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GENERAL MAINTENANCE HANDBOOK FOR NATIONAL AIRSPACE SYSTEM (NAS) FACILITIES



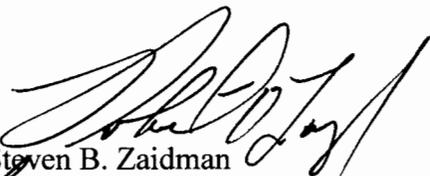
July 23, 2004

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

FOREWORD

This order establishes the Air Traffic Organization (ATO) maintenance program for the Technical Operations Services. General administrative and management standards, procedures, and guidelines are provided for the management, operation, and maintenance of the National Airspace System (NAS).

Related directives provide detailed guidance in the specialized areas of administrative management and technical applications. This order complements these directives and should be collocated with the other maintenance handbooks.



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CHAPTER 1. GENERAL

1. PURPOSE.

This order provides overall maintenance philosophy, general maintenance procedures, and requirements essential for managing and maintaining the National Airspace System (NAS). Its purpose is to ensure that all facilities are capable of satisfying the NAS mission regardless of the organization that maintains the facility.

2. DISTRIBUTION.

This order is distributed to the division level in Airway Facilities, Air Traffic, Flight Standards, office of Communications, Navigation, and Surveillance Systems, Communications, Navigation, Surveillance, and Infrastructure Directorates, and the Office of Airport Safety and AAS Standards in Washington; to the Logistics Center and the Academy at the Aeronautical Center; to the division level at the Air Traffic Control (ATC) Engineering and Test Division; Communication, Navigation, and Surveillance (CNS) Engineering and Test Division at the William J. Hughes Technical Center; to branch level in the regional Airway Facilities, Air Traffic, Flight Standards, and Airports Divisions; and to Airway Facilities Control Centers; and Airway Facilities and Air Traffic field offices with a standard distribution.

3. CANCELLATION.

Order 6000.15C, General Maintenance Handbook for Airway Facilities, dated August 20, 2000, is canceled.

4. EFFECTIVE DATE.

This order is effective October 1, 2004.

5. EXPLANATION OF CHANGES.

This revision incorporates changes resulting from field, regional, and headquarters comments, organizational realignment, and the evolution of the NAS. These changes include:

- a. Renaming the order to General Maintenance Handbook for NAS Facilities.
- b. Standardizing the maximum certification intervals.
- c. Establishing event management requirements and control center logs.
- d. Providing guidance on the establishment, termination, and disposition of Technical Performance Records (TPR), and the requirement for a supervisor review.
- e. Providing clarification on coordination of Notice to Airman (NOTAM).
- f. Providing clarification on making a certification statement.
- g. Providing guidance on logging services.
- h. Establishing a requirement to track certification accomplishment.
- i. Incorporating information system security requirements including:
 - (1) Establishing a requirement for a Security Certification and Authorization Package (SCAP) for each NAS system.
 - (2) Providing guidance on password management.
 - (3) Introducing the NAS Security Information Group (SIG) and the Computer Security Incident Response Center (CSIRC) with their responsibilities regarding computer security incident detection and response.

- j. Adding guidance on physical security.
- k. Adding guidance on prevention of runway incursions.
- l. Updating the Universal Resource Locator (URL) for Appendix 3, Systems Subsystems, and Services Requiring Certification.
- m. Replacing Appendix 4, Facilities Not Requiring Maintenance Logs, with criteria to determine which facilities require a maintenance log.
- n. Providing guidance for logging services not in the Facility Service Equipment Profile (FSEP) in a Service Delivery Point (SDP) log.
- o. Adding criteria for determining which facilities require a Facility Reference Data File (FRDF).
- p. Adding requirement for oversight of NAS maintenance.
- q. Added guidance for local outage coordination.

6. GUIDING PRINCIPLE.

The Air Traffic Organization (ATO) shall meet the needs of the Federal Aviation Administration (FAA) operational mission in accordance with FAA standards and procedures, ensuring safe operation of the NAS, with continually improving performance, at a minimized cost.

7. SCOPE.

This order establishes common maintenance and certification requirements for all systems, subsystems, and services in the NAS, and maintenance standards for all FAA maintained facilities. This order takes precedence over the 6000 series maintenance handbooks.

a. General Maintenance Philosophy. The ATO Maintenance Program is dedicated

to ensuring safety and providing the best possible service for the lowest possible cost. The FAA is continually improving NAS systems and services, and ensuring the requirements of the customers are being anticipated and met. Stringent risk management practices shall be incorporated into all maintenance actions prior to project implementation, configuration changes, or scheduled interruptions of NAS systems to ensure services are available and reliable. Environmental and national defense issues shall be given full consideration in the planning and conduct of NAS maintenance activities.

b. Certification. Certification is the quality control method used by the ATO to ensure NAS facilities are providing their advertised service. The ATO employee's independent discretionary judgment about the provision of advertised services, the need to separate profit motivations from operational decisions, and the desire to minimize liability, make the regulatory function of certification and oversight of the NAS an inherently governmental function. Verification is the process by which non-Federal personnel (as defined in FAR 171 and Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities) perform a similar quality control function. The ATO is responsible for overseeing the verification process for non-Federal systems.

c. Maintenance Activities. ATO maintenance activities are both periodic and corrective in nature.

(1) Periodic maintenance (PM) includes performance checks, preventive maintenance inspections, and routine maintenance. PMs are designed to verify that equipment is operating within established standards and tolerances, and minimize unscheduled interruptions throughout the life of the equipment.

(2) Corrective maintenance is maintenance performed to identify or correct a problem. It is typically performed to accomplish the restoration of service to the users of the NAS after an unscheduled interruption.

d. Risk Management. Risk Management is the process of identifying, quantifying, and mitigating the probability of an undesirable event, as defined in Order 6000.50, Airway Facilities National Airspace System Operations Procedures. When maintenance activities are performed, risk assessment analysis techniques shall be used to determine the impact of ATO maintenance activities. Risk management should consider the following:

(1) The criticality of the system's function within the NAS.

(2) Whether a scheduled interruption is required and properly coordinated.

(3) Whether this service or system is redundant.

(4) Whether the interruption occurs during peak traffic periods.

(5) The criticality of the service provided.

(6) Weather conditions.

e. Restoration. When unscheduled interruptions occur and corrective maintenance is required, system or service restoration will be done by efficiently utilizing appropriate resources, so that the interruption/outage is minimized and customer requirements are met.

8. TERMINOLOGY AND DEFINITIONS.

Appendix 1, Definitions, lists the definitions used by the system specialist. These definitions apply to terms used in

maintenance handbooks and may not agree with those used in other directives.

9. MAINTENANCE RESPONSIBILITY.

Title 49 of the United States Code assigns the FAA the legal responsibility for ensuring the proper operation of equipment used in air navigation and air traffic control systems, with all its implications before boards of inquiry and the courts. These implications are beyond the internal interest of FAA management and employees, and involve public scrutiny, expectations, and Tort law. This responsibility belongs to the ATO Technical Operations Services. The ATO is responsible for management, maintenance, and operation of the NAS infrastructure. The ATO Technical Operations Services will determine the concepts, philosophies, and implementation methods for fulfilling these responsibilities.

10. GENERAL MAINTENANCE GUIDELINES.

Maintenance of systems, subsystems, and equipment in the NAS shall be guided by the following general principles:

a. Availability and reliability of air traffic control, communication, navigation, and surveillance services shall be maximized to the extent practical, consistent with established FAA policies, procedures, and practices. The quantity and duration of interruptions shall be minimized. Scheduled interruptions shall be coordinated with appropriate air traffic controller personnel.

b. The ATO shall conduct a maintenance program to ensure maximum efficiency in system, subsystem, and equipment performance, designed to minimize interruptions.

c. NAS users such as air traffic controllers, airlines, or general aviation, depend on maintenance personnel to determine NAS status. NAS status is used to modify aviation procedures to ensure they are safe, and the aircraft and crew are prepared to fly without specific NAS systems. When maintenance personnel do not provide adequate advanced notification of scheduled maintenance activities, the NAS user is impacted as if the interruption were unscheduled.

d. Maintenance personnel shall react promptly to unscheduled interruptions as well as to potential problems, consistent with established FAA policies, practices, and procedures.

e. Information sharing and notification ensure all parts of the ATO have information necessary for efficient operations. Information sharing allows the ATO to obtain operational data for better decisions. Notification allows maintenance personnel to respond to problems with the resources required to resolve issues in a timely manner.

f. Uniform national standards, tolerances/limits, schedules, and procedures for maintenance shall be promoted. NAS Change Proposals (NCP) shall be granted judiciously. Site adaptation will be permitted, but shall not conflict, negate, circumvent, or lessen the effectiveness of the national standards unless permitted by an approved NCP.

g. An adequate number of highly competent technical system specialists will be assigned necessary workloads. This skilled staff shall be trained in the specialized needs of maintenance personnel as necessary.

h. The types and quantities of test equipment, tools, spare parts, etc., required by system specialists to perform their

technical duties, will be provided consistent with FAA policies, practices, and procedures.

i. Comprehensive, accurate, current, and timely maintenance technical documentation shall be provided to define and specify the duties, responsibilities, and authority granted to the system specialist for the maintenance program.

j. An active feedback system shall be implemented throughout the maintenance organization. It should provide field input to the NAS Operations Program and other cognizant headquarters offices. The feedback system includes, but is not limited to:

(1) Employee suggestions.

(2) Unsatisfactory Condition Reports (UCR).

(3) Formal and informal on-site inspections.

(4) Proposed modifications.

(5) Directive improvement reports.

(6) NAS Change Proposals (NCP).

(7) Informal letters.

k. Field personnel are encouraged to submit, through appropriate administrative channels, information on existing or potential problems, deficiencies, errors, or suggested improvements that may affect the FAA's ability to conduct its mission in a safe and efficient manner.

l. All system specialists shall exercise proper personal and equipment safety precautions, fire prevention techniques, and safe working practices when performing maintenance activities.

m. Maintenance personnel should strive to achieve quality work, consistent with the high standards promoted by the FAA and to take pride in their maintenance activities.

n. The quality of the nation's environment and natural resources shall be protected and enhanced consistent with the maintenance mission. Environmental pollution and inconvenience to the general public shall be avoided to the maximum extent possible.

o. The ATO maintenance organization shall foster a cooperative working relationship with other segments of the FAA, particularly the Air Traffic and Flight Inspection organizations. A comparable liaison shall be maintained with other relevant entities such as the military or other government agencies, local authorities, airport managers, fixed base operators, and the general public.

11. COMPUTER WORKSTATIONS.

Computer workstations, desktops or portable laptops that are used in support of the NAS are categorized as either a Maintenance Data Terminal (MDT), or Computer Terminal (CTERM).

a. Maintenance Data Terminal. An MDT is a desktop or laptop personal computer that is loaded with the event logging application or the remote monitoring application software. The MDT is used by maintenance personnel to perform any of the following:

(1) Generate or receive NAS event notifications.

(2) Schedule facility equipment and/or service outages.

(3) Document administrative or maintenance activities.

b. Computer Terminal. A CTERM is a personal computer used mainly for administrative functions such as maintenance record report generation, inventory database management, word processing, spreadsheets, logistics, and interfacing with other administrative systems.

12. MAINTENANCE DATA TERMINAL.

The Maintenance Data Terminal (MDT) is a tool to be used by the system specialist for the maintenance of the NAS. All specialists shall have ready access to an MDT. System specialists that perform their duties at remote locations, without a dedicated MDT, shall be assigned their own unique MDT laptop computer. Specialists that perform their duties in a work center environment, such as an Air Route Traffic Control Center (ARTCC) or Automated Flight Service Station (AFSS), shall utilize a common MDT desktop computer if one is not assigned to them. Typical functions include, but are not limited to:

a. Downloading documents including drawings and schematics.

b. Accessing the FAA's Internet and Intranet servers.

c. Accessing electronic mail.

d. Remote maintenance monitoring and control.

e. Performing periodic or corrective maintenance.

f. Record keeping, logging, or reporting.

g. Supporting or providing training.

h. Word processing and other office related work, etc.

13. PERSONAL USE OF GOVERNMENT COMPUTING RESOURCES.

Using FAA computing resources for personal purposes is allowed as long as the incremental cost of the usage is negligible and no FAA governmental activity is preempted by the personal use. For guidance on Internet usage, reference Order 1370.79, FAA Internet Policy.

14. PERSONAL COMPUTING RESOURCES USED FOR GOVERNMENT PURPOSES.

Personally owned computers and/or software may be used to conduct Government business under certain conditions. All software usage shall comply with copyright restrictions. FAA may permit employees (and contractors) to use privately owned computers to work on Government business, subject to prior written approval by the organizational manager. Both users and their managers shall sign a user agreement prior to being granted approval.

15. REFERENCED DOCUMENTS.

The nature of this directive requires reference to numerous publications. To avoid frequent revision, for the purpose of changing references to the latest issue, personnel shall consider all references as the most recent edition.

16. CONFIGURATION MANAGEMENT.

Many NAS items such as software, hardware, and documents have been placed under configuration control. These items are listed in the National Airspace System Configuration Management Document, NAS MD-001. These items shall not be modified and placed in service without proper authorization.

17. RECOMMENDATION FOR CHANGES.

Users are encouraged to submit recommendations for improvement to this order. Pre-addressed comment sheets are provided at the back of this order.

18. EMPLOYEE SUGGESTIONS.

Suggestions for technical improvements to items not under configuration management are submitted in accordance with Order AF 3450.1, AF Technical Employee Suggestion Program.

19-199. RESERVED.

CHAPTER 2. ADMINISTRATIVE MANAGEMENT

SECTION 1. TECHNICAL DOCUMENTATION

200. INTRODUCTION.

A key to effective maintenance is comprehensive, accurate, and usable technical documentation. This section contains a description of various documents, defines their hierarchy, and provides guidance on their use.

201. FAA DIRECTIVES.

FAA directives consist of national, regional, and local orders, notices, and supplements issued in accordance with Order 1320.1, FAA Directives System. The following examples are included in this category:

- a. Policy orders.
- b. Maintenance handbooks.
- c. Notices.
- d. Other orders, notices, and supplements issued by headquarters, regions, or field offices.

202. SYSTEM SUPPORT DIRECTIVES.

System Support Directives (SSD) are used to update or modify maintenance handbooks or maintenance procedures. There are three types of SSDs:

- a. A System Support Modification (SSM) is used to transmit system hardware, software, or plant modifications.
- b. A System Technical Release (STR) is used to deliver technical system information that does not require hardware or software modification.
- c. A System Documentation Release (SDR) is used to deliver TI documents or change pages.

203. DIRECTIVES CHECKLIST.

ATO system specialists should consult local directives, checklists, and other publications to determine those applicable and current to their maintenance requirements. System Support Center (SSC) managers shall ensure the required directives, including the latest versions of any maintenance handbooks for equipment or infrastructure, are available at that work center. The directive library shall include at least the following directives:

- a. 6000.30, NAS Maintenance Policy.
- b. 6000.15, General Maintenance Handbook for NAS Facilities.
- c. 6040.15, National Airspace Performance Reporting System.
- d. 6000.48, General Maintenance Logging Handbook.
- e. 6030.31, Restoration of Operational Facilities.
- f. 6000.50, Airway Facilities National Airspace System Operations Procedures.
- g. 6000.5, Facility, Service, and Equipment Profile.
- h. 6030.45, Facility Reference Data File.
- i. 3900.19, FAA Occupational Safety and Health Program.
- j. 8200.1, United States Standard Flight Inspection Manual.
- k. 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, or regional equivalent.
- l. 1370.82, Information Systems Security Program.

204. MAINTENANCE HANDBOOKS.

Maintenance handbooks provide system-oriented information, tying together the various units, and/or components that comprise a system, subsystem, or equipment. Maintenance handbooks are written in accordance with Order 1320.58, Equipment and Facility Directives—Modification and Maintenance Technical Handbooks. Maintenance handbooks should contain the following:

- a. General information and requirements.
- b. Technical characteristics.
- c. Standards and tolerances, also known as the blue pages.
- d. Periodic Maintenance tasks, including the accomplishment interval associated with each task stipulated in precise terms; i.e., weekly, quarterly, etc. or in general terms; e.g., as required, every 3 to 4 months. Changes to PM tasks or certifications shall be coordinated with the office of primary responsibility (OPR) for the National Periodic Maintenance/Certification Scheduling (PMS) database.
- e. Maintenance Procedures and other maintenance activities.
- f. Flight inspection.
- g. Certification Requirements.

205. LOCALLY DEVELOPED DIRECTIVES.

Regions or SMOs may issue directives to supplement published guidance, as necessary, to meet local conditions, implement local policy, or fill a need prompted by the absence of appropriate published guidance. This shall not conflict, negate, or lessen the effectiveness of any

documentation issued at a higher organizational level without NCP approval. Supplemental directives shall be canceled when no longer required. Copies of all locally developed publications shall be forwarded to the next higher organizational element no later than the time of issuance.

206. CONTRACTOR-DEVELOPED PUBLICATIONS.

Contractor-developed publications are documents prepared and/or furnished by an equipment manufacturer as part of its contractual obligations to FAA. The newer publications contain an identifying publication number in anticipation of the implementation of a technical issuance directive. These publications are distinct from the general FAA directives system, and include instruction books, instruction booklets, and manufacturer's brochures. They may not be suitable as the maintenance handbook. The second level support organization is responsible for making this determination.

207. TECHNICAL INSTRUCTION BOOKS.

Technical instruction books are written for specific systems. The technical instruction book provides the following benefits in the ATO maintenance program:

- a. Quick and precise access to system, subsystem, and equipment details.
- b. Improve comprehension of NAS technology.
- c. Facilitate troubleshooting, corrective, and periodic maintenance.
- d. Elimination of redundant training material.

e. Guidance allowing field technical personnel, in some cases, to successfully maintain FAA systems, subsystems, and equipment to FAA standards with minimal training.

208. MISCELLANEOUS DOCUMENTS.

The following are examples of documents in the miscellaneous category:

- a. Military publications; e.g., Air Force technical orders.
- b. Systems research and development reports.
- c. Facility inspection reports.
- d. Flight inspection reports.
- e. Preprinted forms.
- f. Letters and memorandums of agreement (LOA and MOA, respectively).
- g. Standard Operating Procedures (SOP).

209. DOCUMENTATION ACCURACY.

All documentation shall be accurate and adequate enough to meet the requirements of field personnel. Users of maintenance documents are requested to report any errors or conflicts and to make suggestions for improvement. Proposed corrections shall be forwarded through appropriate administrative channels to the applicable regional office for evaluation and subsequent transmittal to the OPR for action.

210. DOCUMENT HIERARCHY.

ATO personnel shall adhere to all documented maintenance requirements in Order 6000.15, maintenance handbooks, and Technical Instruction Books. If the published requirements conflict, the following guidelines

shall apply to all systems, subsystems, and equipment:

- a. FAA directives shall take precedence over non-FAA prepared publications; e.g., military manuals.
- b. Order 6000.15 shall take precedence over all other 6000 series maintenance directives.
- c. Maintenance handbooks shall take precedence over technical instruction books.
- d. Headquarters publications (both FAA-issued and FAA-adopted) shall take precedence over regional and local publications.
- e. Standard Operating Procedures (SOP) provide detailed interpretation of directives but do not supersede them.
- f. Conflicts between comparable publications shall be reported as indicated in paragraph 211.

211. DEVIATIONS FROM PUBLISHED REQUIREMENTS.

When the requirements of FAA directives cannot be met, the following guidelines apply:

- a. **Deviations From Published Procedures.** The maintenance procedures published in technical documentation are prepared for general use, and will normally be used for routine system, subsystem, and equipment maintenance. Local conditions, such as siting peculiarities or lack of test equipment, may occasionally require substitute procedures. Such procedures are acceptable provided they achieve the goal of the published procedure.

b. Deviations From Published Schedules. Maintenance intervals specified in FAA-wide technical documentation may be shortened, but may not be lengthened except by an NCP with an approved configuration control decision (CCD).

c. Deviations From Standards. The standards, tolerances, or adjustment procedures contained in applicable maintenance handbooks represent operational requirements for all facilities.

(1) Regions shall obtain an NCP for the requirements that cannot be met by readjustment or revision of procedures. During the interim period, operating parameters and procedures established at facility commissioning shall be considered as standard for that facility. Tolerances to the parameters shall be commensurate with those established for similar parameters published in the maintenance handbook.

(2) Some facilities may have been commissioned with standards/tolerances and/or procedures that differ from those specified in maintenance handbooks. This occurs when standards are nonexistent at the time of commissioning. These facilities shall adopt the prescribed standards, tolerances, and/or procedures promptly once they are available.

212. DOCUMENTATION OF DEVIATIONS FROM PUBLISHED REQUIREMENTS

When one or more of the “shall” requirements in a maintenance handbook or technical instruction book cannot be met, an NCP shall be submitted as soon as practical to the regional office in accordance with Order 1800.66, Configuration Management Policy. The NCP shall fully describe the circumstance and contain a detailed justification for the request.

a. Concurrence with the NCP must be obtained from the regional OPR. The regional OPR may disapprove, but does not have approval authority for the NCP.

b. FAA Headquarters level of approval is required on deviations to requirements, standards, and criteria specified in FAA directives.

c. A copy of the NCP and approved CCD shall be filed at the site.

213. DOCUMENTATION OF TIME AND DATE ENTRIES.

Since NAS facilities are dispersed over a wide range of time zones, all documented time and date entries shall use Universal Coordinated Time (UTC) and date for standardization.

214. DOCUMENTATION DISTRIBUTION AND ACCESSIBILITY.

a. Document Location. Maintenance handbooks, specifying the policies, practices, duties, and responsibilities that govern the activities of maintenance personnel, shall be readily available for those who require a copy. Maintenance handbooks related to maintenance of the facility shall be available at the site or routinely carried by all personnel with maintenance responsibility for the site. Maintenance handbooks related to support; i.e., roads, structures, electrical systems, etc, of a facility are not required to be filed at the site. They must, however, be readily available in a central location for use by system specialists when required. The first-level technical supervisor shall designate the location of directives. A directives checklist is available online through the TechNet website at: <http://technet.faa.gov>.

b. Contractor-Developed Publications. Equipment instruction books and booklets are distributed as follows:

(1) Two copies of the final instruction books will be distributed to each equipment location, when available. Additional or replenishment copies of these books can be provided by the document management office.

