ORDER

6180.8

PROJECT IMPLEMENTATION PLAN
FOR THE
WEATHER MESSAGE SWITCHING CENTER REPLACEMENT

AUGUST 27, 1990

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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RECORD OF CHANGES

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CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE

FOREWORD

This order prescribes the Project Implementation Plan (PIP) for the acquisition, implementation, and support of the Weather Message Switching Center Replacement (WMSCR).

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Program Director, for Weather
& Flight Service Systems

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CHAPTER 1. GENERAL

1. PURPOSE. This order identifies the activities and schedules of the Project Implementation Plan (PIP) required to implement the Weather Message Switching Center Replacement (WMSCR) and provides guidance and direction to all levels of the Federal Aviation Administration (FAA) responsible for the implementation of the WMSCR. Project management information is presented in chapters 2 through 6 and project implementation guidance in chapters 7 through 10. The references provide further detailed technical information on the implementation of the WMSCR.

2. DISTRIBUTION. This order is being distributed to branch level in the office of the Program Director for Weather and Flight Service Systems, Systems Maintenance, NAS System Engineering, and Logistics Services; director level to the Offices of Budget and Training and Higher Education, and the Air Traffic Plans and Requirements and Flight Standards Services; director level to the Engineering, Test, and Evaluation Service at the FAA Technical Center and the FAA Depot at the Aeronautical Center; branch level to the regional Airway Facilities and Air Traffic divisions.

3. DEFINITIONS. An acronym list is provided in appendix 1.

4. AUTHORITY TO CHANGE THIS ORDER. Any updates, revisions, or changes to this order can be authorized by the Program Director for Weather & Flight Service Systems, ANW-1.

5.-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The WMSCR will serve as a collector and distributor of weather and Notice to Airmen (NOTAM) data within the National Airspace System (NAS). The WMSCR will consist of two identical nodes located in the National Aviation Weather Processing Facility (NAWPF) sites in Salt Lake City, Utah (SLC), and Atlanta, Georgia (ATL), and a National Weather Service Telecommunication Gateway (NWSTG)/WMSCR Interface Device (NWID) located at the Washington Air Route Traffic Control Center/Area Control Facility (ARTCC/ACF) in Leesburg, Virginia (ZDC). Each WMSCR node will normally serve approximately half the NAS. If one node fails, the surviving node will assume total responsibility to service the entire NAS. This system redundancy will provide increased operational availability to NAS users. One of WMSCR's primary functions is to perform as a gateway for exchanging weather data between the National Weather Service (NWS) and the FAA via NWSTG. The WMSCR will collect NOTAM's for processing by the Consolidated NOTAM System Processor (CNSP), and will store and distribute the processed NOTAM's received from the CNSP. The service provided by WMSCR will be continuous, 24 hours a day, 7 days per week. WMSCR will become operational in 1992. WMSCR will be flexible enough to allow for initial growth without the addition of hardware or software, and further expansion through the installation of additional hardware only, without requiring additional software.

21. PURPOSE. The purpose of the WMSCR project is to replace the current Weather Message Switching Center (WMSC) system in Kansas City, Missouri. It will support all functions related to weather processing presently performed by the WMSC as well as storage and distribution of NOTAM's. The WMSCR is expected to reduce maintenance and operational costs through the use of up-to-date technology. The WMSCR is expected to reduce communication costs through the use of the National Airspace Data Interchange Network (NADIN) Packet-Switching Network (PSN).

22. HISTORY. In December 1981, the FAA chartered a comprehensive NAS Plan for modernizing and improving air traffic control (ATC), and airway facilities through the year 2000. As part of the NAS Plan, Order 7032.3, Air Traffic Service Operational Requirements for the Weather Message Switching Center Replacement (WMSCR), was issued on November 9, 1983, promulgating the Air Traffic Service operational requirements for the WMSCR.

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The detailed functional description of the WMSCR is contained in the WMSCR System Specification, FAA-E-2764. The following is a summary of the WMSCR's primary functions:

a. Communications. Acquire and disseminate weather and NOTAM information over the interfacing communications network and dedicated circuits.

b. Processing. Identify, validate, and distribute weather data and NOTAM information that is received from the communications function.

c. Storage and Retrieval. Receive and store weather and NOTAM data from the communications function. Retrieve weather and NOTAM data for external users as well as for WMSCR internal functions. Purge obsolete weather and NOTAM data.

d. Control. Provide for operator control for error correction and configuration modification.

e. Development and Test. Support continuing system enhancement and revisions throughout the lifetime of the system by providing a software development Test Bed and a communications network simulator.

31. SYSTEM PHYSICAL DESCRIPTION. The WMSCR nodal architecture is built around two Digital Equipment Corporation (DEC) Virtual Address Extension (VAX) 6220 processors with shadowed discs connected through a VAX cluster passive star coupler. The first processor carries the normal work load of the WMSCR node. The second processor monitors the active processor and assumes the primary role when a failure is detected or can serve as the Network Simulator and Software Test Bed, allowing simultaneous testing and simulation. The primary communications processor and backup processor connect to the external communications lines through automated switching and manual switching equipment. This provides the flexibility for performing automated switchover and configuring the system for alternative test configurations. External communications interfaces are accommodated by programmable Intelligent Communications Processor boards (ICP-1632), that are compatible with the VAX bus. The boards are manufactured by Simpact Corporation. Each board provides two communications ports, operating at rates up to 64 kilobits per second. X.25 Link Access Procedure Balanced and Network Layer as well as High Level Data Link Control and Advanced Data Communications Control Protocols, are implemented on the ICP-1632, thus off-loading this task from the host processor. Operator position Video Display Terminals (VDT) and printers are connected through DEC terminal servers and an Ethernet Bus to the host processors. The National Weather Service Telecommunication Gateway (NWSTG)/WMSCR Interface Device (NWID) Hardware Configuration consists of a VAX

station 3100 consisting of a microcomputer VDT and Keyboard and a Digital Network (DECNET) router providing X.25 compatible communications ports. The router and VAX station 3100 are connected via an Ethernet Bus. A second set of NWID hardware provides backup.

32. SYSTEM REQUIREMENTS. The following WMSCR requirements that impact facility planning are taken from the WMSCR System Specification:

a. Hardware Physical Requirements.

(1) Weight Limits. The cabinets and frames will be designed for an average weight distribution of floor loading not to exceed 125 lb/sq.ft. (610.3 kg./sq.m.).

(2) Dimensional Limits. The WMSCR node equipment, including the operational positions and equipment units (racks, cabinets, consoles, and frames), will be placed within a 1,450-sq.ft. (134.7-sq.m.) area in the NAWPF. The WMSCR equipment dimensions will not exceed the size limits for transportability within the NAWPF. The NWID equipment, will be placed within a 180 sq. ft. area within the Washington, DC; ARTCC/ACF in Leesburg Virginia.

(3) Accessibility. Equipment units will provide front access, rear access, or both, as needed for maintenance and repair activities.

(4) Access Clearance. Distance required for maintenance access between the rows of nodal equipment units will not exceed 5 feet (1.5m) for front access and 4 feet (1.2m) for rear access.

b. Hardware Power Requirements. The WMSCR will operate on one or both of the FAA-supplied electrical power services available within the NAWPF. These services are summarized below:

Service	Voltage	Frequency	# of Phases	# of Wires
1	120 ± 10%	60Hz ± 2%	1	Two wires plus ground
2	208 ± 10%	60Hz ± 2%	3	Three wires plus ground

The total electrical power and heat load are estimated to be 11,800 watts and 42,270 BTU/hr respectively for each WMSCR node. The total electrical power and heat load for the NWID are estimated to be 340 watts and 1500 BTU/hr respectively. WMSCR power protection devices will be provided to ensure that the WMSCR operates without damage from power and frequency fluctuations. Power will be furnished to the WMSCR through individual circuit breakers. Overload protection and further distribution will be designed within WMSCR.

c. Environmental Characteristics. The WMSCR mainly consists of Commercial Off-the-shelf (COTS) equipment which will be manufactured to the vendor's normal specification for environmental parameters. Since the equipment is designed for the type of environment where it will be employed;

no special enviromental provisions will be required. In the event that any custom designed equipment would be required for the WMSCR it would be designed for the operating and non-operating conditions listed in Table 3-1.

