performance of the [*insert system name*] System intrafacility (e.g., LAN) communication system, and ability to interpret data collected
* Monitor the [*insert system name*] System help-desk and problem tracking activity
* Demonstrate knowledge and understanding of all [*insert system name*] System external interfaces, including the ability to detect, identify, and correct interface problems attributable to the [*insert system name*] System
* Review and approve changes to all technical documentation developed for [*insert system name*] System
* Develop and provide FAA unique data base inputs to the Contractor in an appropriate medium
* Test and approve 56-Day data base updates and out-of-cycle data base updates

The Contractor must emphasize hands-on training where practical.

#### 3.16.3.2 FAA Second-Level Training Development

In preparing the FAA Second-Level Engineering Support Course, the Contractor must assume that students will be experienced system engineering professionals with technical knowledge on the current M1FC system. The course must include appropriate material from the NITE/NOTE course and the AF first level maintenance course development.

The course must be developed using best commercial practices and maximize the material available from the NITE/NOTE course, AF First Level Maintenance Course and the COTS training material.

#### 3.16.3.3 FAA Second-Level Training Conduct

The course must be conducted at the FAATC after the [*insert system name*] System NITE/NOTE effort is completed. An [*insert system name*] System Support System located at the FAATC will be used to conduct the course. Up to [*insert quantity*] classes, with up to [*insert quantity*] students each must be conducted. A copy of the training material will be provided to each student. An additional hard copy and a copy in electronic media must be delivered.

### 3.16.4 Airway Facilities First Level Maintenance Training

The Contractor must deliver and conduct an Airway Facilities First-Level Maintenance Training Course for personnel responsible for first-level maintenance of the [*insert system name*] System.

#### 3.16.4.1 Airway Facilities Maintenance Training Requirements

The Contractor must provide first-level maintenance training to experienced AF technicians. Upon completion of training the AF Technician(s) must be able to:

* Locate and identify [*insert system name*] System assemblies and subassemblies to the Line Replaceable Unit (LRU)
* Perform system power up, power down, start up, start over, and recovery
* Perform periodic operational and performance checks
* Interpret results of functional diagnostics tests
* Use technical documentation to fault isolate to the failed LRU
* Remove and replace faulty LRUs
* Conduct a system test to verify that the maintenance action returned the system to a fully operational state
* Perform system/service certification

#### 3.16.4.2 Airway Facilities Maintenance Training Development

The Contractor must develop and deliver training material for personnel responsible for the [*insert system name*] System first-level maintenance. Training must be developed using accepted Instructional Systems Development methodologies. Best commercial practices must be employed and must meet the requirements identified in FAA-STD-028B Appendix 2, paragraph 2-5, Best Commercial Practice. Commercially available training materials must be employed to the extent possible.

##### 3.16.4.2.1 Airway Facilities Task and Skills Analysis

The Contractor must perform a task and skills analysis and develop and deliver a Task and Skills Analysis Report using FAA-STD-028B, as a guide.

CDRL A043 Task and Skills Analysis Report

##### 3.16.4.2.2 Course Design Guide

The Contractor must develop and deliver a Course Design Guide. The Course Design Guide must document the sequence of instructional topics, training outcomes, and learning objectives using FAA-STD-028B as a guide.

CDRL A044 Course Design Guide

##### 3.16.4.2.3 Lesson Plans

The Contractor must develop and deliver a Lesson Plan (Instructor Guide) for first-level maintenance training.

CDRL A045 Lesson Plan (Instructor Guide)

##### 3.16.4.2.4 Student Materials

The Contractor must develop student materials and deliver a Student Materials (Student Guide) for first-level maintenance training.

CDRL A046 Student Materials (Student Guide)

##### 3.16.4.2.5 Instructional Media Material

The Contractor must develop and deliver Instructional Media Material to augment instructional topics. The media materials must be developed using FAA-STD-028B as a guide.

CDRL A047 Instructional Media Material

##### 3.16.4.2.6 Student Achievement Test

The Contractor must develop and deliver a Student Achievement Test to measure student achievement, using FAA-STD-028B as a guide. The Contractor must devise a minimum of examination questions that must address each learning objective.

CDRL A048 Student Achievement Test

##### 3.16.4.2.7 Theory of Operations Examination

The Contractor must develop and deliver a Theory of Operations Examination.

CDRL A049 Theory of Operations Examination

##### 3.16.4.2.8 Performance Examination

The Contractor must develop and deliver a Performance Examination.