(2) One or two copies are distributed per addressee on the distribution list, developed in accordance with Order 1320.37, Contractor Development Equipment Instruction Books, to the regional Division, FAA Technical Center, the Aeronautical Center (FAA Academy), FAA Logistics Center, and the National Engineering Field Support Division.

c. Distribution of Maintenance Handbooks, Changes, and Modifications. Copy requirements for field distribution are established according to the Facility, Service, and Equipment Profile (FSEP) by cost center code and matched with addresses in the AF Field Address File. Mailings are direct to the field office according to Order 1720.30, Distribution of Airway Facilities Technical Directives.

d. Other FAA Technical Directives. Maintenance technical documentation, other than those types included in the above subparagraphs, are distributed directly on an "as needed" basis in accordance with Order 1720.18, FAA Distribution System.

215. UPDATING TECHNICAL DOCUMENTATION.

When changes are made to equipment that require changes to equipment documentation, both the Maintenance handbook and Technical Instruction Book will be updated as appropriate.

a. Retaining the SSD. Changes and updates are implemented via an SSD as prescribed in Order 6032.1, National Airspace System Modification Program.

(1) The specialist must document the completion of an SSM in the appropriate FRDF.

(2) The specialists must document an STR or SDR by logging it on the Record of Changes page and filing it with the order.

b. Updating the TI. The maintenance handbook shall not be used to update or change the technical instruction book. Duplication of information contained in technical instruction books should be avoided.

216. FILING OF DOCUMENTATION.

Maintenance documentation shall be filed on-site in accordance with Order 1320.1 in such locations as necessary to ensure accessibility and availability by all maintenance personnel. When documentation is received, it shall be filed promptly by personnel with assigned responsibility.

217. GOVERNING DIRECTIVES.

For further details on documentation requirements, refer to Appendix 4, List of Related Publications in this order.

218-219. RESERVED.

SECTION 2. REPORTING AND RECORD FORMS

220. INTRODUCTION.

This section describes various FAA forms that system specialists will use in the performance of day-to-day technical duties. References to FAA directives that authorize and explain the use of the forms are provided where appropriate.

221. FACILITY REFERENCE DATA FILE (FRDF).

a. The Facility Reference Data File (FRDF) is a collection of documents providing a comprehensive, quantitative, and permanent record showing how systems, subsystems, or equipment performed during initial acceptance, and after modifications or modernization.

b. An FRDF is required for each FSEP entity that meets all of the following criteria:

(1) Contributes to and is identified with a NAS infrastructure service.

(2) Defined as a tangible element of the NAS.

(3) Requires maintenance by FAA or others such as FAA contractors, Non-Federal technicians, or the military.

c. Information in the FRDF is required in connection with joint acceptance inspection (JAI) and commissioning activities. Historical information serves as a comparison from which day-to-day performance can be evaluated, and may contain significant technical data used as a reference during system or subsystem certification activities. Order 6030.45, Facility Reference Data File,

provides guidance on the preparation and use of this data file.

222. FLIGHT INSPECTION REFERENCE DATA.

Flight inspection reference data; e.g., ILS Flight Inspection Data Worksheets, VOR ground check screen prints, document the correlation between simultaneous airborne and ground measurements of corresponding parameters. These documents shall be stored in the FRDF in accordance with maintenance handbooks.

223. TECHNICAL PERFORMANCE RECORD (TPR).

a. Purpose of Form. The 6000 series forms provide a technical performance record of a system or equipment over a specified period of time. This information is collected and recorded on a periodic or on an as-needed basis as specified in the appropriate maintenance handbooks.

b. TPR Requirement Criteria. A TPR form shall be used to document the periodic measurements of key performance parameters and/or certification parameters in a maintenance handbook. A TPR form is not required for equipment with only non-numerical checks.

(1) The handbook OPR shall establish a nationally approved TPR form and provide an example in the maintenance handbook.

(2) Until nationally approved TPRs become available, the standard FAA Form 6000-8, or an approved computer generated facsimile shall be used.

c. Establishment of Form.

(1) Technical performance records shall be maintained at each facility with an individual geographic location.

(2) When TPR data is generated from a remote location, that data shall be taken to the site at the next regularly scheduled site visit.

(3) TPRs shall be maintained for each individual set of equipment within a facility; e.g. channel A and channel B, or equipment number 1 and number 2, main and standby.

(4) The following forms may be used:

(a) A standard preprinted form, usually contained in the maintenance handbook. Computer generated forms identical to the preprinted forms are an acceptable facsimile.

(b) FAA Form 6000-8, Technical Performance Record - Continuation or Temporary Record/Report form or facsimile.

(c) A customized computer-generated form. Forms that deviate from the standard must be approved by the regional Division for standardization and completeness. Approved forms are distributed through the FAA Electronic Document System (FEDS) website. These forms may include the header information, nominal values and tolerances/limits as long as the values match those in the current handbook when the form is initiated.

d. Use of Form. TPR forms shall not be removed from their normal location except to make photocopies or if required for a post aircraft accident package. All line entries shall be made with blue or black indelible ink or typewritten; computer entered values subject to editing are not authorized. When the FAA Form 6000-8 is used, column headings shall designate the parameter or appropriate manufacturer's documentation to be recorded. These forms may be developed to fit the needs of one or more specific types of systems or equipment.

e. Applicability of Guidance. The information contained in the succeeding subparagraphs will generally apply to all technical performance record forms issued. Maintenance handbooks will provide specialized guidance on the preparation of forms. If other guidance on the preparation of FAA Form 6000-8 conflicts with this order, this order shall take precedence.

f. Corrections. Erasures are not allowed; errors shall be voided by a single line strikeout and the correct information neatly inserted or added on a new line. The initials of the person making the correction(s) shall be placed adjacent to the lined out portion.

g. Entry Frequency. Normally, line entries shall be made as frequently as the normal maintenance interval (daily recorded once per day, weekly once per week, etc.) Exceptions to this interval are acceptable when additional documentation is required in cases such as:

- (1) Post-accident/incident evaluations.
- (2) Restoration activities.

h. Heading Entries. The facility block shall contain the facility identifier followed by the facility type contraction; i.e., RNO ASR. The facility type contraction and the facility location shall agree with the current FSEP list.

i. Column Headings. The column headings on the form are system performance indicators checked or measured most frequently. Do not cross out, paste over, or modify specified column headings unless directed by the maintenance handbook. Enter not applicable (N/A) if the parameter column is not applicable to the equipment involved. Additional space for other parameters is available on the form itself or on continuation sheets; i.e., FAA Form 6000-8. The regions or SMOs may

utilize this additional space for local purposes as required.

j. Date and Time Entries. The month and year shall be entered in the date heading. When the form is used to cover multiple months, enter the year in the date heading and month and day on each line entry. Time entries shall be made in UTC. Forms having few entries may be used over multiple years; however, only the first year shall be entered in the date heading. Separate additional years by entering the new year on a separate line entry in the date column and a horizontal line through the remainder of the row.

k. Nominal Block Entries. Nominal entries shall note the desired parameter value as prescribed in maintenance handbooks (blue sheets), equipment instruction books, or other appropriate reference data. The other appropriate reference data may be based upon commissioning, flight or ground inspection, or locally developed data. The following instructions shall apply:

(1) Numerical Entries.

(a) When the column heading data is identified in the maintenance handbook or equipment instruction books, the standard value shall be used in the nominal block. The operating tolerance/limit values shall be included in the parameter column heading immediately above the nominal block as the maximum and minimum values, or in the line immediately below the nominal block if the parameter column heading does not have room.

(b) When the column heading data is not identified in the maintenance handbook or equipment instruction book, the nominal value shall be the Facility Reference Data File value. If that value is not available, then the commissioning,

flight/ground inspection, or locally developed value shall be used.

(c) When nominal values change, the current form shall be terminated and a new form initiated to reflect the changed value. The reason for the changed value shall be noted in the remark column of both forms. A corresponding entry providing the reason(s) for the change shall also be noted in the appropriate maintenance log.

(2) Non-numerical Entries. When non-numerical entries are appropriate under a column heading; e.g., focus, brightness, intelligibility, or other subjective observations, the nominal entry shall be a checkmark (√). The checkmark will be preprinted on the form or shall be entered manually as each sheet is started.

l. Line Entries. Line entries are observed values of the operating data being recorded. Lines shall not be left blank to separate successive entries.

(1) Numerical Entries. Numerical entries shall be entered in the following manner:

(a) Enter the as-found parameter value in the appropriate column.

(b) If the as-found value is beyond the operating tolerance or limit, circle the value to note an out-of-tolerance condition.

(c) If the as-found value is adjusted, record the new value on the next line.

(d) Adjustments made to any parameter may affect other parameters. If this occurs, the affected parameters shall be re-measured and the new values recorded on the next line.

(2) Non-numerical Entries.

(a) When a non-numerical parameter is satisfactory, enter a checkmark (√) in the appropriate column.

(b) When a non-numerical parameter is unsatisfactory, enter a circled "(X)" in the appropriate column. The parameter correction should be noted on the next line.

(3) Referenced Entries. System generated printouts do not replace the requirement for a TPR; however, they may be referenced from a TPR line entry in lieu of entering measured values. The referenced printouts shall either accompany the TPR, or be stored in the same facility as the TPR. The TPR line entry shall specify where they are located.

m. Remarks Entries.

(1) When a parameter is found to be unsatisfactory, a brief explanation shall be provided in the remark column. If corrective action must be delayed, this shall also be noted in the remark column.

(2) A notation in the remark column of the technical performance record form is not a substitute for a required entry in the maintenance log. If appropriate, the entry on the form may reference the more complete entry in the maintenance log.

n. Immediate Review and Initials. The system specialists shall initial each line of data, including line entries, nominal values and tolerance/limits, as it is entered. It is incumbent on the system specialists to review the TPR entries for technical accuracy and identify adverse trends prior to initialing.

o. TPR Administrative Review. The site supervisor shall conduct an administrative TPR review. This review should be performed annually, but shall be performed at least biannually. Entries shall be reviewed for format and completeness. The site supervisor shall sign and date the next blank line on the TPR and enter a horizontal line through the remainder of the

row. After the TPR is filled or terminated, the site supervisor shall review the form and sign the TPR review block. Every review shall be documented by an appropriate entry in the maintenance log.

p. Termination. To terminate a TPR form, void the blank lines by placing a diagonal line through them and start a new TPR form. TPR forms shall be terminated only for any of the following conditions:

(1) When a nominal value or standard/tolerance value is changed.

(2) When the current form has been filled.

(3) When the current form has become damaged, or otherwise has deteriorated to the point that replacement is necessary.

(4) When required as part of a post aircraft accident/incident package.

(5) When directed by the maintenance handbook.

q. Disposition. The authority to destroy TPRs is granted by Order 1350.15, Records Organization, Transfer, and Destruction Standards. The retention period shall be a minimum of 2 and a maximum of 3 years after the last line entry date; destruction after 2 years is preferred.

224. AUTOMATED PERFORMANCE MONITORING.

With the advent of remote maintenance monitoring (RMM), certain facility performance and status data will be presented via an automated system. Such data provides an indication of facility performance and may form the basis for facility certification.

a. Automated Presentation of Alarms.

Facility alarm data presented automatically does not become a matter of permanent record unless facility performance deterioration or a status alarm requiring remedial action is indicated. In those cases, the first maintenance personnel to become aware of the deteriorated condition or alarm shall initiate follow-up action. The incident and activities associated with it shall be entered in the maintenance log for the facility.

b. Data Retention.

Some facilities continually generate printouts or files of monitored data, such as ARTS II and III, second-generation VORTAC, etc. One copy of the printouts will be kept where they are generated for 30 days. Maintenance log entries or TPRs may reference these printouts as needed. Printouts referenced in a maintenance log or a TPR shall assume the retention criteria of the parent document. The first-level supervisor or designee shall ensure copies of referenced printouts are available and properly stored if they are needed longer than one calendar month.

c. Recording Maintenance Data.

Remote site or control point system specialists shall periodically access and record facility performance data as required in the applicable technical handbooks or orders. The specialist shall make appropriate maintenance log or TPR entries regarding facility performance, status, or certification based on assessment of the RMM data.

d. Remote Access. When maintenance actions are performed remotely on a facility, the person initiating the action is responsible for ensuring a corresponding entry is made in the appropriate maintenance log. This applies specifically in those cases where a facility is accessed by remote terminal; i.e., MDT.

225. FAA FORM 4650-10, WARRANTY FAILURE REPORT.

FAA Form 4650-10 shall be used to report equipment failure or a part thereof under warranty. Completion and submission of this form enables the FAA to obtain a replacement at contractor cost and a failure analysis on high-failure items. The form is used to minimize parts replacement costs. Order 4650.20, Reporting and Replacement of Items Failing Under Warranty, provides detailed guidance on the preparation and use of FAA Form 4650-10.

226. FAA FORM 6032-1, AIRWAY FACILITIES MODIFICATIONS RECORD.

Modification records constitute an official record of the modification status of a system, equipment, or instruction book, and shall be kept current and accurate. Order 6032.1, National Airspace System Modification Program, provides guidance on the preparation and use of modification records.

a. Modification Records.

Documentation of the addition or removal of all authorized modifications to systems, equipment, and related instruction books in the NAS shall be maintained in the Facility Reference Data File (FRDF). Modification records can be either of the following:

(1) FAA Form 6032-1, Airway Facilities Modification Record.

(2) A printout of the logging screen documenting the completion of the modification and the serial number.

b. Transferring Modification Records.

Modification records shall accompany the equipment through its full life cycle. When transferring equipment from one location to another, modification records shall be removed from the FRDF, placed in an envelope along with an inventory list of records and secured to the items being shipped.

227. MAINTENANCE LOGS.

The FAA uses a variety of logging methods to create a single maintenance log for each facility.

228. REVIEW AND ACKNOWLEDGEMENT OF AIR TRAFFIC LOG.

Air Traffic Control (ATC) personnel maintain some form of a daily record of operations such as the Daily Record of Facility Operation, FAA Form 7230-4, which is governed by Order 7210.3, Facility Operation and Administration. All NAS equipment related entries made by any air traffic operations personnel shall be reviewed by maintenance personnel under the following guidelines:

a. The review procedure and interval are determined by the responsible maintenance personnel manager with the concurrence of the responsible air traffic operations facility manager.

b. The review may be accomplished via telephone, electronic transfer of data, or in person at the facility.

c. The review shall be documented using the locally approved method.

d. Maintenance personnel shall address all flagged entries in the ATC log, and actions taken concerning equipment shall be

documented appropriately in the maintenance log of the affected NAS facility.

229. PERIODIC MAINTENANCE COMPLETION MONITORING.

Periodic maintenance completion monitoring provides an indication of organizational effectiveness and compliance with maintenance orders.

a. The SMO shall track the percentage of on-time accomplishment of Periodic Maintenance (PM) tasks scheduled at weekly or longer intervals. The SMO manager or designee shall review the tracking at least quarterly.

b. This percentage of PM tasks accomplished on-time is calculated by dividing the number of tasks completed on-time by the sum of tasks (completed on-time, missed, and late), and multiplying this ratio by 100.

230. INFORMATION DISSEMINATION.

The National Operations Control Center (NOCC) provides coordination and management of facility activities providing NAS infrastructure services. The NOCC is the focal point for information dissemination.

a. Maintenance Alerts. When events, maintenance activities, or logistic support have the potential to systemically affect NAS operations, the NOCC shall, in partnership with maintenance support organizations, generate Maintenance Alerts utilizing electronic technologies to heighten the awareness of the maintenance community. The intent of the Maintenance Alerts is to quickly notify maintenance personnel of procedural changes, safety awareness, logistic support problems or maintenance activities that may or will impact system users.

b. Safety Alerts. Safety Alerts are developed and distributed when an issue related to equipment operations or maintenance arises, in order to alert maintenance personnel to potential safety problems with NAS equipment.

SECTION 3. MAINTENANCE LOGS

231. INTRODUCTION.

This section provides the procedures that apply to any logging system. Logging provides the official record of NAS events, equipment performance, and maintenance activities. It is important to prepare logs carefully. For instructions on a specific logging system, reference the appropriate logging procedures.

232. CONTROL CENTER LOGS.

Control center logs are used by the control center to document activities related to event management. These logs provide a means to plan, manage and respond to events that impact the NAS.

a. Entries that are facility or service specific shall be entered in the corresponding maintenance log.

b. Entries that are not facility specific are unique to the control center and should not be part of the maintenance log.

233. MAINTENANCE LOGS.

The maintenance log provides an official historical accounting of status, maintenance activities, and a certification record for the facilities and equipment in the NAS. Refer to the latest version of Order 6000.48, General

Maintenance Logging Handbook, for logging procedures.

a. A single electronic maintenance log maintained in accordance with nationally standardized methods is required for each FSEP entity that meets all of the following criteria:

(1) Contributes to and is identified with a NAS infrastructure service.

(2) Defined as a NAS Infrastructure Service or a tangible element of the NAS.

(3) Requires maintenance by FAA or others such as FAA contractors, Non-Federal technicians, or the military.

b. Classified or Sensitive Security Information (SSI) data shall not be placed into any electronic format.

c. Non-Federal facilities are not required to use electronic logs; however they must use a nationally approved method.

d. SMO managers or their designee may establish other logging requirements as needed.

234. LOG ENTRY AUTHORITY.

Authorization to make log entries shall be made a matter of written record by the SMO manager or designee. This authorization shall be issued on the basis of need, cognizance, and competence prior to operational use.

a. Each employee shall be identified by his/her initials when making log entries.

b. In the event two people at a facility have identical initials, the supervisor shall assign distinctive initials (for logging purposes) to avoid confusion.

c. Control center personnel shall be given log entry authority to make entries on NAS systems, subsystems, equipment or services they monitor or control.

d. Log entry authorization for non-FAA personnel shall be restricted to those under contract or Non-Federal personnel.

(1) The contractor or Non-Federal sponsor will provide a list of personnel requesting written log entry authority. The SMO manager will then grant log entry authorization in writing.

(2) Assignment letters shall list, by name, those authorized to make log entries. They may list more than one authorized person. (A notation such as "representative from XYZ Corporation" is not acceptable).

e. Regional or headquarters FAA personnel, on official business, may make log entries concerning that visit when requested by SMO personnel, without written authorization.

235. ACTIVITIES REQUIRING LOG ENTRIES.

Entries in the logs shall provide a complete historical account of activities related to facility status, certification, operation, or performance. They shall include but are not limited to:

a. Physical arrivals and departures at facilities without permanent maintenance staff. At least one entry shall include the purpose of the visit.

b. All system, subsystem, and service interruptions and related activities.

c. Start and completion of periodic or corrective maintenance actions performed.

d. Identification of failed or replaced equipment components.

e. Start and completion of flight inspections if on-site personnel are involved or notified.

f. Technical evaluations, inspections of any kind, and aircraft accident/incident investigations.

g. Equipment changes, replacement, or adjustment of parameters.

h. Modification, commissioning, or decommissioning activities.

i. Pilferage, vandalism, or related events.

j. Adverse weather effects, known commercial power failures, access road problems, or any other conditions that have specifically impacted a facility.

k. Certification or decertification of systems, subsystems, or services.

l. Visits of a technical nature by regional, headquarters or non-FAA personnel.

m. Coordination entries concerning facility transfer, intentional channel changes, interruption, refusal of interruption request, or restoration.

n. Supervisory log reviews.

o. Start and completion of radio frequency interference investigation if system specialists are involved.

p. Relevant statements from personnel cognizant about facility operations.

236. LOG ENTRY CHARACTERISTICS.

The log is a factual and chronological documentation of events. Log entries shall comply with the following requirements:

a. Content shall be accurate, complete, clear, concise, and entered in a timely manner. Elaborate details and opinions shall be avoided. The use of approved contractions and reference to substantive records and directives should be used when describing maintenance activities. The

following references provide approved word and phrase contractions:

(1) Order 1375.4, Standard Data Elements and Codes—Facility Identification and Supplemental Standards.

(2) Order 6000.5, Facility, Service, and Equipment Profile.

(3) Order 7340.1, Contractions.

(4) NAS MD-001, National Airspace System Configuration Management Document.

b. All entries shall be date and time stamped using Universal Coordinated Time (UTC).

c. Content shall correlate with related data on other forms, records, and reports.

d. Entries shall cite the appropriate instruction books, maintenance handbooks, directives, maintenance charts, or other documents when appropriate.

e. Erroneous entries shall be voided or corrected, not erased or deleted.

f. Certification statements shall be entered as specified in the maintenance handbooks. Certification entries shall be made by a single party.

g. Multiple certification entries on similar equipment may use an inclusive statement. For example, "all" (or a partial list) of the communication frequencies at a facility may be certified with a single entry, in lieu of listing the separate frequencies.

h. A certification entry, if required, shall precede a "return to service" entry in conjunction with a facility restoration entry.

i. Coordination entries shall state the organizational element and initials of the person contacted; i.e., AFSS (JS), ARTCC (LC), ATCT/RD.

j. Each log entry, change, or void shall contain the initials of the person making the entry.

k. All relevant statements regarding facility operations or status made by Flight Inspection, or other organizational representatives, (FAA or non-FAA), shall be entered into the log by designated personnel only. These entries shall include:

(1) The identity including the last name and organization of the statement source.

(2) Project information if any, and any known effects of the project on facility operation or status.

237. LOG REVIEW.

Maintenance logs shall be subjected to three levels of review: immediate, supervisory, and administrative.

a. Immediate Review. Personnel making log entries shall review each entry for compliance with logging requirements before initialing or saving.

b. Supervisory Review. The supervisor shall conduct a log review. This review should be performed annually, but shall be performed at least biannually.

(1) The purpose of this review is to:

(a) Recognize facility performance trends and recurring malfunctions.

(b) Identify procedural or policy discrepancies.

(c) Ensure technical completeness.

(2) Noted logging discrepancies shall be brought to the attention of the person making the entry in the interest of corrective instruction. Mistakes or unclear entries shall be corrected by an additional entry

referenced to the erroneous entry by date and time. (Deletions are not allowed).

(3) The Supervisor must document the log review in each associated log.

c. Administrative Review. The SMO manager or designee shall conduct administrative log reviews. Reviews at this level are intended to detect systemic problems throughout the SMO and monitor completion of supervisory reviews. During these reviews, no deletions, corrections, or additions to previous entries are permitted.

238. DISPOSITION OF LOGS.

The authority to destroy logs is granted by Order 1350.15, Records Organization, Transfer, and Destruction Standards.

a. The retention period for log entries shall be a minimum of 2 and a maximum of 3 years after the last log entry date; destruction after 2 years is preferred. Providing that there are no unresolved claims against the Government with regard to the facility involved, all log copies shall be destroyed after 3 years.

b. Classified logs shall be transferred to the regional office for destruction in accordance with Order 1600.2, Safeguarding Controls and Procedures for Classified National Security Information and Sensitive Unclassified Information.

c. Logs shall be destroyed at the office or facility of concern, except for classified or aircraft accident logs.

d. Non-FAA entities shall not be provided copies or access to facility logs without prior approval from the Region or the Washington office.