TABLE 3-1. WMSCR ENVIRONMENTAL CHARACTERISTICS

Environment	Equipment Operating	Equipment Non-operating
Altitude	0 to 8,000 feet	0 to 50,000 feet
Temperature range	+10 to +40 degrees centigrade	-50 to +70 degrees centigrade
Relative Humidity	10% to 80%	Up to 100% noncondensing

The environmental characteristics do not apply to commercial off-the-shelf equipment.

d. System Security. The principal threats to WMSCR are environmental disaster, electrical grid failure, and unauthorized access. The threat of unauthorized system access will be minimized by built-in security provisions. The operating system will ensure its own security and integrity and that of other software components. Access to the system will be limited to authorized users. Security measures will be consistent with Order 1600.54, Security of FAA Automatic Data Processing Systems and Facilities. There will be no physical security devices required on WMSCR equipment.

e. Hardware Safety. The WMSCR system is being designed to be compliant in all aspects with Occupational Safety and Health Administration (OSHA) Safety and Health Standards (29 CFR 1910).

f. System Expansion. The initially installed system will have sufficient system components and resources to permit a 100 percent growth capability without enhancement, modification, or expansion of the operational WMSCR system components. In addition, the initially installed system will have sufficient expansion capability through the addition of system components, but without any change in system design or any requirement for further software development, to support a 100 percent increase in communications connectivity and traffic to external users, a 100 percent increase in central processing unit (CPU) power, a 400 percent increase in control terminals, and a 200 percent increase in data storage.

g. Electromagnetic Interference. The WMSCR equipment will meet the

conducted and radiated emission requirements of Federal Communications Commission (FCC) Rules and Regulations, Part 15, Subpart J, and of MIL-STD-461, Parts 1 & 7.

33. INTERFACES. A repertoire of network user services has been established to provide a uniform set of procedures that will serve all current and potential NADIN packet network users. The principal flow of weather data is from the NWSTG through WMSCR, to the Aviation Weather Processor (AWP) and the packet network users. The principal message users of WMSCR are the Aeronautical Fixed Telecommunications Network (AFTN) and the 9020/HOST replacement ATC computer. In addition, the flow of NOTAM data will be principally from the flight service environment through the AWP to the CNSP via WMSCR and from CNSP to WMSCR for storage and distribution. Figure 3-1 is a WMSCR system functional interconnection diagram showing the principal external interfaces to the WMSCR. Each WMSCR node will have interfaces as described in subparagraphs a. through n.

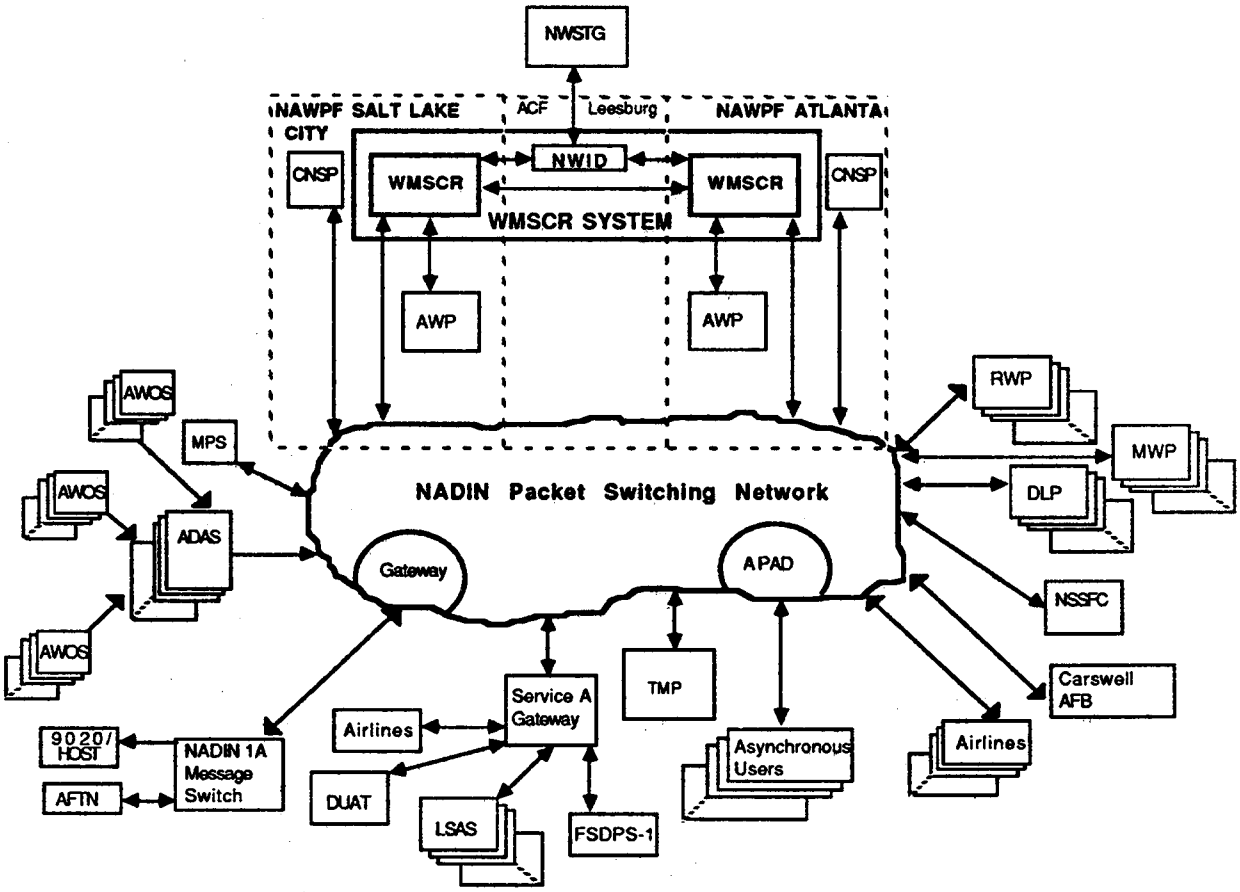
a. WMSCR/WMSCR Interface. The two WMSCR nodes will be connected by a dedicated communication link. The WMSCR/WMSCR interface will support the data base, data exchange, and data communication requirements of the WMSCR system. The WMSCR/WMSCR interface will be described in an Interface Control Document (ICD) to be prepared by the WMSCR contractor as Contract Data Requirements List item A019, WMSCR/WMSCR ICD.

b. WMSCR/NWSTG Interface. Each WMSCR node will receive meteorological data from the NWSTG. The data will be exchanged between the NWSTG and the two WMSCR nodes by means of the NWID. Detailed information regarding this interface can be found in NAS-IR-90022507, WMSCR/NWSTG Interface Requirements Document (IRD).

c. WMSCR/AWP Interface. Each WMSCR node will exchange weather and NOTAM data with the AWP collocated at the respective NAWPF via a dedicated link. The AWP will also be able to request data from the WMSCR data base via this link. Detailed information regarding this interface can be found in NAS-IR-25042507, WMSCR/AWP IRD.

d. WMSCR/Coded Time Source (CTS) Interface. Each WMSCR node will receive a continuous flow of time code data from the CTS collocated at the respective NAWPF. Detailed information regarding this interface can be found in NAS-IR-92020000, CTS User's IRD.

FIGURE 3-1 WMSCR SYSTEM INTERCONNECTION DIAGRAM



e. WMSCR/NADIN PSN Interface. The NADIN PSN is a general purpose X.25 packet switch network that is an integral part of the NAS. The NADIN PSN is described in FAA-E-2770, NADIN PSN Functional Specification. The WMSCR will use the NADIN PSN as an intermediate interface pathway between the WMSCR and users who are attached to the NADIN PSN directly or through gateways and Asynchronous Packet Assembler/Disassemblers (APAD). The WMSCR/NADIN PSN interface will be the same for each interface that uses the NADIN PSN. Detailed information regarding this interface can be found in NAS-IR-43020001, NADIN/X.25 packet Node User's IRD.

f. WMSCR/CNSP Interface. The WMSCR and CNSP will exchange NOTAM data via the NADIN PSN. The principal flow of data will be NOTAM's originating in the NAS being sent (via AWP) through the WMSCR to the CNSP for processing. The CNSP will transmit NOTAM's it has processed to WMSCR for storage and distribution. Detailed information regarding this interface can be found in NAS-IR-25072505, WMSCR/CNSP IRD.

g. WMSCR/Real-Time Weather Processor (RWP) Interface. The WMSCR and the RWP will exchange meteorological data via the NADIN PSN. The principal flow of data will be from the WMSCR to the RWP. Data originating in the RWP's will also be sent to the WMSCR for storage and distribution. The WMSCR will have the capability to accept RWP requests for data from the WMSCR data base. The WMSCR will establish an independent connection via the NADIN PSN to each RWP for bi-directional data exchange. Detailed information regarding this interface can be found in NAS-IR-25072511, WMSCR/RWP IRD.