CDRL A050 Performance Examination

##### 3.16.4.2.9 Course Walk-Through

The Contractor must conduct a course walk-through at the Contractor's facility using training materials intended for use in the [*insert system name*] System first-level maintenance course. The purpose of the course walk-through is to perform an in-process review of the training course development effort and provide real time feedback and assistance to the personnel developing the course. The Contractor must correct errors, omissions, or deficiencies discovered during the course walk-through. Materials must be corrected and resubmitted as directed by this contract. It is envisioned that the course walk-through will take about half the length of the proposed course and be attended by not more than [*insert quantity*] AF training personnel.

##### 3.16.4.2.10 Operational Tryout

The Contractor must conduct an operational tryout of the [*insert system name*] System first-level maintenance course materials. The operational tryout must be conducted at the Contractor's facility and must be planned to last one and a half times the length of the proposed course and will be attended by not more than [*insert quantity*] AF training personnel. The purpose of the operational tryout is to perform a detailed final review of the training course prior to conduct of the first course and provide real time feedback and assistance to the personnel developing the course and the instructors conducting the first course. The Contractor must correct errors, omissions, and deficiencies discovered during the operational tryout and resubmit materials as directed by this contract.

##### 3.16.4.2.11 Training Conduct

The Contractor must conduct first-level maintenance training for AF technicians at the [*insert system name*] System sites after the system is installed. The Contractor must plan for up to [*insert quantity*] students per class. There must be up to [*insert quantity*] classes of the first-level maintenance course conducted at each [*insert system name*] System site.

The Contractor must furnish instructor and student training materials and media materials for the first-level maintenance course. The quantity must be sufficient to provide each student a copy of all handouts and media materials.

The Contractor must develop and deliver a class roster for each class. The class roster must state the class number, student's name, social security number, and final grade.

The Contractor must deliver a certificate of training for each student who successfully completes the first-level hardware maintenance course. The certificate must be in Contractor's format and must include the course number, course title, class number, and start date.

###### 3.16.4.2.11.1 First Course Conduct and Course Report

The Contractor must develop and deliver a First Course Conduct and Course Report upon completion of the first-level maintenance course at the FAA designated site.

CDRL A051 First Course Conduct and Course Report

###### 3.16.5 Training Updates for FOC System Refreshes and Upgrades

The Contractor must provide updates to the training documentation if modifications to the [*insert system name*] System impact the validity of the training. The Contractor must also conduct NITE/NOTE training, Second-Level Engineering Support training and AF First-Level Maintenance training as directed by the FAA, and provide source material to allow the FAA to update the AFSS Specialist and Site Supervisor courses.

## 3.17 Operational Support

The Contractor must provide operational support for the [*insert system name*] System at the AFSSs, Alaskan FSSs, and the FAATC and FAAAC. Additionally, the Contractor must provide operational support for [*insert system name*] System remote workstations that are temporarily deployed. The Contractor's ISP will identify the Contractors organization and procedures to provide [*insert system name*] System operational support. Section J, Attachment [*insert attachment number*], [*insert system name*] System Operational Support Document, defines the proposed FAA and Contractor roles and responsibilities for operationally supporting the [*insert system name*] System and is provided as a guide to assist the Contractor in developing the [*insert system name*] System ISP.

### 3.17.1 Operational Performance

The Contractor must provide full service to each [*insert system name*] System operational site and ensure a site operational availability of no less than [*insert operational availability factor*]. Site operational availability criteria must be identified in the [*insert system name*] System B-Level Specification.

The Contractor must provide full service to the [*insert system name*] System support systems at the FAATC and FAAAC and to the remote workstations that are temporarily deployed. The operational availability of these support systems and the remote workstations that are temporarily deployed will not be used as a performance measure.

Whenever a [*insert system name*] System site has the potential for service disruptions, the Contractor will notify the appropriate Maintenance Control Center (MCC) for that site. Attachment [*insert attachment number*] lists the FAA Maintenance Control Center Locations.

The Contractor must provide [*insert system name*] System performance reports at the PMRS and in the Monthly Program Status Report. As a minimum, the following subjects will be covered:

* Operational availability at each site
* Maintenance actions at each site
* Trends/analysis on system performance
* Number of Help-Desk inquiries and how many were resolved by Help-Desk personnel
* Number of Problem Trouble Reports (PTRs) opened during the month
* Status of all open PTRs
* Any issues with site maintenance, spares, depot level maintenance or the flow of faulty LRUs from the [*insert system name*] System sites to the Contractor's designated depot repair activities
* Results of any on-site field support provided by the Contractor

CDRL A002 Monthly Program Status Report

### 3.17.2 Site Operations

The Contractor must provide support to Air Traffic operations personnel at the [*insert system name*] System sites using the Remote Monitoring and Control (RMC) and Help-Desk functions.