239-299. RESERVED.

CHAPTER 3. MAINTENANCE REQUIREMENTS

SECTION 1. TECHNICAL COGNIZANCE REQUIREMENTS

300. INTRODUCTION.

This section summarizes the technical aspects of the ATO maintenance program for operational facilities in the NAS. Each ATO maintenance employee is charged with the responsibility of providing support for the operational activities of the NAS.

301. MAINTENANCE FAMILIARIZATION.

All personnel engaged in NAS maintenance activities shall familiarize themselves with ATO policy, general philosophy, and procedures, particularly those having a direct bearing on the areas of specialty, facilities, or systems involved, including but not limited to the following:

a. System Knowledge. Specialists should be aware of the function each facility performs in the NAS. Personnel should familiarize themselves with the local airspace to understand how a given facility will impact air traffic operations within that airspace.

b. Equipment Characteristics.

(1) Technical standards and procedures as published in appropriate maintenance handbooks and equipment instruction books.

(2) Technical performance record data.

(3) Commissioning data.

(4) Applicable equipment warranties.

(5) Integrated Logistics Support Plan (ILSP).

(6) Ground check data.

(7) Flight inspection data.

(8) Use and care of test equipment.

c. Safety. Published precautions and procedures applicable to maintenance activities. See chapter 6 of this order.

d. NAS Change Proposal (NCP). Configuration control of approved changes to equipment, subsystem, system, or facility.

e. Documentation. Technical documentation applicable to the system, subsystem, equipment, or facility maintenance activities. In addition, an annual review of Order 6000.15 should be accomplished, preferably in an interactive group setting.

f. Coordination. Knowledge of the procedures for coordination with FAA and non-FAA personnel.

302. STANDARDS AND TOLERANCES/LIMITS.

Technical performance of NAS systems is characterized by performance parameters, some of which are considered critical indicators of proper system operation and are designated as key performance parameters; e.g., output voltage is key for a power supply. Key performance parameters are identified in the standards and tolerances chapter of the maintenance handbooks by an arrow placed to the left of the applicable item.

a. Adjust-and-Maintain Value. Each performance parameter has a maintenance standard that is the optimum value from a

system engineering viewpoint. Tolerances/limits around that value are defined.

b. Monitor Alarm Value. Some parameters are so important that they are monitored by a shutdown function and have standard values with tolerances/limits around that value defined.

c. Pre-Alarm Value. Some parameters may have alarms set to provide an indication that they are approaching an out-of-tolerance condition. These are commonly referenced as soft alarms or maintenance alerts, and have standard values with tolerances/limits defined.

d. Tolerances and Limits. If defined, each standard value has been assigned an "initial" and an "operating" tolerance/limit expressed in terms of permissible deviation from the standard, or in absolute maximum or minimum performance levels, as appropriate, for use during maintenance and certification activities

e. Source of Standards and Tolerances. Equipment standards are normally found in the maintenance handbooks but may be listed in the individual technical instruction books. The standards and tolerances are based on system performance requirements, manufacturer specifications, and use of standard test equipment. If discrepancies exist between the standards and tolerances listed in maintenance handbooks and individual technical instruction books, the maintenance handbook shall take precedence.

f. Adjustment of Performance Parameters. Parameters may be adjusted to optimize or shall be adjusted to correct out-of-tolerance operation.

(1) To avoid the unnecessary expenditure of manpower, repairs or adjustments should not be made solely because a particular reading is not exactly

the same as the standard value. Adjustments are required only if one or more of the performance parameters, listed in the appropriate maintenance handbook or manufacturer's instruction book, meet(s) any one of the following conditions:

(a) If a performance parameter exceeds its operating tolerance/limit.

(b) If, in the opinion of the person making the measurement, a facility, system, or equipment failure may occur prior to the next scheduled maintenance activity if the adjustment is not made.

(c) If NAS operations are being degraded.

(2) When corrective action is performed, the action shall result in the affected parameter(s) being adjusted to within the specified operating tolerance/limit as a minimum, and to within the specified initial tolerance/limit to the extent practical. In addition, whenever adjustments are made to alleviate an out-of-tolerance/limit condition, the system specialist shall verify that the corrective adjustments have not affected the within-tolerance/limit operation of other parameters. Refer to Paragraph 503 to determine if certification is required.

g. Philosophy of Standards. Where system, subsystem, or equipment parameters are monitored, the monitors alarm standards and tolerances/limits for the parameters often differ from the adjust-and-maintain or maintenance standards and tolerances/limits for the same parameters.

(1) The maintenance tolerances/limits are considered quality-control type requirements, and exceeding these tolerances/limits will usually not endanger the user. The monitor alarm tolerances/limits are the values beyond

which conditions may be unsafe. Therefore, maintenance standards and tolerances/limits are generally more stringent than monitor alarm standards and tolerances/limits for the same parameter. This relationship provides an early warning for action on system performance derogation situations.

(2) For example, the operating tolerance/limit for a transmitter power output may be "less than 40 percent reduction" from the specified standard value, whereas the monitor alarm point may be a 50 percent reduction from the specified standard value. Thus, if the transmitter power output is found to have deteriorated 45 percent from the standard value, corrective maintenance action would be required, but the monitor would not have alarmed, and no shutdown would have occurred.

303. MINOR EQUIPMENT ADJUSTMENTS.

Minor adjustments to operating equipment may be performed without removing the equipment from service, provided the adjustments will not place any parameters beyond published operating tolerances/limits, or cause confusing or disturbing indications to aircraft or controllers, or cause an interruption to the service being provided. For example, a maintenance handbook may authorize a temporary reduction of power output to check the power monitor alarm, provided the power output is not reduced below operating tolerance for the power monitor, and a momentary change of alarm status is not indicated at the control point.

304. PRIME DIRECTIVE.

Maximum availability of safe services is of prime importance to the users of the NAS. Accordingly, equipment downtime shall be kept to a minimum. Coordination with lead-time for the appropriate control center before shutdown of equipment and prompt reporting of interruptions are equally important. This minimizes the impact of a facility or service loss in the air traffic environment.

305. LIAISON RESPONSIBILITIES.

ATO personnel shall be cognizant of the interaction between their duties and responsibilities and those of others, both within and outside FAA. A liaison through the office of primary responsibility (OPR) shall be established to ensure the mission of the FAA can be accomplished in a timely, efficient, and effective manner with those indicated below:

a. Air Traffic Controller Personnel.

All maintenance activities that may adversely affect the service provided by a commissioned facility shall be coordinated with air traffic operations personnel in advance through the control center or by local procedures. A Notice to Airmen (NOTAM) will be issued when required in accordance with Order 7930.2, Notices to Airmen (NOTAMS). Some conditions requiring close coordination with air traffic operations personnel are described below.

(1) Whenever performing any operation where an interruption would be observed by a user; e.g., a change of transmitters, maintenance personnel shall not start their activities until the appropriate air traffic control facility concerned has been notified and approved the release.

(2) Immediately upon equipment failure or upon notification that a facility is out-of-service because of equipment failure.

(3) When transferring the facility to standby power.

(4) Whenever service can be restored after an interruption of a system, subsystem, or equipment.

(5) When construction or modernization may cause interruptions.

(6) When the certification has been removed, or the maximum certification interval has been exceeded.

b. Other ATO Personnel. The appropriate control center shall coordinate all maintenance activities that may adversely affect other NAS facilities.

c. Flight Inspection Personnel. Maintenance personnel may be required to work with Flight Inspection personnel during flight inspections.

d. Other Government Agencies. Maintenance personnel shall coordinate activities with other Government agencies, in accordance with FAA directives or formal agreements.

e. Local Authorities. Maintenance personnel shall cooperate with local government authorities (including airport, fire and police officials) in areas applicable to the FAA mission and in the performance of their assigned duties.

f. Telephone Companies. Maintenance personnel shall coordinate their activities with appropriate telephone company personnel to expedite tests and repairs of telephone lines and equipment.

306. OPERATIONAL STATUS, NOTICES TO AIRMEN (NOTAM).

Notices to Airmen (NOTAM) are issued and disseminated by air traffic operations to advise NAS users on the status and availability of NAS facilities.

a. Air traffic operations personnel are responsible for initiation, dissemination, and cancellation of NOTAMs.

b. Maintenance personnel shall keep air traffic operations personnel informed of the current operational status of all systems, subsystems, facilities, and equipment.

c. Any interruption or change in the performance characteristics that would, in the judgment of the system specialist, adversely affect service to the user shall be reported immediately to air traffic operations personnel for possible NOTAM or other appropriate action.

d. Maintenance personnel shall document the issuance and cancellation of requested NOTAMs by logging the NOTAM number in the maintenance log.

e. The National Flight Procedures Office (NFPO) is responsible for issuance and cancellation of procedural NOTAMs on navigational aids used for multiple purposes.

f. A periodic review of Aeronautical Information Publications (AIP) is necessary to confirm properly published facility descriptions and accurate status indications are provided to users of the NAS.

(1) The SMO manager or designee shall review the appropriate Airport Facility Directory each charting cycle.

(2) The control center managers or designee shall review all current NOTAMs daily.

(3) The manager of the appropriate air traffic operations facility manager shall be notified immediately of any AIP discrepancy so that appropriate action may be taken.

307. AVIATOR AWARENESS.

Aviators have several methods available to determine the operational status of navigational aids (navaids), including NOTAMs, broadcast messages, and communications with air traffic operations personnel. Certain maintenance procedures on navaids, however, produce indications that can confuse or mislead aviators. Additional precautions can reduce the risk of aviators making use of these signals.

a. Removal of Identification. On those systems providing identification signals, the identification signal shall be removed during any maintenance activities that affect the radiated signal. This signifies to the user that equipment adjustments are being accomplished and the system may be unreliable.

b. Hazardously Misleading Information (HMI). Certain maintenance practices may require intentional radiation of HMI. Such occurrences shall be minimized in both number and duration when practical. Methods to accomplish this include using more than one specialist to eliminate access time to far-field measurement areas, and using additional or specialized test equipment and procedures as a substitute for radiating HMI.

308. ORDER OF RESTORATION ACTIVITIES.

Restoration activities shall be accomplished in the following order:

a. Corrective maintenance, if necessary, of the facility providing the service.

b. Certification or verification, as required, of the facility or service.

c. Notification of the appropriate points of contact that the facility or service is restored.

309. SIGNIFICANT EVENT REPORTING.

a. A significant event is any event causing an impact to air traffic operation or that may cause a facility/service interruption at airports, centers, and other FAA facilities.

b. A Significant Event Report (SER) shall be submitted by the appropriate control center in accordance with Order 6030.41, Notification Plan for Unscheduled Facility and Service Interruptions and Other Significant Events.

310. REPAIR OF SYSTEMS OR EQUIPMENT.

As equipment becomes more modular and complex, it is often more cost effective, timely, and efficient to restore systems/equipment by replacing modules rather than replacing components.

311. MODULE REPAIR PHILOSOPHY.

The ATO philosophy is to repair modules at the field level, whenever cost effective, practical and not prohibited, and in coordination with the FAA Logistics Center. This applies to both expendable and Exchange and Repair (E&R) items. Expendable items are not to be automatically discarded without attempting reasonable repairs, even though the initial cost of the items is minimal. The designation of an item as E&R does not preclude on-site repair if a local repair effort is determined to be feasible.

a. Sites should be aware that any attempt to perform repairs during the warranty period may void any FAA Logistics Center Warranty.

b. If repairs are attempted, and the equipment is damaged beyond economical repair, the full retail price will be charged rather than the E&R price.

312. REPAIR DECISIONS.

The SMO manager shall ensure that field repairable equipment is not sent to a servicing depot for repair.

a. Factors that may make field repair impractical include:

(1) The unavailability of special tools and equipment.

(2) The extent of the training the system specialist has received, and the time required to effect repairs.

(3) The availability of depot or other outside repair facilities.

b. When depot repair is required the item shall be sent to the appropriate servicing depot within 15 days.

313. REPAIR METHODS.

a. The following methods are available for items that can be repaired:

(1) Repair by warranty. Maintenance personnel shall not attempt to repair items under warranty unless required to return a critically needed facility to service. In this case, field repair of failed printed-circuit boards in equipment under warranty may be made where the technical capability exists to isolate the fault and effect repairs. Failed or defective component parts on printed-circuit boards shall be reported in accordance with Order 4650.20, Reporting and Replacement

of Items Failing Under Warranty. Where repairs exceed the technical capability of field personnel, the printed-circuit board itself shall be reported as failed, per Order 4650.20, and a replacement requisitioned from the servicing depot. e.g. FAALC or contractor depot.

(2) Repair on-site by system specialist using parts from station stock, local purchase, or requisitioned from the FAA Logistics Center.

(3) First, repair using local vendors with current repair contracts. Second, use local vendors without a current contract where economically feasible,

(4) Repair at the depot using Repair & Return (R&R), or Exchange & Repair (E&R) methods. All items returned to the FAA Logistics Center for E&R or R&R shall be accompanied by an Airway Facilities Modification Record (FAA Form 6032-1) or an approved electronic equivalent. A sufficiently detailed description of defects, problems, and repairs attempted shall be included to provide depot personnel necessary information to restore the item.

b. Items that cannot be repaired by any of the above methods will be replaced.

314. LOGISTICS REQUIREMENTS.

Before a new system, subsystem, or equipment is introduced into the NAS, the ATO shall assist the requirements, acquisition, and logistics organizations in developing an Integrated Logistics Support Plan (ILSP) that includes the following:

- a. Maintenance planning.
- b. Maintenance staffing.
- c. Maintenance support facilities.

d. Packaging, handling, storage transportation and disposal.

e. Supply support.

f. Support equipment.

g. Technical data.

h. Training.

i. Computer resource support.

315. PROVISIONING.

The NAS Operations office develops the maintenance program in support of the stated operational requirements of the system. Through coordination with the FAA Logistics Center (depot) throughout the provisioning cycle, and by participation in provisioning conferences, the NAS Operations office endeavors to ensure adequate and timely depot and on-site support of all systems, subsystems, and equipment as they are introduced.

316. SUPPLY SUPPORT.

The FAA Logistics Center is responsible for providing logistical support to meet the operational requirements of any system used in the NAS.

a. Initial spares and other provisions are determined individually for each system as part of the National Airspace Integrated Logistic Support (NAIS) process. Subsequent supply requirements, as they develop, are furnished upon demand by submission of a requisition to the depot in accordance with Order 4250.9, Field Material Management and Control. Field logistic operations such as Exchange and Repair (E&R), Repair and Return (R&R), packing, marking and shipping, inventory control, and replenishment are covered in Order 4250.9.

b. Maintenance personnel shall keep an accurate inventory of site spares.

317. COMMISSIONING.

Commissioning is the formal incorporation of a new facility, system, subsystem, or equipment into the NAS. The ultimate determination that the facility, system, subsystem, or equipment will be commissioned for service shall be dependent upon the technical performance of the electronic and/or plant equipment, the results of flight inspection, and the attainment of the required operational service. A facility, system, subsystem, or equipment shall be commissioned only after the following actions have been completed:

a. The joint acceptance board members have determined the conditions of acceptability in accordance with established standards and specifications and signed the JAI report for their respective offices.

b. Certification, if required, and commissioning statements have been entered in the appropriate maintenance log by responsible maintenance personnel.

c. Flight inspection, when required, has evaluated the operation of the facility and issued any required restrictive NOTAM.

d. Standard Instrument Approach Procedures (SIAP) have been developed by Aviation System Standards office (AVN) if required.

e. The commissioning NOTAM has been issued, if required.

f. The FRDF has been established and includes all applicable NCPs/CCDs, technical reference data documentation, and reference materials.

g. A change to the FSEP has been initiated, where required, to place the facility in a commissioned status. The facility may be commissioned if the action has been initiated even if the FSEP action has not been completed.

318. DECOMMISSIONING.

Decommissioning is the permanent removal of a facility, system, subsystem, or equipment from service in the NAS. The actions outlined below are required for facility decommissioning and associated service terminations. The regional division or the SMO, if so designated, shall:

a. Coordinate with air traffic operations personnel to begin their decommissioning activities.

b. Ensure the National Flight Data Center (NFDC) has been notified of the proposed decommissioning at least 90 days prior to the actual decommissioning.

c. Verify with the Regional Airspace and Procedures Team (RAPT) that action has been initiated to cancel or amend the SIAP, predicated on the facility to be decommissioned.

d. Initiate action, as required, for termination of leased telecommunication services and frequency assignment.

e. Initiate FSEP changes, as required.

f. Initiate actions, as required, to terminate property leases and utility contracts.

g. Redistribute, declare excess, or contact the FAA Logistics center for return, as appropriate, all real and personal property, facility maintenance and operating supplies, and materiel in accordance with Orders 4660.1, Real Property Handbook and 4800.2, Utilization and Disposal of Excess and Surplus Personal Property.

h. Provide for restoration of facility site, including environmental restoration in accordance with all federal, state, and local regulations.

i. Degauss all magnetic storage media to remove sensitive information.

j. Take action to transfer, store, or dispose of facility records and technical reference materials in accordance with Order 1350.14, Records Management.

k. Terminate any open procurement requests.

l. Ensure that the decommissioning NOTAM has been issued, if required.

319. AUTOMATED LOGGING SYSTEMS.

a. Automated record keeping capabilities have evolved over many years. The Maintenance Management System (MMS) has been the primary automation tool used by maintenance personnel for many years. A graphical user interface for MMS was provided by using Simplified Automated Logging (SAL). SAL contained a simplified subset of MMS functionality. The NAS Infrastructure Management System (NIMS), Event Management System (EMS) is new software that combines event management and logging documentation in a single EMS application designed to replace MMS and SAL.

b. The system specialist should remain aware that in addition to completion of logging responsibilities for a particular event, there might be reporting requirements for the same event. ATO Logging policies and procedures are contained in this order and Order 6000.48, while ATO reporting policies and procedures are contained in Order 6040.15, National Airspace Performance Reporting System.

SECTION 2. FACILITY MAINTENANCE REQUIREMENTS

320. INTRODUCTION.

This section covers ATO maintenance activities, which are both periodic and corrective in nature. They are intended to ensure accuracy, integrity, continuity, and availability to promote system safety. All maintenance shall be performed with minimum interference to facility operation.

321. PERIODIC MAINTENANCE.

Periodic Maintenance (PM) consists of preventive maintenance inspections, performance checks, and routine maintenance.

a. Preventive Maintenance consists of activities that are accomplished on a scheduled or as-required basis in accordance with technical directives and instruction manuals.

b. Performance Checks confirm the operating status of the equipment at a given time.

c. Routine Maintenance consists of tasks not identified in maintenance handbooks.

322. CORRECTIVE MAINTENANCE.

Corrective maintenance is maintenance performed to identify or correct a problem. It consists of activities performed when reacting to an interruption of a system, subsystem, equipment, or service. However, it is not restricted to events following an interruption. Corrective maintenance includes fault detection, troubleshooting, fault isolation, and replacement of any failed components.

Figure 3-1. PM Accomplishment Windows.

Recurring PM Interval	Window Within the Interval		
	Due	Time on Each Side of Due Date	Total Window Length
Daily	1	± 0 Days =	1 Day
Semi-Weekly	1	± 1 Days =	3 Days
Weekly	1	± 3 Days =	7 Days
Bi-Weekly	1	± 3 Days =	7 Days
Monthly	1	± 7 Days =	15 Days
Bi-Monthly	1	± 7 Days =	15 Days
Quarterly	1	± 15 Days =	31 Days
Tri-Annual	1	± 15 Days =	31 Days
Semi-Annual	1	± 30 Days =	61 Days
Annual	1	± 60 Days =	121 Days
2 Year	1	± 90 Days =	181 Days
3 Year	1	± 120 Days =	241 Days
5 Year	1	± 120 Days =	241 Days
8 Year	1	± 120 Days =	241 Days
12 Year	1	± 120 Days =	241 Days

323. SCHEDULES.

a. **Scheduling.** Periodic maintenance activities shall be scheduled in accordance with equipment maintenance handbooks and manufacturer technical instruction books. A basic recurring periodic maintenance schedule shall be established including all required tasks.

b. Periodic. Scheduled PM due dates for recurring PM tasks are based on the number of days between task accomplishment. This time is called the interval. Specific values for each interval are found in Appendix 1. A window within each interval defines the period in which PM accomplishment is considered on-time. The window is centered on the task due date. Windows for daily intervals equal the entire interval. Intervals and associated windows are shown in Figure 3-1.

c. Consistency. Periodic maintenance tasks shall be performed as close as possible to the actual scheduled date.

d. Late or Missed PMs. If a periodic maintenance task cannot be performed within the specified accomplishment window it shall be performed at the earliest possible date, and is considered late or missed.

(1) Late PMs are those performed after the scheduled window, but prior to the next regularly scheduled window. The basic periodic maintenance schedule shall not be adjusted when tasks are performed outside of their scheduled window.

(2) Missed PMs are those not accomplished prior to the next scheduled window.

e. PM Requirements. PM requirements and intervals are derived from the following documents in the order listed:

(1) FAA Maintenance Handbooks. Periodic maintenance tasks identified are the basic requirements.

(2) FAA Technical Instruction Books. PM identified will be performed if a national/regional maintenance order does not exist or fails to identify periodic requirements.

(3) Manufacturer Instruction Books. PM identified will be performed if guidance from the previous three documents does not exist.

f. Adaptability. PM may be accomplished at more frequent intervals than published due to operational or environmental conditions. Regional maintenance orders and supplements may identify additional PM required or shorten the intervals defined in national orders.

324. MODIFICATIONS TO FACILITIES, SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.

Requests for approval of modifications to items under Configuration Management (CM) shall be submitted in accordance with Order 1800.66. Requests for approval of modifications to items not under configuration management shall be submitted in accordance with Order 6032.1, National Airspace System Modification Program.

a. Modifications to ground facilities, systems, subsystems, equipment, including software, associated monitor and test equipment, structures, and buildings, shall be authorized only to correct deficiencies, satisfy changing requirements, improve performance, increase reliability, minimize or eliminate safety hazards, reduce manpower requirements, facilitate maintenance, save money, or enable commissioning.

b. Changes to established baselines of installed systems require NCP submission and approval by the appropriate Configuration Control Board (CCB) before the change may be installed. Emergency modifications may be verbally authorized but shall be documented within two days of approval by submittal of an NCP.

c. Authorized modifications shall be considered priority projects and shall be accomplished within the required timeframe in accordance with Order 6032.1.

d. Temporary (test or training) modifications shall be removed as soon as practical.

e. Unauthorized modifications are expressly prohibited. If unauthorized modifications are found they shall be reported promptly to the supervisor for removal or proper authorization.

f. Guidance on FAA modification policy and procedures is contained in Orders 1320.58, 1800.66, and 6032.1.