h. WMSCR/Maintenance Processor Subsystem (MPS) Interface. Each WMSCR node will communicate via NADIN PSN with the MPS. This link will be used to transfer status information concerning the WMSCR node to the MPS. The status information will include hourly status reports and system anomalies. Detailed information regarding this interface can be found in NAS-IR-51030002, MPS/Automation Subsystems IRD.

i. WMSCR/Data Link Processor (DLP) Interface. The WMSCR will exchange weather and NOTAM data with the DLP, formerly called the Weather Communications Processor (WCP), via the NADIN PSN. The principal flow will be from the WMSCR to the DLP. The WMSCR will have the capability to accept DLP requests for data from the WMSCR data base. The WMSCR will establish an independent connection via the NADIN PSN to each DLP for bi-directional data exchange. Detailed information regarding this interface can be found in NAS-IR-25072503, WMSCR/WCP IRD.

j. WMSCR/Traffic Management Processor (TMP) Interface. The WMSCR will exchange weather data with the TMP via the NADIN PSN. The principal flow will be from the WMSCR to the TMP. The WMSCR will also respond to requests from the TMP for data. Detailed information regarding this interface can be found in NAS-IR-25072401, WMSCR/TMP IRD.

k. WMSCR/Automated Weather Observing Stations Data Acquisition System (ADAS) Interface. The WMSCR will receive weather information collected by Automated Weather Observing Stations (AWOS) via the NADIN PSN through the ADAS. Each of the ADAS units serves multiple observing sites. Hourly the ADAS establishes a network connection with the WMSCR via the NADIN PSN and sends in all available observations. Special observations are sent in whenever changed meteorological conditions warrant. Detailed information regarding this interface can be found in NAS-IR-25082507, WMSCR/ADAS IRD.

l. WMSCR/Message Switch Network (MSN) Users Interface. The WMSCR will support data exchange with subscribers connected to the NADIN 1A message switch. The NADIN 1A message switch is a store-and-forward message switch using International Civil Aviation Organization (ICAO) procedures and message formats. The NADIN 1A message switch interfaces with the NADIN PSN via the NADIN packet switch/message switch gateway. MSN subscribers who exchange data with the WMSCR are the ATC system and the AFTN. Detailed information regarding this interface can be found in NAS-IR-94012507, User IRD.

m. WMSCR/APAD User Interface. This interface will serve those subscribers of the WMSC system in Kansas City, Missouri, who currently are served by an asynchronous interface and who will not convert to X.25 network user interface procedures. There will be no change in the service provided to these users. The APAD are part of the NADIN PSN and appear to WMSCR as packet network users. The APAD's will distribute alphanumeric weather and NOTAM data to the users through 1200 to 9600 bits per second asynchronous circuits. Protocol converters provided by the APAD at each of the NADIN PSN nodes will convert from the X.25 procedures used by WMSCR to the asynchronous interface seen by the subscribers. Detailed information regarding this interface can be found in NAS-IR-94032507, WMSCR/NADIN Asynchronous PAD Users IRD. The IRD's for the various WMSCR external interfaces are found in separate documents as listed in appendix 2.

n. WMSCR/X.25 Converted Users Interface. The interface will serve those subscribers served by the WMSC in Kansas City, Missouri, who will convert to X.25 network and link layer protocols. Detailed information regarding this interface can be found in NAS-IR-94022507, WMSCR/NADIN Packet Network User IRD. The users consist of:

(1) Service A gateways located in each ARTCC. The Service A gateways will serve the Flight Service Data Processing System-1 (FSDPS-1), the Direct Users Access Terminal System (DUATS), the Leased AB Service (LABS) GS-100s at Flight Service Stations (FSS) and airline users who do not convert to X.25.

(2) Carswell Air Force Base (KAWN) located in Fort Worth, Texas.

(3) National Severe Storms Forecast Center (NSSFC) in Kansas City.

(4) Airline users, geographically distributed.

(5) Meteorologist Weather Processors (MWP).

34. WMSCR SITE LOCATIONS. A WMSCR node will be installed at the NAWPF locations in:

a. Salt Lake City, Utah.

b. Atlanta, Georgia.

The NWID will be installed in the Washington, D.C., ARTCC/ACF located in Leesburg, Virginia.

35.-39. RESERVED.

CHAPTER 4. PROJECT SCHEDULES AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. The WMSCR contract was awarded to Harris Corporation on July 22, 1988. For planning purposes, the regions may obtain an ARTEMIS schedule from the System Engineering and Integration (SEI) contractor regional representative.

41. MILESTONE SCHEDULE SUMMARY. Milestones that pertain to implementation are listed in fig 4-1. These milestones reflect key contract deliverables required by the Statement of Work.

42. INTERDEPENDENCIES AND SEQUENCE. There is an interdependency between WMSCR and NADIN II. Due to the large number of WMSCR users that will communicate with WMSCR via NADIN PSN, the completion of WMSCR Operational Test and Evaluation (OT&E)/integration is dependent upon successful NADIN II phase I cutover.

43.-49. RESERVED.

FIGURE 4-1 MILESTONE SUMMARY SCHEDULE

ACTIVITY DESCRIPTION	BASELINE DATE
Master Test Plan Approved	APR 21 1988
Contract Awarded (NAS Plan 7/88)	APR 29 1988
Preliminary Design Review (PDR) Completed	SEP 21 1989
Project Implementation Plan Approved	MAR 15 1990
Critical Design Review (CDR) Completed	APR 05 1990
Provisioning Tech Documentation/Logistics Support Analysis Data Delivered	APR 11 1990
Factory Acceptance Test Plan Approved	APR 23 1990
Provisioning Conference	JUL 09 1990
Training Materials Delivered (first)	JUL 16 1990
Integrated Logistics Support (ILS) Plan Approved	JUL 30 1990
Prerequisite (Vendor) Training Begins	JUL 30 1990
ACN-230 OT&E/Integration Plan Approved	JUL 31 1990
Site Acceptance Test Plan Approved - NWID	SEP 19 1990
Factory Acceptance Test Complete	JAN 14 1991
System Delivered To first T&E Site (SLC)	FEB 14 1991
NWID Delivered To first T&E Site (ZDC)	FEB 14 1991
Test Equipment Delivered	FEB 14 1991
First Site Acceptance Tests Completed	MAR 22 1991
System Delivered To Last Operational Site (ATL)	MAR 29 1991
Site Spares Delivered	MAR 29 1991

FIGURE 4-1 MILESTONE SUMMARY SCHEDULE (CONTINUED)

ACTIVITY DESCRIPTION	BASELINE DATE
ASM-400 OT&E/Shakedown Plan Approved	APR 30 1991
Last Site Acceptance Tests Completed	MAY 06 1991
Operator/Maintenance Training Begins	MAY 07 1991
Completion of Training	SEP 30 1991
WMSCR/MPS ICD Baseline	OCT 07 1991
DRR Report Delivered to AND-2	DEC 15 1991
ACN-230 OT&E/Integration Completed	AUG 01 1992
ASM-400 OT&E/Shakedown Completed	OCT 01 1992
System ORD (NAS Plan 12/92)	OCT 31 1992
Decommission NATCOM (NAS Plan 6/93)	MAR 30 1993

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT GENERAL.

a. FAA Project Management. The overall technical management of the WMSCR project is the responsibility of Weather Processors Branch, ANW-130. This organization will accomplish management tasks within the guidelines provided by FAA policies, procedures, and directives. A member of ANW-130 has been designated WMSCR Project Manager and is the single focal point for all WMSCR project activities.

b. Contracting Officer (CO). The CO has been designated by the Logistics Service, Contracts Division, ALG-320. The CO performs the general contracts management activities of monitoring contractor schedules, assessing problem reports and solutions, attending meetings, conducting inspections, conducting in-progress reviews, and all other activities concerned with assuring that the terms of the contract are met. The CO shall be the only person authorized to make changes that will affect prices, deliverables, or schedules.

c. Contracting Officer's Technical Representative (COTR). The CO has designated a representative of ANW-130 as the COTR to provide technical guidance and direction to the contractor within the scope of the contract. The COTR ensures that the contractor has access to technical documentation, appropriate data bases, and sources of information relative to Government Furnished Equipment. The COTR has overall responsibility for inspection and acceptance of activities for the WMSCR service. The COTR may designate the NAWPF Technical Representative as the Technical Onsite Representative (TOR) responsible for inspecting and accepting the WMSCR.

d. Quality and Reliability Officer (QRO). WMSCR QRO's have been designated by ALG-400 to monitor quality and reliability aspects during development. The monitoring includes monitoring at the contractor and subcontractor facilities.