The Contractor must provide Help-Desk support to [*insert system name*] System users using the DUAT service capability. If the Contractor's RMC and Help-Desk functions cannot solve a problem, they will forward the problem to the Contractor's second-level engineering support activity for resolution. The Contractor's personnel at the RMC and Help-Desk will be trained and qualified to support [*insert system name*] System operations personnel in using the [*insert system name*] System.

### 3.17.3 First-Level (Site) Maintenance Support

The Contractor must provide support to the AF technicians by using the RMC and Help-Desk functions if the AF technicians require assistance.

AF Technicians will perform first-level maintenance. The FAA's responsibility for first level (site) maintenance will begin after the Contractor conducts first-level maintenance training at each site. The Technicians will be responsible to perform diagnostics in coordination with the Contractor's RMC or Help-Desk personnel as required, remove and replace the defective Line Replaceable Unit (LRU), test and certify the system, then package and ship the defective LRU to the Contractor's designated depot.

The Contractor must provide RMC capability to monitor [*insert system name*] System sites on a 24 hours a day, seven (7) days a week basis. When problems/alerts occur, the Contractor's RMC personnel must notify FAA personnel at the appropriate Maintenance Control Center (MCC) for that [*insert system name*] System site. The RMC must have a toll free (800/888 prefix) number that will be used by FAA personnel seeking assistance. The Contractor's RMC must utilize the "800/888 services" provided as GFE through FTS-2000.

The Contractor must provide Help-Desk coverage for use by Air Traffic operations personnel and AF technicians and DUAT users when [*insert system name*] System incorporates DUAT capability. The Contractor must provide Help-Desk support 24 hours a day, seven (7) days a week. The Contractor must log all requests for assistance and problems, as well as the solutions provided, and have the information available at the PMRs. Those problems that cannot be solved by the RMC or Help-Desk functions must be forwarded to the Contractor's second-level engineering support activity. The Help Desk must have a toll free (800/888) prefix number for use by FAA personnel and a separate toll free (800/888) prefix number for DUAT service users. All "800/888 services" for RMC Help Desk, and DUAT must be acquired through FTS-2000, and must be provided as GFE.

### 3.17.4 Second-Level Engineering Support

The Contractor must perform all hardware and software maintenance beyond first-level maintenance. The Contractor must have the capability to dispatch second-level engineering support personnel to [*insert system name*] System field sites when RMC, Help-Desk assistance or the Technicians cannot correct problems. Field support may also be required in those unique situations where there is damage to a [*insert system name*] System site caused by unusual events or natural disasters (i.e. floods, hurricanes, tornadoes, or fires.)

The Contractor must advise and coordinate with FAA personnel on all [*insert system name*] System configuration changes. The FAA technical focal point for configuration management is the FAATC.

### 3.17.5 Supply Support

The Contractor must be responsible for providing and replenishing spares, expendable items and consumable items to all [*insert system name*] System sites. The spares, expendable items and consumable items must be properly packaged and marked for use by AF technicians in accordance with good commercial practice. When a spare is required for a [*insert system name*] System maintenance action, the AF technician will use the spare that is available at the site. In those cases where a spare is not available, the Contractor must be notified, and the Contractor must be responsible to ship the required LRU.

For critical spares, those spares that are required to ensure that a failure will not result in the system losing redundancy, the spare will arrive at the [*insert system name*] System site within 24 hours of the material request. For non-critical spares, the spares will arrive at the [*insert system name*] System site within five (5) days of the material request.

AF technicians will receive, store and inventory the Contractor's [*insert system name*] System site spares and expendable and consumable items. When a maintenance action is completed, the AF technician will package and ship the defective LRU to the Contractor's designated depot.

When shipping an LRU to replace an LRU that has been used from the site spares inventory, the Contractor must include a paid return shipping invoice and address label for the depot facility destination.

### 3.17.6 Depot Maintenance

The Contractor must be responsible to manage the depot maintenance effort. This must include management of all the warranties. The FAA will perform the tasks necessary as stated in the [*insert system name*] System Integrated Support Plan to ensure that the Contractor's warranties remain valid.