325. NONSTANDARD MAINTENANCE PROCEDURES.

When conditions preclude maintenance according to established criteria or procedures, the cognizant SMO shall initiate a notification to the 2nd level engineering support activity and the cognizant Configuration Control Board (CCB). The notification shall include all pertinent information such as the reason(s) for nonstandard maintenance, problems encountered or anticipated, etc. If any hardware, software, or documentation under configuration management is required to be modified, a NAS Change Proposal (NCP) shall be processed according to procedures in Order 1800.66, with accompanying FAA Form 1800-2.

326. MOBILE FACILITIES PROGRAM.

The FAA requires adequate mobile units to meet the following requirements:

a. Emergency or special event requirements.

b. Replacing facilities destroyed by natural or manmade disasters.

c. Supporting scheduled maintenance and modernization programs.

d. Establishing temporary service at locations qualifying for facilities where lack of a facility would adversely affect flight safety.

327. MANAGEMENT OF MOBILE FACILITIES.

The Aeronautical Center is the OPR for the management of the mobile facility program.

a. **Program Management.** Order 6030.18, Mobile Air Traffic Control, Navigational Aid, Communication and Power System, and Order 6480.2, Maintenance Of Mobile Air Traffic Control Towers, provide more detailed information relative to the overall program management of mobile facilities.

b. **Maintenance of Mobile Facilities.** Maintenance of mobile facilities is the responsibility of the organizational element having custody. Maintenance personnel shall be cognizant of their duties and responsibilities in the deployment, installation, maintenance, and operation of mobile air traffic control, navigational aids, communications, and power systems. Detailed guidance is contained in Order 6030.18 and Order 6700.16, Maintenance of Mobile VHF Omni-range (VOR) Facilities, and individual maintenance handbooks.

328. MAINTENANCE OF AIR TRAFFIC TRAINING EQUIPMENT.

a. Maintenance personnel will cooperate to the extent practical in maintaining approved training aids, both electronic and mechanical, used by air traffic operations personnel at field locations such as:

- (1) Air Traffic Control Tower (ATCT).
- (2) Air Route Traffic Control Center (ARTCC).
- (3) Flight Service Station (FSS).
- (4) Automated Flight Service Station (AFSS).
- (5) Terminal Radar Approach Control (TRACON).
- (6) Combined Center Radar Approach Control (CERAP).
- (7) Air Traffic Control System Command Center (ATCSCC).

b. The Washington headquarters and/or regional offices will issue directives and procedures covering specific items of equipment.

329. MAINTENANCE OF JOINT-USE MILITARY EQUIPMENT.

The joint use of military facilities is governed by Order AF 6430.49, Ground Rules for Air Defense Command and CAA Joint Use of Radar Facilities, and the approved agreements of the Joint Radar Planning Group (JRPG) meetings. The FAA Washington office will, when required, issue directives to its field organizations to implement FAA JRPG commitments.

SECTION 3. OTHER MAINTENANCE REQUIREMENTS

330. INTRODUCTION.

This section covers additional maintenance activities that may not be identified in other maintenance handbooks. All maintenance shall be performed with minimum interference to facility operation.

331. OVERSIGHT REQUIREMENTS.

The FAA requirement is to ensure that all facilities used in the NAS regardless of ownership or maintenance responsibility shall be maintained to provide the same level of service.

a. Areas of FAA oversight on non-FAA maintained systems include:

(1) Oversight for contractor maintained systems. This shall be in accordance with Order 6000.41, Policy Governing Contractor-Assisted Maintenance for the National Airspace System.

(2) Oversight of Non-Fed facilities. This shall be in accordance with Order 6700.20.

(3) Oversight of facilities with military responsibility for maintenance. This shall be in accordance with Order 6000.6, United States Interagency Ground Inspection Manual for Air Traffic Control and Navigational Aids Facilities.

b. Oversight covers topics such as maintenance practices, configuration management, periodic technical evaluation, personnel evaluation, and test equipment calibration standards traceability.

c. Technical support and maintenance work accomplished at NAS facilities shall be supervised or performed by FAA personnel who are knowledgeable about the specified NAS operations.

332. HEADQUARTERS REQUIREMENTS.

The appropriate divisions in Washington headquarters shall provide for training, arrange for procurement and the repair of test equipment, and furnish necessary documentation, including directives, as required for all programs.

333. REGIONAL REQUIREMENTS.

The regions shall ensure field repair capabilities are established and the policies and procedures of this order are implemented.

a. Test equipment at the facility is provided in accordance with standards established by Order 6200.4, Test Equipment Management Handbook.

b. Adequate working equipment shall be available at the facility, in accordance with standards established by Order 4630.2, Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.

c. A site stock of replacement parts and components should be available at the facility in accordance with Order 4620.3, Initial Support for New or Modified Equipment Installation.

d. Personnel training is scheduled in accordance with established training programs, and as directed by Order 3400.3, Airways Facilities Maintenance Personnel Certification Program.

334. TEST EQUIPMENT.

Test equipment shall be maintained in proper operating condition. General guidelines regarding calibration and repair of test equipment are contained in Order 6200.4.

335. MAINTENANCE OF RADIO FREQUENCY (RF) CABLES AND CONNECTORS.

Unless specified otherwise in applicable documents, RF cables, connectors and terminations shall be inspected, and repaired, if required, at least annually at all

facilities in the NAS. Schedules shall be established based on local conditions. Moisture proofing shall be accomplished after all maintenance or when there may be a possible or potential moisture problem. Reference Chapter 4, Paragraph 445, for moisture-proofing procedures.

336. MAINTENANCE OF NONCOMMISSIONED FACILITIES, SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.

During tests, modernization, relocations, and operational readiness demonstrations, when a noncommissioned status exists on the facility, system or subsystem concerned:

a. Such equipment shall be maintained to the standards of commissioned equipment to the extent practical to prevent degradation of quality and capability.

b. The facility, system, subsystem, or equipment may be removed from service at any time without a NOTAM; however, prior coordination with air traffic operations personnel may be appropriate.

c. Identification signals shall not be broadcast by a noncommissioned facility, except for the specific identification "TEST."

d. Custodial maintenance shall be performed to the extent practical and as the workload permits.

337. AIRCRAFT ACCIDENT ACTION.

a. The data on technical performance record forms and maintenance logs are of prime concern and legal importance during aircraft accident investigations. Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, contains detailed instructions on

the responsibilities of maintenance personnel in the event of an aircraft accident/incident. Order 6000.48 contains detailed instructions on maintenance log entries for aircraft accidents.

b. The originals of TPR forms become part of the post aircraft accident/incident package. Complete and authenticate the TPR in accordance with Order 8020.11, then terminate the TPR and place a photocopy in the FRDF.

c. Order 8020.11 and its supplements, or any displacing regional directive, shall be maintained in a plainly marked document, prepared in advance, and readily available to facility personnel when needed.

338. PRESERVATION OF NATIONAL ENVIRONMENT AND RESOURCES.

ATO personnel, in accordance with applicable laws and regulations, shall ensure that all maintenance operations promote the prevention, control and abatement of air and water pollution. Maintenance personnel shall use techniques for the disposal or discharge of waste and radioactivity that are consistent with the national effort. Order 1050.10, Prevention, Control, and Abatement of Environmental Pollution at FAA Facilities, outlines the basic FAA policies, plans, and responsibilities that will enable the FAA to fulfill its obligations in this area.

339. EQUIPMENT WARRANTIES.

a. **Background.** Some new equipment introduced into the NAS is covered by a warranty (or guarantee) clause. The terms of the warranty can usually be found in the forepart of the equipment instruction book. Warranties on such equipment normally run for two years from the date of factory

acceptance or one year from the date of first use by FAA, whichever occurs first. Items of test equipment are normally covered by a commercial warranty. The terms and duration of commercial warranties vary between individual manufacturers. Some items furnished through the FAA Logistics Center, such as vacuum tubes, may also be warranted, and the warranty information is often printed on the item itself. In other cases of warranted items furnished by the depot, warranty information is printed on the shipping container.

b. **Action Required.** ATO personnel shall identify items and equipment under their purview that are in warranty and comply with the provisions of Order 4650.20. Failure to report failures, which occur during the warranty period, may affect FAA's entitlement for repair or replacement by the contractor or manufacturer and may also mask design deficiencies.

SECTION 4. TECHNICAL EVALUATIONS AND INSPECTIONS

340. INTRODUCTION.

This section explains the types of evaluations and inspections, that provide a quality assurance function on NAS facilities.

341. TYPES OF EVALUATIONS AND INSPECTIONS.

ATO personnel conduct inspections to assure the quality of system performance in the NAS. Several types are:

- a. Routine.
- b. NAS Technical Evaluation Program (NASTEP).
- c. Acceptance inspections.
- d. Flight inspections.
- e. Safety inspections.

342. ROUTINE INSPECTIONS.

System specialists, and others engaged in routine maintenance activities, are required to inspect system, subsystem, and equipment performance according to appropriate maintenance handbooks.

343. NAS TECHNICAL EVALUATION PROGRAM (NASTEP).

a. The NASTEP contained in Order 6040.6, Airway Facilities NAS Technical Evaluation Program, is the main component in the overall evaluation and quality assurance of ATO maintenance activities.

b. NASTEP provides the following:

(1) Periodic independent technical review of services provided by systems, subsystems, and equipment.

(2) Review of how well the services match customer needs.

(3) On-site in-depth technical inspections by NASTEP evaluators including review of:

- (a) Maintenance logs.
- (b) Technical performance records.
- (c) Facility Reference Data File (FRDF).
- (d) Required maintenance handbooks.

(e) Aircraft accident reporting procedures.

(f) Certification intervals.

(g) Certification and key performance parameters.

344. ACCEPTANCE INSPECTIONS.

Projects to establish, relocate, and improve NAS facilities require a Joint Acceptance Inspection (JAI) and may require a Contractor Acceptance Inspection (CAI). These inspections are conducted to ensure facility projects are completed in accordance with project specifications and facility performance is within established standards and tolerances. Representatives of the maintenance organization, Logistics, Flight Standards, and other air traffic operations organizations, as appropriate, participate in these inspections. Refer to Order 6030.45, Facility Reference Data File, for guidance on conducting a JAI or CAI.

345. FLIGHT INSPECTIONS.

Many NAS facilities have performance characteristics that can only be measured or validated by airborne measurements. The FAA maintains a fleet of flight inspection aircraft, specially equipped with high quality avionics equipment and position-determining systems, to make these measurements. Most flight inspection activities occur on a periodic basis throughout the lifetime of a facility; commissioning and special inspections are also conducted. Details on the scheduling and conduct of flight inspections are published in Order 8200.1, United States Standard Flight Inspection Manual, and in Chapter 4 of this order.

346. SAFETY INSPECTIONS.

a. Safety inspections of FAA facilities are required in accordance with the latest version of Order 3900.19, Occupational Safety and Health Program.

b. Safety inspections are conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations and Order 3900.32, Agency Compliance With Occupational Safety and Health Administration Standards: APM National Abatement Plan, to provide a safe and healthful working environment.

347-399. RESERVED.

CHAPTER 4. MAINTENANCE PROCEDURES

SECTION 1. PROCEDURES FOR UNSCHEDULED FACILITY INTERRUPTIONS

400. INTRODUCTION.

This section provides guidance and requirements for handling unscheduled facility interruptions and their reporting and restoration activities. Maintenance personnel having firsthand knowledge of an unscheduled interruption shall promptly report the incident to the appropriate control center.

401. FACILITY RESTORATION.

Upon discovery or notification of a facility interruption, ATO personnel shall determine the cause of the interruption and perform the necessary corrective maintenance to restore the facility to normal operation. The urgency of facility restoration shall be determined by the needs of the users and the impact of the service in accordance with Order 6030.31, Restoration of Operational Facilities. If the corrective action involves characteristics that can only be verified by flight inspection, the facility shall not be returned to service until flight inspection has been accomplished.

402. DECERTIFICATION PROCEDURES.

When a Specialist determines that decertification is necessary, maintenance personnel must take immediate specific actions. Outages resulting from decertification are unscheduled outages.

a. If the system or subsystem in question is a navigational facility, neither air traffic operations personnel nor the flying public can discern whether the service is safely usable. Therefore, maintenance personnel shall immediately remove the system or subsystem from operation in the NAS.

(1) Notify the local or relevant air traffic operations personnel as soon as possible, to ensure that aircraft do not continue to use the facility. In extreme cases it may be necessary to physically turn off the navigation signals. Notify the appropriate control center.

(2) Initiate corrective action as required.

(3) Certify the facility before returning it to service.

b. For other than navigational facilities, immediately advise air traffic operations personnel of the decertification. Air traffic operations personnel will decide whether or not to continue using the uncertified system, subsystem, or service.

(1) Request an outage through the appropriate control center, and provide an estimate of the time required to return to service.

(2) If the outage request is approved, initiate corrective action as required. Certify the facility before returning it to service.

(3) If the request is denied, make an additional entry in the appropriate maintenance log describing the situation, including names of personnel contacted. When an outage can be obtained, initiate corrective action as required, and certify the facility before returning it to service.

403. OUTAGES DUE TO FLIGHT INSPECTIONS.

During navigation facility flight inspections, if adjustments necessitating an outage are required, system specialists shall coordinate with the appropriate control center, which will coordinate NOTAM initiation through AT as required.

404. INTERRUPTION REPORTING.

Upon termination of an unscheduled facility interruption, proper notification shall be made to the appropriate control center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

405. PRIORITIES OF RESTORATION.

The SMO manager or designee shall establish priorities for restoration of out-of-service facilities for delayed responses. However, air traffic operations personnel have the responsibility for determining priority of restoration where two or more facilities, systems, subsystems, or equipment are inoperative at the same time. In such cases, and when maintenance resources for restoration cannot be applied to all equipment, a priority of restoration shall be requested from the appropriate air traffic operations facility manager in accordance with Order 6030.31. Military requirements shall be taken into consideration in cases involving joint-use radar.

406. MOMENTARY INTERRUPTIONS.

Any interruption of the service provided by a system, subsystem, or equipment can be a potential cause of mistrust for the users. Non-reportable interruptions may be coordinated locally.

a. Switching of operating equipment shall never be done indiscriminately.

b. Before changing equipment or performing any other action on a facility, which may cause momentary interruption of the service, notice shall be given to the appropriate air traffic operations personnel.

c. Such switching or changeovers shall not be accomplished until air traffic operations personnel concur with such action unless loss of service is imminent.

d. The system specialist shall follow interruption coordination procedures to gain approval.

407-419. RESERVED.

SECTION 2. PROCEDURES FOR SCHEDULED FACILITY INTERRUPTIONS

420. INTRODUCTION.

This section provides guidance and requirements for scheduling, coordinating and the reporting of facility interruptions and their restoration activities. The appropriate air traffic operations facility manager (en route or terminal) is responsible for providing final approval of scheduled facility interruptions.

421. RISK MANAGEMENT.

Risk management techniques examine shutdown plans to identify risk to NAS services and mitigate much of the impact to the NAS user. Risk management techniques shall be used to determine the impact to the NAS when scheduling ATO maintenance activities.

422. SCHEDULING.

Scheduling of maintenance activities is necessary to provide enough lead-time to coordinate with and notify NAS users. NAS users such as air traffic controllers, airlines, and general aviation, depend on maintenance personnel to distribute NAS status and ensure aircraft and pilots are prepared to fly longer or fly without specific NAS systems.

a. General Practices. Maintenance and training should be accomplished, to the maximum extent practical, on the off-line equipment. If maintenance or training on the on-line operating equipment is necessary, it shall be coordinated as soon as the need is identified with the appropriate personnel (air traffic operations, control center, NFPO, military, etc.) and accomplished with minimum interference to facility operation.

b. Schedules for Recurring Maintenance Activities. The SMO Manager or designee shall develop a periodic shutdown schedule for publication. Schedules shall be coordinated in advance with the appropriate air traffic operations facility manager and control center. Schedules shall be distributed to the air traffic operations and maintenance managers. Deviations from an approved outage schedule shall be coordinated with the appropriate control center.

c. Schedules for Outages Managed by the Regional Shutdown Committee. Interruptions of long duration (typically 24 hours or greater), shall be coordinated through a regional shutdown committee.

d. Scheduling of All Other Interruptions. As-needed interruptions shall be coordinated in a timely manner. This includes interruptions for training, corrective maintenance, flight inspection, modifications, or momentary interruptions.

423. ADVANCE NOTIFICATION.

The appropriate air traffic operations personnel shall be notified by maintenance personnel not later than the day preceding a scheduled outage, (except in instances where circumstances prevent this amount of advance notice), to allow sufficient time for publication of a NOTAM, rerouting of air traffic, and other activities. Scheduled outages are to be advertised by NOTAM at least 5 hours in advance of the outage.

424. EMERGENCY INTERRUPTIONS.

An emergency interruption is one necessary to prevent catastrophic failure or damage to the facility. The air traffic operations facility manager shall be given as much advance notice as possible so that appropriate action can be taken. The responsible system specialist shall advise the appropriate control center, shut down the facility, and take appropriate follow-up action.

425. INTERRUPTION COORDINATION.

All requests to remove equipment from operation shall be coordinated with the appropriate air traffic operations facility manager. Interruptions that affect multiple Service Delivery Points (SDP) or require a NOTAM shall be coordinated through the appropriate control center. Interruptions that affect only a single SDP may be coordinated locally with air traffic operations personnel.

a. Requests for authority to remove equipment from service shall include the desired time of shutdown, probable duration, and reason.

(1) System specialists coordinating with local air traffic operations personnel shall obtain approval or justification for refusal.

(2) Control center personnel shall coordinate requests with air traffic operations personnel and all other appropriate entities, obtain approval or justification for refusal, and advise the requesting organization or the system specialist of the results.

b. The control center shall coordinate NOTAM information with air traffic operations personnel as required.

c. The control center shall notify the NFPO of the issuance or cancellation of any facility NOTAM that affects instrument flight procedures.

d. The system specialist should confirm the approval for the interruption with air traffic operations personnel or control center personnel immediately prior to the shutdown to ensure the approval status has not changed.

e. System specialists shall confirm that a NOTAM has been issued prior to removing any NAVAID from service if Hazardously Misleading Information (HMI) will be radiated. This may be accomplished by a variety of methods, including but not limited to calling the servicing AFSS, coordinating with control center or air traffic operations personnel, or monitoring the applicable Automatic Terminal Information System (ATIS). The system specialist shall document NOTAM confirmation by entering the NOTAM number or ATIS designation in the appropriate maintenance log.

f. Special coordination procedures with the military have been established for National Defense Program Systems (NDPS) and shall apply as appropriate.

426. INTERRUPTION APPROVAL REFUSED.

It is incumbent upon air traffic operations and maintenance personnel to maintain a spirit of cooperation regarding a scheduled

interruption. Further, an aggressive periodic maintenance schedule will do much to solidify this cooperation. However, in the event maintenance activities are seriously hampered by repeated refusal to approve interruptions, this shall be reported via official channels. The report shall contain all pertinent information with accurate documentation. Every effort shall be made at the local level to work out differences prior to submitting any problem of this nature to the next level for resolution.

427. RESTORATION AND REPORTING ACTIVITIES.

Upon completion of a scheduled interruption, proper notification shall be made to the appropriate control center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

428-429. RESERVED.

SECTION 3. PROCEDURES FOR SERVICE INTERRUPTIONS

430. INTRODUCTION.

This section provides guidance and requirements for scheduling, coordination and reporting of NAS service interruptions. Service interruptions can be either scheduled or unscheduled.

431. RISK MANAGEMENT.

Risk management techniques examine shutdown plans to identify risk to NAS services and mitigate much of the impact to

the NAS user. Risk assessment analysis techniques shall be used to determine the impact to the NAS when scheduling service interruptions.

432. INTERRUPTION COORDINATION.

a. Coordination is required for scheduled service interruptions of any length, whether caused by facility interruptions, or by other causes such as loss of telecommunications.

b. Requests for authority to interrupt service shall be directed to the appropriate control center and include the desired time of interruption, probable duration, and reason.

c. The control center shall coordinate the request with air traffic operations personnel and all other appropriate entities, obtain approval or justification for refusal, and advise the requesting organization or the system specialist of the results.

d. The control center shall initiate a NOTAM through air traffic operations if required.

e. The control center shall notify the NFPO of the issuance or cancellation of any facility NOTAM that affects instrument flight procedures.

f. System specialists shall confirm that a NOTAM has been issued prior to removing any NAVAID from service if HMI will be radiated. This may be accomplished by a variety of methods, including but not limited to calling the servicing AFSS, coordinating with control center or air traffic operations personnel, or monitoring the applicable ATIS. The system specialist shall document NOTAM confirmation by entering the NOTAM number or ATIS designation in the appropriate maintenance log.

d. Special coordination procedures with the military have been established for

National Defense Program Systems (NDPS) and shall apply as appropriate.

433. ADVANCE NOTIFICATION.

The appropriate air traffic operations facility manager shall be notified by the control center on the day preceding a scheduled service interruption, (except in instances where circumstances prevent this amount of advance notice), to allow sufficient time for activities such as planning, rerouting, and publishing.

434. RESTORATION AND REPORTING ACTIVITIES.

Upon restoration of a service, proper notification shall be made to the appropriate control center. The interruption shall be reported in accordance with Order 6040.15, National Airspace Performance Reporting System (NAPRS).

435-439. RESERVED.

SECTION 4. OTHER MAINTENANCE PROCEDURES

440. INTRODUCTION.

This section provides additional maintenance procedures required by system specialists.

441. ROUTINE MAINTENANCE.

During normal duties, maintenance personnel shall accomplish the following tasks:

a. Check the operational status of all equipment.

b. Inspect for overheating, leakage, loose hardware, poor electrical connections, worn mechanical parts, and accumulations of dirt, corrosion, rust, mildew, and fungus growth.

c. Report evidence of damage, sabotage, theft, or destruction as required, to the appropriate control center and your immediate supervisor.

d. Ensure that facilities and equipment present a clean, well-ordered professional appearance at all times. All equipment storage and workrooms shall be kept clean, and supplies and working equipment stored in a neat and orderly manner.

e. Lubricate all rotating and mechanical devices in accordance with manufacturer's schedules and instructions.

f. The cleaning and replacement of all air filters shall be in accordance with local conditions, giving special attention to the facility Asbestos Control Program.