e. FAA Airway Facilities Regional Project Management. Each region involved in WMSCR implementation shall appoint a WMSCR Airway Facilities Associate Project Manager (AFAPM). The AFAPM shall ensure that facilities and engineering work is completed prior to the delivery of the WMSCR equipment. The AFAPM shall monitor the installation of the WMSCR equipment and coordinate requests for contractual or technical support with ANW-130. Each AFAPM shall designate an Airway Facilities Technical Representative (AFTR).

f. FAA Technical Center Project Management. A test director shall be appointed from the FAA Technical Center Engineering Division, ATC Systems Branch, ACN-230. Test Director activities in accordance with Order 1810.4A, FAA NAS Test and Evaluation Program, will be coordinated with the WMSCR Project Manager, ANW-130.

g. FAA Operational Suitability Testing Manager. ASM-400 shall have responsibility for testing operational suitability of the WMSCR service in accordance with Order 1810.4A. ASM-400 shall name a representative who shall coordinate with the users and ANW-130 on all testing issues (Factory Acceptance Test (FAT), Site Acceptance Test (SAT), and OT&E/shakedown) through the conclusion of Joint Acceptance Inspection (JAI). The ASM-400 representative shall coordinate with the users and ANW-130 to resolve any issues that may arise.

h. Training Contracting Officer's Representative. The training COTR from AAC-942 will ensure that all contractor training of WMSCR operational personnel is satisfactorily completed.

51. PROJECT CONTACTS.

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52. PROJECT COORDINATION. The WMSCR COTR has the overall responsibility for the acceptance of the WMSCR. Table 5-1 contains major organizational responsibilities.

TABLE 5-1 MAJOR ORGANIZATIONAL RESPONSIBILITIES

ORGANIZATION	AREA OF RESPONSIBILITY.
ANW-130	Project management. PIP, Master Test Plan, Subsystem Training Plan, Integrated Logistics Support Plan.
AEA-400, 500	Support development of OT&E/Integration and OT&E/Shakedown Plans and Procedures.
ACE-400, 500	Support development of OT&E/Integration Plan and Procedures.
ACN-230	Prepare OT&E/Integration Plan and Procedures. Conduct OT&E/integration.
ASE-500	Develop NAS functional and performance requirements for the WMSCR Project.
ANM-400, 500	Support development of OT&E/Integration and OT&E/Shakedown Plans and Procedures.
ASO-400, 500	Support development of OT&E/Integration and OT&E/Shakedown Plans and Procedures.
ASM-300	Provide interfacility communication lines.
ALG-400	Definition and implementation of WMSCR services.
AHT-400	Personnel and technical training.
AAC-445b	Review logistics and support related Contract Data Requirements List (CDRL) items during the development phase.

AAC-942d	Coordinate training activities.
ANS-200	Space configuration management, power connection, and configuration management.
ASM-400	Prepare OT&E/Shakedown Plan and Procedures. Conduct OT&E/shakedown.
SEI	Provide Development Test and Evaluation, and Production Acceptance Test and Evaluation (DT&E/PAT&E) requirements, support ANW-130.
Contractor	Prepare Contractor Test Plan and Procedures. Develop, test, and install WMSCR system.

a. WEATHER & FLIGHT SERVICE SYSTEMS (ANW) RESPONSIBILITIES.

(1) Direct, guide, and coordinate overall project activities.

(2) Develop and baseline a system specification based on functional and performance requirements contained in NAS-SS-1000.

(3) Procure a contractor.

(4) Develop and maintain project master schedule.

(5) Ensure adherence to the NAS Plan and the availability of funds.

(6) Develop and maintain the PIP.

(7) Develop an ILS Plan.

(8) Develop and maintain project Master Test Plan in conjunction with the FAA Technical Center WMSCR Test director.

(9) Ensure vendor maintenance support is in place.

(10) Accept the WMSCR services from the contractor.

(11) Task SEI and other support contractors as required for effective project management.

(12) Develop equipment removal plans in accordance with Order 4800.2, Utilization and Disposal of Excess and Surplus Personal Property.

(13) Coordinate the training program with AHT-400.

b. FAA Technical Center (ACN) Responsibilities.

(1) Appoint a test director for OT&E/integration.

(2) Develop the OT&E/Integration Plan and Procedures.

(3) Conduct OT&E/integration at the operational sites in Atlanta (ATL), Salt Lake City (SLC), and Leesburg, VA. (ZDC)

(4) Support ANW-130 in the review and acceptance of contractor provided test documentation.

(5) Provide Master Test Plan jointly with the project office.

c. Mike Monroney Aeronautical Center (AAC) Responsibilities

(1) Provide the training COTR.

(2) Review logistics or support related CDRL items.

d. System Maintenance Service (ASM) Responsibilities.

(1) Appoint a test manager for OT&E/shakedown.

(2) Develop the OT&E/Shakedown Plan and Procedures. In accordance with FAA-STD-024.

(3) Validate the OT&E/Shakedown Plan and Procedures.

(4) Conduct OT&E/shakedown.

(5) Support ANW-130 in the review of FAT, Installation and Checkout (I/CO), SAT and Integration Testing & Evaluation (IT&E) plans and procedures.

(6) Support ANW-130 in monitoring FAT, I/CO, SAT and IT&E tests for compliance to their respective plans and procedures.

(7) Support ANW-130, Airway Facilities, and Air Traffic during OT&E/shakedown at WMSCR sites. Also support development of DT&E documentation.

(8) Modify Order 6040.15A, National Airspace Performance Reporting, to reflect the WMSCR as a reportable system.

(9) Process daily down time and maintenance action information

through National Aviation Processing and Reporting System (NAPRS).

(10) Provide communications circuit engineering and allocation of FAA communications facilities or funding for leased lines.

e. Airway Facilities and Air Traffic Regional Responsibilities.

(1) Conduct initial site survey and support contractor's site survey to identify cable run paths, potential structural modifications to support WMSCR, and establish a location for the leased line connections.

(2) Generate NAS Change Proposal (NCP's) to establish configuration baselines for each site which satisfy floor space and critical power requirements.

(3) Supervise and direct the performance of site preparation including site engineering and planning, update facility documentation, drill holes through operations floor and walls for cable routing, install signal and power cables and install furniture to support the new work stations and peripherals.

(4) Provide assistance to the contractor during communication line installation.

(5) Review test procedures, site survey report, and installation plan prior to installation and ensure that all FAA activities are completed.

(6) Provide the contractor access to the installation site and coordinate with the contractor on installation and integration activities.

(7) Appoint a representative to be designated TOR by the COTR in each NAWPF and the Washington, DC ARTCC/ACF to inspect and accept the WMSCR. Supply the TOR with the documentation required to perform, including a copy of the contract, the specification and other applicable documentation.

(8) Appoint a representative in each NAWPF and the Washington D.C. ARTCC/ACF to monitor, sign-off, and report through NAPRS all WMSCR maintenance activities in accordance with Order 6040.15A, National Airspace Performance Reporting.

(9) Monitor and report, to ANW-130, contractual compliance with installation plan and site test procedures and insure that all non-conformances have been documented.

(10) Support site acceptance testing.

(11) Provide input to the Master Test Plan.

(12) Support the conduct of OT&E/integration and OT&E/shakedown.

(13) Jointly responsible with the project office for JAI.

(14) Provide circuit requirements.

f. System Engineering and Integration (SEI) Contractor Responsibilities.

(1) Support overall project activities.

(2) Support the development and baselining of a system specification based on validated user requirements.

(3) Support the development and maintenance of a project master schedule.

(4) Support adherence to the NAS Plan and availability of funds.

(5) Support the development and maintenance of a PIP.

(6) Support the development of an ILS Plan.

(7) Support development of the project Master Test Plan.

g. Other Support Contractor Responsibilities.

(1) Support overall project activities.

(2) Support the development and baselining of a system specification based on validated user requirements.

(3) Support adherence to the NAS Plan and availability of funds.

(4) Support the development and maintenance of a PIP.

(5) Support the development an ILS Plan.

(6) Support the development of training requirements.

(7) Support development of the project Master Test Plan.

h. WMSCR Contractor Responsibilities

(1) Prepare all contract specified plans:

(a) Site Preparation Requirements (SPR) Plan

(b) Installation and Checkout Plan (I/CO)

(c) Operations and Maintenance (O&M) Plan

(d) Contractor Master Test Plan

(e) FAT Plan

(f) SAT Plan

(g) Contract Training Plan

(2) Conduct FAT at the contractor facility.

(3) Install WMSCR equipment.

(4) Conduct checkout and SAT of the WMSCR.

(5) Ensure contractor maintenance support is in accordance with contract provisions.