### 3.17.7 56-Day Database Update Responsibilities

The Contractor must develop the [*insert system name*] System data base and 56-day update, including incorporation of FAA unique data base inputs as required, test the update, provide a copy of the proposed update to the FAA for testing, then deliver it to the [*insert system name*] System sites after the FAA successfully tests and approves the update. Section J, Attachment [*insert attachment number*], [*insert system name*] System Database Management, provides additional information to assist in understanding the 56-day database effort.

The FAA, if required, will be responsible to provide the FAA unique 56-day update inputs to the Contractor in accordance with the schedule identified in the ISP. The FAA will also test the advance copy of the 56-day update provided by the Contractor and provide results of the test and evaluation the Contractor in accordance with the schedule in the ISP. The Contractor must inform FAATC of any [*insert system name*] System database problems that may impact the M1FC system.

### 3.17.8 Technical Manual Revisions

The Contractor must develop, validate and distribute any required revisions to the Operations Manual and Maintenance Manual.

### 3.17.9 Management of Contractor Material

The Contractor must maintain an inventory of Contractor owned and provided hardware (operational and spares) at each [*insert system name*] System site.

## 3.18 Contractor Exit Transition

At the completion or termination of this contract, it must be the responsibility of the Contractor to remove and dispose of all [*insert system name*] System hardware and software installed at FAA facilities. The Contractor must advise the FAA of any deinstallation preparation requirements 60 days in advance of the start of deinstallation. The Contractor must prepare a [*insert system name*] System Exit Transition Plan. In addition:

* All residual terminations must comply with NFPA-70 and site local building codes
* Deinstallation activities must not interfere with the day-to-day operation of the sites and its related systems
* The Contractor must coordinate deinstallation activities with each facility prior to deinstallation
* The Contractor must inventory, package, and ship the contents of the [*insert system name*] System Document library to a FAA designated location in accordance with the [*insert system name*] System Exit Transition Plan

CDRL A052 Exit Transition Plan

# 4 Acronyms

AF Airway Facilities

AFSS Automated Flight Service Station

AWP Aviation Weather Processor

C/SSR Cost/Schedule Status Report

CAS Commercially Available Software

CCITT Consultative Committee for International Telegraph and Telephony

CDRL Contract Data Requirements List

CFSR Contract Funds Status Report

CI Configuration Identification

CM Configuration Management

CO Contracting Officer

COR Contracting Officer Representative

COTS Commercial Off-the-Shelf

CSA Configuration Status Accounting

C/SSR Cost Schedule Status Report

CWBS Contract Work Breakdown Structure

DUAT Direct User Access Terminal

ECP Engineering Change Proposal

FAA Federal Aviation Administration

FAAAC Federal Aviation Administration Aeronautical Center

FAATC Federal Aviation Administration Technical Center

FCA Functional Configuration Audit

FOC Full Operating Capability

FSAS Flight Service Automation System

FSDPS Flight Service Data Processing System

FSS Flight Service Station

GFE Government Furnished Equipment

GFI Government Furnished Information

GFP Government Furnished Property

ICD Interface Control Document

ILS Integrated Logistics Support

IOC Initial Operational Capability

IPT Integrated Product Team

IRD Interface Requirement Document

ISP Integrated Support Plan

LRU Line Replaceable Unit

M1FC Model 1 Full Capacity

MCC Maintenance Control Center

MIL Military

MPMP Master Program Management Plan

MPSR Monthly Program Status Report

NAS National Airspace System

NDI Non-developmental Item

NEC National Electrical Code

NIMS NAS Interface Management System

NIST National Institute of Standards and Technology

NITE/ Integration Test and Evaluation and NAS Operational Test and Evaluation

/NOTE NAS

NLS Network Logic Schedule

OCT Operational Capabilities Test

ODMS Operational Data Management System

PCA Physical Configuration Audit

PSN Packet Switch Network

PSR Program Status Report

PTR Program Trouble Report

QA Quality Assurance

RMA Reliability, Maintainability and Availability

RMC Remote Monitoring & Control

SAT Site Acceptance Test

SAT&E Site Acceptance Test & Evaluation

SER System Engineering Review

SOW Statement of Work

SPR Software Problem Report

SPRIP Site Preparation Requirements and Implementation Plan

SRR Site Readiness Review

T&E Test and Evaluation

TEM Technical Exchange Meeting

TRR Test Readiness Review

VRTM Verification Requirements Traceability Matrix

WBS Work Breakdown Structure