442. FLIGHT INSPECTION PROCEDURES.

This information is general in nature and applicable to most facility types. Detailed maintenance information related to flight inspection of specific types of systems, subsystems, or equipment is found in the flight inspection chapter of the appropriate maintenance handbook(s). In addition, because the flight inspection of a system, subsystem, or equipment is a coordinated effort with Aviation System Standards (AVN) personnel, maintenance personnel shall familiarize themselves with detailed information as published in Order 8200.1, United States Standard Flight Inspection Manual.

a. Requesting a Flight Inspection. The control center shall coordinate the requests for Flight Inspections with the Flight Inspection Central Operations (FICO) office. Special flight inspections may require additional coordination directly with the System Specialists to provide the technical information necessary to process the request.

b. Maintenance Performed before Flight Inspection. If time permits, the system, subsystem, or equipment may be ground checked to be sure there have been no undesirable changes. When two sets of equipment are available and prior approval of an outage can be obtained, the equipment may be checked to determine the possible need for non-routine maintenance. However, maintenance resulting in a delay or postponement of the flight inspection shall not be performed unless it is absolutely necessary. On such occasions, maintenance personnel should use the control center to coordinate the delay with flight inspection scheduling personnel, and with the local aircrew if already on site. Proper coordination will allow flight inspection personnel to accommodate the delay and use their time to flight inspect other facilities. On such occasions, maintenance personnel should discuss the issue with flight inspection scheduling personnel, who may find it possible to accommodate the delay and use the time in flight inspecting other facilities.

c. Flight Inspection Activities. System specialists at the facility during flight inspection shall be prepared to correct any observed discrepancy immediately, when possible, as discussed in Order 8200.1.

(1) Discrepancies corrected during flight inspection will be included in the flight inspection report. When it is impossible to correct a discrepancy while the flight inspection is in progress, maintenance

personnel shall inform flight inspection personnel and take action to correct the discrepancy as soon as possible. Immediately following correction, another flight inspection shall be requested if appropriate. A report of the discrepancies noted during the flight inspection shall be submitted to the immediate maintenance supervisor.

(2) Occasionally it is necessary to make equipment adjustments that may appear to be abnormal on the basis of previous operational adjustments, or that may exceed tolerances. The need for such adjustments may be due to maladjustment elsewhere in the ground equipment, a change in terrain or multi-path environments, defective airborne equipment, radio frequency interference, or other factors.

(a) ATO personnel shall observe equipment performance during the flight inspection and be aware when tolerances are being exceeded or abnormal adjustments are required to satisfy flight inspection.

(b) If measurements made with approved test equipment do not agree with the measurements reported by flight inspection personnel, the flight inspection personnel should be advised and requested to repeat their measurements. If reasonable agreement cannot be attained, the flight inspection measurements shall govern, and a report of the discrepancy shall be submitted to the immediate maintenance supervisor.

(3) When it is necessary to exceed equipment tolerances to meet flight inspection requirements, the maintenance supervisor shall be notified immediately. The supervisor shall determine whether the variance is sufficiently severe to require immediate investigation or whether the investigation can be deferred. If this determination cannot be made prior to departure of the flight inspection aircraft, the system, subsystem, or equipment may remain in service, provided the following:

(a) The performance stability has not been impaired to the extent that operation will be unreliable.

(b) Flight inspection personnel concur in the continued operation.

(c) The maximum rating or manufacturers specification; e.g., power output, temperature, etc. of equipment is not exceeded.

d. Post-Flight Inspection Actions. During or upon completion of the flight inspection, maintenance personnel shall accomplish the following actions:

(1) Record meter readings or other data affected by adjustment, correction, or equipment change, if accomplished during the flight inspection.

(2) Make available to flight inspection personnel all pertinent system, subsystem, and equipment parameters needed to complete the flight inspection report, such as transmitter power, or receiver sensitivity.

(3) Discuss with flight inspection personnel any problems encountered during the flight inspection.

(4) Notify the appropriate control center of unexpected results in the status of the facility or its procedural uses.

e. Readjustment of System Monitor(s) Following Flight Inspection. Order 8200.1 provides that during periodic and certain special flight inspections, flight inspectors will not request adjustment to a facility that is operating within prescribed tolerances. However, operation within prescribed flight inspection tolerances does not imply that the facility parameters are at the center of their allowable range. Therefore, it is very important that maintenance personnel avoid re-centering the system monitor(s) or establishing revised references based on normal parameters found acceptable by flight

inspection but not necessarily at their optimum values. This will prevent unwarranted "following" of facility parameters.

443. AIRCRAFT REPORTED NAVIGATIONAL AID MALFUNCTIONS.

When a report of a navigational aid facility malfunction is received from an aircraft, air traffic operations personnel will request a check from a second aircraft. If air traffic operations personnel cannot obtain a report from a second aircraft within a reasonable time period, maintenance personnel shall initiate action to investigate the pilot report. If the second aircraft reports normal operation, the incident is recorded by air traffic operations personnel with no maintenance action required. If the second aircraft confirms the malfunction, the following steps should be taken:

a. Standby Equipment Available.

(1) Air traffic operations personnel will select standby equipment.

(2) If operation is reported normal on standby equipment, operation is continued and air traffic operations personnel will notify maintenance personnel.

(3) Should the malfunction continue or if the standby equipment cannot be selected, treat the reports as if the standby equipment is not available.

b. No Standby Equipment Available.

Air traffic operations or maintenance personnel shall immediately request a NOTAM removing the potentially suspect navigational aid from operation until one of the following is completed:

(1) A flight inspection can validate proper operation.

(2) The three following maintenance actions are accomplished.

(a) Inspect the ground equipment, perform a standard ground check (if applicable), and correct the fault if one exists.

(b) Certify the appropriate system, subsystem or service. If necessary, request a restoration flight inspection in accordance with the maintenance handbook.

(c) Notify air traffic operations personnel using the appropriate control center of all pertinent facts concerning restoration and make the appropriate entries in the maintenance log.

c. Priority. Maintenance activities shall be prioritized in accordance with the assigned restoration strategy for the particular system, subsystem, or service involved.

444. RADIO FREQUENCY INTERFERENCE.

Maintenance personnel shall notify the appropriate control center who will notify the appropriate regional Frequency Management Office if radio frequency interference (RFI) is suspected.

445. MOISTURE-PROOFING RADIO FREQUENCY CABLE CONNECTIONS.

Facility outages have been attributed to moisture accumulation in outside, unsheltered coaxial cable connectors. Inspection of cable connectors as a preventive measure is an annual requirement. The following information is provided as guidance in moisture-proofing these connectors. The material and technique used should be based on the need for permanency and the particular situation.

a. Preliminary. The connectors shall be free of internal moisture and the adhering surfaces shall be dry and free of dirt, grease, oil, or any other substance that could affect adhesion. Prior to mating connectors they should be cleaned with alcohol to ensure that all moisture has evaporated.

b. Semi-Permanent Connections. These materials and techniques offer a reasonable compromise between cost effectiveness and the need for later accessibility to the treated connection.

(1) Tape only. The use of electrical tape only is satisfactory except where moisture and humidity is high. Two layers of tape should be applied. The wrapping should extend 2 to 3 inches on both sides of the connector, and the wrapping should start at the bottom for both layers if the connection is in a vertical run. Use the proper tape for the local prevailing climate.

(2) Tape and Non-silicone Compound. Having taped the connection as in step (1), additional moisture proofing will result with an application of an appropriate spray-on or a brushed-on sealer. Silicone rubber compounds are not recommended for semipermanent-type connections because the silicone is difficult to remove. Failure to remove the entire silicone compound results in poor adhesion of tape when it is necessary to reseal the connection.

c. Permanent Connections. The following techniques and materials may be employed where access to the connector will probably not be required or where the connection is subjected to excessive moisture.

(1) Sealant. One of the most effective ways of preventing the entry of moisture is to encapsulate the connection with one of several products, which seal against water,

yet are easily stripped if repair is ever required.

(2) Heat-shrinkable Tubing. Either thin-wall or thick-wall shrinkable tubing may be applied. The thin-wall type has a shrink ratio of about 2 to 1, while thick wall types have a shrink ratio of about 3 to 1. The thick-wall types are available with a factory-applied sealant that will soften and flow around irregularly shaped surfaces. Heat can be applied with a heat gun.

(3) Tape and Glyptal. Connections may be moisture proofed by application of one layer of rubber electrical tape followed by two layers of friction tape. This wrapping should then be covered with black Glyptal electrical varnish, applied with a brush. Reference 29 CFR 1910.1200 Hazard Communication (Workers Right to Know).

446. SHIPMENT OF EQUIPMENT.

ATO personnel shall pack, mark, and ship equipment according to the following guidelines:

a. Preparation and Packing. Modification kits on hand shall be installed before equipment is packaged and transferred to another location or depot. Equipment shall be packed such that it will not be damaged in transit. The equipment should be checked for heavy components, such as transformers or motors, that may need additional bracing or support to avoid damage in the event the container is dropped during handling. In some cases, it may be necessary to remove such items and pack them separately. Transformers, capacitors and other equipment may contain Polychlorinated Biphenyl's (PCBs) and require special shipping and handling procedures contained in Order 1050.14, Polychlorinated Biphenyl's in the National Airspace System.

b. Items to be Included. The following items shall be included as appropriate with equipment being shipped:

(1) Documentation (Instruction books, modification and other records.)

(2) Spare parts, cables, and accessory items furnished with the equipment.

(3) Any parts or assemblies removed for reasons other than an agency-wide modification; e.g., any item removed to satisfy conditions unique to one facility but that may be needed if the equipment should be installed at another facility.

c. Packing List. Each individual shipping container, or one container of each shipment, shall contain a packing list showing in detail a complete description and quantities of each item in the shipment. When the packing list is enclosed in one container of the group, that container shall be clearly marked "PACKING LIST INSIDE." It is also permissible to place the packing list in a heavy envelope marked "PACKING LIST," and securely fasten it to one of the containers.

d. Marking. Each shipping container shall be marked to allow identification of contents without unpacking.

447-499. RESERVED.

CHAPTER 5. CERTIFICATION

500. INTRODUCTION.

This chapter establishes FAA requirements for certification of systems, subsystems, and NAS infrastructure services provided to users of the NAS.

501. PHILOSOPHY.

Certification is the determination and validation that a system, subsystem, or service is providing or is capable of providing the advertised service to the user. Certification includes an independent determination, which ascertains the quality of advertised services, and a validation, which officially confirms and documents the determination in the maintenance log.

a. Certification is used to determine when a system, subsystem, or service should be continued in, restored to, or removed from service.

b. Certification is performed on periodic and specific occasions, as defined in paragraph 503.

c. The process of performing a certification includes the insertion of the prescribed certification statement in the maintenance log.

d. A system, subsystem, or service remains certified unless its certification is retracted or expires.

502. CERTIFICATION RESPONSIBILITIES.

a. The key to the certification program is the part played by the system specialist whose qualifications have been demonstrated by:

(1) Satisfactorily completing the ATO Maintenance Personnel Certification Program.

(2) Maintaining sufficient theoretical and practical knowledge.

(3) Using their professional capacity for independent judgment.

(4) The performance of responsible actions.

b. Personnel with specific written certification authority and responsibility on the subject facility shall perform certification. Certification authority credentials are established in Order 3400.3, Airways Facilities Maintenance Personnel Certification Program. Personnel without certification authority may perform maintenance and logging duties. These activities shall either be confined to non-certification parameters or followed with the appropriate certification by a fully qualified system specialist.

503. CERTIFICATION ACCOMPLISHMENT.

a. System, subsystem, and service certification shall be made prior to commissioning, periodically thereafter, upon request following aircraft accident/incidents, and as part of the restoration process after the following:

(1) An interruption or outage caused by or affecting a certification parameter. Re-certification is not required when a facility with internal monitoring and auto-reset or operator-initiated reset returns to service, and no other action other than the reset was taken.

(2) The removal of certification due to system degradation.

(3) The maximum certification interval has been exceeded.

(4) Any maintenance activity affecting a certification parameter.

b. The certification statement made in the log shall contain only one of the following:

(1) Prescribed certification statement from the maintenance handbook. Some handbooks require site-specific variables to be included in the certification statement; e.g., “Local transmitter (identity of frequency) (main and/or standby) certified” should be entered as “Local transmitter 123.4 Mhz main certified”.

(2) Prescribed certification statement and identification or removal of exceptions.

(3) Prescribed certification statement incorporating multiple certifications; e.g. certifying multiple receivers with one certification statement.

504. CERTIFICATION CRITERIA.

All required certifications shall be listed in Appendix 3, Systems, Subsystems, and Services Requiring Certification. The following rules shall be used by the appropriate national organization to determine which systems, subsystems, and services require certification.

a. FAA NAS systems, subsystems, and services directly affecting the flying public shall be certified when they do any of the following:

(1) Provide moment-by-moment positional information to pilots or air traffic operations personnel during aircraft operations.

(2) Provide necessary communication or communication control among pilots and air traffic operations personnel during the above aircraft operations.

(3) Provide decision support information that directly affects aircraft heading, altitude, routing, control, or conflict awareness.

(4) Provide essential meteorological information for takeoff and landing aircraft at airports.

(5) Provide short term, long term, continuous, and conditioned power to NAS systems requiring certification at a Service Delivery Point (SDP). Figure 5-1 depicts the elements necessary to require certification. These terms are characterized as follows:

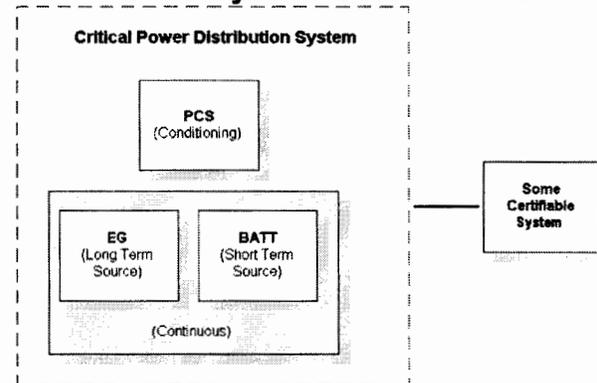
(a) Short term power source; e.g., batteries, or flywheel capable of carrying the load during the transfer.

(b) Long term power source; e.g., an engine generator, or fuel cell.

(c) Continuous indicates capability for transparent transfer between power sources; e.g., an automatic transfer switch.

(d) Conditioned power; e.g., voltage regulation and filtering of the waveform.

Figure 5-1 Elements Required for Power System Certification.



b. Certification is not required for weather systems of an advisory nature, supportive facilities, and intermediate facilities. This includes systems used exclusively for maintenance support activities at control centers.

(1) Examples of weather systems of an advisory nature are the Next Generation Weather Radar (NEXRAD), and the Weather and Radar Processing (WARP) system.

(2) Examples of supportive facilities are Local Area Networks (LAN) or power systems not at an SDP.

(3) Examples of intermediate facilities are:

(a) Radio communications links (RCL).

(b) Television microwave links (TML).

(c) Data multiplex (DMUX).

(d) Bandwidth manager (BWM).

505. SERVICE CERTIFICATION.

a. A service is an intangible functional benefit provided by individual systems and/or subsystems working together. NAS infrastructure services listed in Appendix 3 shall be certified.

b. Service certification is based upon several fundamental characteristics of NAS service such as:

(1) Constituent systems and subsystems are certified.

(2) Indications on monitor and control consoles are normal.

(3) Customer activity reports contain no complaints.

c. Appendix 3 shows the hierarchical relationship between facilities; i.e., systems and subsystems and the associated NAS service they provide.

d. Service certifications shall be entered against the FSEP entity matching the service acronym, if available. If there is no matching FSEP acronym, the service certification shall be entered against the service delivery point in the FSEP.

506. BASIS OF CERTIFICATION.

a. The basis of certification is the determination that the system or subsystem is providing (or capable of providing; e.g., standby equipment), the advertised service to the user.

b. Some NAS systems contain user controls that will allow a certification parameter to be adjusted beyond its tolerance or limit. Such adjustments shall not void the certification.

507. GENERAL CERTIFICATION TECHNIQUES.

a. The FAA has identified systems requiring certification and the certification parameters on those systems, but the choice of methods used for certification determination is left to the professional judgment of the certifying system specialist. The system specialist may use one, several, or a combination of various methods to determine that a system is providing the advertised user service.

b. Generally, performance of the prescribed system periodic maintenance tasks will provide the necessary information for certification determination. Dependent on the system, there are any number of methods available to provide a basis for a certification determination. Frequently used methods include:

(1) Observation of equipment providing the advertised services in the operating environment.

(2) Direct measurement of certification parameters. Values approved by NCP shall be used in place of directive values.

(3) Monitor indications. These should include the satisfactory operation of both the control and remote indications.

(4) By recording and analysis of required information on technical performance record forms (FAA Form 6000 series).

(5) By performing a comparative analysis of flight inspection data with previous results.

(6) Visual and aural observations, such as meter readings, radar display, pilot instrument indications, and absence of extraneous noises, excessive heat, or questionable odors.

(7) User (pilot) report of satisfactory operation as with a voice communication check on Remote Center Air Ground (RCAG) equipment.

(8) By the completion of local or remotely conducted hardware or software diagnostic tests, where that capability exists.

508. REMOTE CERTIFICATION.

Systems and services may be certified via remote maintenance monitoring (RMM) when the capability to remotely verify system certification parameters is available.

a. If a Remote Monitoring System (RMS) is used as a substitute for calibrated test equipment to provide data for certification, the following requirements shall be met:

(1) The RMS shall be calibrated or verified at least annually to achieve accuracy appropriate to the measured parameter's tolerance.

(2) Verification of RMS accuracy may be accomplished through comparison to the equivalent calibrated test equipment. When this method is used as a transfer standard, RMS accuracy requirements shall be defined in the applicable equipment handbook.

(3) The RMS data accuracy shall be verified through the operating range specified

under standards and tolerances in the applicable equipment handbook.

b. When RMS equipment is impaired, the certifying system specialist must be confident that the impairment does not affect the certification process. If it does, the RMS capability cannot be used for remote certifications.

509. DECERTIFICATION.

Decertification is the official determination that a service or system is not capable of providing its advertised service(s) by credentialed personnel.

a. Decertification shall be performed only when the following conditions are met:

(1) A system, subsystem, or service normally requires certification.

(2) The system, subsystem, or service according to the judgment of the certifying ATSS, does not meet published certification requirements.

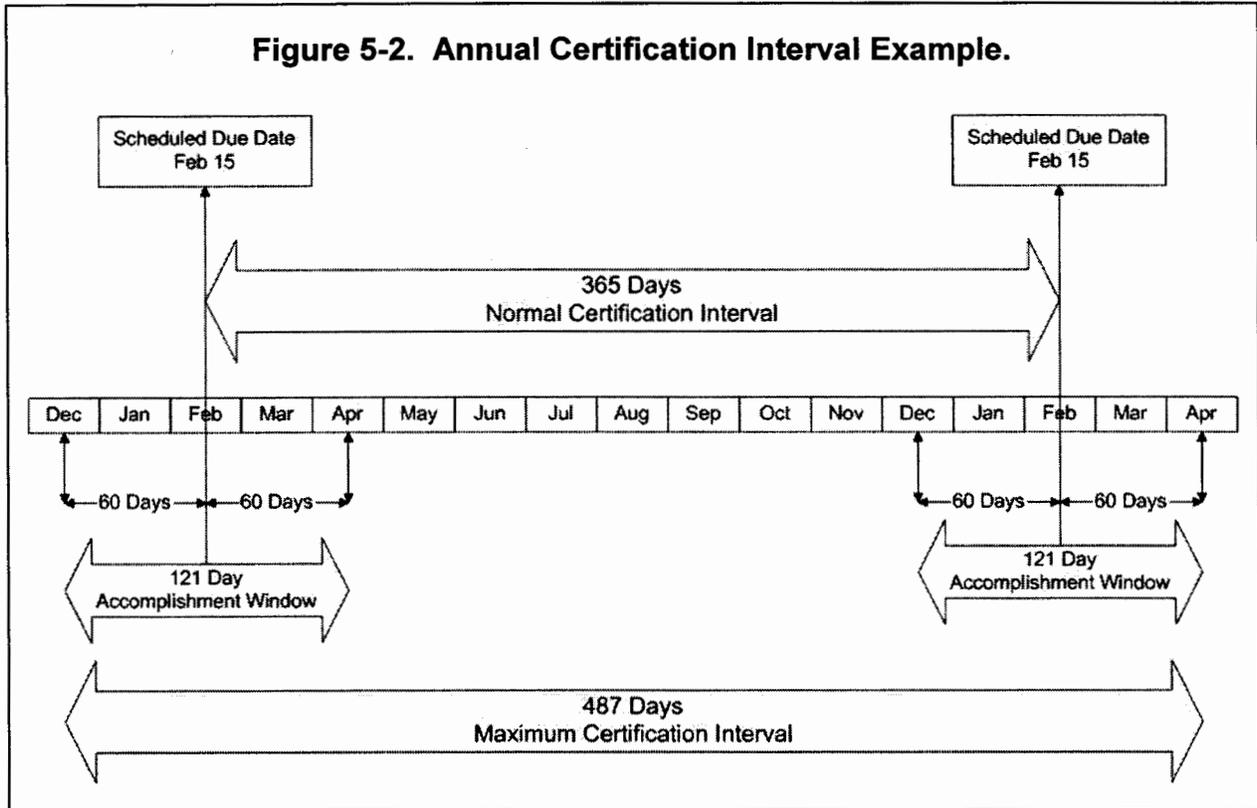
b. Decertification shall not be performed for the following purposes:

(1) To log the expiration of a certification, i.e., when the maximum certification interval is exceeded.

(2) To document a failure, outage, or interruption.

c. Decertification shall be documented in the applicable maintenance log.

d. Decertification does not necessarily require an interruption of the related system or subsystem. See paragraph 402 for decertification procedures.



510. CERTIFICATION WITH EXCEPTION.

a. A service or system may be unable to satisfy all certification parameters or provide all advertised services. In this event, a certification with exception is permitted. The certification statement shall identify the specific certification parameter or advertised service to be excluded.

Examples: ASR certified except WX; RCAG transmitter 123.4 main certified except transmitter power output.

b. The issuance of a certification with exception does not necessarily require an interruption of the system, subsystem, or equipment.

c. Certification with exceptions shall not be performed to document a partial failure, outage, or interruption.

d. A corresponding certification log entry shall be made when the full service is restored.

e. Facilities that are designed to automatically downgrade to another level of service; e.g., second generation Tactical Air Navigation (TACAN), ARTS-III, Mode-S, and some visual navigational aids, do not require an exception.