53. PROJECT RESPONSIBILITY MATRIX. Table 5-2 shows the organization responsible for implementation of each significant function of the project.

TABLE 5-2 PROJECT RESPONSIBILITY MATRIX

WMSCR RESPONSIBILITY MATRIX

ACTIVITY	ACE 400-500	ACN 230	AEA 400-500	ASE 400	ANM 400-500	ANW 130	ASO 400-500	ASM 400	ASM 300	SEI	CONTR
1 Provide NAS System-Level Test Requirements (WRTM)				△		○				▲	
2 Provide OT&E Requirements		△		○		●		▲		▲	
3 Provide DT&E./PAT&E Requirements						○				△	▲
4 Prepare Master Test Plan	✖	△	✖		✖	○ △	✖	▲		▲	
5 Review Conformity of Test Programs With Order 1810.4		●		△		●		●		●	
6 Provide Supprt to PM For All T&E Phases		▲				○		▲		▲	
7 Prepare Contractor Test Plan	✖	●	✖		✖	○	✖	●		▲	△
8 Prepare Software Test Plan		▲				○		▲		▲	△
9 Prepare System Integration Test Plan	▲	●	▲		▲	●	▲	●		▲	△
10 Prepare FAT & SAT Plans	✖	▲	✖		✖	○	✖	▲		▲	△
11 Develop Site-Specific Requirements For Test Plans And Procedures	▲	▲	▲		▲	○	▲	▲		●	△
12 Prepare Test Procedures And Test Reports						○				▲	△
13 Prepare Shakedown Test Plan/ Procedures	✖	●	▲		▲	○	▲	△	●	▲	
14 Prepare NAS Integration Test Plan/Procedures	✖	△	▲		▲	○	▲	●	●	▲	
15 Installation And Checkout of System	▲	▲	▲		▲	○	▲	▲		▲	△
16 Conduct NAS Integration / SLT Testing	●	△	●		●	●	●	●	▲	▲	
17 Conduct Shakedown Testing	●	●	▲		▲	●	▲	△	▲	▲	▲
18 Provide leased communications		●	▲		▲	○	▲	●	△	▲	▲

Code:

- △ Primary Responsibility
- ▲ Support
- ● Notification
- ○ Approval Authority
- ✖ Occasional Notification

54. PROJECT MANAGERIAL COMMUNICATIONS. To maintain effective and responsive control of overall progress, frequent reviews, conferences, and working sessions will be held among FAA management, the project manager, and regional TOR. Participation in these conferences and working groups by contractor personnel and/or representatives of various other FAA offices is at the discretion of the project manager. Routine status reporting will be required.

a. Monthly Program Review. The project manager will conduct monthly reviews of the project status and progress. These reviews will normally include representatives from headquarter organizations and contractors as requested. Special status reviews and technical interchange meetings may be scheduled at the contractor's or region facilities as required. The program/project Manager normally briefs the division manager on the status of the WMSCR project each month or as requested. Project status reports will be prepared by ANW-130 each quarter and distributed to the regional TOR's and other key program personnel.

b. Program Reviews. Bimonthly, the program manager briefs the program director on the status of project schedules and current project topics. These reviews provide for top-level management control of the project. In preparation for them, the project manager may request the support of functional or contractor organizations in providing status and information on specific project topics.

c. Implementation Working Group. The primary objective of this group will be to ensure a smooth and successful WMSCR installation, OT&E/integration, OT&E/shakedown, and transition of user services from the WMSC in Kansas City to the WMSCR system. This group will meet periodically at FAA headquarters or other locations to address both high-level project issues and specific functional activities. Membership consists of the following personnel:

(1) Project/program manager.

(2) Headquarters functional area representatives.

(3) Airway Facilities Associate Project Managers.

(4) Airway Facilities technical representatives.

(5) Test representatives from ACN-230 and ASM-400.

(6) SEI contractor.

(7) Contractor.

Note: Other offices (including regional TOR's) will be asked to participate as required. Action items generated at these meetings will be

resolved by the WMSCR Project Office or representatives from functional areas. Minutes of each meeting will be distributed to attendees and include a summation of the topics discussed and description of all action item resolutions.

d. Program Conferences. These conferences will be scheduled as necessary. These meetings are attended by TOR's from the appropriate regions, the project manager, and representatives from headquarters organizations. They provide a forum to discuss and resolve project issues of special interest to the Regions. Action items generated at these conferences focus on regional concerns and are resolved by the WMSCR Project Office, and designated TOR's or representatives from functional areas. In addition to the above reviews, the following meetings will also be conducted.

(1) The contractor will schedule and conduct monthly progress meetings at the contractor's facility until the last SAT is complete.

(2) The contractor's project manager will meet, as needed, with the COTR for discussions regarding WMSCR status.

(3) ANW-130 will hold weekly staff meetings to discuss project progress and issues.

(4) Project Status Review Board (PSRB) meetings are held with ANW-1 bimonthly to review project status including cost and schedule issues.

55. IMPLEMENTATION STAFFING. There are no unique or peculiar staffing requirements associated with the implementation of this project.

56. PLANNING AND REPORTS.

a. Regional Status Reporting. Quarterly status reports regarding technical progress and cost performance will be submitted to the Project Manager by each Regional TOR. Routine reporting as well as responses to specific requests will be covered in these reports.

b. Contractor's Monthly Reports. Monthly status reports as required by the WMSCR Statement of Work.

57. APPLICABLE DOCUMENTS. A complete list of applicable documents is included in appendix 2.

58.-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. This project is fully funded.

61.-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. The general deployment aspects and the schedule for the Deployment Readiness Review (DRR) of the WMSCR are:

a. Deployment Aspects.

(1) The contractor will perform site surveys. The roles of FAA site personnel and the contractor concerning the physical installation of system cabling will be determined in conjunction with each site manager during the site survey.

(2) The contractor will prepare detailed Installation and Checkout (I/CO) Plans for each site.

(3) The contractor will deliver the Site Preparation Requirements (SPR) as part of the contractor I/CO Plan which will include specific site preparation actions to be accomplished at FAA sites.

(4) FAA will accomplish required site preparation as defined in the SPR.

(5) The contractor will ship the system to the site.

(6) The COTR, or his/her designated representative, along with the contractor and FAA site personnel will conduct pre-installation walk-through. This will ensure that all site preparations activities have been successfully completed and that all equipment, tools, and personnel are onsite and ready for the I/CO.

(7) The contractor will install and checkout the system in accordance with the approved I/CO Plan.

(8) The contractor will perform the SAT in accordance with the contractor developed and FAA approved SAT Plan and procedures. The FAA will monitor the conduct of the SAT and review the SAT report for approval .

(9) The contractor will provide required operation, software, and maintenance training in accordance with approved training plans and course documentation.

(10) A system-level Initial Operational Capability (IOC) will be declared and the OT&E/integration performed in accordance with ACN-230 developed plans and procedures.

(11) System OT&E/shakedown will be performed in accordance with ASM-400 developed plans and procedures.

(12) Each site will perform the Contractor Acceptance Inspection (CAI) in accordance with provisions of Order 6030.45.

(13) A system JAI will be performed and Operational Readiness Demonstration (ORD) declared in accordance with the provisions of Order 6030.45.

b. DRR Schedule.

ACTION	ESTIMATED-WORKING DATE
SEI Contractor Conducts Initial Review	Oct 18 1989
FAA DRR Team Meeting	Dec 05 1989
DRR-1 EXCOM	Nov 20 1990
First Test Site Delivery (SLC)	Nov 28 1990
Final DRR Report to AND-2	Mar 08 1991
AND-1 Approval	May 01 1991
Deployment Memorandum	May 15 1991
DRR-2 EXCOM	Sep 24 1992

71. SITE PREPARATION. Site preparation will be performed in accordance with the Contractor prepared and FAA approved I/CO Plan. This plan will be based upon the results of each individual site survey. Site preparation will be performed by the FAA.

72. DELIVERY. Shipment of all material and equipment required for WMSCR installation at any site listed in the contract schedule will be the responsibility of the contractor, including off-loading and emplacement of equipment.

73. INSTALLATION PLAN.

a. Plan Development. The contractor will prepare a plan and set of instructions detailing all tasks related to the system installation. The plan will include site preparation requirements, floor plan layouts, and detailed installation procedures.

b. Site Preparation. The FAA will perform site preparation based on the requirements in the contractor prepared I/CO plan.

c. Installation Concept. Once site preparation is completed, installation of the system hardware and related checkout testing will be performed by the Contractor.

74.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. FACTORY VERIFICATION. The WMSCR will be tested in a series of tests that demonstrate, verify, and validate compliance with all functional and performance requirements. WMSCR testing will be based on a bottom-up, building-block approach that takes a defined subset of WMSCR requirements and validates compliance of that building block with its requirements before proceeding to validate the next higher level of integration. Major test series will progress from the module level, to the component level, to the subsystem level, and up to the system test level. Special test requirements will be developed to accommodate each test phase. The functional capabilities of each successive building-block increase until the final building-block implements all WMSCR system requirements. The network simulator will be utilized for interface and full nodal testing of the WMSCR system.

a. Unit Test (UT). Unit test will consist of software module and component-level design tests prior to delivery of configuration items to System Integration Test (SIT). The UT will demonstrate the operation of individual components or modules. UT serves to verify functional performance, data flow, and interface compatibility of Computer Software Configuration Item (CSCI) components.

b. System Integration Test (SIT). SIT will consist of configuration item (CI) and CSCI integration testing and will include system function, performance, and support tests. The SIT will demonstrate the successful concurrent operation of from 2 to all WMSCR CI, CSCI's, and subsystems in the contractor's facility environment. The complete WMSCR configuration will be tested using an environment that simulates the external environment anticipated by the FAA. A Test Readiness Review (TRR) will be conducted prior to the SIT. The SIT efforts will be documented in the CSCI test plans and procedures.

c. Factory Acceptance Test (FAT). FAT will consist of pre-shipment, system-level testing. The FAT will be performed to validate the function of the system at the contractor's test facility and will be witnessed by the FAA. The FAT will demonstrate the adequacy of the WMSCR design by testing all aspects of system function and performance, as defined in the system specification. The FAT Plan will define the range of tests, input data, initialization requirements, expected output, and test success criteria. Testing resources such as personnel, equipment facilities, and schedules will also be identified. Upon the successful completion of the FAT and DRR, each WMSCR node and NWID will be transported to and installed at their intended locations.

81. SITE ACCEPTANCE TEST (SAT). The SAT will be performed to validate the function and performance of the system (previously demonstrated by the FAT at the contractor's test facility) in its intended field test environment. This

test will use all available actual field stimuli and inputs. Field inputs not available will be simulated. The SAT Plan will present descriptions and test success criteria that are to be satisfied after the WMSCR systems have been installed at the respective NAWPF's and the Washington DC, ARTCC/ACF. The SAT Plan will define the range of tests, input data, initialization requirements, expected output, and criteria for evaluating test results. Testing resources such as personnel, equipment, facilities, and schedules will also be identified.

82. CONTRACTOR INTEGRATION TESTING. There is no requirement for contractor integration testing of the WMSCR system with other NAS systems. However, the WMSCR specification for SAT requires that all available field stimuli and input be used. SAT Plans and Procedures will be written by the contractor and approved by the FAA. The SAT will be performed by the contractor after completion of the I/CO. The SAT will demonstrate the functional performance of the WMSCR. Following SAT the contractor will provide interim support while the FAA conducts OT&E/integration.

83. CONTRACTOR ACCEPTANCE INSPECTION (CAI). A CAI of the WMSCR will be performed at each of the three WMSCR sites. The CAI will be accomplished in two steps. The first will be based on completion of the I/CO and SAT. At this point the FAA will accept the hardware and software from Harris, this will allow training to commence. At the second step, following the completion of training, the WMSCR acquisition contract will be certified as completed. A CAI check list will be prepared by ANW-130, coordinated with Harris, the WMSCR sites and TORs. Representatives from FAA Headquarters, Harris and the site TORs will be the responsible CAI signatures.

84. OT&E/INTEGRATION. In accordance with Order 1810.4A, the integration of the WSMCR into the NAS will be performed by ACN-230 during the period of OT&E/integration following the OT&E/Integration Test Plan and procedures developed by ACN-230. OT&E/integration will include verification of system interfaces, request/reply processing and end user data flows. Final integration testing will be performed after full implementation of the NADIN PSN.

85. OT&E/SHAKEDOWN AND CHANGEOVER. ASM-400 will be tasked to develop the OT&E/Shakedown Plan and Procedures as required by Order 1810.4A. The OT&E/shakedown will exercise the WMSCR system in the real operational environment and assist in the development and refinement of operational procedures. Initial shakedown testing will be performed using the NADIN PSN pilot network.

86. JOINT ACCEPTANCE INSPECTION (JAI). The JAI will be conducted by the regions in accordance with Order 6030.45. Partial JAI's may be conducted by each site (ATL, SLC, ZDC) as required to support a final JAI and ORD of WMSCR as a total system.

87.-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT.

a. General Concept. The Integrated Logistics Support Plan (ILSP) for the WMSCR provides guidance for Integrated Logistics Support (ILS) planning and execution over the life cycle of the system. The ILSP is a living document. The current draft ILSP is being reviewed to include the proposed changes to the WMSCR strategy. The final determination of the division of maintenance activity between the FAA and possible contractors will be reflected in the ILSP.

b. Quality factors.

(1) Reliability. The WMSCR will achieve a nodal Mean Time Between Failure (MTBF) of 1,666 hours, minimum, for critical equipment. The critical equipment consists of the CPU, the communications equipment supporting the synchronous interface to the NADIN PSN, NWID, the primary and secondary storage device, and the interface supporting at least one operator position.

(2) Design policy. WMSCR is designed to avoid single-point failure. The WMSCR will be designed so that the primary failure of a component does not cause subsequent failure of other components. Reliability will be increased by the use of backup equipment, where appropriate. The WMSCR will have no performance degradation once backup equipment is switched on-line. The WMSCR design will minimize functional interdependency of separate components.

(3) Maintainability. The WMSCR will achieve a nodal Mean Time to Repair (MTTR) of 0.5 hours, maximum, for critical equipment. The design of the WMSCR will be compatible with the logistics maintenance concept set forth herein. Equipment utilized in the WMSCR will be designed to expedite restoration of a system function interrupted by a failure through removal of a readily replaceable modular element containing the faulty element; this replaceable modular element is designated as the Line Replaceable Unit (LRU).

The system will incorporate automatic fault-isolation capabilities in the form of built-in test equipment/built-in test (BITE/BIT) and/or external test equipment utilizing test points such that 85 percent of all failure occurrences can be isolated to the single faulty LRU, and 95 percent to no more than two LRU's. On-site WMSCR preventive maintenance tasks will be required no more than once every 90 days, as specified in Order 6000.30, Airway Facilities Service Policy Decisions for the Maintenance Program of the 1980s. Interchangeability will be in accordance with FAA-G-2100. The equipment will be modular and standardized. Each WMSCR LRU will be physically, mechanically, structurally, and electrically interchangeable without modification, and without causing any unit to deviate from the requirements of this document or the WMSCR System Specification. Where functional interdependencies do exist, the WMSCR design will attempt to allow,

after the loss of a functionality, only controlled degradations of other functionalities. A degradation can be considered controlled if WMSCR may still perform all its functions at a rate or volume reduction of no more than 10 percent.

(4) Availability. The WMSCR inherent availability at a node will not be less than 0.9997, excluding noncritical equipment and excluding FAA-supplied air conditioning and power.

91. TRAINING. The contractor will conduct an analysis of WMSCR maintenance tasks, operation tasks, and software tasks to identify the training requirements. The WMSCR contractor will develop and conduct a training program for maintenance training, operator training, and software training, in accordance with FAA-STD-028. Contract Training Program.

92. SUPPORT TOOLS AND TEST EQUIPMENT. The WMSCR system will consist of commercial off the shelf equipment. No special support and test equipment is anticipated, other than a time-domain reflectometer for local area network cable maintenance. Depot level maintenance is not anticipated therefore no special equipment for depot level maintenance is required.

93. SUPPLY SUPPORT. Supply support requirements are described in detail in the contractor prepared Integrated Support Plan. No implementation requirements are necessary outside these described in this plan. The exact methods of supply support and the maintenance concept have not been finalized.

94. VENDOR DATA AND TECHNICAL MANUALS. Vendor data and technical manuals will be supplied by the contractor.

95. EQUIPMENT REMOVAL. Each WMSCR node will be installed in a reserved space in its respective NAWPF. No equipment removal will be required to achieve WMSCR ORD. Following WMSCR ORD, the decommissioning and removal of the WMSC at Kansas City, Missouri will be the responsibility of the FAA WMSCR Project Office.

96. FACILITIES. WMSCR will be installed in a reserved space in an existing facility. It will use existing power and air conditioning capabilities. Facility impacts and consideration of implementation will be detailed in the SPR of the contractor prepared I/CO plan.

97. COMMUNICATIONS CIRCUITS. ASM-300 will be responsible for circuit engineering, the funding of leased circuits and coordination of circuit procurement. The designated region will be responsible for ordering the appropriate communications circuits required for the WMSCR internal network.

98.-99. RESERVED.

CHAPTER 10. CONFIGURATION MANAGEMENT

100. CONFIGURATION MANAGEMENT. Configuration Management (CM) is the process used to identify and document the functional and physical characteristics of a CI, control changes to those characteristics, and record and report change processing and implementation status. CI's of concern for this implementation are the hardware, software, and associated documentation which comprise the WMSCR system baseline. The CM discipline will be applied to all CI's included in the WMSCR baseline. All additions and changes to the WMSCR baseline will be proposed in the form of a case file, and shall be reviewed for recommended approval or is approved by a Configuration Control Board (CCB). All changes to the WMSCR baselines will be controlled by the Weather & Flight Service Stations Engineering Division (ANW-100) CCB.

a. Acquisition Phase Configuration Management. ANW-100 CCB controls the establishment, and changes to, the WMSCR hardware and software baselines during the acquisition phases. For WMSCR, the ANW-100 CCB will include members from Maintenance Operations, Contracts, Air Traffic, Systems Engineering, Configuration Management, and SEIC. The ANW-100 CCB is responsible for ensuring that the functional performance and interface requirements allocated to the WMSCR hardware and software subsystems are reflected in the baselines, and in any changes to those baselines until product acceptance. The ANW-100 CCB is also responsible for ensuring that baseline documentation is accurate and reflects WMSCR operational requirements. Baseline documentation includes specifications and ICD's. The ANW-100 CCB retains this CM responsibility until the ORD. The contractor will plan, execute, and manage the CM functions associated with the development of WMSCR hardware and software enhancements during contract performance, in accordance with the applicable Department of Defense (DOD) and FAA standards cited in the SOW. This will include configuration identification, control, status accounting and baselining of hardware configuration items. As a prerequisite to accepting the WMSCR, the contractor is required to conduct Functional and Physical Configuration Audits (FCA/PCA) as part of the Formal Qualification Review (FQR) with FAA participation. The Audit team will consist of ANW-130, ASM-400, ASE-220, AAC-400, and SEI contractor. Upon successful completion of the configuration audits, ANW-130 will initiate a case file for the WMSCR Product Baseline in accordance with Order 1800.8E, NAS Configuration Management. Approval of the Product Baseline NCP by the ANW-100 CCB initiates FAA baseline management activity.

b. Transition of Hardware/Software Configuration Management. The CM responsibility associated with the WMSCR hardware and software products will transition from ANW-130 to ASM-400 after ORD. Subsequently, approval authority of all WMSCR NCP activity will transition from the ANW-130 Cluster CCB to the Maintenance Engineering (ME) CCB. A hand off package for the WMSCR will be prepared by ANW-130 consisting of all hardware technical and

provisioning documentation, all software magnetic tapes and supporting documentation and site installation documentation.

c. Operational Support Phase Configuration Management. During the operational support phase, and for the entire life-cycle of the implemented WMSCR hardware and software, CM functions will consist of maintenance and change control management to ensure the integrity of the approved product baseline. The roles of all hand off participants are depicted as follows:

(1) National Automation Engineering Field Support Division (ASM-400). This office will chair the CCB for all changes to the WMSCR hardware and software. They will authorize all local WMSCR software and hardware modifications at this level in accordance with Order 1800.8E.

(2) National Automation Engineering Field Support Division (ASM-400). is the recipient organization for system engineering technical documentation for all WMSCR hardware and software. They are the custodians of WMSCR hardware/software documentation and all WMSCR software magnetic media. ASM-400 will perform development and testing of modified WMSCR hardware, software, and data bases, and will prepare Electronic Equipment Modifications (EEM). They are responsible for status accounting of WMSCR system hardware/firmware configurations and provide repository and library services for the permanent storage of WMSCR engineering drawings and documentation. Finally, they will perform the status accounting function of the WMSCR system software configuration and provide library services for the permanent storage of WMSCR programs and documentation.

(3) The FAA Depot. AAC-400 is the recipient organization for all provisioning technical documentation for the WMSCR. They are responsible for maintaining all logistics oriented documentation such as provisioning parts list, program parts selection list, Engineering Drawings, etc., as assumed at hand-off.

(4) Regions. The regional Associate Program Manager will be responsible for the review and approval of site acceptance and site specific documentation, for all sites within their jurisdiction. They must generate case files for changes to site specific documents for site adaption purposes and have them processed in accordance with Order 1800.8E and regional CCB procedures. Upon approval of the Configuration Control Decision (CCD), they must maintain records of the CCD's and revised documentation and verify the implementation of the change.

101.-109. RESERVED.

APPENDIX 1. ACRONYMS

Defined acronyms used in this PIP are listed below:

AAC	Mike Monroney Aeronautical Center
ACE	Central Region
ACF	Area Control Facility
ACN	Engineering, Test, and Evaluation Service
ADAS	AWOS Data Acquisition System
AEA	Eastern Region
AF	Airway Facilities
AFAPM	Airway Facilities Associate Project Manager
AFTN	Aeronautical Fixed Telecommunication Network
AFTR	Airway Facilities Technical representative
AHT	Office of Training and Higher Education
ALG	Logistics Service
AND	Associate Administrator for NAS Development
ANM	Northwest Mountain Region
ANW	Weather & Flight Service Systems
APAD	Asynchronous Packet Assembler Disassembler
ARTCC	Air Route Traffic Control Center
ASE	NAS System Engineering Service
ASM	Systems Maintenance Service
ASO	Southern Region
AT	Air Traffic
ATC	Air Traffic Control
ATL	Atlanta, Georgia
ATR	Air Traffic Plans and Requirements Service
AWOS	Automated Weather Observing System
AWP	Aviation Weather Processor
BIT	Built-In Test
BITE	Built-In Test Equipment

CAI	Contractor Acceptance Inspection
CCB	Configuration Control Board
CCD	Configuration Control Decision
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CI	Configuration Item
CM	Configuration Management
CNSP	Consolidated NOTAM System Processor
CO	Contracting Officer
COTR	Contracting Officers Technical Representative
COTS	Commercial Off-the-Shelf
CPU	Central Processing Unit
CSCI	Computer Software Configuration Item
CTS	Coded Time Source
CUT	Coding and Unit Test
DEC	Digital Equipment Corporation
DECNET	DEC Network
DLP	Data Link Processor
DOD	Department of Defense
DRR	Deployment Readiness Review
DT&E	Development Test and Evaluation
DUAT	Direct User Access Terminal
EEM	Electronic Equipment Modifications
FAA	Federal Aviation Administration
FAT	Factory Acceptance Test
FCA	Functional Configuration Audit
FCC	Federal Communications Commission
FSDPS	Flight Service Data Processing System
FS	Flight Service
FSS	Flight Service Station
FQR	Formal Qualification Review
ICAO	International Civil Aviation Organization

ICD	Interface Control Document
I/CO	Installation and Checkout
ICP	Intelligent Communications Processor
ICS	Interfacility Communication System
ILS	Integrated Logistics Support
ILSP	Integrated Logistics Support Plan
IOC	Initial Operational Capability
IRD	Interface Requirements Document
IT&E	Integration Testing & Evaluation
JAI	Joint Acceptance Inspection
KAWN	Carswell Air Force Base (Air Weather Network)
LRU	Line Replaceable Unit
ME	Maintenance Engineering
MPS	Maintenance Processor Subsystem
MSN	Message Switching Network
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
MWP	Meteorologist Weather Processor
NADIN	National Airspace Data Interchange Network
NAPRS	National Aviation Processing and Reporting System
NAS	National Airspace System
NATCOM	National Communication Center
NAWPF	National Aviation Weather Processing Facility
NCP	NAS Change Proposal
NOTAM	Notice to Airmen
NSSFC	National Severe Storm Forecasting Center
NWID	NWSTG WMSCR Interface Device
NWSTG	National Weather Service Telecommunication Gateway
NWS	National Weather Service
O&M	Operations and Maintenance
ORD	Operational Readiness Demonstration
OSHA	Occupational Safety and Health Administration

OSI	Open System Interface
OT&E	Operational Test & Evaluation
PAD	Packet Assembler Disassembler
PAT&E	Product Acceptance Test and Evaluation
PC/PAD	Protocol Converter/Packet Assembler Disassembler
PCA	Physical Configuration Audit
PDR	Preliminary Design Review
PIP	Project Implementation Plan
PSRB	Project Status Review Board
PSN	Packet Switching Network
QRO	Quality and Reliability Officer
RWP	Real-Time Weather Processor
SAT	Site Acceptance Test
SEI	System Engineering and Integration
SIT	System Integration and Test
SLC	Salt Lake City, Utah
SOW	Statement of Work
SPR	Site Preparation Requirements
TMP	Traffic Management Processor
TOR	Technical Onsite Representative
TRR	Test Readiness Review
UT	Unit Test
VAX	Virtual Address Extension
VDT	Video Display Terminal
WCP	Weather Communications Processor
WMSC	Weather Message Switching Center
WMSCR	Weather Message Switching Center Replacement
ZDC	Washington DC ARTCC

APPENDIX 2. APPLICABLE DOCUMENTS

1. GENERAL. The documents listed below form a part of this order and are applicable to the extent described in this order.

2. GOVERNMENT DOCUMENTS. The version of the following Government documents, current on the date of the invitation for bids or request for proposals, apply to this specification.

a. Specifications.

(1) Federal Specifications.

(a)	FAA-E-2764	WMSCR System Specification
(b)	FAA-E-2770	NADIN PSN Functional Specifications

(2) Military Specifications.

(a)	MIL-E-17555	Preparation for Delivery of Electronic and Electronic Equipment and Associated Repair Parts

b. Standards.

(1) Federal Standards.

(a)	FAA-STD-013	Quality Control Program Requirements
(b)	FAA-STD-018	Computer Software Quality Program Requirements
(c)	FAA-STD-020	Transient Protection, Grounding, Bonding, and Shielding for Equipment
(d)	FAA-STD-021	Configuration Management
(e)	FAA-STD-028	Contract Training Program
(f)		FCC Rules and Regulations, Part 15, Subpart J
(g)	OSHA-CFR-29	CFR 1910 OSHA Safety and Health Standards

(2) Military Standards.

(a)	DOD-STD-2167	Defense System Software Development
(b)	MIL-STD-785	Reliability Program for System and Equipment Development and Production
(c)	MIL-STD-454	General Requirements for Electronic Equipment
(d)	MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment, and Facilities
(e)	MIL-STD-415	Design Criteria for Electronic Systems and Associated Equipment
(f)	MIL-STD-889	Dissimilar Metals
(g)	MIL-STD-1250	Corrosion Protection and Deterioration Control in Electronic Components and Assemblies
(h)	MIL-STD-810	Environmental Test Methods and Engineering Guidelines, Engineering Micro Reproduction Systems
(i)	MIL-STD-129	Marking for Shipment and Storage
(j)	MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements
(k)	MIL-STD-462	Measurements of Electromagnetic Interface Characteristics

c. Other Publications.

(1)	NAS-DD-1000	National Airspace System Level 1 Design Document
(2)	NAS-SS-1000	NAS System Specification, Volume II, Functional and Performance Requirements for the National Airspace System, Air Traffic Control Element
(3)	Order 1600.54	Security of FAA Automatic Data Processing Systems and Facilities
(4)	Order 1800.8E	NAS Configuration Management

(5)	Order 1810.4A	FAA NAS Test and Evaluation Program
(6)	Order 4800.2	Utilization and Disposal of Excess and Surplus Personal Property
(7)	Order 6000.30	Airway Facilities Service Policy Decisions for the Maintenance Program of the 1980s
(8)	Order 6030.45	Facility Reference Data File
(9)	Order 6040.15A	National Airspace Performance Reporting
(10)	Order 7032.3	Air Traffic Service Operational Requirements for the Weather Message Switching Center Replacement (WMSCR)
(11)	Order 7110.80	Data Communications
(12)	NAS-IR-43020001	WMSCR/NADIN PSN IRD
(13)	NAS-IR-90022507	WMSCR/NWSTG IRD
(14)	NAS-IR-25042507	WMSCR/AWP IRD
(15)	NAS-IR-94032507	WMSCR/NADIN Asynchronous PAD Users IRD
(16)	NAS-IR-94022507	WMSCR/PSN User IRD
(17)	NAS-IR-51030002	Maintenance Processor Subsystem (MPS) to Remote Monitoring Subsystems and Remote Monitoring Subsystem Concentrators IRD
(18)	NAS-IR-25072503	WMSCR/WCP IRD
(19)	NAS-IR-25082507	WMSCR/ADAS IRD
(20)	NAS-IR-94012507	WMSCR/Message Switch Network User IRD
(21)	NAS-IR-25072505	WMSCR/CNSP IRD
(22)	NAS-IR-25072511	WMSCR/RWP IRD
(23)	NAS-IR-92020000	WMSCR/CTS IRD
(24)	NAS-IR-25072401	WMSCR/TMP IRD

3. NON-GOVERNMENT DOCUMENTS. Only the current version of the following non-Government documents, on the date of the invitation for bids or request for proposals, unless otherwise noted, apply to this document.

a. Standards.

(1)	ANSI X3.66	American National Standard for Advanced Data Communications Control Procedure (ADCCP)
(2)	ANSI/IPC-A-610	American National Standards Institute/Institute of Printed Circuits Quality Standard A-610
(3)	CCITT X.224	Transport Protocol Specification for OSI
(4)	CCITT X.25	1984 Interface between Data Terminal Equipment (DTE) for Terminals Operating in Packet Mode on Public Data Networks
(5)	IEEE 200-75	Reference Designations for Electrical and Electronic Parts and Equipment
(6)	ISO/OSI 7498	International Standards Organization Standard for Open System Interface
(7)	EIA-RS-232	Interface between data terminal equipment and data communications equipment employing serial binary data interchange
(8)	EIA-RS-422	Electrical characteristics of balanced voltage digital interface circuits
(9)	EIA-STD-449	General-purpose, 37-position and 9-position interface for data terminal equipment and data circuit-terminating equipment employing serial binary data interchange

b. Publications.

(1)	ICAO Annex 10	Aeronautical Telecommunications Vol. 1
(2)	ICAO Annex 10	Aeronautical Telecommunications Vol. 2
(3)	WMO 306	World Meteorological Organization, Manual on Codes

(4)	WMO 386	World Meteorological Organization, Manual on Telecommunications
(5)	NEC-NFPA-70	National Electric Code (NEC)

c. Contractor Deliverables -

(1)	CDRL Item C001	Integrated Support Plan
(2)	CDRL Item A037	Installation and Checkout Plan

4. PRECEDENCE OF DOCUMENTS. When the requirements of the contract schedule, this document, or subsidiary applicable documents are in conflict, the contract schedule will have precedence. This document will have precedence over subsidiary applicable documents in the event of conflict between this document and any subsidiary applicable documents.

5. SOURCES OF DOCUMENTS. The following is a list of places from which documents may be obtained.

a. Sources of FAA Documents. Copies of FAA specifications, standards, and publications may be obtained from the Contracting Officer, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, DC 20591. Requests should clearly identify the desired material by number and date, and state the intended use of the material.

b. Military and Federal Documents. Single copies of unclassified military and Federal specifications, standards, and publications may be obtained by writing the Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120; or calling (215) 697-3321, Monday through Friday, 8:00 a.m. to 4:30 p.m. E.S.T. Department of Defense (DOD) documents may be obtained from Department of Defense, Washington, DC 20301.

c. CCITT Documents. Copies of Consultative Committee on International Telegraphy and Telephony (CCITT) standards may be obtained from the International Telecommunications Union, Place des Nations, CH-1211, Geneva 20, Switzerland.

d. ANSI Documents. Copies of ANSI standards may be obtained from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

e. EIA Documents. Copies of EIA standards may be obtained from the Electronic Industries Association, 2001 "I" Street, N.W., Washington, DC 20006.

f. NFPA Documents. Copies of NFPA codes may be obtained from the National Fire Protection Association (NFPA), Batterymarch Park, Quincy, MA 02269.

g. ISO Documents. Copies of ISO standards may be obtained by writing the International Organization for Standardization, 1 Rue de Varemb, CH-1211 Geneva, Switzerland, or from ANSI (see address above).

h. IEEE Documents. Copies of IEEE documents may be obtained from the IEEE Service Center, 445 Hoes Lanes, Piscataway, NJ.

i. ICAO Documents. Copies of ICAO documents may be obtained from the International Civil Aviation Organization, 1000 Sherbrooke Street West, Suite 400, Montreal, Quebec, Canada H3A 2R2.

j. Contractor Deliverables. Copies of contractor deliverables will be distributed, as required, by the project manager, ANW-130.

k. WMO Documents. Copies of common WMO documents may be obtained from the American Meteorological Society, 45 Beacon Street, Boston, MA 02108. Documents not obtainable from this source may be ordered from World Meteorological Organization, Publications Sales Unit, P.O. Box NO5, CH-1211 Geneva 20, Switzerland.