511. FREQUENCY OF CERTIFICATION.

Periodic certification is performed at a frequency published in the maintenance handbook.

a. The Maximum Certification Interval (MCI) is that beyond which reliable system performance can no longer be assured without verification. Standardized MCIs are defined in Figure 5-3.

b. A certification is valid until the maximum certification interval is exceeded.

c. Certifications shall be scheduled for routine accomplishment at the normal interval.

d. The PM scheduler tool may be used to manage the accomplishment of certifications, even though the scheduling policies for PMs and certifications are different. To facilitate this use without the risk of exceeding the maximum interval, the maximum certification interval is defined to be the normal certification interval plus the length of a PM on-time accomplishment window. This relationship is depicted in Figure 5-2.

512. EXPIRATION OF MAXIMUM CERTIFICATION INTERVAL.

a. Maximum effort shall be made to certify a system before the expiration of the maximum certification interval. This effort may include early certification to move the next interval to a more favorable timeframe, use of the wide range of methods for certification determination as described in paragraph 507b, or use of personnel from outside the work center, etc.

b. If a certification maximum interval is exceeded, the certification is no longer valid. Certification shall be immediately performed. If certification cannot be accomplished the following actions shall be taken:

(1) Notify the appropriate control center. Air traffic operations personnel may elect to continue using the facility if it is not a navigational facility.

(2) Ensure a NOTAM is issued for systems providing a direct service to the flying public, stating: "(subject of the NOTAM) may be unreliable."

(3) Make an entry in the maintenance log noting the maximum certification interval has been exceeded.

(4) Notify the division at the regional office.

Figure 5-3. Standardized Maximum Certification Intervals.

Normal Certification Interval	Maximum Certification Interval
Daily	System Specific
Weekly	14 Days
Bi-Weekly	22 Days
Monthly	46 Days
Quarterly	123 Days
Tri-Annual	155 Days
Semi-Annual	245 Days
Annual	487 Days

513. CERTIFICATION ACCOMPLISHMENT TRACKING.

The SMO shall track the accomplishment of certifications to ensure they are completed before their maximum certification interval is reached. The SMO manager or designee shall review the tracking at least quarterly.

514. CERTIFICATION OF PROTOTYPES.

New systems, subsystems, and services, are continually added to the facility population in the NAS. Each of these will be included in Appendix 3, Systems, Subsystems, and Services Requiring Certification if their functionality meets the certification criteria of paragraph 504. Certification shall be required prior to operational use.

a. New or prototype systems occasionally require a lengthy test and evaluation involving control of live air traffic before commissioning.

(1) A new or prototype system used in this manner shall be certified based on interim certification requirements if these requirements have not yet been published in the applicable maintenance handbook.

b. It is the responsibility of the sponsoring requirements organization to coordinate the establishment of any certification requirements with the Technical Operations Services for new or prototype systems at least 90 days prior to planned operational use.

c. If a prototype system must be altered in a way that materially affects certification parameters, certification requirements shall be re-coordinated with the Technical Operations Services. Otherwise it shall not be certified.

d. Requests for certification analysis can be initiated by any organization sponsoring a system in the NAS. Instructions for initiating certification analysis are published on the certification website at <http://intranet.faa.gov/ats/aaf/aop/300/certification/>.

515. CERTIFICATION REQUIREMENT ANALYSIS.

a. Certification requirements shall be issued by the Director of Technical Operations for ATO prior to operational use, and fully coordinated with the appropriate maintenance operations support

organizations in the headquarters and regional offices of concern. Certification requirements are published in the applicable maintenance handbook.

b. Certification requirements shall be based on the intended operational functionality and consist of the following components:

(1) Advertised services that are subjective capabilities provided to the user. Advertised services are the primary focus of certification judgments.

(2) Certification parameters that closely correspond to the advertised service. Certification parameters are one way of measuring an advertised service.

(3) References to the maintenance handbook standards and tolerances for each certification parameter.

(4) Interval frequency of the required certification.

(5) Appropriate syntax of the required certification statement.

516-599. RESERVED.

CHAPTER 6. PROTECTION OF AGENCY PROPERTY AND PERSONNEL

SECTION 1. SAFETY HAZARDS

600. INTRODUCTION.

This section provides guidance on FAA directives in the 3900 series and other FAA safety alert directives discussing personnel safety at FAA facilities. Many of these directives contain precautions regarding personnel safety and identification of hazards in the workplace.

601. USE OF FIRE EXTINGUISHER.

A CO₂ fire extinguisher shall be maintained, inspected, and used in combating electronic fires in accordance with 29 CFR 1910.157, Portable Fire Suppression Equipment, Order 6930.1, Fire Prevention and Maintenance of Fire Protection Equipment, and Order 3900.19.

602. MACHINERY AND TOOLS.

a. Gloves, ties, and loose clothing shall not be worn around moving machinery.

b. Tools should be kept clean and in good working condition.

c. Bench grinders, drill presses, vises, and other similar tools should be bolted to the workbench and be guarded as required by 29 CFR 1910.211-.219.

d. Always wear goggles when hazards to the eyes are present.

e. Avoid cleaning, adjusting, or lubricating machinery while it is in operation.

f. Before any repairs are undertaken, open all electrical switches controlling the equipment, and tag and lock them to prevent accidental closing.

603. FALL PROTECTION/WORKING ON ELEVATED STRUCTURES.

Employees shall use fall restraint devices and exercise extreme caution when work is to be performed 4 feet or more above the normal walking level. Fall protection systems include railings, perimeter lines, nets, spotters, and fall arrest systems. At some locations, ice is a special hazard. Not only is climbing dangerous when ice is present, but there is also the very real hazard of ice falling from elevated structures because of wind or thawing conditions.

604. WORKING IN CONFINED SPACE.

Personnel planning entry into or working in confined spaces shall follow the provisions of the confined space entry program at their sites in accordance with Order 3900.19.

605. HAZARDOUS ENERGY CONTROL (LOCKOUT/TAGOUT PROCEDURES).

a. Prior to servicing or maintaining equipment where unexpected energizing, start-up, or release of stored energy (e.g., electrical, heat, mechanical (movement or hydraulic), chemical (potential or stored), and radiation) could occur, the equipment shall be isolated and rendered inoperable through the use of a lockout device. If this is not possible, then a tag-out device shall be used.

b. Personnel authorized and designated to perform maintenance on energized equipment shall receive training on recognition, determination, safe approach distances, and safety practices specific to the hazard as identified in 29 CFR 1910.147 and Subpart S (1910.331). Such employees shall use appropriate tools and personal protective equipment.

606. ELECTRICAL SHOCK HAZARDS.

Personnel shall exercise extreme care while working on equipment, particularly where dangerous high voltages or high currents exist. Contact with A.C., D.C., or RF potentials can result in severe shocks, burns, or loss of life.

a. Particular attention shall be given to the proper methods of measuring electrical energy potential prior to working around stored energy devices or high-voltage circuits.

b. Approved lockout/tagout procedures or hot work permits shall be used when personnel must work on equipment with hazardous energy.

c. A grounding stick shall be used to discharge dangerous stored electrical energy.

d. The wearing of jewelry, e.g. watches, rings, or bracelets, is not recommended. Reference Order 3900.19, Occupational Safety and Health Program.

607. ELECTROSTATIC DISCHARGE (ESD).

Semiconductor devices can be damaged by electrostatic discharges (ESD). Proper ESD procedures shall be employed to discharge energy before handling semiconductors. The following guidelines describe an ESD prevention method that is consistent with the

intent of proper handling and protection of ESD sensitive components.

a. Assume that all circuit packs containing electronic (solid-state) components can be damaged by ESD.

b. When handling circuit packs (storing, inserting, and removing), always use the appropriate grounding procedure: either a wrist strap connected to ground or, when standing, a heel strap with a grounded dissipative floor mat. Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.

c. Observe warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic bags or cartons until ready to insert into operation. Open all circuit packs at a static-safe work position with wrist straps and dissipative tablemats.

d. Always store and transport circuit packs in antistatic packaging. Shielding is not required.

e. Keep all static-generating materials, such as food wrappers, plastics, and Styrofoam containers, away from all circuit packs.

f. Upon removal from storage, immediately put circuit packs into antistatic packages.

g. Whenever possible, maintain relative humidity above the 20-percent level.

h. Some anti-static bags are conductive. Care should be taken to prevent accidental shorts between the bag and current carrying circuits.

608. EQUIPMENT POWER CONNECTIONS.

Particular attention should be given to power circuits of equipment designed for use with multiple input voltages. The wiring diagram, rather than the color coding of the equipment's internal wiring, should be checked when connecting or servicing equipment.

609. EQUIPMENT INTERLOCKS.

DO NOT DEPEND ON INTERLOCK SWITCHES TO REMOVE HAZARDOUS VOLTAGES. Interlocks are not a substitute for proper lockout/tagout procedures. After lockout, always verify de-energization as directed in the Safety approved lockout/tagout procedure. Always touch circuits with the grounding stick before touching them with the hands or body. Access gate, door, or safety interlock switches shall not be removed, short circuited, or tampered with in any way, except by an authorized system specialist.

610. INTEGRATED CIRCUIT PRECAUTIONS.

External grounds and A.C. lines shall be disconnected to eliminate ground-return paths before touching semiconductor device terminals with hand tools or soldering tools. Do not test any semiconductor device without carefully observing input/output limitations and polarity.

611. HEAT SINKS.

Where heat sinks are used, it is important to recognize and avoid certain maintenance activities that could result in damage to the equipment or present a shock hazard to the maintenance person. Do not block or

restrict the convection airflow over the heat sink, and recognize that the heat sink may not be at chassis ground potential.

612. HEAT DAMAGE TO PRINTED CIRCUIT BOARDS.

Caution should be exercised to prevent heat damage to printed circuit boards caused by the overheating of board mounted components.

613. GROUNDING PORTABLE EQUIPMENT.

All portable test equipment and electric tools shall be grounded before use. The only exceptions are for test equipment measurements that must be isolated from ground, or electric hand tools that are classified as being double insulated and approved for use without a grounding type A.C. plug. Adapters for connecting grounding type A.C. plugs to non-grounding type ac receptacles shall be used with caution.

614. RADIATION HAZARDS.

High power transmitters used in surveillance and communications systems, subsystems, and equipment may present radiation hazards to maintenance personnel, if precautions are not followed. Hazards include both ionizing radiation and non-ionizing radiation.

a. Work on equipment capable of producing radiation shall be scheduled when the equipment can be de-energized. If this is not possible, monitoring should be conducted to ensure exposure does not exceed recommended levels as found in 29 CFR 1910.97 for non-ionizing radiation and 29 CFR 1910.1096 for ionizing radiation including dosimetry monitoring.

b. Order 6050.32, Spectrum Management Regulations and Procedures Manual, provides procedures and criteria for the evaluation and control of radiation in the occupational environment, identifies specific hazards, and describes precautions which shall be observed by FAA personnel.

615. HAZARD COMMUNICATION / MATERIAL SAFETY DATA SHEETS.

The Hazards Communication Program communicates hazard information to employees about hazardous chemicals in the workplace through labels, Material Safety Data Sheets (MSDS), and training. The intention is that employees should always be aware of potential chemical hazards in the workplace. Prior to handling any hazardous chemical, personnel shall review the MSDS. The MSDS contains the following information:

- a. The chemical and common names of all ingredients, which have been determined to be health hazards.
- b. Physical and chemical characteristics of the hazardous chemical.
- c. Physical hazards of the hazardous chemical.
- d. Health hazards of the hazardous chemical and primary routes of entry.
- e. Permissible exposure limits of the hazardous chemical.
- f. Whether the hazardous chemical is a known or suspected carcinogen.
- g. Any applicable precautions for safe handling of the hazardous chemical.
- h. Any applicable control measure for the hazardous chemical.
- i. Emergency and first aid procedures for the hazardous chemical.

j. The date of preparation of the MSDS.

k. Name, address and telephone number of the chemical manufacturer.

616. ASBESTOS CONTROL.

Many facilities were constructed during the period of extensive asbestos use. As NAS facilities are modernized, asbestos containing materials (ACM), or presumed asbestos containing materials (PACM) may be encountered and disturbed during renovation and demolition process. Refer to Order 3900.19B, FAA Occupational Safety and Health Program, for policy on the management of ACM/PACM in FAA facilities. Additional guidance can be found in Order 1050.20, Airway Facilities Asbestos Control Program.

617. SILVER SOLDER.

Cadmium Oxide fumes are a by-product of using hard solders; e.g., when brazing air-conditioner refrigerant lines.

- a. When cadmium containing silver brazing alloy is heated appreciably above its melting point, acutely poisonous brown or yellow cadmium oxide fumes are released.
- b. Inhalation of cadmium oxide fumes, even short exposures to high concentrations, can result in serious and sometimes fatal injury.
- c. Precaution should be taken to ensure adequate ventilation is available whenever any silver solder is used. Where adequate ventilation cannot be supplied, respirators shall be used to effectively prevent serious exposure to the cadmium oxide fumes.

618. CLEANING SOLVENTS.

Only solvents approved by local FAA safety personnel shall be used. FAA safety personnel shall consider conditions of use, ventilation, and methods of storage when evaluating usage requests. Whenever any solvents or cleaners are used, the following guidelines apply:

a. Adequate ventilation shall be provided.

b. Care should be used in cleaning equipment with solvents, especially where the temperature of the air or parts being cleaned is in excess of 100° F (38° C).

c. Solvents shall be stored in safety cans or approved storage cabinets.

d. Isopropyl alcohol is a recommended cleaning substitute where circuit elements involve rubber terminal seals. Trichlorethylene has been identified as the cause of multiple printed-circuit board capacitor failures, because it affected rubber seals on the capacitors. Reference 29 CFR 1910.1200 Hazard Communication (Workers Right to Know).

e. Contact environmental and safety staff for disposal and respiratory requirements.

619. BATTERY SAFETY, LEAD DUST, ACID SPILLS, BURNS, AND EXPLOSION HAZARDS.

System specialists are required to inspect, evaluate, and maintain several types of storage batteries. Knowledge of batteries and needed safety precautions will protect the system specialist from hazards or further injury should an accident occur. Specific guidance on batteries is located in Order 6980.25, Maintenance of Batteries for Standby Power.

a. **Battery Hazards.** Some hazards to be considered when handling batteries include:

(1) Improper lifting procedures will cause muscle strains. Improper lifting procedures could cause muscle strains and foot injuries. When batteries are located where proper procedures cannot be followed or are too heavy, either a mechanical lifting device should be used or two people should make the lift. When large stationary batteries are being moved or installed, non-conducting safety toed shoes should be worn.

(2) Many batteries contain a liquid solution, which means that the center of balance can change. If a person's grasp on the battery is not secure, the battery can slip from their hands. A battery should be carried with an insulated battery strap or a battery cradle. The battery strap attaches to the battery terminals to form a handle for carrying. The battery cradle encases the battery with insulated netting material or is a platform with a handle for carrying.

(3) Battery fumes may be harmful to personnel because of:

(a) The hazards of breathing the fumes themselves.

(b) The lack of oxygen displaced by fumes.

(c) Explosion hazard.

(4) Splashes may occur when pouring prepared electrolyte into batteries, mixing electrolyte, checking the electrolyte levels, or charging batteries.

b. Industrial Batteries. Industrial batteries, such as those used in heavy equipment or power conditioning systems, weigh several hundred pounds. A mechanical lifting device should always be used for moving industrial batteries. Handling batteries of this size should not be attempted without proper equipment and operational knowledge. Some mechanical lifting devices are:

- (1) Chain hoists.
- (2) Overhead cranes.
- (3) Forklifts.

c. Lead-Acid Batteries. Batteries such as lead-acid batteries contain an electrolyte, which is a mixture of sulfuric acid and water. This acid solution is corrosive to certain metals, will destroy clothing, and can cause severe burns or blindness. Batteries of this type are designed to be used in a level or near-level position. These batteries are equipped with vent caps that allow hydrogen gas to escape while preventing the electrolyte from splashing out. The caps will allow some tilting of the battery; however, prolonged tilting or inversion of the battery will allow the electrolyte to leak. When carrying a battery-containing electrolyte, use a battery strap or cradle. Dripping electrolyte on clothing will destroy most fabrics, if the solution is not neutralized immediately after the spill. Reference material safety data sheets on batteries for proper protective equipment. Using any of the following solutions can neutralize the electrolyte:

(1) Bicarbonate of Soda. Bicarbonate of soda mixed with water can be used to rinse the area of an acid spill.

(2) Soda Ash. The soda solution will neutralize the corrosive effects of the sulfuric acid.

NOTE: Skin contact with acid should be flushed and cleaned with soap and water, or bicarbonate of soda and soda ash if soap and water are not available.

(3) Caustic Soda. Caustic soda will neutralize the acid, but it can cause skin burns. Caustic soda should be used with extreme care, ensuring that the solution does not come in contact with the skin or eyes.

d. Acid Burns. Acid burns to the skin should be treated immediately. A physician should inspect the area as soon as possible for damages which may not be apparent. Remove clothing on which the acid solution has been spilled. Remember that chemical burns to the skin will occur if the electrolyte is allowed to remain in contact with the skin.

e. First Aid. There may be occasions when a system specialist will have to mix electrolyte. Before mixing this acid solution, the Specialist should know where the first aid equipment is located, how to administer first aid to oneself or to fellow workers, and the nearest source of running water or a sealed container of eyewash. Splashing electrolyte acid into the eyes requires immediate first aid. Should this occur, flush the eyes with running water, and see a physician as soon as possible. Do not apply neutralizing agents or salves to the eyes, or do not rub the eyes.

NOTE: Damage to the eyes by acid solutions can cause blindness. Rubbing the eyes or applying salves or neutralizing agents can cause further damage. Flush the eyes with an approved eyewash system. All FAA battery work areas shall be equipped with eyewash systems in accordance with 29 CFR 1910.151.

f. Protective Equipment. The best protection against chemical burns when working with electrolyte is protective clothing. Protective equipment, such as splash proof goggles, face shield, gloves, aprons, and chemical resistant footwear shall be worn at all times when the hazard of electrolyte splash or spill is present.

g. Mixing Electrolyte. Pouring prepared electrolyte into batteries, mixing electrolyte, checking the electrolyte levels, or charging batteries are times when splashes may occur. Mixing electrolyte improperly may cause an accident that requires immediate first aid.

CAUTION: When mixing electrolyte, always pour acid into water. Never pour water into acid.

h. Explosion Hazards (Batteries).

(1) Hydrogen is generated when some batteries are being charged or recharged. The electrochemical process also produces heat. The hydrogen and heat could create a volatile situation. Overheating can be damaging to the internal composition of the battery, while hydrogen could be explosive.

(2) During the charge and recharge periods, hydrogen is released through the vent caps. Hydrogen is 14 times lighter than air and is dispersed quite rapidly outside the battery cells. Air containing as little as 4 percent hydrogen is highly volatile if ignited.

(3) Batteries should be maintained in a well-ventilated and ignition-free area. Some sources of ignition are:

- (a) Open flames from any source.
- (b) Sparks from welding or electrical equipment.
- (c) Lighted cigarettes.

(d) Sparks caused by connecting batteries to electrical circuits or charging systems.

(4) Sealed batteries have a potential to explode when exposed to excessive float voltages, ambient temperature extremes or equalize voltages are applied to them. Sealed batteries also have a potential to explode if battery cells become defective. Defective battery cells may be detected if low battery cell voltages are measured. A higher than normal battery temperature may be a warning that that battery cells are defective and a potentially hazardous condition may exist.

i. Working Equipment.

(1) Use a flashlight that will not cause a spark to inspect electrolyte levels of a battery. These flashlights are typically labeled "NFPA Class 1 Division 1 Group B and D intrinsically safe flashlight" or similar.

(2) Always use well-insulated tools when working on or around batteries. The combination of heat and hydrogen gas generated by recharging a battery can be explosive.

(3) Always assume that there is explosive potential at the battery vent caps and practice those procedures that ensure the safety of yourself and others.

620. CHLOROFLUOROCARBONS.

Chlorofluorocarbons (CFCs) are used as refrigerants in air conditioners, refrigeration units, chillers, and condensers. Restrictions have been put in place on the production, use, and handling of CFCs and related compounds by the Environmental Protection Agency (EPA). CFCs and the equipment that use them are slated for replacement. CFCs used as refrigerants are subject to strict recovery and recycling requirements to prevent the release of refrigerant gases to the atmosphere. CFC equipment servicing can only be performed by EPA certified technicians. Consult the supervisor or environmental staff about handling requirements.

621. POLYCHLORINATED BIPHENYLS (PCB).

PCBs, even at extremely low concentrations, present a health hazard. Order 1050.14, Polychlorinated Biphenyl's in the National Airspace System, provides the FAA policy on procedures and responsibilities for personnel safety and regulation compliance concerning PCBs.

SECTION 2. GENERAL SECURITY**622. INTRODUCTION.**

This section provides guidance for protection of government property through requirements for physical security, personnel security and reporting of theft or vandalism.

623. COMPUTER SECURITY, PRIVACY, AND FREEDOM OF INFORMATION ACT.

Certain legal restrictions are placed on the collection, use, and dissemination of information. See Order 1280.1, Protecting Privacy of Information About Individuals, and Order 1370.82, Information Systems Security Program. These requirements shall be applied, when and where appropriate, to the provisions of this directive.

624. PERSONNEL SECURITY.

a. Maintenance Personnel. Security clearances are issued to personnel based on the type of sensitive information accessed in the performance of assigned duties. Security clearances are issued in accordance with Order 1600.1, Personnel Security Program.

b. System Access Rights. Government and contractor/vendor personnel who no longer require access to the system and/or facility shall have their access rights terminated.

625. PHYSICAL SECURITY.

Physical Security is the implementation of a set of physical measures, which are designed to provide safeguards to reduce security vulnerabilities and prevent unauthorized access to activities, property, equipment, classified information and sensitive unclassified information. The FAA reduces security vulnerabilities in its critical infrastructure through the Facility Security Risk Management (FSRM) Program in accordance with Order 1600.69, FAA Facility Security Management Program.

a. Managing Physical Security. Physical security is a key element in managing and maintaining security controls, and is interdependent with the administrative, operational and technical controls that comprise FAA security. It is important that fundamental physical security practices be adopted to provide maximum protection of all personnel and property.

b. Threats to Physical Security. Threats to physical security can include intrusion or unauthorized access to NAS systems, misrepresentation or impersonation of authorized personnel, or interception of confidential or sensitive data.

c. Physical Security Controls. FAA physical security controls address interruptions in computer services, physical damage, unauthorized disclosure of information, loss of control over system integrity, and theft.

d. Physical Access Controls. FAA employee understanding of individual security responsibilities in restricted areas is imperative to effective physical security. FAA employees shall challenge any unbadged and unescorted, or unauthorized person.

e. Data Interception Policy. Data interception controls are essential to the protection of confidential and sensitive FAA data. Maintenance personnel shall not install or operate unauthorized software or hardware, such as sniffers or traffic analyzers, to either intentionally or unintentionally capture system or network traffic.

f. Unauthorized Entry. All equipment areas shall be secured from unauthorized entry, including wire closets and electrical access points.

g. Access Control. Access keys to all equipment areas shall be controlled in either

the facility electronic database access list or a lock repository.

h. Security Warnings. Security warnings and banners shall be placed at all physical access points, or other areas containing sensitive systems, equipment, and workstations.

626. INCIDENTS OF THEFT OR VANDALISM.

a. Discovery of Theft or Vandalism. Employees discovering incidents theft or vandalism shall take immediate action to assess the extent of damages and shall take those steps necessary to prevent further loss of government property.

b. Protection Against Further Loss of Government Property. Protective action may include such measures as temporary repairs to buildings, fences, or security lights. In incidents of recurring vandalism involving FAA facilities, the SMO manager or designee, in cooperation with regional representatives, shall take such action as deemed appropriate to prevent further occurrence of such incidents. This may include, but is not limited to, installing burglar alarms, 24-hour facility surveillance, or fencing. Reference Order 1600.69.

c. Reporting of Theft or Vandalism. All incidents involving theft of, or vandalism to, government property shall be reported to the appropriate control center as soon as possible.

(1) The control center shall notify management personnel, agency security representatives, and other law enforcement agencies as required (local police, state police, and the Federal Bureau of Investigation).

(2) For theft incidents, the SMO manager or designee should ensure that agency security personnel are provided with any available serial number of each item stolen.

(3) Incidents involving theft or damage to a NAS facility shall be described in the maintenance log.

(4) AT personnel shall be advised of any unscheduled changes to operational status.

627. REFERENCE.

For detailed information, refer to Order 1600.69, FAA Facility Security Management Program, and Order 1900.X for FAA Security Condition (SECON) level definitions and emergency readiness requirements.

628-629. RESERVED.

SECTION 3. INFORMATION SECURITY

630. INTRODUCTION.

This section identifies essential activities that provide comprehensive NAS system security protection. Implementation of these security measures is necessary for mitigation of security threats, and compliance with agency and Government security directives.

631. SECURITY CERTIFICATION AND AUTHORIZATION.

NAS systems must include the appropriate level of security to ensure information availability, confidentiality and integrity. This is accomplished through a combination

of design, analysis, and vulnerability assessment of security features and is documented in a Security Certification and Authorization Package (SCAP) in accordance with Order 1370.82.

632. INFORMATION SYSTEM SECURITY (ISS)

This paragraph describes security management and administration procedures for users and system administrators of NAS systems. Users of NAS systems shall follow the following security procedures.

a. System Access Controls.

(1) User Identification and Authentication (I&A). The identification component of an I&A system consists of a set of unique user identifiers. Authentication involves verifying the identity of a user. Passwords provide reasonable deterrence to unauthorized access if properly handled by people authorized to use them and if properly stored and processed in the password verification system. The National Institute of Standards and Technology (NIST) has developed a standard for secure password usage published as Federal Information Processing Standards Publication 112. This publication provides guidance to users on the reasonable handling, storage and processing of passwords.

(2) Creation and Handling of Passwords. Passwords shall be used to make unauthorized access to NAS systems more difficult. The user shall not disclose the individual password to another user or non-user. If the user believes that the individual password has been compromised, then the password shall be changed. The user shall be responsible for maintaining the integrity of the individual password. When applicable, users shall be responsible for:

(a) Following password configuration procedures.

(b) Changing passwords as required.

(c) Ensuring passwords are secure.

(3) Password Configuration.

Passwords should be easy to remember, but difficult for others to guess. Do not use obvious words such as your name, names of a spouse or children, car license plates, or other, easily guessed words. The best passwords are “made-up” phrases that are created from two or more words.

(4) Automatic Screen Blanking.

Automatic screen blanking and locking shall be implemented for workstations left unattended, if possible per the operating system.

(5) Display of Site-Specific Information. Site-specific information shall not be displayed by the system until system users have been properly identified and authenticated.

b. Session Controls.

(1) Session Logon and Logoff. The system shall be configured so that users cannot gain access to system resources by bypassing the session logon function.

(2) Concurrent Sessions. The system user’s ability to initiate concurrent sessions/simultaneous logons shall be restricted to the minimum necessary to perform the job, task or function.

(3) Session Lockout. Session lockout criteria shall be set so that session lockout occurs after three unsuccessful login attempts.

(4) Security Warning Banners. Computers used as NAS Support Workstations or NAS Operational Workstations shall display an FAA-approved

warning banner on each user’s screen before they login.

c. External Connectivity for Telecommunications.

Remote access controls shall be established to ensure that only authorized users (including vendors /contractors) have access to authorized system resources. When applicable, remote access controls shall include:

(1) Remote Access Configurations.

The number and type of protocols, internal, and external connections that interface with the system shall be limited to those that are part of the official NAS-approved system configuration.

(2) User Access Privileges. Remote system access shall be provided to only those personnel that require access. User remote access privileges shall be limited to only those access levels necessary to perform the job, task or function (e.g., super user, system administrator, operator).

(3) Identification and Authentication.

Remote users shall be required to logon to the system using an authorized user ID and password before being allowed access to system resources, as applicable.

(4) Remote Access Address Information.

Remote access telephone numbers and/or IP addresses shall not be published in the facility telephone directory and shall only be provided to those authorized personnel that require remote access.

(5) Display of Site-Specific

Information. Site-specific information shall not be displayed by the system until system users have been properly identified and authenticated.

(6) Warning Banners. Warning banners shall be displayed prior to remote access to system resources.

d. System Integrity Monitoring and Reporting, Including Virus Protection. The system shall have appropriate integrity monitoring and virus protection, including:

(1) Integrity Monitoring. The system shall be configured so that changes to executable file configurations can be monitored, logged, and reported.

(2) Intrusion Detection Tools. Intrusion detection tools, if applicable, shall be configured in accordance with NAS approved security baselines.

(3) Virus Protection. Systems that require virus protection shall use an FAA approved anti-virus software package. All files shall be scanned for viruses prior to their execution on the system. Anti-virus definition files shall be updated according to an FAA approved update cycle.

e. Security Monitoring. Security monitoring provides a method to detect unauthorized activities or assist in the analysis of suspicious activities. Auditing functions are used to enable the tracing of system activities to individual users, providing individual accountability for actions on the system and detecting malicious or security-relevant activities.

(1) System Auditing. User and system activities are logged to create a record of events. Audit logs include, as a minimum, user ID and password, and failed/successful login attempts.

(2) Management of Audit Logs. Audit logs shall be controlled by limited access to authorized personnel only.

(a) Audit logs shall be reviewed and analyzed by the system administrator.

(c) Audit logs shall be retained for at least 6 months.

(3) Reviewing Audit Logs. Audit logs are reviewed and analyzed regularly to identify unauthorized access attempts and ensure all actions on the system are proper. The reviewer should look for activities that are suspicious or abnormal such as:

(a) Failed or repeated logon attempts and file access attempts.

(b) Use of logins/accounts during nonstandard work hours.

(c) Use of logins/accounts that are normally not accessed.

(d) Any unusual writing to or deleting from files, particularly from accounts where such activity is not normal.

(e) Unauthorized modification of the password files.

(f) Unexplained gaps in the audit records.

(g) The loading of any unauthorized files; these may be indicators of the presence of hacking tools or other unauthorized use of the system.

f. Account Management. Effective administration of FAA user account information is essential to maintaining system security.

(1) Default Accounts and Passwords. Many systems, network devices, and applications contain one or more default system accounts and passwords (or no password) and are set up to make system installation easy for novice users.

(a) All default accounts shall be removed from the system or the default password shall be changed prior to system or device deployment.

(b) All system or root level accounts shall have a password assigned prior to system or device deployment. Accounts with this level of access shall be kept to a minimum.

(c) All "guest" accounts shall be removed from the system or shall have a password established to access the system or device.

(d) All user accounts shall be unique and assigned to an individual.

(e) All new user accounts shall have a password assigned to them.

(2) User Account Administration. The creation, modification or deletion of user's accounts must be approved by a supervisor. System administrators shall ensure only authorized users have accounts. They shall audit and periodically verify the legitimacy of current accounts and access authorizations. User accounts of terminated employees shall be disabled prior to the employee receiving the termination notice from the FAA.

(3) Responsibility for User-IDs. All users shall be responsible for all activities performed on a NAS system using their personal user-IDs.

(4) Spoofing Users. Users are prohibited from masquerading as another user on any FAA system.

(5) Authorized Software. Obtain all executable software used on NAS operational systems through authorized procurement methods in accordance with Software Licensing/Copyright Agreements contained in Title 17 USC.

(6) Software Maintenance. Privately owned, commercial, shareware, or freeware software shall not be loaded on any NAS operational system without testing by the owning organization with an approved CCD.

Approval documentation should be stored in the FRDF.

g. Configuration Management. System users shall not perform unauthorized modifications to a baselined NAS system, including the addition, modification, or removal of baselined hardware, software or firmware, without formal approval by the appropriate system configuration control authorities.

h. Maintenance. Maintenance security controls shall be implemented as follows:

(1) Contract personnel who service and maintain NAS systems shall be properly cleared in accordance with Order 1600.1, Personnel Security Program.

(2) Local and remote maintenance shall be limited to only those personnel requiring system access.

(3) Emergency repair and maintenance personnel shall have restricted access to only those system assets and information that is necessary to perform their job functions.

(4) System components that contain sensitive security information shall be adequately controlled if serviced through off-site maintenance.

(5) System users shall ensure that remote maintenance activities, including diagnostics, are performed in a secure environment, including:

(a) Ensuring Memorandums of Agreement (MOA) or other policies exist to prevent external maintenance organizations/personnel from initiating a dial-in connection to the system while connected to the Internet/Intranet.

(b) Ensuring remote devices accessing the system have approved virus protection measures.

(c) Ensuring remote devices accessing the system are under formal configuration control.

(d) Ensuring remote devices accessing the system have adequate physical security protection.

(6) Maintenance activities shall be logged and records retained for future audits.

633. SECURITY INCIDENT RESPONSE CAPABILITY.

Despite the best security effort expended, an Information System Security (ISS) incident may sometimes occur. This section describes how to detect, handle and report security incidents involving computer hosts or networks.

a. Information System Security (ISS) Incident Response and Handling. The NAS Security Information Group (SIG) is the central organization for managing NAS operational and mission support ISS incidents.

(1) The NAS SIG maintains communications with the system administrator, the appropriate manager, and the control center concerning analysis of security incidents.

(2) The Computer Security Incident Response Center, (CSIRC) performs coordination with organizations or agencies outside the FAA. The CSIRC is responsible for reporting incidents to the FBI and other law enforcement officials.

b. Information Security Incident. An ISS incident is an event or circumstance associated with a system that presents a threat to the confidentiality, integrity, or availability, of data or the systems that results in: an attempted, or successful intrusion, the attempted or successful compromise of data, system abuse or misuse

of Government systems. Any new security vulnerability that is discovered shall be reported in the same way as an incident.

c. Types of Information Security Incidents. Possible ISS incidents may include (but are not limited to) the following types of activity or violations:

(1) Attempts (either failed or successful) to gain unauthorized access to a system or its data.

(2) Viruses, Worms, Malicious Code.

(3) Unwanted disruption or denial of service.

(4) Unauthorized use of a system for the processing or storing of data.

(5) Change to system hardware, firmware, or software characteristics without the owner's knowledge, instruction or consent.

(6) System abuse or misuse of Government systems (viewing, transmitting, threatening, harassing material, use of system for personal gain.)

(7) Unauthorized use of another user's account.

(8) Elevating of system privileges (gain root access).

(9) Malicious destruction or modification of data.

(10) Illicit information gathering.

(11) Running hacking probes against other systems.

(12) Notification by an outside source that they are being attacked by a FAA IP address.

(13) Fraud and theft.

d. Security Incident Detection. System specialists should be aware of vulnerabilities and recognize abnormalities. It is not always possible, without analysis, to determine if a security incident, operator error, or maintenance problem occurred. If in doubt, users should notify their manager and contact the NAS Security Information Group (SIG) for assistance. Any new security vulnerability that is discovered shall be reported in the same way as an incident. The following symptoms may not conclusively prove a security incident, however they justify further investigation and possible incident reporting:

(1) New files with novel or strange names.

(2) Altered files when no change should have occurred.

(3) Unexpected changes in a file size or modification date.

(4) Sudden unexplained poor performance or slow communication.

(5) System logs are missing or appear altered.

(6) New user accounts are mysteriously created.

(7) Sudden high activity on accounts that previously had little or no activity.

(8) User password changed without the user's knowledge or consent.

(9) Numerous unsuccessful login attempts to a user's account by someone other than the user.

(10) User logging in at odd hours or frequent failed login attempts.

(11) Last login time does not correspond with user's recollection.

(12) Data on the system hard drive is no longer accessible.

(13) System programs disappearing or behaving strangely.

(14) Unusual processes running.

(15) Monitoring capabilities indicating questionable system activity or activities that usually do not appear during daily operation.

(16) System will not boot properly.

e. Security Incident Reporting And Handling.

Suspicious activities shall be reported to personnel designated to handle system security administrative functions. All incidents must be reported to the SMO. The reporting process contains stepped levels designed to resolve the suspected security occurrence at the lowest level possible. Continue the notification process above the SMO level until the occurrence can be resolved. The notification and reporting process is as follows:

(1) Notification to the System administrator, if one exists, to begin assessment of the suspected security occurrence.

(2) Notification to the SSC manager and the appropriate control center.

(3) Notification to the SMO by the control center.

(4) Notification to the Regional Managers by the control center if necessary.

(5) Notification to the NAS Security Information Group (SIG), and the appropriate second level support organization by the control center if necessary.

(6) Notification to the ISSO by the NAS SIG if necessary.

(7) Notification to the FAA CSIRC by the NAS SIG if necessary.

634. CONTINGENCY PLANNING

SSC Managers are responsible for local contingency and disaster recovery planning. Contingency plans shall be developed in accordance with Order 1900.47, ATS Contingency Plan. They shall include:

- a. Storage of operational software and site adaptations.
- b. System configuration, and inventory.
- c. Frequency and scope of backups if not included in a maintenance handbook.

635. MILITARY EMERGENCIES

Military necessity may require some navigational aids to be shut down during military emergencies in accordance with Order 7610.4, Special Military Operations.

636-639. RESERVED.**SECTION 4. SAFETY ON AIRPORTS.****640. INTRODUCTION.**

This section provides guidance to ensure personnel safety.

641. AIRCRAFT JET BLAST HAZARD.

Use caution when crossing runways behind jet aircraft to avoid accidents resulting in damage to vehicles or injuries to FAA personnel by jet blast.

642. HEARING PROTECTION.

Hearing protection shall be provided and should be worn when noise hazards are present.

643. USE OF RUNWAY MOVEMENT AREAS.

The following shall apply for pedestrian or vehicle use of runway movement areas on airports:

a. FAA employees that require unescorted access to any part of the airport operations area (AOA) must complete Airport Ground Vehicle Operations, course 12723, training.

b. All individuals are required to have authorization from airport management to be in the movement area.

c. A trained individual shall escort FAA personnel, or individuals working in the interests of the FAA, who have not completed Airport Ground Vehicle Operations training or do not have appropriate authorization.

d. All vehicles used on any part of the movement area shall display the proper flag or amber beacon required by Order 4670.2, Motor Vehicle Management. At airports with an airport traffic control tower, vehicles or pedestrians on or using the movement area shall be equipped for two-way radio communications with the tower ground traffic controller. In order to facilitate clear and concise communication, standard ATC phraseology shall be used for two-way radio communications.

NOTE: Use extreme caution when you hear the phrase "go ahead." Controllers use this to mean, "state your request." It never means, "proceed!" Additionally, aircraft always have the right-of-way.

e. In the event of a radio failure, move your vehicle off the runway or taxiway and turn your vehicle towards the tower, and flash your headlights. This will signal to the controllers that you need assistance. Be patient as the attention of the controller may be directed toward another part of the airport. A failed radio is not an excuse for proceeding without a proper clearance.

f. Authorized FAA employees shall obtain permission from the control tower to enter the movement area. If there is no boundary marking present between the movement and non-movement area, FAA employees shall check with the airport manager's office to find out where the actual boundary is located.

g. All test and working equipment, tool boxes, or other cargo should be firmly lashed down, shock mounted, or placed securely in the trunk compartment.

h. FAA employees shall use peripheral service roads whenever possible. The crossing and use of active runways should be kept to a minimum.

i. Measurements which must be made on an active runway shall be accomplished during low-activity periods whenever possible, and two-way radio communications shall be maintained with the ground traffic controller at all times. These activities shall be accomplished as rapidly as possible.

j. Airports that do not have tower operations on a 24-hour basis or do not have a control tower shall establish documented ground rules to supplement those for towered airports in order to ensure adequate safety of vehicles and FAA personnel accessing the AOA. These ground rules shall include, but shall not be limited to:

(1) Provisions for aircraft right-of-way over ground vehicles.

(2) Requirements for vehicle operators to bring their vehicles to a complete stop at least 100 feet from runway and 25 feet from a taxiway, look both ways, and listen for aircraft in the vicinity. The vehicle operator should proceed only when they will not impede an aircraft. Always proceed with caution after this visual check.

(3) Utilization of Common Traffic Advisory Frequency (CTAF) procedures. CTAF is a frequency designated for pilots to conduct airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency, and is identified in appropriate aeronautical publications. Instructions for its use should include topics such as:

(a) Monitoring aircraft transmissions for situational awareness. Listen before transmitting.

(b) Announcing your intentions before entering aircraft movement areas.

(c) Using an appropriate radio call sign and identifying your location.

NOTE: Remember, aircraft at these airports may not be radio equipped or the pilot may not be making radio position reports. Therefore, always consider all runways to be active in both directions.

APPENDIX 1. DEFINITIONS

1. AIRPORT OPERATIONAL AREA (AOA). The AOA consists of all restricted ground areas of the airport, including taxiways, runways, loading ramps, and parking areas. The AOA is divided into two distinct areas: the movement area and the non-movement area.

2. ANNUAL. A scheduling term, meaning once every year, and at 12 month intervals.

3. AS REQUIRED. A scheduling term, meaning whenever the need has been detected.

4. ASSEMBLY. Two or more parts joined together to perform one or more elementary functions not normally subject to disassembly without losing the designed function.

5. BASELINE. A configuration identification document or a set of such documents formally designated and fixed at a specific time during the configuration items life cycle. Baselines, plus approved changes to those baselines, constitute the current configuration identification. FAA establishes baselines of NAS requirements, for each NAS design level, for the four major acquisition baselines, as well as for the NAS product baseline.

6. BI-ANNUAL. A scheduling term, meaning once every 2 years, and at 24 month intervals.

7. BI-WEEKLY. A scheduling term, meaning once every 2 weeks, and at 14 day intervals. Also known as Semi-Monthly.

8. CERTIFICATION. Certification is the determination and validation that a system, subsystem, or service is providing or is capable of providing the advertised service to the user. Certification includes an independent determination, which ascertains

the quality of advertised services, and a validation, which officially confirms and documents the determination in the maintenance log.

9. CERTIFICATION PARAMETER. Certification parameters are selected critical indicators of the quality of the required advertised services being provided to the user of systems, subsystems, equipment, and services.

10. COMMISSIONED. A facility, system, subsystem, or equipment is considered to be commissioned if it has been formally accepted and placed into operational use of service in the NAS. It indicates that the ATO has assumed formal maintenance responsibility.

11. COMMISSIONING. The formal exercise of incorporating a facility, system, subsystem, or equipment into the NAS. This term has legal and budgetary significance and has been used to justify logistic and manpower operational support as a FAA obligation under public law.

12. CONFIGURATION CONTROL DECISION (CCD). A record of decision on a proposed change to a baseline configuration item. If a change is approved, a CCD directs the action required implementing the decision.

13. CONFIGURATION MANAGEMENT. A discipline applying technical and administrative direction and surveillance to:

a. Identify and document the functional and physical characteristics of a configuration item.

b. Control changes to those characteristics.

APPENDIX 1. DEFINITIONS (CONTINUED)

c. Record and report change processing and implementation status.

14. CONTROL CENTER. The control center is the NAS management entity responsible for coordination with air traffic operations personnel or other users of the NAS.

15. RESERVED.

16. CORRECTIVE MAINTENANCE. Corrective maintenance is maintenance performed to identify or correct a problem.

17. DAILY. As used in stating a maintenance schedule, daily is intended to mean once every calendar day for those locations staffed 7 days a week. At other locations, daily is intended to mean every calendar day a specialist is on duty. The schedule may be reduced to a minimum of 3 times a week, with not more than 3 days between successive occurrences, at unstaffed locations.

18. DECISION SUPPORT SYSTEMS. Decision support systems provide routing information to improve efficiency and freedom of flight.

19. ELECTRONIC LOG. A chronological record of all maintenance activities (such as restoration, repair, modification, flight checks, certification) contained or resident on a software system running on a computer. It will consist of a combination of databases of logged entries as well as reference tables of data that may be inserted (by default or manually) into the logging entry for validation and linking of information.

20. EMERGENCY MODIFICATION. An emergency modification is a temporary modification installed to maintain continuity

of air navigation, air traffic control, communications, or support service during unusual or emergency conditions.

21. EQUIPMENT. Equipment is a complete assembly, operating either independently or within a subsystem or system, that performs a specific function.

22. FACILITY. Used generically in this order to mean FSEP entity; reference Order 6000.5, Facility Service and Equipment Profile, for other uses of this term.

23. FIRMWARE. Software instructions which have been permanently stored in read-only memory (ROM.)

24. GROUND CHECK. A ground check is an evaluation, performed without an aircraft, of the radiated signal associated with a system, subsystem, or equipment.

25. HARDWARE. In computer applications and elsewhere, the term hardware refers to the physical equipment of devices used to perform simple or complex functions. This term must be qualified by an appropriate restrictive modifier to carry a specific identification or meaning.

26. HAZARDOUSLY MISLEADING INFORMATION (HMI). Erroneous information that is sent by navigational aids to an aircraft instrument, and that is presented in a manner that could result in a significant reduction in terrain, obstacle, or object clearance.

27. INITIAL TOLERANCE/LIMIT. As used in maintenance handbooks, the initial tolerance/limit is the maximum allowable deviation from the standard value of a parameter, or the range, that was acceptable or permissible at the time of initial installation, tune up, or construction; that will

APPENDIX 1. DEFINITIONS (CONTINUED)

be allowable after any modification or modernization; and that is desirable after any readjustment following an out-of-tolerance/limit condition.

28. INSURANCE STOCK. These are items of material essential for continued service of a facility, or for human safety, for which procurement delays are intolerable.

29. INTERRUPTION. A break in continuity, the loss or unavailability of a facility/service, regardless of duration or cause.

30. JOINT-USE. Whenever an installed facility, system, subsystem, or equipment provides services to both the FAA and one or more other agencies or military services, it is known as "joint-use." Either FAA or the sharing organization may own the facility, system, subsystem, or equipment. The term is used primarily in connection with radars.

31. KEY PERFORMANCE PARAMETER. A key performance parameter is a selected parameter of the system, subsystem, or equipment, which is a critical indicator of whether or not it is performing its intended function. These parameters are clearly identified in maintenance handbooks with an arrow.

32. LOGISTIC SUPPORT. A disciplined, unified, and iterative approach to the management and support of NAS operational requirements through the acquisition, storage, distribution, and inventory control of supplies, spare parts, tools, and working equipment. Logistic Support is necessary to:

a. Integrate support considerations into system and equipment design.

b. Develop support requirements that are related consistently to readiness objectives, to design, and to each other.

c. Acquire the required support.

d. Provide the required support during the in-service phase at minimal cost.

33. MAINTENANCE. Maintenance, as used in connection with NAS systems, subsystems, and equipment, is intended to mean any specified sequence of steps prescribed to accomplish an activity to justify or continue a system or service as operational. As used in maintenance handbooks issued before 1970, the term was more restrictive in that it only applied to corrective maintenance activities; i.e., repair, adjustment, calibration, troubleshooting, or other functions.

34. MAY. As used in maintenance documentation, MAY denotes permission. For example: at navigational aid facilities, certain maintenance activities MAY be performed without reliance on flight inspection. See Order 1320.1, FAA Directives System. (Also see Shall, Should, and Will.)

35. MODIFICATION. A modification to a ground facility, system, subsystem or equipment is an alteration in its electrical, mechanical, or physical characteristics, arrangement, configuration, or use that results in a need for:

a. Changes to record documentation.

b. Changes to existing standards and tolerances/limits.

c. The need for establishing new standards and tolerances/limits.

APPENDIX 1. DEFINITIONS (CONTINUED)

NOTE: See Order 6032.1, National Airspace System Modification Program.

- 36. MONITOR.** A monitor is a device designed to detect when a designated parameter has deviated beyond its prescribed tolerance/limit, and then to activate an alarm to this effect or alter the operation or both.
- 37. MONTHLY.** A scheduling term, meaning once every 30 days or at approximately 30-day intervals. A calendar month is the period between like dates in successive months.
- 38. MOVEMENT AREA.** The movement area consists of taxiways, runways, and other areas designated by each airport that require the authorization of airport management and/or the permission of air traffic control to enter.
- 39. NATIONAL AIRSPACE SYSTEM (NAS).** The NAS is a complex collection of systems, procedures, facilities, aircraft, and people. These components work together as one system to ensure safe and efficient services are provided to the flying public, airlines, and airports.
- 40. NAS CHANGE PROPOSAL (NCP).** The means for proposing changes to NAS configuration items, FAA Form 1800-2.
- 41. NAS INFRASTRUCTURE.** The physical components of the NAS, excluding people. This includes systems, facilities, leased services, support services, inventory, vehicles, and real estate.
- 42. NAS INFRASTRUCTURE SERVICE.** The physical components of the NAS, excluding people, that support the core functions performed by the NAS in the execution of its mission to provide safe separation and control over aircraft; e.g., communication, navigation, surveillance, and information relevant to the aeronautical environment.
- 43. NAS SERVICES.** Core functions performed by the NAS in the execution of its mission to provide safe separation and control over aircraft; e.g., separation assurance, traffic management, aviation information, navigation, and landing.
- 44. NAS SYSTEM USER.** The governmental, commercial, and public, organizations that use the NAS to carry out the functions of government, business, and aviation travel.
- 45. NAS-MD-001.** This is the document that lists all of the NAS items (including hardware, software, and documentation) that are under configuration management.
- 46. NON-FEDERAL FACILITY.** A non-federal facility is a facility owned by a state or local government, U.S. possession or territory, or private interest.
- 47. NON-FEDERAL PERSONNEL.** Non-federal personnel are personnel responsible for the maintenance of non-federal facilities.
- 48. NON-MOVEMENT AREA.** The non-movement area includes airport areas that do not require the permission of air traffic control to enter such as parking, loading ramps, and maintenance ramps.
- 49. NONSTANDARD SPARE PARTS.** These are replaceable parts (often-called parts peculiar) that are unique in characteristic or function to the degree that they are not readily obtainable from sources other than the prime contractor.
- 50. OFFICE OF PRIMARY INTEREST (OPI).** The organizational element primarily

APPENDIX 1. DEFINITIONS (CONTINUED)

affected by decisions or actions of the OPR and held accountable for proper responsiveness, coordination, and feedback prior to assumption of OPR status in the next sequence of events, is considered the office of primary interest.

51. OFFICE OF PRIMARY RESPONSIBILITY (OPR). The organizational element held accountable for taking appropriate action or for making a decision between alternatives at a specific turn of events is considered the office of primary responsibility.

52. OFF-THE-SHELF ITEMS. These are commercial items of equipment and test equipment that are sold in substantial quantities to the general public at established catalog or market prices.

53. OPERATING STOCK. This is the quantity of material stored on-site to meet anticipated operating requirements during the interval between replenishment actions, based on the annual demand value of each item.

54. OPERATING TOLERANCE/LIMIT. As used in maintenance handbooks, the operating tolerance/limit is the maximum deviation from the standard value of a parameter, or the range within which normal functioning can continue without adjustment or corrective maintenance, and beyond which remedial action by system specialists is mandatory.

55. OTHER MAINTENANCE TASK. As used in maintenance handbooks issued in 1970 and later, an "other maintenance task" is any periodic scheduled task other than a performance check that is necessary to prevent deterioration or ensure reliable operation of the system. These tasks are not performance checks. PM activities now

prescribed in maintenance handbooks are separated into performance checks and other maintenance tasks. The term is not used in maintenance handbooks issued before 1970.

56. OUTAGE. The loss of a facility/service for 1 minute or more.

57. PART. This is a one-piece element designed to perform a simple function in an assembly, module, unit, equipment, or facility; and normally used to repair an assembly or module.

58. PERFORMANCE CHECKS. As used in maintenance handbooks issued in 1970 and later, a performance check is a periodic scheduled test, measurement, or observation of normal operating controls and functions, which is necessary to determine whether a system is operating within its established tolerances and limits. PM activities prescribed in the later maintenance handbooks are separated into "performance checks" and "other maintenance tasks." This term is also used in maintenance handbooks issued before 1970, but in these handbooks it means a procedure required evaluating the performance of a system rather than just the description of the activity.

59. PERIODIC MAINTENANCE (PM). As used in maintenance handbooks issued in 1970 and later, any scheduled PM activities that include performance checks and/or maintenance tasks are periodic maintenance activities.

60. PREVENTIVE MAINTENANCE. The routine maintenance designed to preserve the equipment or to reduce the chance of failure. As used in handbooks issued prior to 1970, it covers all mandatory activities.

APPENDIX 1. DEFINITIONS (CONTINUED)

Preventive maintenance may be used as a generic term discussing all kinds of tasks, including even nonscheduled tasks the performance of which meets the general definition.

61. PROTOTYPE. A System that is not within the configuration management requirements specified in Order 1800.66, Configuration Management Policy, has been designated a prototype by the acquisition office, or is being used operationally to prove concept of operations or refine its functionality.

62. PSEUDO FACILITY/SERVICE. A pseudo facility is an activity not classified as an operating type facility, requiring the expenditure of maintenance manpower or material resources or which has been established to capture the effectiveness of a specified aeronautical service.

63. REGIONAL AIRSPACE AND PROCEDURES TEAM (RAPT). The RAPT is the regional focal point for all matters involving airspace instrument flight procedures.

64. QUARTERLY. A scheduling term, meaning four times each year, and at approximately 90-day intervals.

65. REPLACEABLE SPARE PART. This is a part interchangeable with a part being used in equipment, but furnished separately and not required for operation except as a replacement (often called a spare part).

66. RESTORATION. Restoration encompasses the maintenance activities required to return a system, subsystem, equipment, or service to normal use

following an interruption, equipment failure, or out-of-tolerance/limit condition.

67. RISK MANAGEMENT. Risk management is identifying, managing, eliminating and/or mitigating the chance of something bad happening.

68. SAFETY STOCK. This is the quantity of material stored on site to meet unpredictable fluctuations in operating requirements and provide sufficient lead-time to accommodate delays between ordering and receiving replenishment.

69. SEMI-ANNUAL. A scheduling term, meaning twice each year, and at 6-month intervals.

70. SEMI-MONTHLY. A scheduling term, meaning twice each month, and at approximately 15-day intervals. Also known as Bi-Weekly.

71. SEMI-WEEKLY. A scheduling term, meaning twice each week, and at 3- or 4-day intervals. Also known as Twice-Weekly.

72. SERVICE. A service is an end product, resulting from a specific combination of system(s), subsystem(s), and/or equipment(s), delivered to a user (internal or external to the FAA) of the NAS.

73. SERVICE DELIVERY POINT. A service delivery point (SDP) is a manned air traffic control facility where Air Traffic Control personnel provide NAS services. SDPs include all ARTCC, CERAP, ATCT, TRACON, and AFSS facilities as well as the ATCSCC.

74. SHALL. As used in maintenance documentation, "SHALL" denotes compulsory or mandatory action that the

APPENDIX 1. DEFINITIONS (CONTINUED)

person being directed is obliged to take. For example: The equipment SHALL be adjusted to operate in accordance with directive tolerances. See Order 1320.1. (Also see Should, Will, and May).

75. SHOULD. As used in maintenance documentation, "SHOULD" denotes an action that is desirable but not mandatory. For example: The equipment SHOULD be shut down if, in the opinion of the system specialist, a failure is imminent. See Order 1320.1. (Also see Shall, Will, and May.)

76. SIGNIFICANT EVENT. An event that affects NAS systems and requires notification.

77. SOFTWARE. A set of programs, procedures, rules, and documentation concerned with the operation of a data processing system; for example, compilers, library routines, and manuals.

78. SPECIAL MAINTENANCE PROCEDURES. As used in maintenance handbooks issued in 1970 and later, a special maintenance procedure is the prescribed procedure for doing incidental, nonscheduled tasks. This may include repair, adjustment, calibration, alignment, and other procedures. The term was not used in maintenance handbooks issued before 1970.

79. SPECIALLY SELECTED STANDARD PARTS. These are replaceable parts readily available from commercial sources, which have been selected on the basis of special treatment, reliability tests, and/or high performance validation.

80. STANDARD. As used in maintenance handbooks, a standard is the optimum value (on which the initial and operating tolerances are based) assigned to an essential parameter of a system, subsystem, or equipment. Design plans and specifications usually establish this value.

81. STANDARD ALLOWANCE. This term is applicable to two categories of logistic support items—working equipment and test equipment. These are documented by facility type in tabular format, listing each line item by type designation or description and quantities required as officially approved to implement maintenance operations for all FAA facilities in the NAS.

82. STANDARD SPARE PARTS. These are replaceable parts readily available from commercial sources (often called "parts common".)

83. SUBSYSTEM. A subsystem is a portion of a system that performs a specific function.

84. SYSTEM. A system is a combination of subsystem(s) and/or equipment(s) whose individual functions produce by engineering design a specific operating product in the NAS.

85. SYSTEM COMPONENT (SYSTEM ELEMENT). This may be a major operating element, active or passive, which would affect the overall performance or characteristics of the system if removed or maladjusted.

86. TASK. A task is a unit of work to be performed under each activity. These tasks are identified according to the maintenance handbook subparagraphs at the lowest subparagraph.

APPENDIX 1. DEFINITIONS (CONTINUED)

87. TEMPORARY MODIFICATION. A temporary modification is a non-permanently installed modification. The term as used informally, is usually intended to apply to either a “test modification” or an “emergency modification,” but may also apply to a “training modification.”

88. TEST MODIFICATION. A test modification is a temporary modification installed by the FAA Academy to facilitate training or a temporary modification installed in operational equipment in the NAS to verify the effectiveness of a proposed modification. See Order 6032.1.

89. TRI-ANNUAL. A scheduling term, meaning three times each year, and at 4-month intervals.

90. TRIAL MODIFICATION. A trial modification is usually synonymous with a “test modification.” See Order 6032.1.

91. TWICE-WEEKLY. A scheduling term, meaning twice each week, and at 3- or 4-day intervals. Also known as Semi-Weekly.

92. TYPE DESIGNATION. A FAA type designation is an assigned combination of alphanumeric characters used to identify specific production equipment, custom-built for FAA. The identification is also imprinted in the equipment nameplate. Examples are FA-9996, FAA-7201, RTA-2, and ASR-9. See Order 0000.1, FAA Standard Subject Classification System.

93. UNIVERSALCOORDINATED TIME (UTC). UTC is the time provided in the worldwide time signal broadcasts used in aviation. It has replaced Greenwich Mean Time as the accepted standard clock time in many countries.

94. VALIDATION. Validation is the second step in the certification process. It involves the act of making an official statement or declaration.

95. VERIFICATION. Process similar to Certification except performed by Non-Federal personnel as defined by Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control.

96. WAIVER. A written authorization to change an item not under configuration management. Waivers are requested in the form of a local NCP.

97. WEEKLY. A scheduling term, meaning once each week, and at 7 day intervals.

98. WILL. As used in maintenance documentation, WILL is intended to denote action in the future tense. For Example: Obsolete equipment WILL be replaced as soon as funds can be made available. See Order 1320.1. (See also Shall and May).

99. WORKING EQUIPMENT. This is a category of equipment that includes all special tools, devices, and accessories required to install, adjust, or align operating equipment in performance of maintenance operations, exclusive of test equipment. See Order 4630.2, Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.

APPENDIX 2. MAINTENANCE AND SUPPORT LEVELS

The following chart outlines maintenance and support levels as they apply to the ATO.

First Level: Maintenance Personnel directly or indirectly responsible for specific system(s).	Second Level: Engineering and Technical Support Personnel responsible for system type(s) contribute to:	Third Level: Logistical Support Responsibilities of the FAA Logistic Center (depot), or commercial equivalent for logistical support.
Periodic Maintenance	Periodic Maintenance	
(1) Preventive Maintenance Inspections (2) Performance Checks & Status Monitoring (3) Routine Maintenance	(1) Developing and publishing procedures (2) Developing and publishing standards and tolerances	
Corrective Maintenance	Corrective Maintenance	Corrective Maintenance
(1) Restoration (2) Troubleshooting (3) System reset & reconfiguration (4) Repair and replacement (5) Alignment and tuning (6) Parameter Setting	(1) Developing and publishing procedures (2) Developing and publishing standards and tolerances (3) Providing remote and on-site technical support to first level maintenance. Requests for technical support should be made in the following order: (a) SMO (b) Regional (c) National	(1) Stocking spare LRUs (2) Shipping/receiving LRUs (3) Stocking and shipping commonly used materials for corrective maintenance

APPENDIX 2. MAINTENANCE AND SUPPORT LEVELS (CONTINUED)

Certification	Certification	
<ul style="list-style-type: none"> (1) Initial (2) Periodic (3) After Corrective Maintenance (4) Post-accident/Incident Evaluation 	<ul style="list-style-type: none"> (1) Developing procedures (2) Publishing procedures 	
Modification	Modification	Modification
<ul style="list-style-type: none"> (1) Installation of Modification (2) Functional check-out/testing (3) Documentation and tracking of modification completion 	<ul style="list-style-type: none"> (1) Configuration Management (2) Engineering Modifications (3) Tracking Modifications (4) Developing software changes (5) Stocking and shipping modifications 	<ul style="list-style-type: none"> (1) Stocking and shipping modifications
Documentation	Documentation	
<ul style="list-style-type: none"> (1) Documenting maintenance (Logging) (2) Documenting modifications (Data Entry) (3) Maintaining on-site technical publications (Handbooks, TIs, FRDF, redlining prints) (4) Spares management, processing logistical data and documentation 	<ul style="list-style-type: none"> (1) Configuration management of Technical Instruction Books 	

APPENDIX 3. SYSTEMS, SUBSYSTEMS, AND SERVICES REQUIRING CERTIFICATION

Appendix 3 is maintained electronically and is available on the FAA Intranet. A link for Appendix 3 is contained at: <http://intranet.faa.gov/ats/aaf/aop/300/6000.15/>

The published appendix on the web shall be considered official. Updates to this appendix shall be published on the Internet 4 times per year, the first day of each quarter. A short electronic bulletin shall be sent out to alert the field organizations whenever a revision occurs. All additions, deletions, or corrections will be annotated with an asterisk for easy reference.

Personnel responsible for maintaining a technical order library are authorized to print new versions from the web and insert them into this handbook at anytime.

APPENDIX 4. LIST OF RELATED PUBLICATIONS

1. GENERAL. The following publications provide guidance to ATO personnel for use in the performance of their maintenance technical duties. Except for the air traffic operations directives, these documents have been distributed to System Management Office level and should be available there for general reference and use. The air traffic operations directives are available at the local air traffic facility.

- a. 0000.1 FAA Standard Subject Classification System.
- b. 1050.10 Prevention, Control, and Abatement of Environmental Pollution at FAA Facilities.
- c. 1050.14 Polychlorinated Biphenyl's (PCBs) in the National Airspace System.
- d. 1050.20 Airway Facilities Asbestos Control Program.
- e. 1280.1 Protecting Privacy of Information About Individuals.
- f. 1320.1 FAA Directives System.
- g. 1320.37 Contractor Development Equipment Instruction Books.
- h. 1320.58 Equipment and Facility Directives-- Modification and Maintenance Technical Handbooks.
- i. 1350.14 Records Management.
- j. 1350.15 Records Organization, Transfer, and Destruction Standards.
- k. 1370.79 FAA Internet Policy
- l. 1370.82 Information Systems Security Program.
- m. 1375.4 Standard Data Elements and Codes-Facility Identification and Supplemental Standards.
- n. 1600.2 Safeguarding Controls and Procedures for Classified National Security Information and Sensitive Unclassified Information.
- o. 1600.69 FAA Facility Security Management Program.
- p. 1720.18 FAA Distribution System.
- q. 1720.30 Distribution of Airway Facilities Technical Directives.
- r. 1800.66 Configuration Management Policy.
- s. 3400.3 Airway Facilities Maintenance Personnel Certification Program.
- t. AF 3450.1 Airway Facilities Technical Employee Suggestion Program.
- u. 3900.19 Occupational Safety and Health Program.

APPENDIX 4. LIST OF RELATED PUBLICATIONS (CONTINUED)

- v. 3900.32 Agency Compliance With Occupational Safety & Health Administration Standards: APM National Abatement Plan.
- w. 4250.9 Field Material Management and Control Handbook.
- x. 4620.3 Initial Support for New or Modified Equipment Installation.
- y. 4630.2 Standard Allowance of Supplies and Working Equipment for National Airspace System Facilities.
- z. 4650.20 Reporting and Replacement of Items Failing Under Warranty.
- aa. 4660.1 Real Property Handbook
- bb. 4670.2 Motor Vehicle Management.
- cc. 4800.2 Utilization and Disposal of Excess and Surplus Personal Property.
- dd. 6000.5 Facility, Service, and Equipment Profile.
- ee. 6000.6 United States Interagency Ground Inspection Manual for Air Traffic Control and Navigational Aid Facilities.
- ff. 6000.15 General Maintenance Handbook for NAS Facilities.
- gg. 6000.30 NAS Maintenance Policy
- hh. 6000.41 Policy Governing Contractor-Assisted Maintenance for the National Airspace System.
- ii. 6000.48 General Maintenance Logging Handbook.
- jj. 6000.50 Airway Facilities National Airspace System Operations Procedures.
- kk. 6030.18 Mobile Air Traffic Control, Navigational Aid, Communication, and Power System.
- ll. 6030.31 Restoration of Operational Facilities.
- mm. 6030.41 Notification Plan for Unscheduled Facility and Service Interruptions and Other Significant Events.
- nn. 6030.45 Facility Reference Data File.
- oo. 6032.1 National Airspace System Modification Program.
- pp. 6040.6 Airway Facilities NAS Technical Evaluation Program.
- qq. 6040.15 National Airspace Performance Reporting System.
- rr. 6050.32 Spectrum management Regulations and Procedures.
- ss. 6200.4 Test Equipment Management Handbook.

APPENDIX 4. LIST OF RELATED PUBLICATIONS (CONTINUED)

- tt.** AF 6430.49 Ground Rules for Air Defense Command and CAA Joint Use of Radar Facilities.
- uu.** 6480.2 Maintenance Of Mobile Air Traffic Control Towers.
- vv.** 6700.16 Maintenance of Mobile VHF Omnirange (VOR) Facilities.
- ww.** 6700.20 Non-Federal Navigational Aids and Air Traffic Control.
- xx.** 6930.1 Fire Prevention and Maintenance of Fire Protection Equipment.
- yy.** 6980.25 Maintenance of Batteries for Standby Power.
- zz.** 7210.3 Facility Operations and Administration.
- aaa.** 7340.1 Contractions.
- bbb.** 7610.4 Special Military Operations.
- ccc.** 7930.2 Notices to Airmen (NOTAMS).
- ddd.** 8020.11 Aircraft Accident and Incident Notification, Investigation and Reporting.
- eee.** NAS MD-001 National Airspace System Configuration Management Document.
- fff.** 8200.1 United States Standard Flight Inspection Manual.
- ggg.** 29 CFR 1910.1200 Hazard Communication (Workers Right to Know).

APPENDIX 5. FAA FORMS

The following FAA Forms are referenced in this Order 6000.15D.

Form #	Title	NSN	Unit of Issue
1800-2	NAS Change Proposal	0052-00-801-6004	SH
4650-10	Warranty Failure Report	0052-00-030-5003	PD
6000-8	Technical Performance Record	0052-00-686-0001	PD
6030-1	Facility Maintenance Log	0052-00-028-5001	PD
6032-1	Airway Facilities Modification Record	0052-00-620-1001	SH



Memorandum

U.S. Department
of Transportation

**Federal Aviation
Administration**

Subject: **INFORMATION**: Suggested improvements to
Order 6000.15D, General Maintenance
Handbook for NAS Facilities

Date: _____

From: _____

Signature and Title

Reply to _____

Attn of: Facility Identifier
AF Address

To: Director, ATO Technical Operations Support

Problems with present handbook:

Recommended improvements: