NATIONAL AIRSPACE CONFIGURATION MANAGEMENT

1800.8f

May 20, 1991

1800.8F

CHAPTER 1.

GENERAL

1. PURPOSE. This order prescribes configuration nanagement (CM) policy, delegates authority, and assigns responsibility for CM of the development, installation, and maintenance of the Nationat Airspace System (NAS).

2. DISTRIBUTION. This order is being distributed at division level to the Offices of the Associate Administrator for NAS Development, the Associate Administrator for Air Traffic, and the Associate Administrator for Airway Facilities; branch level to the Systems Maintenance Service, Office of Air Traffic System Management, Air Traffic Rules and Procedures Service, and Air Traffic Plans and Requirements Service; branch level at the FAA Technical Center; director level at the Aeronautical Center; branch level at the FAA Logistics Center and the FAA Academy in the Aeronautical Center; branch level in the regional Airway Facilities, Logistics, Air Traffic, and Flight Standards Divisions; a limited distribution to all Airway Facilities field offices; and selected offices of the Department of Defense.

3. CANCELLATION. Order 1800.8E, Mational Airspace System Configuration Management, dated July 11, 1985, and Order 6000.20B, Waiver of Criteria for Establishment and Maintenance of Airway Facilities, dated February 12, 1979, are hereby canceled.

4. BACKGROUND.

a. The need for CM is emphasized with the advent of the systems engineering and integration approach to implementation of the NAS Plan. The increased emphasis on technical management of the NAS design process mandates exercising CM over the technical documentation as subsystems evolve through each life-cycle phase; requirements determination, acquisition, and operational support.

b. Order 6000.20B prescribes methods of processing requests for waivers and for issuing waivers of national criteria. Since this order was approved, site equipment has been entered into the NAS baseline. Consequently, changes to site equipment are now handled as local changes and waivers are no longer necessary.

5. EXPLANATION OF CHANGES.

a. The latest FAA reorganization has been incorporated throughout the document.

b. Specific documentation comprising each baseline has been listed using FAA-STD-005, Preparation of Specification Documents, as a guide.

c. Regional Configuration Control Boards (RCCB) have been established with authority delegated in the Regional CCB charter by the NAS Configuration Control Board (paragraph 31c(3)).

d. The Baseline Documentation and Configuration Identification System (DOCCON) automated support tool which collects, stores, and reports data about NAS facilities, hardware and software is discussed. Procedures are included for ensuring that appropriate documentation is forwarded to the given address with the proper cover sheet (paragraph 45).

e. FAA acquisition CM requirements are defined to reflect FAA-STD-021, Configuration Management (Contractor Requirements). Configuration audits have been added to CM responsibilities with expanded definitions under Review and Audits.

f. Deployment Readiness Reviews (DRR) have been added as a required review prior to deployment of a project to the field (paragraph 66c(2)).

g. Guidance has been added for performing CM on Commercial Off-The-Shelf (COTS) hardware and software (paragraph 64).

h. Changes have been made to improve the readability of the document. CM procedures were removed from chapter text and moved to appendixes. Documents referenced in the order and an acronyms listing have been listed in separate appendixes (appendixes 2 and 3).

i. Specification Review Board procedures have been reworked to accommodate not only the establishment of the Interface Control Working Group (ICWG), but also the refinement of ASE-600 responsibility and NCP processing procedures (appendix 4).

j. Configuration Control and Status Accounting procedures for proposing, reviewing, approving, and implementing changes to the NAS configuration have been added (appendix 5).

k. Policy and procedures for the transitioning of CM responsibilities from one NAS life-cycle phase to another have been added including candidate documentation for each baseline (appendix 6).

1. Roles and responsibilities of the ICWG have been added for processing Interface Requirements Documents (IRD) and Interface Control Documents (ICD) (appendix 7).

m. Guidance for planning and conducting configuration audits has been added including definitions of roles and responsibilities and a brief overview of a Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) (appendix 8).

n. Requirement Change Proposals (RCP) were deleted as vehicle for proposing changes to the NAS System Requirement Specification (NASSRS).

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6. DEFINITIONS. The definitions of terms used in this document are included in Appendix 1, Glossary, and Appendix 2, Acronyms. Key definitions are as follows:

a. Baseline refers to technical documentation (a single document or a set of documents) formally designated and fixed at a specific time during a configuration item's life cycle. Baselines, plus approved changes to those baselines, constitute the current configuration identification.

b. Configuration Item (CI) is an aggregation of hardware/software/firmware, or any of its discrete portions, which satisfies an end-use function and is designated by the FAA for configuration management. For purposes of applying configuration management to space utilization, floor space is defined as a CI.

(1) Computer Software CI is a CI for computer software.

(2) Hardware CI is a CI item for hardware.

c. Configuration Management (CM) is a discipline applying technical and administrative direction and surveillance to: identify and document the functional and physical characteristics of a CI; control changes to those characteristics; record and report change processing and implementation status; and audit documentation and CI's to ensure adequacy of the baseline that is being established. These basic elements are defined as follows:

(1) Configuration identification consists of the currently approved or conditionally approved technical documentation for a CI as set forth in' specifications, drawings and

associated lists, and documents referenced therein.

(2) Configuration control is the systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of a CI after formal establishment of its configuration identification.

(3) Configuration status accounting records and reports the information that is needed to manage the conflguration effectively. This includes a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

(4) Configuration auditing is the formal examination of the configuration identification and the CI's to ensure product integrity prior to establishing a baseline for a CI.

d. Configuration Control Board (CCB) is the official FAA authorlzed vehicle to approve baselines and changes to baselines.

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7. FORMS. The following forms are available through normal distribution channels with the exception of FAA Form 1800-49:

a. FAA Form 1800-2, NAS Change Proposal, NSN 0052-00-801-6003, Unit of Issue: Sheet.

b. FAA Form 1800-15, Case File Transmittal/Evaluation (inter/intra region), FSN 0052-00-817-6000, Unit of Issue: Sheet.

c. FAA Form 1800-17, Case File Comments, NSN 0052-00-817-8000, Unit of Issue: Sheet.

d. FAA Form 1800-49, NAS Configuration Control Decision, available through ASE-600, Unit of Issue: Sheet.

e. FAA Form 6030-3, Hardware Discrepancy Report, NSN 0052-00-026-9000, Unit of Issue: Sheet.

f. FAA Form 6100-1, Program Technical Report, NSN 0052-00-322-7000, Unit of Issue: Sheet.

g. FAA Form 1800-60, NAS DocumentatLon and Configuration Identification Data Sheet, NSN 0052-00-906-3000, Unit of Issue: Sheet.

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8. AUTHORITY IO CHANGE THIS ORDER. The Associate Administrator, System Engineering and Development, ASD-1, may issue changes to this order necessary to implement and manage the NAS Configuration Management System. The Administrator reserves the authority to approve changes that establish policy, delegate authority, or assign responsibility.

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9. POLICY. It is FAA policy to develop and implement the techniques of configuration management in accordance with this order to achieve required NAS performance, operational efficiency, reliability, maintainability, and safety. Chapters 1 through 7 contain FAA CM policy, and appendixes 1 through 8 contain further guidance and procedures.

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10. APPLICATION. CM is applied to NAS design levels as well as all elements of a system: hardware, software, firmware, test equipment, facilities, and documentation (specifications, plans, drawings, manuals, etc). The basic approach is to use standard CM techniques but retain flexibility to tailor requirements for each CI.

a. CM shall be applied to the NAS design levels, subsystems, equipment, and software throughout

each phase of the life cycle. Specific application of the CM policy contained in this order shall be tailored to each subsystem life cycle based on quantity, slze, scope, and complexity.

b. Initiation of CM shall occur in the requirements determination phase with establishment of the NAS operational requirements and the NAS functional and allocated design baselines.

c. CM shall continue throughout the NAS life cycle, and any proposed changes to the baseline configuration and associated documentation shall be subject to CCB review and approval/disapproval action.

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11. RESPONSIBILITY FOR CONFIGURATION MANAGEMENT

a. Associate Administrator for Systems Engineering and Development, ASD-1, as Chairperson of the NAS CCB, has responsibility for providing technical and administrative direction to properly identify, control changes, and record the configuration and change implementation status to NAS requirements and the Level I Design Document.

b. Director, System Engineering Service, ASE-1, has responsibility for providing FAA-wide technical and administrative direction to properly identify, control changes, conduct reviews, and record the configuration and change implementation status of the functianal and physical characteristics in NAS designs.

c. Associate Administrator for NAS Development, AND-1, has responsibility for providing service-wide technical and administrative direction to properly identify, control changes, record the configuration and change implementation status and conduct reviews and audits of the functional and physical characteristics of NAS subsystems, equipments, and software CI's.

d. Program Directors and Program Managers have responsibility for compliance with established CM policy and procedures relating to subsystems, equipments, and software.

e. Division Manager, Automation Software Division, ATR-200, has responsibility for providing division-wide technical and administrative directLon to properly identify, control changes, conduct reviews, ant record the configuration and change implementation status of ART- maintained and acquired software during the operational support phase of the life cycle.

f. Director, System Maintenance Service, ASM-1, has responsibility for providing service-wide technical, maintenance, and adminiserative policy and direction to properly identify, control changes, and record the configuration and change implementation status of all existing facilities and equipment in the operational support life-cycle phase. Additionally, ASM-1 is responsible for CM of software in this life-cycle phase except that software maintained by Air Traffic. Note that ASM-1 is responsible for all commissioned facilities and equipment including airway facilities maintained firmware and software.

g. Manager, Regional Airway Facilities Divisions has responsibility for providing division-wide technical and administrative direction to properly identify, control changes, and record the configuration and change implementation status to all CI's under their control. These may include items such as Air Route Traffic Control Centers (ARTCC)/Area Control Facility (ACF), Terminal Radar Approach Control (TRACON), Air Traffic Control Tower (ATCT), and Automated Flight Service Station (AFSS) site specific transition equipment layout drawings, ARTCC/ACF critical power panel drawings, site adaptation (including air handling equipment), region-unique equipment and regionally tailored construction specifications.

h. Manager, Regional Air Traffic Divisions has responsibility for providing division-wide technical and administrative direction to properly identify, control changes, and record the configuration and change implementation status to all CI’s under their control. Additionally, the Regional Air Traffic division manager is responsible with the Regional Airway Facilities division manager for reviewing and approving changes relating to ARTCC/ACF, TRACON, ATCT, AFSS, operational and administrative space management.

i. Division Managers, NAS Development (AND) are responsible for assuring that CCB approvals are received for NAS Plan specifications, both for initial award and planned subsequent changes to the baseline, prior to submission of a procurement request (PR) to the Acquisition and Material Service (ALG).

j. Division Managers, Configuration Management and Engineering Support Division, ASE-600, has CM system responsibilities. This includes the development and implementation of CM policy, procedures, standards, and includes performance of CCB secretarist functions for CCB's. ASE-600 monitors the CM requirements on NAS subsystems. In addition, ASE-600 is responsible for the Specification Review Board (SRB) and provides administrative support for change processing, scheduling, monitoring, and updating status accounting documents.

k. Division Managers (ASE-100 through ASE-500) have responsibility for conducting change reviews. In addition, ASE-600 is responsible for specifications and interface requirements.

l. Director, NAS Transition and Implementation Service, ANS-1, has responsibility for Regional CCB's, facility as-built, site-specific end-state and transition drawings, and Computer Aided Engineering Graphics.

m. FAA project personnel have responsibility for complying with established FAA orders. Additionally, they may be responsible for generating specifications, monitoring contractor CM systems, performing CCB secretariat functions, performing configuration audits, and performing change processing and status accounting functions.

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12. CONFIGURATION MANAGEMENT DOCUMENTS. The documents listed in Appendix 3, Applicable Documents, are applicable to the extent specified herein.

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CHAPTER 2.

NAS CONFIGURATION MANAGEMENT OVERVIEW

20. GENERAL. This chapter describes CM activities during each phase or the 'NAS life cycle. To make the NAS Plan a reality and to establish a firm foundation for NAS evolution, discipline must be exercised at every step of the FAA system engineering process. This discipline is achieved, in part, through the application of C! concepts throughout the NAS design, as well as during periods of equipment/software acquisition and operation.

21. NAS LIFE CYCLE. The NAS life cycle is complex and varies from more traditional system life-cycle processes. There is a current operational system which is to be transformed into the desired modernized system. However, embedded within the overall NAS is a diverse set of NAS subsystems, each executing its assigned portion of the NAS mission and each with its own, unique subsystem life cycle. These individual subsystem life cycles must be coordinated and managed for the NAS Plan to be implemented effectively. This situation is depicted in figure 2-1 for a representative subsystem within the NAS. However, from time to time groups of NAS subsystem life cycles must be synchronized so that incremental capabilities may be introduced into the operational NAS. Interfaces among NAS subsystems must be controlled when allocation of functionality to subsystems is defined and throughout the life cycle of each subsystem.

22. CONFIGURATION MANAGEMENT AND NAS LIFE-CYCLE PHASES. The three basic NAS life-cycle phases depicted in figure 2-1, requirements determination, acquisition, and operational support, provide the framework for CM activity. While CM is applied throughout the life cycle, its specific application is dependent upon the life-cycle phase being considered. Each of the three phases is always in execution--requirements are continually being updated, subsystems are continually being acquired, and the operational NAS is in continuous operation. Subsystems or equipment under CM during each life-cycle phase are listed in NAS-MD-001, NAS Subsystem Baseline Configuration and Documentation Listing.

a. Requirements Determination. In this NAS life-cycle phase, the operational requirements are determined through mission, support, and integration transition analysis; technology application studies; and concept analysis. The operational requirements are baselined and then used as input to the development of the NAS functional, allocated, and transition baselines. These baselines are addressed further in chapter 5.

b. Acquisition. During this phase, NAS functional requirements are allocated to major subsystem components; subsystem component interface requirements are determined and documented; and subsystem equipment, software, and firmware are designed, developed, produced, installed, and commissioned. The program/project manager is responsible for managing the functional activities necessary to produce and maintain the functional, allocated, design, and product baselines. These baselines are addressed further in chapter 6.

c. Operational Support. This phase encompasses the period of time the products of each project enter operational service until they are decommissioned. The objective of this phase is to provide necessary operational services in the most efficient and cost-effective manner through the maintenance of the NAS operational baseline. The program/project manager retains subsystem CM responsibility until transitioned to the user or maintenance organization(s). The NAS operational baseline is maintained during the operational support phase. For hardware, the operational baseline will be controlled to each serialized equipment by location and modification level. For software, the operational baseline will be controlled to the computer program member (smallest definable unit of code) level. Operational support baselines are addressed further in chapter 7.

23. CONFIGURATION MANAGEMENT TRANSITION. There are two transition points for any subsystem evolving through the three NAS life-cycle phases.

a. Requirements Determination/Acquisition. Transitioning from the requirements determination phase to the acquisition phase is the responsibility of the Specification Review Board (SRB). All proposed specifications developed for NAS subsystems must be processed through the SRB before they are baselined by the Systems Engineering (SE) CCB and can be used. After initial baselining of these documents, changes will be processed as directed by this order. SRB membership and responsibilities are described in Appendix 4, Specification Review Board. s

b. Acquisition/Operational Support. Transfer of a subsystem from the acquisition program/project manager to the appropriate operational support manager(s) will take place during this transition. CM supports the transition to ensure that CM responsibility and requirements are handed-off and maintained. Procedures for formalizing the hand-off are detailed in a Memorandum of Understanding (MOU) signed by affected acquisition and operational support organizations. Transition of CM responsibility is addressed further in Appendix 6, NAS CM Transition.

24.-29. RESERVED.

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CHAPTER 3.

CONFIGURATION CONTROL BOARDS

30. GENERAL. The CCB is the official agency-authorized vehicle to establish baselines and to approve or disapprove subsequent changes to those baselines. This chapter discusses the functions, membership, and responsibilities of all the NAS CCB's which include NAS, SE CCB, Program CCB's, Air Traffic (AT) CCB, Maintenance Engineering (ME) CCB, and Regional CCB's.

31. STRUCTURE. The NAS CCB structure established by Order 1800.57, National Airspace (NAS) Configuration Control Board (CCB), provides authority to control the NAS configuration. Authority may be delegated by the NAS CCB to lower level CCB's for effective administration of proposed changes at the most appropriate level. Figure 3-1 reflects the NAS CCB structure which represents configuration control responsibilities by life-cycle phase.

a. Requirement Determination Phase.

(1) The NAS CCB is responsible for the formal review and resolution of all changes to NAS operational requirements, the NAS Functional (Level I) Design baseline, and all related systems engineering documentation including: the NAS System Requirements Specification (NAS-SR-1000) and the NAS Functional (Level I) Design Document (NAS-DD-1000). The NAS CCB reviews and approves charters for the program CCB's, SE CCB, ME CCB, AT CCB, and the Regional CCB's, and delegates decision authority and provides oversight to these boards. The NAS CCB is chaired by the Associate Administrator for System Engineering and Development (ASD-1).

(2) The SE CCB is accountable for the activities of all lower boards and is responsible for controlling baselines, engineering standards, and administering change control for the NAS allocated and transition design baselines. It is also responsible for controlling the interfaces between NAS subsystems. The documents for which the SE CCB is responsible are the NAS System Specification (NAS-SS-1000), NAS Transition Plan, generic space allocation drawings used for transition planning and facility space management, FAA engineering standards and specifications, IRD's, and NAS-MD-001. The SE CCB is co-chaired by the Deputy Associate Administrator for System Engineering and Development (ASD-2) and the Deputy Associate Administrator for Airway Facilities (AAF-2).

b. Acquisition Phase. During the acquisition phase, both the FAA and FAA contractors have CM responsibilities. Contractor CM responsibilities are specified in FAA-STD-021, Configuration Management (Contractor Requirements). FAA acquisition phase responsibilities are as follows:

(1) Program CCB's are responsible for controlling the subsystem functional, allocated, design, and product baselines and for administering change control for the NAS subsystems under project acquisition. Program CCB's are responsible for documents including the FAA-controlled system/segment specification and the contractor-maintained development specifications, ICD's, and documents comprising the product baseline as listed in paragraph 62d. Documentation comprising a project product baseline varies for each acquisition. Additionally, the ANS CCB is responsible for baselining and ensuring configuration control of site-specific end-state equipment layout drawings used for space management. Each programn CCB is chaired by the program director/manager.

(2) Each program CCB is required to operate within cost, schedule, and technical thresholds in the approval of changes. A Configuration Control Decision (CCD) authorizing a change exceeding an approval threshold shall not be signed by a CCB

Chairperson until the required approvals are available in writing and the program funds have been allocated.

(a) The cost impact must be less than the dollar amount established in Order WA 4400.1, Guide for Preparing Procurement Requests.

(b) A change approved by a Program CCB must not impact any milestone in the NAS Master Schedule or NAS Transition Plan. The SE CCB Chairperson or a delegated representative is the approval authority for changes that do impact these milestones.

(c) A change approved by a Program CCB must not result in a change to any baseline outside the domain of the cognizant Program CCB. The NAS CCB or SE CCB, depending on the CI impacted, is the higher authority for changes which exceed the technical authority of a Program CCB.

c. Operational Support Phase. During the Operational Support Phase, the following CCB's are active:

(1) ME CCB is responsible for controlling baselines and administering change control for the NAS hardware and airway facilities maintained software subsystems in operational service. The ME CCB is responsible for a subsystem's product baseline documentation as handed off by the Program CCB responsible for the acquisition of the subsystem and modified as necessary through the NAS Change Proposal (NCP) process to become the operational baseline. The ME CCB is also responsible for any baselined operational support documentation as indicated in paragraph 31b(1), as well as modification handbooks and maintenance technical handbooks. The ME CCB is chaired by the Director, System Maintenance Service, ASM-1, or his designee.

(2) AT CCB is responsible for controlling baselines and administering change control for NAS operational air traffic control (ATC) software and support software. The AT CCB is responsible for Computer Program Functional Specifications (CPFS) and ICD's. The AT CCB is chaired by the Manager, Air Traffic Automation Software Division, ATR-200.

(3) Regional CCB's are responsible for controlling changes to space management, critical power, site adaptation, equipment unique to region and regionally tailored construction specifications as stated in the regional CCB Charters.

(4) As additional CI's are identified, authority will be designated to the appropriate organization(s).

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32. CHARTERS AND PROCEDURES.

a. The NAS CCB is chartered through Order 1800.57. The order provides policy for the establishment of lower level boards. Each CCB is established through a charter defining its authority, responsibilities, and membership. All subordinate CCB charters and changes must be approved by the NAS CCB.

b. Each CCB approves operating procedures defining how it will operate.

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33. CONFIGURATION CONTROL DECISIONS. NCP's are prepared on FAA Form 1800-2, NAS Change Proposals, to establish baselines or to change a baseline. NCP's that have successfully completed the must evaluation and comment resolution process, are submitted to the appropriate CCB for processing. The CCD shall serve as the official notification of CCB decisions/directives. When contractual action is required, the CCD shall serve as the basis for preparation of a PR. CCD's establishing baselines shall direct that two copies of baselined documentation and a NAS documentation data sheet are submitted to the NAS Documentation Control Center. See paragraph 45.

34. MEMBERSHIP RESPONSIBILITIES. Each CCB has its own distinct functional membership. The responsibilities of these members are as follows:

a. Chairperson is responsible for deciding CCB actions, authenticating CCB operating procedures, ensuring strict adherence to the provisions of the CCB's charter and operating procedures, and conducting the meetings.

b. The Executive Secretary is responsible for establishing the agenda and for scheduling the CCB meetings, ensuring that necessary action is taken in processing all proposed changes for disposition by the CCB, maintaining records for the CCB, preparing and distributing the minutes and action items of the meeting, and preparing CCD's for the Chairperson's signature.

c. Permanent Members/Ad Hoc Members will provide guidance to the Chairperson on subjects being considered by the CCB to ensure decisions are based on technical and policy positions consistent with their organization's evaluation of the subject. They will also be responsible for representing and committing their organizations to CCB decisions and accepting action items.

d. Ad Hoc Technical Advisors/Consultants will be invited to CCB meetings whenever certain expertise is required or when the subject matter being considered may impact their areas of interest. They will advise and counsel the Chairperson, when requested, and provide studies and presentations to assist the CCB in its deliberations.

35.-39. RESERVED.

CHAPTER 4.

CONFIGURATION CONTROL AND STATUS ACCOUNTING

40. GENERAL. This chapter describes the actions required to perform configuration control and status accounting activities in support of systems engineering, program/project management and maintenance organizations throughout the NAS life cycle. Configuration control and status accounting begins with the establishment of the requirements baseline during the requirements determination phase and continues throughout the NAS life cycle. Configuration control and status accounting support systems engineering management in maintaining control of design data and interface documentation. These support systems ensure traceability of configuration baselines and changes to baselines. In the acquisition phase, configuration status accounting supports the Program CCB's by providing pertinent information on status of the evolving NAS. In the operational support phase, configuration status accounting supports the ME CCB, AT CCB, and Regional CCB's with pertinent information on proposed/approved changes to the operational NAS. Appendix 5, Configuration Control and Status Accounting Procedures, provides detailed change control procedures.

41. NAS DOCUMENTATION AND CONFIGURATION IDENTIFICATION (DOCCON) SYSTEM.

a. The DOCCON System is the FAA source for information on configuration management documentation and the status of change proposals to the NAS. DOCCON consists of three operational subsystems.

(1) Documentation and Configuration Index (DCI). The DCI subsystem establishes and maintains a focal point for identifying, storing, and retrieving current and historical document information as well as NAS configuration item information. This subsystem maintains the Master Configuration Index (MCI) and produces the NAS-MD-001 report. Users can query for information through a menu of standardized reports that can be routed either to their terminal or to any printer with an address on the system's directory.

(2) Configuration Management/Status Accounting (CM/STAT). The CM/STAT subsystem of DOCCON provides information on proposed changes to configuration items to the general user and also allows those general users granted appropriate access levels to enter and maintain data on proposed changes. All case files, NCP's/CCD's must be entered into CM/STAT to be processed.

(3) Document Ordering. The DOCCON system provides document information for hardware, software, firmware, and facilities under NAS configuration control. Orders for documentation can be placed on-line through the Automated Document Ordering subsystem of DOCCON. Orders for documentation with no document record in DOCCON can be processed by the Document Control Center (DCC), ASE-621, if a document number is provided.

b. While regions and other organizational units may maintain local databases or systems to track case files, NAS Change Proposals, and Configuration Control Decisions; it is vital to the FAA's mission that this information appear in the national DOCCON system in order to effectively manage proposed changes to the NAS.

42. CONFIGURATION CONTROL. Configuration control is the process of coordinating the review and approval of proposed changes and maintaining status of the implementation of approved changes to configuration items. NCP's are required for proposing changes to subsystems, equipments, and software under configuration control as listed in NAS-MD-001. The vehicles for proposing changes to a NAS baseline are Engineering Change Proposals

(ECP), Engineering Change Requests (ECR), Technical Employee Suggestions (in accordance with Order 3450.7, Incentive Awards Program), and Case Files (FAA Form 1800-2). Instructions for completing FAA Form 1800-2 are included in NAS-MD-001 and appear on the form itself. Changes may be originated by personnel in the field, in the region, at FAA headquarters, the Department of Defense, and other Government agencies. Regardless of how a change proposal originates, it eventually becomes a case file. Case files endorsed by prescreening organizations become an NCP when received by ASE-600 and issued an NCP number. ASE-600 is responsible for change control and reviewing case files to assure information describing the change is complete and that a thorough review is accomplished prior to submission to the appropriate CCB(s). All changes (proposed or implemented) to NAS technical baselines must specify a configuration item identifier which identifies the NAS subsystem listed or to be listed in NAS-MD-001. NAS baseline documentation is stored and controlled in the NAS documentation control center and related document change activity data is stored and processed by the automated documentation tool. See chapters 5, 6, and 7 for specific life-cycle phase information.

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43. STATUS ACCOUNTING. The status accounting system is used as a management information service to provide traceability of modifications to baselines and to track the status of actions necessary to implement those modifications, and document actions affecting CI resulting from the modifications. The status accounting system provides information listing the approved configuration identification, the status of all (approved/disapproved) proposed changes to a CI, and the implementation status of approved changes. Current information is available concerning other aspects of a change to a CI, including specification and drawing updates, remarks concerning other hardware affected, operating and technical manual revisions, and modification kit incorporations.

a. Status Accounting Objective.

(1) A principal objective of configuration status accounting for hardware is to achieve complete and current accounting knowledge of the configuration status of installed equipment, and to impose requirements for reporting and recording all changes in configuration. Satisfying this objective requires the initial establishment of records describing where equipment is located or installed, identification of serialized equipment, and modification status.

(2) A principal objective of configuration status accounting for software is to achieve complete and current accounting of the change level for Computer Program Functional Specifications (CPFS) and related software.

b. Status Accounting Functions. Status accounting functions include the:

(1) Establishment of a codification scheme and numbering system to uniquely identify CI baselines and changes.

(2) Preparation and maintenance of a master CI index.

(3) Recording of data concerning CI baselines, status of proposed changes, final change disposition and installation.

(4) Reporting of status information to technical management to provide visibility into a CI's configuration at any point in time.

(5) Development of a status accounting record of each serialized-numbered hardware product from each project relatable to the Integrated Logistic Support data records on this product through its part and serialized numbers and installed change identification number.

c. Status Accounting Records. Configuration status accounting records will support and be consistent with configuration identification documentation. Status accounting data shall be maintained from the time a CI is placed under configuration control until it is decommissioned. The Configuration Management and Engineering Support Division, ASE-600, is responsible for the accuracy of CM data and the quality of record maintenance functions.

d. Status Accounting Reports. Status accounting data and reports are generated by systems under

ASE-600's control. ASE-600 may provide configuration control, status accounting, NCP dispositions, and required follow-up action.

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44. NAS SUBSYSTEM BASELINE CONFIGURATION AND DOCUMENTATION LISTING. Each configuration item identifier in the NAS will be listed in NAS-MD-001 which specifies CI's within each life-cycle phase of the NAS. Each CI listing will indicate the baseline and the baseline documentation including interface control documentation. The Office of Primary Interest (OPI) for each NAS subsystem and associated FA Type number(s) will also be indicated in NAS-MD-001.

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45. BASELINED DOCUMENTATION. The NAS Documentation Control Center, ASE-621, has been established to serve as the repository and central ordering point for NAS documentation, including baselined documentation data. An automated support tool has been developed to collect, store, and report data about NAS facilities, hardware, and software. It shall serve as the authoritative source of information concerning baseline CI's and associated documentation.

a. Candidate Document Characteristics. The following document characteristics should be used for determining when procedures in paragraph 45b are applicable.

(1) The subject document is of the type indicated in Appendix 6, NAS CM Transition, Figure 1, Baseline Documentation, has been baselined and a corresponding CCD has been prepared and signed by the appropriate CCB Chairperson, or

(2) A change to a baselined document already listed in NAS-MD-001 has been approved by the appropriate CCB, a CCD has been signed, and the change implementation directive is one of the following: Specification Change Notice (SCN), Electronic Equipment Modification (EEM) Handbook, Plant Equipment Modification (PEM) Handbook, Site Program Bulletin (SPB), Site Technical Bulletin (STB), F&E Program Description, Special Maintenance Project Description, change notices to Maintenance Technical Handbooks, and CCD's for local and test modifications.

b. Procedures. The procedures to be followed to ensure baselined documentation is received by and stored in the NAS Documentation Control Center and that associated data is maintained in the automated tool are:

(1) Once the CCB has baselined a document or approved a change to a baselined document in accordance with policies and procedures established by this order, the Executive Secretary of the CCB or a designated representative prepares the CCD. Each CCD instructs the action office to complete a NAS Documentation and Configuration Identification Data Sheet identifying the affected baseline document and/or change, and forward two copies of the baselined document/change with a completed data sheet to the NAS Documentation Control Center.

(2) The action office prepares the two copies of the baselined documentation, completes the NAS Documentation Data Sheet, and forwards the package to the NAS Documentation Control Center at the following address:

NAS Documentation Control Center, ASE-621

475 School Street, SW.

Washington, DC 20024

Telephone: FTS 967-2047 or (202) 646-2047

(3) Baselined documentation and approved changes that are to be maintained by the document originator or other responsible FAA organization and not sent to the NAS Documentation Control Center are described on the NAS Documentation and

Configuration Identification Data Sheet, and only the data sheet is forwarded to the NAS Documentation Control Center. These documents include drawings and documents associated with configuration items controlled exclusively by a Regional CCB.

(4) The NAS Documentation Control Center receives the completed NAS Documentation Data Sheet and, if appropriate, the baselined document or approved change from the action office. The center verifies that all required data has been provided and enters appropriate data into the automated tool. The NAS Documentation Control Center advises the appropriate CCB Executive Secretary, or designated representative, via the Documentation Control Center Alert Notice Report that the documentation has been received as indicated in the authorizing CCD.

(5) The Executive Secretary or designated representative annotates on the CCD that the baseline documentation action has been completed and makes the changes to the status of the CCD in the automated tool.

(6) The Executive Secretary or designated representative reviews the status of all CCD's approved by the CCB to ensure that all baselined documentation and approved changes thereof are forwarded to the NAS Documentation Control Center as directed by the appropriate CCB Chairpersons. The Executive Secretary then prepares a summary of open actions for the CCB Chairperson to follow-up with action offices at the next CCB to ensure that the CCD specified action is accomplished.

c. NAS Documentation Control Center Use. The NAS Documentation Control Center is a repository for data on all NAS baselined documentation and related technical documentation that is pertinent to the NAS. Inquiries concerning NAS baselined documentation and requests may be submitted via the on-line DOCCON document ordering function, the address in subparagraph b(2), or by way of the phone number provided.

46.-49. RESERVED.

1800.8F

CHAPTER 5.

CONFIGURATION MANAGEMENT FOR NAS REQUIREMENTS DETERMINATION

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50. GENERAL. This chapter addresses CM during the requirements determination phase of the life cycle, NAS system-level configuration identification, configuration control and design reviews. Effort during this phase centers on the definition of NAS operational requirements and the establishment of NAS designs which result in an assembly of operational requirements into subsystem areas, known quantities of equipment, and top-level interface definitions. The NAS system-level allocated design is used in the procurement of subsystems to satisfy the integrated NAS operational requirements.

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51. BASELINES AND CONFIGURATION IDENTIFICATION. The management approach to effective and efficient implementation of the NAS Plan involves transitioning from a series of functional statements of NAS operational requirements to a NAS design. There are several levels of NAS design, with each successive level representing more detail. The technical baselines shall be consistent, traceable to operational requirements, supportive of the goals and objectives of the FAA, and result in subsystems that are technically and economically practicable. A subsystem is defined as a grouping of one or more end items that is a relatively independent, identifiable functional entity. Subsystems may track to several specifications depending on the acquisition strategy utilized.

a. NAS Requirements. NAS operational requirements are documented in the NAS System Requirements Specification (NASSRS) (NAS-SR-1000) which is a compilation of requirements which describe the operational capabilities for the NAS. It includes both existing and transitional system capabilities. As an internal FAA management tool, it supports the NAS design, engineering, and acquisition activities and is used to manage and control change to the NAS. The NASSRS is maintained to reflect changes as new needs are identified, new capabilities are developed, and existing systems are retired.

b. NAS Functional Design. The NAS Functional Design, documented in NAS-DD-1000, reflects the architecture of the NAS that is expected to exist. The NAS functional design contains the definition of system-level functional requirements based on operational requirements, the allocation of functions to subsystems in the NAS, and the definition of functional interfaces between subsystems including information flows and connectivity. The Level I Design Document includes a description of NAS functional requirements and their allocations and is derived from and traceable to the NASSRS. The NAS functional design considers specifications for subsystems currently being procured, external factors that are outside FAA's control, and the capabilities of those fielded subsystems that are expected to remain in service.

c. NAS Allocated Design. The NAS allocated design reflects the general design for the four major NAS elements: Ground to Air, Interfacility Communications, Air Traffic Control, and Maintenance and Operations Support. The NAS allocated design extends the NAS functional design by establishing the functional, performance, design, manufacture/construction, logistics, personnel and training, documentation, verification, and interface requirements for the NAS. The NAS allocated design includes detailed interface definitions between systems and subsystems including the specific siting requirements and estimates of data communications loadings.

(1) The NAS allocated design, documented in the NAS System Specification (NAS-SS-1000), specifies the functions, performance, and interfaces of the NAS subsystems and support necessary to meet the NAS operational requirements. The NAS System Specification is compliant with the NASSRS, the controlling document for the NAS operational requirements, and the Level I Design Document.

(2) IRD's specify detailed requirements for functional and allocated baselines by describing existing NAS facilities and equipment interfaces. These documents are generated by the FAA in accordance with FAA-STD-025, Preparation of Interface

Documentation, and are provided to NAS contractors.

d. NAS Transition Design. The task of transition includes planning the implementation of all NAS Plan projects as well as required changes to the existing hardware, software, and facilities already in operation in the NAS. The NAS Transition Plan, which guides this process, presents the overall strategy for transition of the NAS from the present to the end-state configuration and specifies organizational roles and responsibilities. The NAS Transition Plan consists of two volumes: Volume I, the NAS Transition Management Plan, which describes the process used to implement and integrate the transition at the national and regional levels and Volume II, the NAS Transition Data Base, which describes the facility and component changes required for transition to the end-state configuration.

e. Facility Space Management.

(1) The objectives of space management are to make optimum use of space at existing NAS facilities, provide for construction of new space at the earliest possible time, and manage the configuration, utilization, and integration of facility space with respect to hardware, support, environmental systems, operations, and personnel. Space planning begins with a comprehensive analysis of space requirements and the development of space allocation plans at the system level. These plans are developed on a generic facility basis used in the development of standard facility designs for new construction, remodeling, and expansion plans followed by site-specific facility construction plans. The space management process provides latitude for existing differences between the generic plan configuration and the site-specific configuration. However, all site-specific space planning shall conform to the end-state planning objectives and be in compliance with Order 4420.4, Space Acquisition, and FPMR Temporary Regulation D-73.

(2) The generic and site-specific end-state and transition facility layout drawings dictate the standard space configuration for the technical, operational, and administrative space utilization. The SE CCB baselines and controls changes to the generic end state and generic transition space allocation drawings. The site-specific transition equipment layout drawings are under Regional CCB control. The ANS CCB baselines and controls changes to the as-built equipment layout drawings which impact the end state configuration. The Regional CCB's control changes which do not impact the end-state configuration and are in accordance with the generic and/or site specific transition drawings.

Note: Site-specific transition drawings are not baselined.

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52. CONFIGURATION CONTROL.

a. NAS Requirements. Changes to the NASSRS are initiated using a case file which is submitted, with supporting data, to ASE-500. ASE-500 conducts a preliminary screening and analysis to determine if the requirement is within the scope of the NASSRS and if it is already included. Invalid requirements are returned to the originating office. APM-300 conducts a thorough requirements analysis including preliminary cost and benefit estimates and an assessment of the technical risk and the impact on the NAS and ongoing programs for valid requirements. A case file package containing the results of the analyses/studies and the recommendations is submitted by ASE-500 to ASE-600 for NCP processing. The NAS CCB is responsible for the NAS requirements reflected in the NASSRS. Approved changes to the NASSRS are implemented via SCN's.

b. NAS Functional, Allocated, and Transition Baselines. Changes to the NAS functional, allocated, and transition design baselines originate as case files. A case file may also result from an ECR/ECP or Technical Employee Suggestion. The case file is prescreened by the appropriate ASE division before NCP processing. The NAS CCB has the responsibility for the NAS functional design baseline as reflected in the Level I Design Document. The SE CCB is responsible for the NAS allocated design baseline as reflected in the NAS System Specification and the NAS transition design baseline as reflected in the NAS Transition Plan. Approved changes to these documents are implemented via SCNs.

53. TRANSITION TO ACQUISITION PHASE. The transition from the requirements determination phase to the acquisition phase for a given requirement or related set of requirements is accomplished by the allocation of those requirements to a specific program or programs and the definition of the interface requirements between this program or programs and other programs. These requirements are transcribed and expanded upon in the specifications and in the IRD's used for acquisition. All specifications used for procurement shall be endorsed by the SRB and approved by the designated Program CCB. All IRD's shall be approved by the SE CCB prior to use. Transition is discussed in appendix 6.

54.-59. RESERVED.

1800.8F

CHAPTER 6.

CONFIGURATION MANAGEMENT FOR NAS SUBSYSTEM ACQUISITIONS

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60. GENERAL. This chapter addresses the CM required for NAS subsystems in acquisition. FAA requirements pertaining to baselines, configuration identification, configuration control, and reviews and audits applicable to NAS subsystem acquisition are also discussed. Figure 6-1 presents the acquisition phase and key CM events.

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61. CONFIGURATION MANAGEMENT REQUIREMENTS. CM during the acquisition life- cycle phase is the responsibility of the FAA program/project organization. While development contractors are largely responsible for CM of their CI's during this phase, the program/project managers are responsible for ensuring contractor performance of contract stipulated requirements including those in paragraphs 61 through 61d. Deliverables produced under the auspices of interagency agreements, through agreements with the Transportation Systems Center and the FAA Technical Center, are subject to CM requirements.

a. CM Plan. The program/project manager is responsible for ensuring that each contractor prepares a CM plan as outlined in FAA-STD-021, Configuration Management (Contractor Requirements). The plan, addressing hardware and software CM, shall describe how the contractor intends to assure proper configuration identification, configuration control, status accounting, and configuration audits. The contractor prepared CM plan must be approved by the FAA and shall govern contractor CM activities during the performance of the contract. The contractor shall be responsible for imposing applicable CM requirements upon any involved subcontractors, vendors, and suppliers.

b. Configuration Control. The program/project manager is responsible for ensuring that each contractor establishes and maintains a configuration control program in accordance with FAA-STD-021. This program shall provide for the orderly development and documentation of the configuration of both hardware and software during the design, development, and production phases. The established program shall be used to ensure positive control of the NAS subsystem configuration after formal establishment of a configuration identification and shall result in an accurate system definition at the completion of all required tests and acceptance by the FAA. This responsibility includes ensuring that all units are upgraded to the change level of the final production unit.

c. Configuration Status Accounting. The program/project manager is responsible for ensuring that the contractor establishes and maintains a configuration status accounting record for each NAS subsystem CI. Each record shall include a listing of the items approved configuration identification, the status of any proposed change to its configuration, and the implementation status of approved changes, waivers, and deviations to its configuration.

d. Configuration Audits. The program/project manager is responsible for ensuring that the procurement package specifies contractor responsibility in a FCA and a PCA. See paragraph 66b.

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62. ACQUISITION BASELINES/CONFIGURATION IDENTIFICATION. There are normally three technical baselines which may apply to a subsystem in the acquisition process: functional, allocated, and product. Each of these baselines consists of configuration identification defining the subsystem at that point in the acquisition process and requiring control and maintenance of baseline documentation. Program managers for acquisitions requiring extensive research and development may apply an additional design baseline to track the complex developmental efforts.

a. Functional Baseline. A subsystem's functional baseline is derived from the NAS allocated design baseline and defines the following for the subsystem: all essential system functional characteristics, necessary interface characteristics, specific designation of the functional characteristics of key CI, and all tests, demonstrations, or analyses required to demonstrate the achievement of each specified

characteristic. Functional baseline documentation includes System/Segment Specification (A Spec) and IRD's. The system/segment specification will be compliant with the NAS System Specification.

(1) The System/Segment Specification generated by the FAA, contractor, or vendor for the contract will state the mission and technical requirements for a system as an entity, allocate requirements to functional areas, and define the interfaces between and among the functional areas. Normally, the initial version of a system/segment specification is based on parameters developed during the requirements determination phase based on concept analyses and studies. The initial version of the specification is used to establish the general nature of the system that is to be further defined during the acquisition process phase. The specification is kept current during all life-cycle phases, culminating in a version that forms the future performance base for the development and production of CI's. The functional specifications shall be prepared in accordance with FAA-STD-005, Preparation of Specification Documents.

(2) Interface documentation for all NAS projects in the acquisition phase is required to define and control subsystem interfaces. Interface control, started during the concept requirements determination phase, shall be between subsystems and defined CI's. This definition shall be documented by interface documents, interface drawings, correlation drawings, letters of agreement, or a combination of these items. The IRD and the ICD are the primary documents used in the interface control process. The IRD is a formal agreement among interfacing subsystems project managers and ASE-500 which documents the functional, performance, and verification requirements for the NAS technical interfaces. The ICD is a formal agreement between interfacing subsystem project managers and the subsystem development contractors which documents how the interface requirements are implemented in the design of the respective subsystem/equipment item. The detailed interface documentation will become part of the product baseline documentation. IRD's and ICD's shall be prepared in accordance with FAA-STD-025. An ICWG is used to provide a forum for facilitating the coordination of interface control activities. Appendix 7, Interface Control Working Group, identifies ICWG participants and responsibilities.

b. Allocated Baseline. The allocated baseline documents the specific functions to be performed by each subsystem CI. This baseline includes: (1) all essential CI characteristics including delineation of interfaces, (2) physical characteristics necessary to assure compatibility with associated systems, CI's, and inventory items, and (3) all tests required to demonstrate achievement of each specified requirement. The allocated baseline is defined by the development specifications which state the requirements for the design and development of NAS CI's and are intended for the engineering development of the subsystem. Each development specification shall be in sufficient detail to describe effectively the performance characteristics that each CI is to achieve when a developed item is to evolve into a detail design for production. A development specification shall state all necessary requirements in terms of performance. Only essential physical constraints shall be included. It shall specify all of the required item functional characteristics and tests required to demonstrate achievement of those characteristics. Development documents for NAS subsystems shall define requirements to accomplish the objectives of the procurement specification. The development specifications shall be prepared in accordance with FAA-STD-005. Allocated baseline documentation includes: Operational Concept Document, Development Specification (B Spec), Software Requirements Specification, and Interface Requirements Specification (Software). The Interface Requirements Specification (IRS) describes the requirements for one or more Computer Software Configuration Item (CSCI) interfaces in the system or segment.

c. Design Baseline. The design baseline is usually applied to software development programs although hardware can be included. Design documentation is retained under configuration control throughout the life cycle of the product, thus, permitting controlled development of test plans and procedures, training, and manuals. Design baseline documentation includes Preliminary Software Product Specification (preliminary C Specification) and ICD's. Software product specifications may include: Software Top-Level Design Document; Interface Design Document; Data Base Design Document; Software Detail Design Document and source code listing for Government-furnished Products (GFP) being modified. The preliminary product specification shall be prepared in accordance with FAA-STD-005.

d. Product Baseline. The product baseline consists of the approved technical documentation defining the configuration of a CI during production, operation, maintenance, and logistics support and the actual equipment and software. For maintenance and logistics support, the documentation prescribes all necessary physical and functional characteristics of each LRU, including characteristics of the piece parts making up reparable LRU's, the selected characteristics designated for production acceptance testing and the production tests. NAS Integrated Logistics Support Policy is contained in Order 1800.58, National Airspace Integrated Logistics Support Policy. Note that for proposed changes having logistics impact, ALG-200 shall be an ad hoc member of the program CCB. The product specifications shall be prepared in accordance with FAA-STD-005. Product baseline documentation may include the following:

(1) Product specification(s) (C Specification)

(2) ICD's

(3) Operator's manuals

(4) Support tool documentation

(5) Maintenance manuals

(6) Technical instruction books

(6) Technical data packages

(8) As-built engineering drawings

(9) Specifications

(10) Special acceptance tools

(11) Version description documents

(12) Software users manuals

(13) Provisioning technical documentation

(14) Subsystem training documentation

(15) COTS documentation

(16) Supply support documentation

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63. ACQUISITION CONTRACTUAL REQUIREMENTS. Prior to initiation of the procurement process for any NAS subsystem, there must be a system/segment specification. The degree of detail available for any subsystem will determine at what stage the subsystem will formally enter the acquisition process. In conjunction with ALG, the assigned program manager will establish the procurement strategy and tailor required standards, procedures, and specifications to meet the needs of the particular program. Solicitation for bids or proposals will include a statement of the exact requirements for CM in sufficient detail to ensure a complete understanding of the precise obligation. During development and initial production, CI's are only those specification items that are referenced directly in the contract. These requirements will cover the contractor's responsibility for:

a. Developing of a CM plan in accordance with FAA-STD-021 that describes the methods and procedures for configuration identification, control, status accounting, and reviews and audits to be used during the contract.

b. Maintaining that part of the assigned technical data base and documentation that is required for configuration identification, change control, and status accounting.

c. Ensuring that all procedures and controls necessary to accomplish CM are implemented by subcontractors.

d. Initiating change proposal and records maintenance to establish baselines based on the criteria delineated in FAA-STD-021.

e. Preparing specification documentation intended as configuration identification in accordance with FAA-STD-005.

f. Preparing ICD's in accordance with FAA-STD-025.

g. Providing configuration identification data in accordance with appropriate FAA standards or other requirements including; specification numbers, engineering drawing numbers, etc.

h. Preparing configuration status accounting records in accordance with the requirements of FAA-STD-021.

i. Conducting Configuration Reviews and Audits for the acquisition phase of subsystem life cycle. Appendix 8, Configuration Audits, describes audit participation and responsibilities.

j. Preparing configuration management documentation delineating exact project requirements through careful tailoring of CM standards. Selected CM documentation described in paragraphs 63j(1)-(3) provides the basic framework for CM on the NAS program. Please note that this order does not apply to contractor requirements and shall not be cited in procurement documentation.

(1) FAA-STD-021, Configuration Management (Contractor Requirements). This standard establishes the general requirements and implementing practices for a contractor's CM program. The CM requirements contained in FAA-STD-021 are invoked through the contractors Statement of Work (SOW) and tailored to the specific NAS project.

(2) FAA-STD-026, National Airspace System Software Development. This document contains requirements for a uniform software development process which is applicable throughout the system life cycle. It includes the generation of different types and levels of software and documentation, the application of development tools, approaches, and methods and project planning and control. The standard should be selectively applied and tailored through the SOW to fit the unique characteristic of each software acquisition.

(3) MIL-STD-1521, Technical Reviews and Audits for Systems, Equipments and Computer Software. This standard defines the contractor's requirements and responsibilities in conducting technical reviews and audits. It is invoked through the SOW and tailored to the specific NAS project.

k. Providing a contractor reprocurement technical data package as specified in the contract when "identical items" are required. Product specifications shall provide the necessary design, engineering, and manufacturing information to enable the procurement of an item that duplicates the physical and performance characteristics of the original design. Reprocurement data shall be provided as stated in the contract in accordance with Order 4405.15, Reprocurement Data Acquisition Policy.

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64. COMMERCIAL OFF-THE-SHELF (COTS) EQUIPMENT. CM performed on COTS equipment includes inventorying of supplied manuals, tracking of serial numbers and equipment location matrices, and tracking of installation space. COTS technical manuals are key instruments in any COTS procurement. The manuals should provide established CI's, serial numbers, a hierarchy, and maintenance information. The FAA should ensure that the manuals are procured and that the contractor has included all the information necessary to identify the specific piece of equipment under procurement. The level of maintenance support should be identified in the contract work statement; for example, full support down to piece part, or medium support down to module. For COTS' software, project/program managers shall ensure:

a. Each commercially available software package is identified and established as a series of separate software CI's.

b. FAA unique changes to commercially available software are identified and controlled in accordance with FAA-STD-021.

c. Changes to commercially available software packages and associated documentation are proposed to the Government and must be approved through the CCB process prior to implementation.

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65. CONFIGURATION CONTROL. Configuration control of acquisition baselines entails the processing of engineering changes, deviations, and waivers to the baselines. The contractor must control the configuration of the subsystem under acquisition in accordance with contractual CM requirements.

a. Initiating Changes. Proposed changes to acquisition baselines may be classified as Class I or Class II in accordance with FAA-STD-021.

(1) Class I Changes. Class I changes are submitted as ECP's/ECR's and upon review by the Quality Reliability Officer (QRO) or Technical Officer (TO) a case file is initiated. Upon assignment of an NCP number, the case file becomes an NCP and the disposition is documented via CCD. Appendix 5 describes change processing.

(2) Class II Changes. Unless otherwise specified in the contract, the site QRO reviews Class II changes (and their classification) which are submitted by the contractor. Copies are provided to the TO.

b. Contractor Notification.

(1) The FAA contracting officer issues the necessary contract modifications (based on a procurement request) for contractor implementation of an acquisition phase approved change. The FAA QRO at the contractor's plant where the change is to be installed verifies the implementation of the change. The verification may be supported by other FAA organizations.

(2) Deviations/waivers may be proposed. If the proposed deviation/waiver changes a baseline, it must be treated as a Class I change. Approved deviations and waivers give the contractor relief from a specific technical requirement. Generally, deviations are anticipated departures from a technical requirement before manufacture, while waivers normally represent inadvertent or erroneous departures from a technical requirement during manufacture. Deviations and waivers are processed according to the instructions of FAA-STD-021. Permanent departures from a technical requirement must be accomplished by ECP/ECR action rather than by deviations or waivers. Deviations that are minor in nature (as defined by the contracting officer or procurement regulations) and meet the definition of a Class II change may be approved by the assigned QRO. This approval authority is delegated to the QRO by the contracting officer. When in doubt as to their applicability or effect, the QRO or contractor should discuss the deviation/waiver with the FAA TO or contracting officer. A copy of each approved deviation/waiver shall be provided to the TO.

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66. REVIEWS AND AUDITS. Configuration reviews and audits are conducted to verify that the level of performance achieved for each subsystem at that point in the life-cycle is as specified. Reviews are the mechanisms by which the different levels of specification documentation are examined and approved before proceeding with the development. Configuration audits must verify documentation against previous baselines and added changes, as well as compare the configuration against the approved configuration identification document. A representative model showing the relationship between reviews, audits, and life-cycle phases is indicated in figure 6-1 of Chapter 6.

a. Reviews. At each review an additional increment of subsystem/CI documentation has been generated. The purpose of each review is to detect and correct errors in this increment of documentation (and the contractor's design) before further subsystem/CI development is undertaken based on the content of this increment. Successful completion of the relevant reviews is required prior to baseline establishment.

(1) Functional Baseline. The following design reviews are conducted prior to the establishment of the functional baseline for the subsystem:

(a) System Requirements Review (SRR) is used to review the adequacy and completeness of the functional configuration identification for the system. The contractor's total system engineering management activity and its output are reviewed for responsiveness to the SOW.

(b) System Design Review (SDR) is used to review and evaluate the total system requirements and adequacy and completeness of the operational/support requirements consisting of the system/segment specification and requirements documents describing what the system is to accomplish.

(2) Allocated Baseline. The following design reviews are conducted prior to the establishment of the allocated baseline for the subsystem:

(a) Software Specification Review (SSR) is used to review the specifications for each identified CSCI and related IRS.

(b) Preliminary Design Review (PDR) addresses the contractor's basic design for a CI or group of items demonstrating that all functions of the subsystem specification have been properly, completely, and accurately allocated to the CI specifications.

(3) Design Baseline. The Critical Design Review (CDR) is conducted prior to the establishment of the design baseline for the subsystem. The CDR addresses the contractor's detail design drawings (or programmable flow charts) prior to releasing them for manufacture/coding of (preproduction) articles. The contractor presents a draft software product specification that is reviewed to ensure that the functions allocated by the development specification are properly addressed at the "build to" level.

(4) Prior to Subsystem Testing. Test Readiness Review (TRR) is used to establish subsystem integrity. This review is held to assure that test procedures are complete and to assess that the contractor is ready for formal subsystem testing. The contract SOW should include the requirement that the FAA makes the final determination that the contractor is ready for formal testing.

b. Configuration Audits. In this context, audits are a check of "the final statement of account" of the development program. The audits are used to verify the products of the full-scale development phase prior to design approval and production authorization. Audit of privately developed items validates that the functional characteristics of the developed items are satisfactory for the intended use, with the audit limited to an examination of the test data applicable to the FAA requirements for that item. Further, an audit is a prerequisite for establishing the product baseline configuration identification to be used for production and acceptance purposes. Normally, the contractor-offered form, fit, and function technical documentation is used to establish the product baseline documentation. However, for those items where the FAA negotiates an agreement with the contractor going beyond form, fit, and function documentation, more detailed documentation may be used to establish the product baseline. Appendix 8 provides guidance for configuration audits.

(1) Functional Configuration Audit (FCA). The FCA is conducted to determine whether or not the actual performance of each CI complies with its controlling specifications. Specifically, an FCA must verify that the functional, allocated, design (if applicable), and proposed product baselines are consistent and that functional requirements are traceable, as shown through the documentation and test results.

(2) Physical Configuration Audit (PCA). The PCA is a formal examination of CI's to ensure that each complies with the technical documentation. It verifies "as-built" configuration conformity with the product configuration identification and document traceability. Successful completion of the PCA is a prerequisite to establishment of the product baseline.

c. Additional review activities. The following events take place after successful completion of the PCA:

(1) Formal Qualification Review (FQR) is used to verify that the actual performance of the total system complies with specifications and requirements.

(2) Deployment Readiness Review (DRR) is an assessment conducted to assure that the subsystem is ready for deployment to the field and the field is ready to accept the subsystem. The results of this review are to ascertain and test subsystem readiness against currently imposed or applicable technical and programmatic requirements. The CM organization, in addition to the various engineering and implementation organizations, provides input to the DRR assessment plan of action.

d. Establishment of the product baseline. This is accomplished after successful completion and approval of the PCA and First Article acceptance (or equivalent). See paragraph 62d.

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67. TRANSITION OF CM RESPONSIBILITY TO OPERATIONAL SUPPORT PHASE. The transition from the acquisition phase to the operational support phase is described in appendix 6.

68.-69. RESERVED.

1800.8F

CHAPTER 7.

CONFIGURATION MANAGEMENT FOR NAS OPERATIONAL SUPPORT

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70. GENERAL. This chapter describes the actions required to perform CM in the operational support phase. The operational support phase activities are performed to ensure the integrity of the operational baseline for all NAS facilities, equipment, and software, including all new projects which complete the acquisition life-cycle phase. The current NAS operational baseline is included in NAS-MD-001. For equipment, the operational baseline will provide control of each serialized part number by location and modification level. For software, the operational baseline will be controlled to the computer program member level. For COTS, operational support CM activities include updating/maintaining of technical manuals and tracking of spares.

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71. TRANSITION FROM ACQUISITION PHASE. The transition of CM responsibilities from the acquisition to the operational support phase is described in appendix 6.

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72. OPERATIONAL BASELINES. Operational baselines consist of approved technical documentation representing installed operational hardware and software. All changes to operational baselines must be implemented through change implementation documents; EEM's, PEM's, SPB's, STB's and SCN's, F&E Program Description, Special Maintenance Project Description, change notices to Maintenance Technical Handbooks, and CCD's for local and test modifications. Components of an operational baseline include the product baseline and any subsequent changes.

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73. CONFIGURATION CONTROL OF HARDWARE AND AIRWAY FACILITIES MAINTAINED SOFTWARE. Change processing for the operational NAS subsystems entails the processing of case files/NCP's describing proposed changes. Also, Hardware Discrepancy Reports (HDR) and Program Technical Reports (PTR) are processed to report potential problems and track activities resolving the HDR/PTR issues. A case file must be initiated if an HDR/PTR indicates a need for a change to a baseline.

a. Case Files. Changes to NAS subsystems which are in operational service involve the use of case files which become NCP's. Approved/disapproved changes to a baseline are resolved by the CCB and documented by CCD's. The procedures for processing changes are described in appendix 5. The requirements for the processing of case files are described in the following subparagraphs:

(1) Originating Changes. Changes affecting the operational baseline are initiated using FAA Form 1800-2. Case files may be originated by personnel in the field, regional offices, FAA headquarters, the Department of Defense, and other Government agencies. Field-originated case files, which have been approved by the facility and sector managers (the case files are withdrawn if there is nonconcurrence) and any supporting documentation are forwarded to the regional office for processing.

(2) Regional Office Processing. For changes submitted by users in the field, the regional office will conduct an indepth evaluation of the operational impact of the change and provide quantitative estimates of the resources needed to implement the proposal in accordance with Order 1320.48, Engineering Field Support Sector Maintenance Program Procedures, National Airway Engineering Field Support Sector, ASM-600, and National Automation Engineering Field Support Sector, ASM-400. The region then coordinates the case file with other regions as the originating region deems appropriate. If, after the intra/interregional coordination, the region endorses the case file, the appropriate regional division manager(s) signs the case file. The change proposal is then forwarded to the appropriate Engineering Field Support Sector (EFSS),

ASM-400/600, with recommendations or to ASE-600 for NCP processing if prescreening is not required. If the case file is not endorsed, it is returned to the originator through the regional office with an explanation.

(3) EFSS Processing. The appropriate EFSS (ASM-400/600) evaluates the case file for impacts on safety, ATC service, and other intangible benefits, as well as cost/benefits implications, and determines if the proposed change should be implemented. The EFSS shall coordinate with the Depot on the provisioning, supply support, and repair impact of the change. If the EFSS determines that the proposed change is valid, cost effective, and will not result in a change to a baseline, the case file is coordinated as necessary by the EFSS and incorporated by maintenance personnel. If the case file is disapproved, it is returned to the region with the reason for disapproval, and ASE-600 is notified for status accounting purposes. If the EFSS-approved case file requires a change to a baseline, it is forwarded to ASE-600 for processing as an NCP.

b. NAS Change Proposals. In processing the NCP, ASE-600 will assign a unique NCP number through the automated CM tool to status progress, review the case file's priority, determine must evaluators, and coordinate the NCP review.

c. Configuration Control Decisions. The CCB review of the NCP package will include the recommendations from previous evaluations and focus on the desirability of implementing the proposed change. Specialists in technical areas will be asked to provide their expertise and analytical studies will be conducted to advise the board members in making a decision on a proposed change. For proposed changes that impact logistics, ALG-200 shall be an ad hoc member of the CCB. The Chairperson is the final authority on the disposition of all change proposals submitted to the CCB. The change proposals being reviewed will be approved, disapproved, deferred, or referred to another CCB. Approval or disapproval of an NCP must be documented with a CCD.

d. Hardware Discrepancy Reports (HDR). HDR's are prepared on FAA Form 6030-3, Hardware Discrepancy Reports, and are used for reporting hardware troubles; i.e., when the hardware is not operating as defined in its baselined documentation. The HDR is used to report discrepancies of an unusual or recurring nature and/or problems for which a correction is required other than replacing a failed component. The HDR will not be used to describe requested functional changes or to suggest hardware improvements as these are to be processed as case files. The preparation and processing procedures for HDR's are described in Order 1100.134, Maintenance of National Airspace System Automation Subsystems.

e. Program Technical Reports (PTR). PTR's (also referred to as program trouble reports), prepared on FAA Form 6100-1, Program Technical Report, are used for reporting all computer/firmware troubles and program improvements. These report problems where the computer software/firmware fails to operate in accordance with the CPFS or equivalent specification. Program improvements are enhancements to the computer program that do not alter the functionality of the software. All enhancements are processed as case files. The preparation and processing procedures for PTR's are described in Order 1100.134.

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74. CONFIGURATION CONTROL FOR AIR TRAFFIC MANAGED SOFTWARE. Configuration control for Air Traffic managed software involves the processing of case files and NCP's. The change processing procedures for Air Traffic managed software are described in Order 1100.144, ATC Field Originated Operational Case Files and appendix 5.

a. Originating Changes. Changes affecting the software operational baseline are initiated by using FAA Form 1800-2. Case files may be originated by personnel in the field, regional offices, FAA headquarters, the Department of Defense, or other Government agencies. Field-originated case files, along with all supporting data, are forwarded to the regional office.

b. Regional Office Processing. The regional office will conduct an indepth evaluation of the operational impact of the change and provide quantitative estimates of the resources needed to implement the proposal in accordance with Order 1100.144. The region then coordinates the case file with other facilities in the regions as the originating region deems appropriate. If, after the

intra/interregional coordination, the regional office endorses the case file, the Air Traffic regional division manager signs the case file. The case file is then held in the region until there is a request for case files issued by the Procedures Division, ATM-100.

c. Prioritization Meeting. "Normal" case files for proposed changes to operational software are held by the region until ATM-100 issues a call for case files which are candidates for the next major upgrade of the system. At the case file prioritization meetings convened by ATM-100, case files for all regions are prioritized. Those case files not selected are returned to the region. Selected case files will be forwarded to ATR-200 for headquarters processing and system packaging. ATR-200 will forward packaged case files to ASE-600 for NCP processing.

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75. CONFIGURATION CONTROL OF REGIONAL CCB. NCP's to be decided by a Regional CCB are processed entirely within the region. If organizations external to the region are impacted, the NCP must be submitted for prescreening or to ASE-600 for NCP processing if prescreening is not required.

a. Regional Case File Processing. When a case file is received by the regional office from the field or region, it is reviewed for completeness, logged in, and forwarded to the appropriate regional organizations for a preliminary technical review. The preliminary reviewers review and comment on the case file and determine whether the case file is within the guidelines specified for regional NCP processing. The regional OPI will resolve any comments and recommend approval/disapproval of the case file. If the regional OPI recommends approval of the case file (national or regional), the case file is distributed to the Regional CCB member organizations for their review. The reviewing organizations forward all comments to the regional OPI for resolution. The regional OPI endorses case files for which approval is recommended. If the regional OPI has endorsed the case file, it is processed as an NCP. If the case file is "national," it is forwarded to the prescreening organization or to ASE-600 (in accordance with NAS-MD-001) for NCP processing. Case files proposing changes under the control of the Regional CCB are submitted to the Regional CCB for processing after the NCP number has been assigned.

b. Regional NCP Processing. For regional NCP's, there is no separate Must Evaluation cycle. After the NCP number has been assigned, the NCP is ready for submittal to the Regional CCB for processing. After the CCD has been signed, the Executive Secretary distributes the CCD to the action organizations for implementation and to the headquarters OPI for information as required. After the change has been implemented, the site forwards the required implementation data to the Regional CCB Executive Secretary who, in turn, forwards it to the headquarters OPI as required. The Executive Secretary will close out any open status accounting records and archive the NCP/CCD.

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76. CHANGE IMPLEMENTATION. In the operational support phase, changes are provided to the field through PEM's, EEM's, SPB's, SCN's, F&E Program Description, Special Maintenance Project Description, change notices to Maintenance Technical Handbooks, and CCD's for local and test modifications.

a. Approved change proposals. For an approved change proposal, the CCD is the authority for the implementation of the change. If the change is approved with changes to the NCP, the changes are documented in the CCD. Implementation of the change is scheduled and accomplished by the appropriate organization in accordance with Order 1320.48, Order 1100.144, Order 6032.1, and FAA-D-2494, as applicable. The schedule and notification of completion will be provided to ASE-600 for status accounting.

b. Disapproved change proposal. If a proposed change is disapproved by the CCB, then disapproval is documented in a CCD and the originator is notified of the disapproval and ASE-600 is informed to complete status accounting records. The NCP and disapproving CCD are disseminated in the CCD package.

c. Implementation directives. The following describes directives implementing approved changes to the NAS configuration:

(1) Electronic Equipment Modifications. EEM's direct implementation of approved

equipment modifications. Upon receipt of a CCD for an approved change to operational systems and equipment, ASM-400 and/or ASM-600 are responsible for ensuring the baseline change is designed, prepared, tested, and distributed. Airway Facilities sectors are responsible for ensuring the change is installed and properly documented.

(2) Plant Equipment Modification (PEM). PEM's direct implementation of approved facility modifications. Upon receipt of a CCD for an approved change to operational systems and equipment, ASM-400 and/or ASM-600 are responsible for ensuring the baseline change is designed, prepared, tested, and distributed. Airway Facilities sectors are responsible for ensuring the change is installed and properly documented.

(3) Site Program Bulletin (SPB)/Site Technical Bulletin (STB). The SPB directs field release of new or modified software program(s) and associated documentation. Upon issuance of a CCD for an approved baseline change to software, ASE-600 forwards the CCD to the maintaining organization for implementation of the change. The software modification is designed, coded, tested, and disseminated to the field for installation. The software modification and associated documentation changes are distributed to all field sites having that configuration via an SPB. The Site Technical Bulletin directs release of new or modified hardware and associated documentation or distributes information on technical hardware. Airway Facilities sectors and/or Air Traffic facilities are responsible for ensuring the change is installed and properly documented.

(4) Specification Change Notice (SCN). The SCN is a document used to propose, transmit, and record changes to a specification. The SCN form is used as a cover sheet and letter of transmittal. The page changes associated with that SCN shall be attached and shall constitute an integral part of the SCN. Detailed instructions for preparation of SCN's appear in FAA-STD-005. Upon completion of the change, the specification change pages and associated SCN are forwarded to the Documentation Control Center, ASE-621.

77.-79. RESERVED.

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APPENDIX 1.

GLOSSARY

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1. BASELINE. A configuration identification document or a set of such documents formally designated and fixed at a specific time during a CI's life cycle. Baselines, plus approved changes to those baselines, constitute the current configuration identification.

a. NAS Requirements. The approved NAS System Requirements Specification (NASSRS).

b. The NAS design level baselines are:

(1) NAS Functional (Level I) Design. Provides a description of the overall NAS architecture of facilities, equipment, and interrelationships that are expected to exist when the NAS Plan is satisfied. It specifies functions (functional requirements) based on operational requirements and identifies functional interfaces, including flow and connectivity.

(2) NAS Allocated Design. Allocates system-level performance requirements and functional requirements to the various subsystems based on operational requirements and determines quantities, locations, and interface definitions for each subsystem.

(3) NAS Transition Design. Provides the overall strategy of transition from planning the implementation of all NAS Plan projects to required changes to the existing hardware, software, and facilities.

c. The acquisition baselines are:

(1) Functional Baseline. The approved technical documentation of a configuration item which prescribes: all necessary functional characteristics; the tests required to demonstrate achievement of specified functional characteristics; the necessary interface characteristics and its key lower level CI's, if any; and design constraints, such as, envelope dimensions, component standardization, user of inventory items, and integrated logistics support policies.

(2) Allocated Baseline. The approved performance-oriented specifications governing the development of configuration items that are part of a higher level CI, in which each specification defines the functional characteristics that are allocated from those of the higher level CI; establishes the tests required to demonstrate achievement of its allocated functional characteristics; delineates necessary interface requirements with other associated configuration items; and establishes design constraints, if any, such as component standardization, use of inventory items, and integrated logistic support requirements.

(3) Design Baseline. This baseline is usually applied to software development programs although hardware can be included. It consists principally of the Software Requirement Specification and Interface Requirements Specification which are retained under configuration control throughout the life cycle of the product, thus permitting controlled development of test plan and procedures, training, and manuals.

(4) Product Baseline. The approved technical documentation which defines the configuration of a CI from the top level system to the lowest level line replaceable unit (LRU) during the production, operation, maintenance, and logistics support phases of its life cycle and which prescribes all necessary physical and functional characteristics of the parts making up reparable LRU's; the selected characteristics designated for production acceptance testing; and the production acceptance tests.

d. NAS Operational Baseline. The approved technical documentation representing installed operational hardware and software. The operational baseline is established at the end of the acquisition phase and consists of the product baseline and approved changes.

2. CASE FILE. The document prepared by the originating organization which proposes a change to an end item. Case files are prepared on FAA Form 1800-2, NAS Change Proposal.

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3. CASE FILE NUMBER. A number assigned by the originating office to FAA Form l800-2 for status accounting purposes. This number is the only number that identifies the change proposal until it has been forwarded to the Configuration Management and Engineering Support Division, ASE-600, for NCP number assignment and NCP processing. The case file number identifies the originating organization, the project/subsystem, and sequence number.

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4. COMPUTER PROGRAM. A series of instructions or statements in a form acceptable to an electronic computer designed to cause the computer to execute an operation or operations.

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5. CONCEPT DEFINITION. The initial period of a program when the technical, functional, and economic basis for an acquisition is established through comprehensive studies and experimental development and evaluation.

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6. CONFIGURATION. The functional and/or physical characteristics of hardware/software as set forth in technical documentation and achieved in a product. The term configuration denotes the orderly agreement of subordinate parts and functional characteristics to give unity to the whole.

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7. CONFIGURATION AUDITS. The checking of an item for compliance with the configuration identification and verification that configuration management processes are being applied as required.

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8. CONFIGURATION CONTROL. The systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of a CI after formal establishment of its configuration identification.

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9. CONFIGURATION CONTROL BOARD. The CCB is the official agency-authorized vehicle to approve baselines and changes to baselines.

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10. CONFIGURATION CONTROL DECISION. A record of decision reached on a proposal to baseline a CI or to change a baselined CI. If the proposal is approved, the CCD directs the action required to implement the change.

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11. CONFIGURATION IDENTIFICATION. The current approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings, associated lists, and documents referenced therein.

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12. CONFIGURATION ITEM. An aggregation of hardware/software/firmware, or any of its discrete portions, which satisfies an end-use function and is designated by the Government for configuration management.

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13. CONFIGURATION ITEM IDENTIFIER. The designator used in DOCCON to identify NAS configuration items, i.e., element, subelement, subsystem, hardware, software, firmware.

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14. 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, (c) record and report change processing and implementation status, and (d) audit documentation and configuration items to ensure adequacy of the baseline that is being established.

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15. CONFIGURATION MANAGEMENT PLAN. The configuration management plan defines the methods and implementation of configuration management on a particular program/project. It may or may not impose contractor requirements depending on whether it is incorporated in the contract.

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16. CONFIGURATION STATUS ACCOUNTING. The recording and reporting of the information that is needed to manage the configuration effectively, including a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

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17. DATA (TECHNICAL DATA AND INFORMATION). The means for communication of concepts, plans, descriptions, requirements, and instructions relating to technical projects, material, systems, and services. These may include specifications, standards, engineering drawings, associated lists, manuals, and reports, including scientific and technical reports. They may be in the form of documents, displays, sound records, punched cards, or any representation such as characters or analog quantities to which meaning might be assigned.

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18. DEFICIENCIES. Deficiencies consist of two types: conditions or characteristics in any hardware/software which are not in compliance with specified configuration; or inadequate (or erroneous) configuration identifi- cation which has resulted, or may result, in configuration items that do not fulfill approved operational requirements.

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19. DEVELOPMENT SPECIFICATION. A specification that states the requirements for the design or engineering development of a product during the development period.

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20. DEVIATION. A specific written authorization, granted prior to the manufacture of an item, to depart from a particular performance or design requirement of a specification, drawing, or other document for a specific number of units or a specific period of time. A deviation differs from an engineering change in that an approved engineering change requires corresponding revision of the documentation defining the affected item, whereas, a deviation does not contemplate revision of the applicable specification or drawing.

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21. ELECTRONIC EQUIPMENT MODIFICATION. EEM's authorize implementation of approved equipment modifications authorized for ground facilities, systems, and equipment (including associated monitor and test equipment, structures, buildings, etc.).

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22. END ITEM. A descriptive designation for a system, subsystem, hardware, software, or combination of end items which satisfies a baseline requirement and is designated for configuration management. End items subject to configuration management are listed in the NAS master configuration index, NAS-MD-001.

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23. ENGINEERING CHANGE. An alteration in the configuration of a CI or end items, delivered, to be delivered, or under development, after formal establishment of its configuration identification.

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24. ENGINEERING CHANGE PRIORITIES. The rank assigned to a Class I engineering change that determines the methods and resources to be used in review, approval, and implementation.

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25. ENGINEERING CHANGE PROPOSAL. A term which includes both a proposed engineering change to an established baseline and the documentation by which the change is described and suggested.

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26. ENGINEERING CHANGE REQUEST. A term which includes both the request for engineering change to an established baseline and the documentation by which the change is described and requested.

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27. ENGINEERING FIELD SUPPORT SECTOR. National Airway/Engineering Field Support Sector (ASM-600) or National Automation Engineering Field Support Sector (ASM-400).

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28. ENGINEERING RELEASE RECORD. The engineering release record comprises the official data file which records and interrelates engineering data, and changes thereto, which technically describe and are to be or have been used to build/operate/maintain CI's.

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29. EXTERNAL INTERFACES. External technical, functional, or physical interfaces between subsystems of the NAS and cooperating systems under cognizance of other agencies will be identified, defined, and controlled in the same manner as intersubsystems interfaces.

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30. FACILITY. The term denotes the total electronic, electric power generating or distribution system, and the structures used to house, support, and/or protect these systems. A facility may include a number of systems, subsystems, or equipment, e.g., a long-range radar facility, or it may in its entirety consist of only a single system, subsystem, or equipment such as an isolated RML repeater facility.

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31. FACILITY INTERFACES. Facility interfaces are interfaces resulting from subsystem designs requiring floor

space, specific environmental control, power schedules, and other support as may be required by a host facility and defined in the Level I Design Document, NAS Transition Plan, and in the NAS System Specification. They will be further defined in NAS standard facility designs, and in installation drawings for the subsystems to be maintained at a designated facility. The requirements for interfaces will be defined in Interface Requirements Documents for the appropriate facility type, considering all subsystems planned for installation at each facility. The specific interface designs will be specified in Interface Control Documents between the site specific facility and the individual subsystem.

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32. FIELD SUPPORT ORGANIZATION. Organization established and maintained by the responsible service for the centralized support of one of the various NAS systems.

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33. FIRMWARE. Firmware is computer software resident in hardware read-only-memory devices that cannot be readily modified under program control. Firmware changes should be treated as a functional change based on the fact that all software changes require some retest.

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34. FORM, FIT, AND FUNCTION. That configuration comprising the physical and functional characteristics of the item as an entity, but not including any characteristics of the elements making up the item.

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35. FULL-SCALE DEVELOPMENT. The phase of a program when the system/equipment/computer program special support and training equipment are designed, fabricated, tested, and evaluated.

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36. FUNCTIONAL AREA. A distinct group of system performance requirements which, together with all other such groupings, forms the next lower-level breakdown of the system on the basis of function.

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37. FUNCTIONAL CHARACTERISTICS. Quantitative performance, operating, and logistic parameters and their respective tolerances. Functional characteristics include all performance parameters, such as range, speed, reliability, maintainability, and safety.

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38. FUNCTIONAL CONFIGURATION AUDIT. The formal examination of functional characteristics for a configuration item, prior to acceptance, to verify that the item has achieved the performance and functional characteristics specified in its functional or allocated configuration identification.

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39. GENERAL SPECIFICATION. A general specification document covers requirements common to two or more types, classes, grades, or styles of equipment, services, or materials, including training services and materials.

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40. INTERFACE CONTROL. Interface control comprises the delineation of the procedures and documentation, both administrative and technical, necessary for identification of functional and physical characteristics between and within configuration items.

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41. INTERSUBSYSTEM INTERFACE. Intersubsystem interfaces are technical interfaces among subsystems of the NAS, systems external to the NAS and NAS subsystems. Included are those interfaces between components of the same subsystem when a connection is via another subsystem. Whenever communication paths exist between two or more subsystems, both interface requirements documents and interface control documents are required. The intersubsystem interfaces are further defined in the NAS System Specification, NAS Transition Plan, and the appropriate subsystem procurement specification.

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42. INTRASUBSYSTEM INTERFACE. Intrasubsystem interfaces are technical interfaces, other than intersubsystem interfaces, within a single NAS subsystem. They are identified and defined in the appropriate subsystem procurement specification. These interfaces are under the cognizance of single NAS Project Manager and may be further defined in internal interface documentation at his/her discretion.

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43. LINE REPLACEABLE UNIT (LRU). An item which may consist of a unit, an assembly (circuit card assembly, electronic component assembly, etc.), a subassembly, or a part, that is removed and replaced at the site maintenance level in order to restore the system/equipment to its operational status.

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44. NAS CHANGE PROPOSAL. The means for baselining and proposing changes to baselined NAS CI's.

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45. NAS CHANGE PROPOSAL NUMBER. Number assigned by the Configuration Management and Engineering Support Division, ASE-600, to one or more case files (FAA Form 1800-2) which have been approved for processing as an NCP.

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46. NATIONAL AIRSPACE SYSTEM. The facilities, equipment, regulations, procedures, and personnel which support the safe and efficient movement of all aircraft in U.S. airspace.

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47. NATIONAL AIRSPACE SYSTEM PLAN. FAA's multiyear plan for the upgrading and modernization of the equipment and facilities comprising the National Airspace System.

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48. OPERATIONAL COMPUTER PROGRAMS. Computer programs for the control of air traffic that have reached initial operating capability at the first facility and have been transitioned to the operating services.

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49. PERSONNEL INTERFACES. Personnel interfaces encompass man-machine interaction involved in command-control operations, as well as maintenance of hardware subsystems, software subsystems, and equipment items. NAS personnel interfaces have been identified in the Level I Design Document and in the NAS System Specification, and are further defined in the appropriate subsystem procurement specification governing acquisition of operator input/output devices.

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50. PHYSICAL CHARACTERISTICS. Quantitative and qualitative expressions of material features, such as

composition, dimensions, finishes, form, fit, and their respective tolerances.

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51. PHYSICAL CONFIGURATION AUDIT. The formal examination of the "as-built" configuration of a unit of a CI against its technical documentation in order to establish the CI's initial product configuration identification.

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52. PLANT EQUIPMENT MODIFICATION. PEM's authorize implementation of approved facility modifications. This may include an alteration in electrical, mechanical, or physical characteristics, arrangement, configuration, or use.

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53. PRODUCT SPECIFICATION. A document which states the complete performance requirements of a product or the detailed fabrication requirements for a product.

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54. PROGRAM IMPROVEMENT. A proposed change that would improve the design or code of a program but would not result in a change to any baseline document. These changes should be suggested on FAA Form 6l00-l, Program Technical Report.

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55. PROGRAM MANAGER. The individual responsible for the design, development, testing, evaluation, production, and introduction into the NAS of the end product of an acquisition.

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56. PROGRAM SPONSOR. The office or service which has a requirement to be met by an acquisition. The sponsor normally develops the systems requirement statement with input from other affected offices and services. The sponsor monitors progress of the acquisition to ensure that the requirement is being met.

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57. QUALITY RELIABILITY OFFICER. The individual responsible for monitoring contractor performance and assuring that the contractor complies with all requirements of the contract.

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58. RETROFIT. Incorporation of an engineering change (at any level) in accepted or in-service items.

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59. SITE PROGRAM BULLETIN. A directive authorizing field release of a new or changed NAS software program and all associated documentation.

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60. SITE TECHNICAL BULLETIN. A directive authorizing field release of new or modified hardware and associated documentation or distributing information on technical hardware.

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61. SOFTWARE. A collection of associated computer programs and computer data required to enable the computer equipment to perform computational or control functions. It is the abstract of tapes, disks, card decks,

and firmware.

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62. SPECIFICATION. A document intended primarily for use in procurement, which clearly and accurately describes the essential technical requirements for items, materials, or services, including the procedures by which it will be determined that the requirements have been met. Specifications may be general (addressing requirements common to a group of items) or detailed (addressing all requirements for one or more types of items). The types of specifications (described elsewhere in this Glossary) are:

a. System requirements specification.

b. System/segment specification.

c. Development specification.

d. Product specification.

e. General specification.

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63. SPECIFICATION CHANGE NOTICE. A document used to propose, transmit, and record changes to a specification.

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64. SUBSYSTEM. A segment of a system that performs a particular function that is a portion of, or contributes to, the overall system product.

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65. SUPPORT PROGRAMS. Includes nonoperational support system, the data reduction and analysis program, and other programs used for system support of a subsystem in each life-cycle phase.

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66. SYSTEM. An integrated combination of equipment or subsystems according to an engineering design and interface requirement in which their independent technical functions are combined to produce a particular operating entity in the overall National Airspace System.

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67. SYSTEM ENGINEERING. System engineering as it relates to configuration management is the application of scientific and engineering efforts to transform an operational need into a description of system performance parameters. A system configuration must be ultimately called out in the configuration identification specifications.

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68. SYSTEM REQUIREMENTS SPECIFICATION. A document which describes the general requirements for an item of equipment in terms of user needs. This document is generally the initial documentation defining the user's need and will be used to identify engineering concepts which may be used to solve the problem.

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69. SYSTEM REQUIREMENTS STATEMENT. This document, prepared by the program sponsor and approved by the Aviation System Acquisition Review Committee (ASARC), defines the requirement and the framework within which FAA intends to satisfy it.

70. SYSTEM SPECIFICATION. A specification that states the technical and mission requirements for a system as an entity, allocates requirements to functional areas, and defines the interfaces between and among functional areas.

71. TECHNICAL INTERFACE. A technical interface is a common functional and/or physical boundary where hardware, software, and/or personnel interact. Physical interfaces are interfaces associated with material contact, and are described in terms of mechanical, electrical/electronic, envelope, and environmental characteristics. Functional interfaces are interfaces which interact across non-material boundaries and are described in terms of information transfer characteristics.

72. WAIVER (MINOR). A written authorization to accept a configuration item or other designated item, which during production or after having been submitted for inspection, is found to depart from specified requirements, but nevertheless, is considered suitable for use "as is" or after rework by an approved method. Also, a written authorization to allow one or more prototypes or early production items to differ from the prescribed configuration, pending installation of a preferred but not yet available part or module.

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APPENDIX 2.

ACRONYMS

ACT	FAA Technical Center
CCB	Configuration Control Board
CCD	Configuration Control Decision
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CI	Configuration Item
CM	Configuration Management
CMO	Configuration Management Officer
COTS	Commercial Off The Shelf
CPFS	Computer Program Functional Specification
CSCI	Computer Software Configuration Item
DID	Data Item Description
DOCCON	Documentation and Configuration Identification System
DRR	Deployment Readiness Review
ECP	Engineering Change Proposal
ECR	Engineering Change Request
EEM	Electronic Equipment Modification
EFSS	Engineering Field Support Sector
FAA	Federal Aviation Administration
FCA	Functional Configuration Audit
FPMR	Federal Property Management Regulation
FQR	Formal Qualification Review
GFP	Government Furnished Property
HDR	Hardware Discrepancy Report
HWCI	Hardware Configuration Item
ICD	Interface Control Document
ICWG	Interface Control Working Group
IMG	Interface Management Group
IRD	Interface Requirements Document
IV&V	Independent Verification and Validation
LRU	Line Replaceable Unit
ME	Maintenance Engineering, Must Evaluator
MOU	Memorandum of Understanding
NAILS	National Airspace Integrated Logistics Support
NAS	National Airspace System

NASSRS	NAS System Requirements Specification
NCP	NAS Change Proposal
OPI	Office of Primary Interest
ORD	Operational Readiness Demonstration
PCA	Physical Configuration Audit
PDR	Preliminary Design Review
PEM	Plant Equipment Modification
PR	Procurement Request
PTR	Program Technical Report
QA	Quality Assurance
QRO	Quality Reliability Officer
SCN	Specification Change Notice
SDR	System Design Review
SE	Systems Engineering
SEI	System Engineering and Integration
SPB	Site Program Bulletin
SRB	Specification Review Board
SRR	System Requirements Review
SSR	Software Specification Review
STB	Site Technical Bulletin
STD	Standard
T&E	Test and Evaluation
TO	Technical Officer
TOR	Technical Officer Representative
TRR	Test Readiness Review

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APPENDIX 3.

APPLICABLE DOCUMENTS

1. APPLICABLE DOCUMENTS. The issue in effect of the documents listed below is applicable to the extent specified herein.

FAA Orders	
Order 1100.134	Maintenance of National Airspace System Automation Subsystems
Order 1100.144	ATC Field Originated Operational Case Files
Order 1230.10	Interagency Agreements
Order 1320.48	Engineering Field Support Sector Maintenance Program Procedures-National Airway Engineering Field Support Sector, ASM-600, and National Automation Engineering Field Support Sector, ASM-400
Order 1800.57	National Airspace (NAS) Configuration Control Board
Order 1800.58	National Airspace Integrated Logistics Support Policy
Order 1810.1	Major System Acquisition
Order 3450.7	Incentive Award Program
Order WA 4400.1	Guide for Preparing Procurement Requests
Order 4405.5	Specification Currency List for Procurement in the Air Traffic Control and Navigation System
Order 4405.15	Reprocurement Data Acquisition Policy
Order 4420.4	Space Acquisition and FPMR Temporary Regulation D-73
Order 6030.29	Assignment & Dissemination of FAA Equipment Type Designation Number for Air Traffic Control and Navigation Systems
Order 6032.1	Modifications to Ground Facilities, Systems, and Equipment in the National Airspace System

FAA Specifications	
FAA-D-2494	Technical Instruction Book Manuscript: Electrical and Mechanical Equipment, Requirements for Preparation of Manuscript and Production of Books

FAA Standards	
FAA-STD-002	Facilities Engineering Drawing Preparation
FAA-STD-005	Preparation of Specification Documents
FAA-STD-021	Configuration Management (Contractor Requirements)
FAA-STD-025	Preparation of Interface Documentation
FAA-STD-026	National Airspace System Software Development

Military Standards	
MIL-STD-1521	Technical Reviews and Audits for Systems, Equipments and Computer Software

Other	
NAS-MD-001	NAS Subsystem Baseline Configuration and Documentation Listing
NAS Transition Plan	NAS Transition Plan
NAS-DD-1000	NAS Functional (Level 1) Design Document
NAS-SS-1000	NAS System Specification
NAS-SR-1000	NAS System Requirements Specification

2. CONFIGURATION DOCUMENTATION PREPARATION. Configuration documentation preparation responsibilities include:

a. During the requirements determination life-cycle phase, the preparation of configuration baseline documentation is an FAA responsibility.

b. During the acquisition phase, the contractor normally produces the majority of configuration documentation and prepares most of the engineering changes. The FAA contracting officer produces contractural modifications that result from approved engineering changes. Configuration status accounting shall be done by the FAA and the contractor. While the contractor prepares most of the audit data for the audit process, configuration audits are conducted jointly.

c. During the operational support phase, the maintenance and control of changes to baseline documentation are FAA responsibilities.

3. DOCUMENT HIERARCHY. Figure 1, NAS CM Document Tree, portrays the hierarchy for NAS documentation. It depicts the relationship of the top-level NAS requirements and design documents to each other and their relationship to hardware and software acquisition documentation.

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APPENDIX 4.

SPECIFICATION REVIEW BOARD (SRB)

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1. PURPOSE. This appendix describes the membership, responsibilities, and procedures of the SRB.

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2. SCOPE. All proposed specifications and new FAA Standards developed for the NAS must be processed through the SRB. After initial baselining by the appropriate CCB of these documents, normal NCP processing will be used to control changes to specifications and standards. This appendix provides guidance for SRB activities.

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3. SPECIFICATION REVIEW BOARD. An SRB will review and endorse all proposed specifications prior to their use.

a. Responsibilities. The SRB shall:

(1) For specifications, review document prospectus and provide recommended changes.

(2) For specifications, endorse document prospectus in its final form.

(3) Review and endorse all proposed specifications and new standards that are being developed for NAS use and provide recommended changes.

(4) For specifications, determine that each document meets administrative and format requirements of FAA-STD-002, Facilities Engineering Drawing Preparation, and FAA-STD-005, Preparation of Specification Documents.

(5) Review and endorse the document after final coordination.

NOTE: All items of disagreement shall be resolved prior to SRB endorsement. Areas of conflict that cannot be resolved will be referred to the appropriate CCB for a decision.

b. Membership. The SRB shall contain the following members:

(1) Chairperson, ASE-600.

(2) Secretary and alternate Chairperson, ASE-600.

(3) ASM representative.

(4) ATR representative.

(5) Initiator.

(6) Initiator's division manager or branch manager.

(7) Additional members as determined by SRB Chairperson.

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4. SRB PROCEDURES. All specifications proposed for NAS subsystems shall be prepared in accordance with

FAA-STD-005 and processed as indicated.

a. ASE-600 provides initiator with a specification number after the SRB endorses the prospectus and assigns/reserves a configuration item identifier(s) in NAS-MD-001.

b. Initiator prepares prospectus, completes clearance record coordination, resolves coordination comments, and submits prospectus and resolution of comments documentation to ASE-600 via an NCP. The prospectus shall discuss the following:

(1) All requirements the proposed document is to meet or have an impact on. These include air traffic and other operational requirements the specification is to address such as certification, repair philosophy, levels of maintenance, supply support, training, off-the-shelf equipment, backup power, use of computers, spares, method of remote control, etc. See FAA-STD-005.

(2) Quality control considerations.

(3) Specific constraints imposed by funding, physical, mechanical, and environmental limitations, estimated maximum size, and estimated maximum power consumption.

(4) The proposed approach to satisfy requirements addressed in paragraph 4b(1).

(5) Proposed review--limited or normal. Limited review may be accomplished, when in the judgment of the initiating division and ASE-600, limited handling is warranted. Examples are specifications having no significant impact on items listed in paragraphs 4b(1) through (3). A positive statement justifying use of a limited review shall accompany the initiating NCP if other than normal processing is desired.

(6) The specification schedule. As a minimum time period for NCP/review board processing, the following submission schedule is suggested:

Prospectus - 120 days before document due date.

Draft - 90 days before document due date.

Final SRB - 60 days before document due date.

NOTE: Due dates are established by branch and division or region and service.

(7) When information is available in other documents, such as acquisition papers, program plans, implementation plans, procurement plans, etc., the prospectus need not repeat the information, but should refer to the other document citing specific paragraphs. Copies of all referenced documents or applicable portions shall be attached to the NCP.

(8) The suggested review/clearance offices for both the prospectus and the specification are: Logistics Service (ALG), Office of Chief Counsel (AGC), Air Traffic (AT), Aviation Standards (AVS), Flight Standards Service (AFS), Mike Monroney Aeronautical Center (AAC), FAA Technical Center (ACT), Airway Facilities (AF), NAS Transition and Implementation Service (ANS), Advanced Automation (AAP), Office of Acquisition Policy and Oversight (ACQ), Office of Management Systems (AMS), Weather/FSS (ANW), Automation (ANA), Communication (ANC), Surveillance (ANR), Navigation and Landing Aids (ANN), Office of Aviation Safety Oversight (AOV); minimum of two regional Airway Facilities divisions and two regional Air Traffic divisions; NAS System Engineering (ASE), Systems Maintenance Service (ASM), and any other offices affected by the specification. Contractors are excluded unless sponsored by an SRB member.

c. ASE-600 will designate a Chairperson and Secretary for each SRB (each specification and new standard will have a separate SRB). The Chairperson/Secretary shall:

(1) Designate SRB members and provide each member with a copy of the prospectus.

(2) Schedule initial SRB meeting which will review the prospectus.

d. The SRB shall meet and comment on the prospectus. Minor changes (administrative) will be documented in SRB minutes, serving as an addendum to the prospectus. Major changes (technical, financial, schedule) may require rewriting of the prospectus. After resolution of all comments, the SRB shall endorse the prospectus, and it will be retained in ASE-600 files.

e. After the prospectus is approved, the initiator shall:

(1) Prepare the draft specification in accordance with the prospectus and the latest edition of FAA-STD-005, FAA-STD-002, or other applicable documents. For format for standards, contact ASE-600.

(2) Prepare FAA Form 1300-1, Specification Clearance Record, or FAA Form 1300-2, Clearance Record, and distribute the draft for review/clearance to interested parties and to SRB members.

(3) Consolidate reviewer's comments and resolve comments and nonconcurrences.

(4) Summarize the resolutions noting any unresolved conflicts.

(5) Revise the draft as necessary.

(6) Prepare a package containing the final draft, a summary of all review comments and their resolution sorted by specification paragraph number, and a statement indicating any elements or changes that do not agree with the endorsed prospectus. Determine the number of packages required and supply sufficient copies to the SRB secretary for distribution to SRB members. Only corrected pages and summarized comments may be submitted.

f. The SRB members shall review these documents and provide written comments to ASE-600. The SRB will be scheduled by ASE-600. After determining that the document meets the stated requirements and that review comments have been resolved or their nonacceptance explained, the SRB shall endorse the specification. If, in the judgment of the initiating division and ASE-600, a limited review is sufficient, limited NCP processing shall be initiated which shall serve in lieu of full SRB review and endorsement.

g. After the document is endorsed by the SRB, ASE-600 will accomplish the following:

(1) Prepare a package containing the NCP, prospectus, document, and SRB endorsement.

(2) Present package to the appropriate CCB level for formal FAA approval. The CCB will formally approve/baseline the document via issuance of a CCD.

(3) Prepare draft update of NAS-MD-001 by including the approved document.

h. The initiator will accomplish the following:

(1) Insert "date of issuance" under the document number on the cover page of the camera-ready copy. The date of issuance is the date the CCB approves the document.

(2) Forward camera-ready copy of document along with form DOT F 1700.3, Printing, Binding, Distribution, and Editorial Services Request, to coordinate printing and initial distribution.

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5. CURRENT SPECIFICATIONS. Refer to Order 4405.5, Specification Currency List for Procurement in the Air

Traffic Control and Navigation System, for specifications, standards, and drawings approved for procurement. An existing (current) specification shall be treated as a new specification and subject to the procedures of paragraph 4 of this appendix each time it is used in a new procurement. An add-on (option, multiyear, etc.) to an existing contract for procurement need not be subject to SRB review.

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6. DOCUMENT MODIFICATIONS.

a. Any modification after baselining shall be accomplished through NCP procedures including modification by PR, provision of the contract, or contract modifications before and after award. The SRB Chairperson and appropriate members shall be "must evaluators."

b. Urgent documents will be processed expeditiously to meet schedule requirements; however, the number of urgent documents must be held to a minimum. Urgency must be mutually agreed upon between the originating division and ASE-600.

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7. CONSTRUCTION SPECIFICATIONS AND DRAWINGS. FAA-STD-005 is the FAA standard for construction specifications. FAA-STD-002 is the FAA standard for construction drawings. Because of soil and climatic conditions, information copies of the construction prospectus and specification drawings involving buildings and foundations in Alaska shall be sent to the Alaskan Region for review and comment. ANS will accomplish the following for storing and issuing numbers for construction specifications and drawings.

a. Maintain a master file for each current camera copy and its associated prospectus, modifications, and other pertinent data.

b. Store the signed reproducible original of each current national standard construction drawing.

c. Maintain a microfilm master file of all national standard construction drawings, including separate prints of all revisions.

d. Assign numbers to national standard construction drawings.

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8. ISSUANCE. Specification documents and engineering drawings shall not be released out of agency prior to formal solicitation of a planned procurement.

a. Exceptions are:

(1) When the availability of this data has been advertised to all prospective parties.

(2) When the opinion of industry is being solicited.

b. The division responsible for the specification or drawing shall notify ASE-600 and ASM-100 of any restrictions on document-drawing release.

c. When prior review by others outside the agency is desired, the views of interested parties shall be solicited in the Commerce Business Daily.

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APPENDIX 5.

CONFIGURATION CONTROL AND STATUS ACCOUNTING PROCEDURES

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1. PURPOSE. This appendix describes the procedures and process for proposing, reviewing, approving, and implementing changes to the NAS configuration.

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2. SCOPE. The procedures described in this appendix support the entire NAS life cycle and begin with the initiation of a proposed change and end with the implementation of an approved change.

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3. APPLICABILITY. Each person proposing, reviewing, approving, implementing, or coordinating a change to the NAS configuration shall comply with the procedures described in this appendix.

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4. CONFIGURATION CONTROL. Configuration control is the process for coordinating, reviewing, establishing, and approving changes to NAS baselined subsystems contained in NAS-MD-001. Configuration control is provided throughout the NAS life cycle. Each phase has unique forms, CCB's, and processing procedures for proposed and implemented changes. Figure 1, Scope of NAS Change Processing, depicts the baselines and change documents by life-cycle phase which are tracked and reported.

a. Baseline Change Process. Changes to NAS baselines are proposed via change documents identifying the CI to be modified and describing the recommended change. FAA Form 1800-2 is completed to establish a baseline or when a change to a NAS baseline is proposed. The proposed change is a case file until it has been approved by a prescreening organization, if prescreening is required, forwarded to ASE-600 and assigned an NCP number through the automated tool. Instructions for completing the form are on the form and in NAS-MD-001. The proposed changes are reviewed by pertinent personnel and approved/disapproved at a CCB. Decisions are documented in a CCD and implementation of approved changes are transmitted using SCN's, SPB's, EEM's, or PEM's. See Chapter 4, paragraph 45a(2) for other implementation documents. Changes to baselined documents in the Requirements Determination life-cycle phase are processed in accordance with procedures detailed in subparagraph 4b(6). Changes to baselined documents in the acquisition life-cycle phase are processed in accordance with procedures detailed in subparagraph 4c. Changes to fielded equipments/software and associated operational support phase baselined documentation are processed in accordance with procedures detailed in subparagraph 4d.

b. Change Processing in the Requirements Determination Phase. During the requirements determination phase, changes are processed against the baselines identified in figure 1. The NAS CCB and the SE CCB are the decision bodies for reviewing and approving NCP's during this phase. Figure 2, NCP Flow for NAS and SE CCB, illustrates the flow for processing changes to baselined documents under NAS CCB or SE CCB control. The paragraph numbers correspond to box numbers on the diagram. The following paragraphs provide a brief description of each function depicted on the diagram:

(1) A NAS user originates a request for a change (new requirement, modification, or deletion) to the baselined NAS requirements or design documents (NAS CCB) or the baselined NAS specification, interface, standard, or transition document (SE CCB). A change to baselined NAS documents shall be classified as administrative if it has no effect on the technical content, schedule, cost, or architecture described in the documentation and the change does not require changes to other baselined documentation (e.g., correction of administrative errors or addition of clarifying notes). Administrative changes will also be recorded on FAA Form 1800-2. The Office of

Primary Interest (OPI) prepares the request in the proper format and forwards the request, along with any supportive data, to ASE-600. A case file and FAA Form 1800-2 are used to initiate a change to the NASSRS.

(2) The request is forwarded to the appropriate NAS System Engineering Service for preliminary review.

(3) System Engineering performs a preliminary review of the change request. If clarification is required, System Engineering coordinates the action with the OPI and/or the originator. Accepted case files are evaluated for technical, cost, benefits, performance, and schedule impact. The case file and evaluation package are forwarded to ASE-600 with recommendation for approval/disapproval for further processing.

(4) Upon return from the preliminary review, the case file is either disapproved and returned to the OPI or prepared for further review. ASE-600 assesses priorities and assigns a CM Lead who will be responsible for processing the change proposal through the formal change control process. The CM Lead prepares evaluation instructions which are based upon information received from the prescreening office, develops an evaluation schedule, and disseminates the NCP package to must evaluator organizations for review. The purpose of the must evaluator review is to ensure that the proposed change has been thoroughly evaluated, to ensure that its impact is completely understood, and to provide a recommendation for the CCB. Normally, fifteen (15) working days is allowed for a must evaluation review. If sufficient justification exists, a must evaluator may request an extension. Administrative NCP's do not require must evaluator review or CCB action, only the signature of the CCB Chairperson or Executive Secretary.

(5) The CM Lead provides the must evaluator comments to the OPI and NAS System Engineering Service as they are received. The OPI schedules coordination meetings with the must evaluators to resolve issues. The resolution of comments is coordinated with and approved by System Engineering. The results of the meetings are documented by the CM Lead. Each comment must be accepted/rejected and nonconcurrences must be coordinated with the originator of the comment.

(6) The NAS or SE CCB Executive Secretary prepares the NCP package for CCB action. The details of the CCB activities are discussed in the pertinent operating procedures for each CCB. An approved NCP results in a CCD being sent to NAS System Engineering Service for action. A CCD affecting subordinate documentation may require notification of impact on subsystem specifications being sent to AAP, APM, etc. Disapproval of the NCP results in a CCD being sent to the originator.

(7) If the CCB Chairperson defers the decision on an NCP because the requirements are unclear or more technical data are required to issue a CCD, the package is forwarded to the OPI where a specific individual will be assigned to coordinate with the ASE-100/ASE-210 and support contractors to provide the information required.

(8) Approved changes to baselined NAS requirements and design documents are implemented by ASE-100/ASE-210, as appropriate. New requirement specifications and design activities are initiated, or revisions to existing documentation are performed. Administrative changes do not require immediate updating of documentation, but are incorporated when a NAS CCB or SE CCB approved change necessitates a documentation update (approved administrative changes are identified in the change notice as appropriate). ASE-100 or ASE-210, as appropriate, is responsible for the printing and distribution of the revised documentation and for notifying ASE-600 and the originator when these implementation activities are completed. Additionally, ASE-100 or ASE-210 is responsible for sending two copies of the revised documentation and a NAS Documentation Data Sheet to the NAS Documentation Control Center.

(9) Upon receipt of implementation data from ASE-100/ASE-210, AAP, APM, etc., ASE-600 closes the NCP/CCD and archives the records.

c. Change Processing in the Acquisition Phase. During the acquisition phase, changes are processed against the baselines previously identified in figure 1. The Program CCB's are the decision bodies for reviewing and approving NCP's during this phase. Figure 3, Program CCB Change Process, illustrates the flow for processing changes to baselines under Program CCB control. The paragraph numbers correspond to box numbers on the diagram. The following paragraphs provide a brief description of each function depicted on the diagram:

(1) The contractor originates an ECR or an ECP, submits it to the Project Technical Officer, and provides a copy to the QRO. The Project Technical Officer, supported by the QRO, reviews the ECR/ECP for completeness in technical clarity and definition. The Project Technical Officer may return the ECR/ECP to the contractor for further definition and clarification. If the Project Technical Officer determines that the ECR/ECP is technically acceptable, it is prepared in the proper case file format (FAA Form 1800-2) and forwarded to the Contracting Officer (ALG-300). The Contracting Officer reviews the case file for cost and legal impact. Endorsed case files are forwarded to ASE-600 for processing.

(2) In those instances where the contractor originates a Field Service Bulletin or an ECR/ECP when equipment has been fielded, the Project Technical Officer initiates a case file and transmits the case file and supporting documentation to the QRO and the EFSS. The EFSS evaluates the change and submits its comments and recommendations to the Contracting Officer. The Contracting Officer reviews the case file for cost and legal impact. Endorsed case files are forwarded to ASE-600 for NCP processing.

(3) Proposed changes to NAS subsystems originated by field organizations are submitted as case files through the region and EFSS to the Project Technical Officer for review and forwarding to ASE-600 for NCP processing. Note that all case files are logged into the status accounting system.

(4) ASE-600, in coordination with the program office, assesses priorities, assigns must evaluators, prepares evaluation instructions, assigns NCP numbers, develops evaluation schedules, and disseminates the NCP's to must evaluator organizations for review.

(5) The must evaluator review is to ensure that the proposed change is evaluated by impacted organizations, to ensure that the impact is understood, and to provide a recommendation to the Program CCB. Substantive rationale must be provided with each recommendation for disapproval. All notes and background information accumulated during the processing of the case file will accompany the case file/NCP when it is forwarded from office to office. The must evaluators return the NCP and their recommendations to the Executive Secretary for processing. Thirty (30) days are normally allowed for must evaluator review; however, if sufficient justification exists and the schedule permits, an extension may be granted.

(6) The Executive Secretary provides the NCP and must evaluator comments and recommendations to the CCB Chairperson for review. The CCB Chairperson may approve or disapprove the NCP (based on evaluation comments) or direct the Executive Secretary to prepare it for the Program CCB. In the event that a change to a Program CCB baseline impacts an area outside the CCB's jurisdiction, that change shall be transferred to the appropriate CCB for action. The details of the Program CCB activities are discussed and illustrated in the operating procedures for each CCB. An approved NCP results in a CCD being signed by the Chairperson and distributed for implementation. Disapproval of an NCP results in a CCD being sent to the originator. Prior to issuing a CCD for any NCP affecting a Designated Major System Acquisition (DMSA) program that falls within the criteria set forth in Order 1810.1, Major Systems Acquisition, the program manager obtains concurrences as required. If an organization impacted by the CCD does not concur with the decision, the CCD may be appealed by that office through normal management channels.

(7) If the Program CCB Chairperson defers the decision on an NCP because the requirements are unclear or more technical data are required to issue a CCD, an action item and schedule are normally assigned to a specific individual to coordinate with the originator/OPI and contractors to provide the information required.

(8) Approved changes to baselined subsystems are implemented and the documentation is distributed. Two copies of the revised documentation and a completed NAS Documentation Data Sheet are sent to the NAS Documentation Control Center.

(9) Upon notice of completion of implementation, ASE-600 closes the NCP/CCD and archives the record.

d. Change Processing in the Operational Support Phase. During the operational support phase, changes are processed against the baselines identified in figure 1. The ME CCB, AT CCB, and Regional CCB's are the decision bodies for reviewing and approving NCP's in this phase. Because of the unique nature of the CCB procedures and CI's under control each CCB will be discussed separately. Change processing for the Regional CCB's is addressed in their CCB operating procedures.

(1) NCP Process for the ME CCB. This section addresses the specific configuration control procedures for ensuring the integrity of the operational subsystem baseline for all NAS existing facilities and equipment and all new projects which complete the acquisition life cycle. Figure 4, ME Change Process, illustrates the flow for processing changes to the CI's under ME CCB control. The following paragraphs provide a brief description of each function depicted on the diagram:

(a) FAA personnel originate a request for a change to the baselined operational NAS subsystem. The request is prepared in the proper case file format using FAA Form 1800-2.

(b) Field-originated case files are forwarded, along with supportive data, to the appropriate region for preliminary review and evaluation of the operational impact of the change.

(c) The region coordinates the case files and supportive data with divisions in the region and with other regions, as the originating region

deems appropriate. After preliminary review, the case files which are recommended for approval are forwarded to the appropriate EFSS. The EFSS shall coordinate with the Logistics Support Center on the provisioning, supply support, and repair impact of a change. Disapproved case files are returned to the regional office.

(d) Case files requiring more supportive data are returned to the originator with a request for more information. If the case file is disapproved by the EFSS, it is returned to the appropriate region with the reason for disapproval. ASE-600 is notified of all EFSS case file dispositions. If the EFSS believes the case file is valid, it is forwarded, along with all supportive data, to ASE-600 for processing. Headquarters offices, EFSS, AAC, and ACT generated case files and regional case files which request to waive installation or siting criteria are submitted directly to ASE-600 for processing.

(e) ASE-600 assesses priorities and assigns a CM Lead who is responsible for processing the change proposal through the formal change control process. The CM Lead prepares evaluation instructions which are based on information received from the EFSS, obtains an NCP number, develops an evaluation schedule, and disseminates the NCP package to the must evaluator organizations for review.

(f) The purpose of the must evaluator review is to ensure that the proposed change has been thoroughly evaluated, to ensure that its impact is completely understood, and to provide a recommendation for the ME CCB. The must evaluators may recommend that the change be approved, disapproved, or deferred in order to conduct a study to evaluate the impacts of the proposed change. Substantive rationale must be provided with each recommendation for disapproval. The must evaluators return the NCP package and their recommendation for disapproval to ASE-600. Normally, thirty (30) days are allowed for the must evaluator review. If sufficient justification exists, a must evaluator may request an extension.

(g) The Executive Secretary provides the NCP and the must evaluator's comments and recommendations to the ME CCB Chairperson for review. The ME CCB Chairperson may approve or disapprove the NCP, approve the NCP with specified changes (as stated in the CCD), or forward the NCP for ME CCB action. The ME Chairperson is ASM-1. If the Chairperson determines that the NCP package be forwarded for ME CCB action, the CM Lead forwards the required material to the ME CCB Executive Secretary for CCB processing. All notes and background information accumulated during the processing of the case file accompany the case file/NCP when it is forwarded from office to office.

(h) If the ME CCB Chairperson requires further study of the NCP, the action is assigned to a particular organization which will return the NCP and study information to the Executive Secretary for processing at the next ME CCB.

(i) In the event that a change to the operational baseline impacts an area outside ME CCB jurisdiction, that change is transferred to the appropriate CCB for action. The details of the ME CCB activities are discussed and illustrated in the ME CCB Operating Procedures. An approved national NCP results in a CCD being signed by the Chairperson and sent to the EFSS for implementation. Local CCD's are sent to the regional Airway Facilities divisions. Disapproval of an NCP also results in a CCD which states the reasons for disapproval. The CM Lead distributes copies of the signed CCD's according to ME CCB Executive Secretary instructions. If an organization impacted by an ME CCD does not concur with the decision, the CCD may be appealed by that office through normal management channels as specified in the ME CCB operating procedures.

(j) If the ME CCB Chairperson defers the decision on an NCP because the requirements are unclear or more technical data are required to issue a CCD, the Chairperson assigns an action item to a specific organizational member of the CCB with a date specified for completion.

(k) Approved changes to baselined operational subsystems are implemented by the EFSS. Local modifications are implemented by the regional Airway Facilities divisions. The EFSS is responsible for the printing and distribution of the revised documentation and for notifying ASE-600 and the originator when these implementation activities are completed. Two copies of the revised documentation and a completed NAS Documentation Data Sheet are sent to the NAS Documentation Control Center.

(1)Upon receipt of implementation data from ASE-100/ASE-210, AAP, APM, etc., ASE-600 closes the NCP/CCD and archives the records.

(2) NCP Process for the AT CCB. This section addresses the specific configuration control procedures for ensuring the integrity of the operational software baselines under Air Traffic management. Figure 5, AT Change Process, illustrates the flow for

processing changes to the CI's under AT CCB control. The following paragraphs provide a brief description of each function depicted on the diagram:

(a) Case files written against the operational software baselines may be originated by FAA headquarters, regional offices, FAA Technical Center, or field sites using FAA Form 1800-2. Field-generated case files are forwarded, along with supportive data, to the appropriate region for review.

(b) The region conducts a preliminary review of field-generated case files to evaluate the operational impact of the change and provide a preliminary estimate of the resources needed to implement the proposal. Disapproved case files are returned to the originator. Approved urgent and time critical case files, and case files designated for the "local patch library" under appropriate orders, are forwarded to ATR-200 for further processing. All other regionally approved case files, with "normal" priority, are prioritized and held by the region pending a "call for case files" from ATM-100 for packaging in the next subject system/version.

(c) The procedures for the handling and packaging of operational case files are contained in Order 1100.144. Normal case files for proposed changes to operational software are held by the region until ATM-100 issues a "call for case files" which are candidates for the next major upgrade to the system. The candidate case files are collected from all regional offices, and other concerned offices, by ATM-100. They are evaluated and prioritized according to their operational benefits. Those case files not selected are returned to the respective regions. The prioritized candidate case files, with all supporting data and evaluations, are then submitted to ATR-200 for Air Traffic prescreening and further handling. ATM-100 and ATR-400 will conduct a formal packaging meeting and identify which case files will be in the subsequent system. Priority shall be given to those case files in the order of their assigned priority. Some manipulation of the priority list may be required, depending on the available resources and other national requirements. ATR-400 and ATM-100 shall publish lists of the packaged case files for each operational system. Regional Air Traffic divisions shall, upon receipt of the lists of packaged case files, decide what action, if any, they will take on those case files not packaged, e.g., cancel, rewrite, consolidate, resubmit next cycle, etc.

(d) Case files received by ATR-100/200 from ATR-400 and headquarters originators are forwarded to any concerned Air Traffic divisions for a prescreening evaluation. ATR-100/200 resolves all necessary comments and nonconcurrences. Case files passing this review are forwarded to ASE-600. These case files contain recommended must evaluators and identify the targeted system/version.

(e) ATM-100 evaluates Traffic Management System (TMS) case files, to include previously approved changes to baseline documentation to support operational implementation of established requirements. Field-originated TMS case files, which have been approved by the facility manager, and regional office-originated TMS case files, are forwarded with supporting documentation to the regional Air Traffic automation office for preliminary processing. The forwarding cover letter shall contain a statement that the case files are not to be held in the region for prioritizing or packaging, but should be forwarded to ATM-100 for evaluation. After evaluation, ATM-100 forwards valid TMS case files to ATR-200 for prescreening.

(f) ASE-600 is responsible for processing the change proposal through formal change control. ASE-600 prepares evaluation instructions using

information received from the prescreening offices, assigns an NCP number, develops an evaluation schedule, and disseminates the NCP package to must evaluator organizations for review.

(g) The purpose of the must evaluator review is to ensure that the proposed change has been thoroughly evaluated, to ensure that its impact is completely understood, and to provide a recommendation for the AT CCB. The recommendation may be: concur without comment, concur with comment, nonconcur with comment, or review not required. Substantive rationale must be provided with each recommendation for disapproval. The must evaluators return the NCP package and their recommendation to ASE-600. Normally, thirty (30) days are allowed for the must evaluator review. If sufficient justification exists, a must evaluator may request an extension. When appropriate, the must evaluator organizations review and discuss technical, schedule, and cost impact of the proposed change, even if all organizations concur with the change.

(h) The results of the must evaluator review are documented by ASE-600. In coordination with ATR-200, ASE-600 attempts to resolve nonconcurrences and critical comments. Disapproved case files are returned to the originator.

(i) The AT CCB Executive Secretary prepares the NCP package for AT CCB action. The AT CCB reviews all submitted NCP's and determines which are to be included in the final subject system/version. The details of the AT CCB activities are discussed and illustrated in the AT CCB Operating Procedures.

(j) If the AT CCB Chairperson defers the decision on an NCP because the requirements are unclear or more technical information is required to issue a CCD, the package is assigned to a specific office which will coordinate with the originator/OPI and support contractors to provide the additional information. The new information is forwarded to ASE-600 for inclusion in the next AT CCB meeting. The AT CCB Executive Secretary prepares a CCD documenting all changes and necessary actions, and it is signed by the AT CCB Chairperson.

(k) Approved CCD's are distributed by ASE-600 to ATR-200 and any affected organizations for implementation.

(l) The software change is designed, coded, tested, and disseminated to the field for installation by ATR-400. Two copies of the revised documentation and a completed NAS Documentation Data Sheet are submitted to the NAS Documentation Control Center.

(m) Upon installation ASE-600 is notified that the implementation is complete. Upon receipt of the implementation data, ASE-600 closes the NCP/CCD and archives the records.

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5. CONFIGURATION CONTROL DECISION. A decision (approval/disapproval) is documented in the form of a CCD. It is signed by the Chairperson of the responsible organization and identifies the action(s) required and the organization(s) responsible to complete the approved modification(s). ASE-600 tracks the CCD and does not close the record until all modifications specified in the CCD have been completed. Copies of CCD's which baseline or direct a change to baselined documentation are forwarded to the Documentation Control Center to maintain information about documentation under configuration control.

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6. STATUS ACCOUNTING. Status accounting tracks and reports the progress of a change (proposed, approved,

or implemented) to a CI within the NAS. Status accounting generates various reports providing information on change proposals in the review process, approved changes in the implementation process, and the current configuration of the NAS.

a. Status Accounting Data Contents. The status accounting data content includes recording the establishment of each baseline and continuously tracking all proposed and approved or disapproved changes to the baselines by:

(1) Recording with controlled access the various documents comprising the baselines and changes to the baselines.

(2) Recording significant data elements, employee suggestions (of a technical nature), ECR's/ECP's, case files, NCP's, CCD's, EEM's, PEM's, SPB's, STB's, and SCN's; identification numbering, serial number; revision numbers; priority; etc., related to the baselines and subsequent changes.

(3) Recording the physical configuration of each serial numbered hardware product through reference to drawing numbers from its top assembly down to its LRU.

b. Records and reports include the following:

(1) Technical documentation comprising the configuration identification. The technical documentation includes specifications, drawings, interface documentation, parts, lists, etc.

(2) Essential CI data, including FA Type Number (see Order 6030.29, Assignment and Dissemination of FAA Equipment Type Designation Number for Air Traffic Control and Navigation Systems), contractor part number, and serial number. A numbering system must be generated for all new systems/components including common operating and common support equipment that interfaces with various CI's.

(3) Contractual information required for each CI and contractor name, contract number, and FAA procuring activity.

(4) Proposed changes to configuration, the status of changes, and responsibility for change decisions.

(5) Approved changes to configuration, including the specific CI's by serial number to which the changes apply, the specific CI's by serial number in which the changes have been incorporated and when, and the organization responsible for their incorporation.

c. Structuring Status Accounting Records. A breakdown of specific requirements to be covered in structuring status accounting records can be formulated to suit each acquisition by selection from the following breakdown.

(1) Configuration Identification for Baseline Application. Identification of each baseline, including:

(a) The complete title, number, and revision symbol of each applicable document for each subsystem, equipment, and other predetermined, designated CI that forms a part of a specific baseline.

(b) The complete title and number of each "top" drawing for each subsystem, equipment, and other predetermined, designated CI that forms a part of a specific baseline.

(2) Configuration Identification Data.

(a) The identifying number of each CI and that of the next higher-level CI (if any) of which it is a part.

(b) The manufacturing code identification number of the design activity of each CI.

(c) The national stock number assigned to each CI.

(d) The part number assigned to units of each CI.

(e) The serial numbers or lot numbers assigned to units of each hardware CI or the version letter for a software CI.

(f) The quantity of units of each CI deliverable under the contract(s).

(3) NCP Information.

(a) The nomenclature of the change proposal.

(b) The number of the change proposal.

(4) Implementation of Approved Changes Information.

(a) Modification implementation directive number.

(b) Modification implementation directive date.

(c) Type designation of modification.

(d) Modification directive nomenclature.

(e) Modification accomplishment sequence number.

(f) Modification effectivity.

(5) Changes to Information. Date(s) when modification(s) is made to the affected CI's or elements.

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APPENDIX 6.

NAS CM TRANSITION

1. PURPOSE. This appendix describes the policy and procedures for transitioning CM responsibilities from one NAS life-cycle phase to another. There are two transition points: transition from requirements determination to acquisition, and transition from acquisition to operational support.

2. TRANSITION OF CM RESPONSIBILITY FROM REQUIREMENTS DETERMINATION TO ACQUISITION. The transition from the requirements determination phase to the acquisition phase for a given requirement or related set of requirements is accomplished by the allocation of those requirements to a specific program or programs and the definition of the interface requirements between this program or programs and other programs. These requirements are transcribed and expanded upon in the specifications and in the IRD's used for procurement. All specifications used for procurement must be endorsed by the SRB and approved by the designated Program CCB. All IRD's must be endorsed by the ICWG and approved by the SE CCB prior to use. Appendixes 4 and 7 provide a more detailed description of the SRB and ICWG.

3. TRANSITION OF CM RESPONSIBILITY FROM ACQUISITION TO OPERATIONAL SUPPORT.

a. Program CCB Responsibility. The cognizant Program CCB bears the responsibility for ensuring the transfer of CM responsibilities to the appropriate operations and maintenance organizations through a formal hand-off agreement/procedure documented in the Project Implementation Plan, project directive, or a separate MOU. The mechanism for documenting successful completion of the transition process shall be specified in the Hand-off Agreement/Procedure, subparagraph 3b(6). Note that two copies of every signed agreement to which FAA is a party should be transmitted to the Office of Management Systems, Organizational Analysis Branch, AMS-530, as prescribed in Order 1230.10, Interagency Agreements.

b. Hand-off Agreement/Procedure. The formal hand-off process shall be defined in a hand-off agreement/procedure which shall include:

(1) Designation of hand-off events. Hand-off events during the transition process span project initiation through full operational status. The key events during the transition process are CDR, FCA/PCA, acceptance from contractor (first system at the FAA Technical Center or key site), product baseline acceptance; for software, national release to key site, key site Initial Operating Capability (IOC), key site ORD, National release to other sites, and last ORD. The hand-off event selected will depend on the type of project, terms of the contracts, and user organization readiness/ability to assume responsibility for the subsystem. An agreement as to when hand-off is to occur is useful before contract award so that budgeting, scheduling, training, etc., can proceed. Additionally, it is important so there is minimum impact on user organizations and that they are ready to take control of the system at the designated hand-off time.

(2) Designation of an agreed hand-off date(s).

(3) Designation of any division of configuration control responsibility within the operation and maintenance organization; e.g., ATR-100, ASM-400, ASM-600, ACT-600.

(4) Identification of the configuration that will be handed-off, including all baselines controlled by the Program CCB and their composition at time of hand-off.

(5) Specification of the contents of the hand-off packages during transition. These will

vary according to the subsystem and the organizational roles and responsibilities. Hand-off package contents may include: baselined documents (see figure 1), review minutes (SDR, PDR, DRR, etc.), design discrepancies, findings, and recommendations; ECP's/ECR's, case files, NCPs and CCDs; impact estimates; test plans, procedures and reports, minutes and action item dispositions; operational concept documentation; training plans; engineering files; audit reports; site-dependent materials; source code listings; Technical Instruction Books; local patches required to meet IOC; and FAA Form 256, Inspection Report of Material and/or Services. Please note that use of the term hand-off package refers to the physical system and its documentation, material and support items that are physically to be transferred to FAA user organizations for management and operational purposes. The FAA CM requirement for hand-off does not encompass the complete hand-off package for life-cycle support, rather that subset necessary to maintain configuration control during the remaining life-cycle of the system.

(6) Identification of the mechanism for specifying that hand-off of CM responsibility from the acquisition Program CCB to the appropriate operations and maintenance CCB(s) has occurred.

(c) Hand-off Package Integrity. The completeness and integrity of the hand-off package will affect the users' ability and effectiveness to assume CM responsibility for the subsystem. The actual integrity of the hand-off package should be assured through configuration audits (FCA, PCA) with joint project office and user organization participation prior to hand-off.

FIGURE 1. BASELINE DOCUMENTATION

Functional Baseline	Purpose
• System/Segment Spec (A Spec)	Statement of procurement requirements; upward traceability to higher level design documents; downward traceability to "B" and "C" level specs.
• IRD	Specific functional interrelationships between two NAS subsystems.
Allocated Baseline	
• Configuration Index	Relational summary of all CI's.
• Operational Concept Document	Identification/description of mission, system operational and support environment, and users' operational interface with the subsystem.
• Prime Item Development Spec ("B1")	Build-to, development requirements allocated to each Hardware Configuration Item (HWCI) link between "A" and "C" specs for each HWCI.
• Software Development Spec ("B5")	Requirement allocation to each CSCI and detailed requirements for CSCI interfaces; link between "A" and "C" specs for each CSCI.
-Software Requirements Spec -Interface Requirements Spec	
Design Baseline	
(Design baseline documentation evolves into product baseline documentation and therefore loses its identity at end state.)	
• Preliminary SW Product Spec (Preliminary "C5")	Preliminary statement of performance requirements and interface and interchangeability characteristics.
- SW Top-level Design	

Document - Interface Design Document - Data Base Design Document - Software Detail Design Document - Source Code Listing for GFP	
Product Baseline	
• ICD's	"As-built" specification of the design of an interface between two NAS subsystems.
• Design "C1b" Spec	"As-built" product description of each HWCI; traceability of CI to "B" spec; use in reprocurement, maintenance, training, etc.
• Drawing package	Detailed "as-built" configuration of each HWCI; use in reprocurement, maintenance, training, etc.
- Assembly drawings - Parts lists - Fabrication details - Procurement drawings	
• Detailed design "C5" Specs (per CSCI)	Representations providing technical detail; as-coded requirements; listings for maintenance, audit, and control.
- SW Top-level Design Document - Interface Design Document - Data Base Design Document - Software Detail Design Document - Source Code Listing - Source Code Listing for GFP - Object Code Listing	
• Version Description Document	Precise description of software; used for traceability.
• COTS Documentation	Whatever documentation is available from the hardware or software manufacturer; used for training, logistic support, etc.
Operational Baseline	
• All documentation listed for Product Baseline	

• User Documentation/Data	May vary from subsystem to subsystem at discretion of user.
- HW Maintenance Manuals - HW Operators' Manuals - Computer System Diagnostic Manuals - Computer System Operator's Manuals - Software Users' Manuals - Software Programmers' Manuals - Site-Adaptation Data - Support Tool Documentation - Technical Instruction Books - Provisioning Technical Documentation - Training Documentation	

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APPENDIX 7.

INTERFACE CONTROL WORKING GROUP

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1. PURPOSE. This appendix describes the membership and responsibilities of the ICWG's for processing IRD's and ICD's.

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2. SCOPE. There are two ICWG forums within the NAS. The IRD forum resides internal to the FAA which facilitates the coordination of interface require- ment activities between FAA project managers and the Systems Engineering Service and Facility System Engineering Service. The ICD forum requires the participation of project managers and NAS subsystem contractors facilitating the coordination of interface design constrained by the associated IRD.

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3. INTERFACE CONTROL WORKING GROUP.

a. ICWG Responsibilities. An ICWG provides the forum to facilitate the coordination of interface control activities between project managers for IRD's and project managers and contractors for ICD's. The ICWG serves as the recognized communications link between the NAS projects on interface matters related to a specific NAS element, subelement, subsystem, or end item. The ICWG is responsible for the following interface control activities.

(1) Endorsing interfacing agreements.

(2) Resolving interface incompatibilities.

(3) Determining the required interface controls.

(4) Resolving disputes.

(5) Determining document compliance with FAA-STD-025 format and content requirements.

b. ICWG Membership for IRD's. The IRD ICWG consists of the following members:

(1) Chairperson:

(a) The NAS Interface Management Group (IMG) shall chair the IRD ICWG's and shall be responsible for resolution of issues raised by the ICWG members.

(b) The project manager of the interfacing system that is more mature in development shall be responsible for implementing the interface requirements activities of a specified subsystem.

(c) The project manager of the interfacing system that is less mature in development shall be responsible for supporting the interface requirements activities of the specified subsystem.

(2) Secretariat. The IMG in Systems Engineering is responsible for administering the interface management activities.

(3) Additional members. Additional members are determined by the Chairperson.

c. ICWG Membership for ICD's. The ICD ICWG consists of the following members:

(1) Co-chairpersons.

(a) The project manager of the interfacing system that is the more mature in development is responsible for supporting the interface control activities in accordance with FAA-STD-021.

(b) The project manager of the interfacing system that is less mature in development is responsible for supporting the interface control activities in accordance with FAA-STD-021.

(2) Secretariat. The secretariat is appointed by the Chairperson and is responsible for administering the interface control activities in accordance with FAA-STD-021.

(3) Originating/Participating Contractors. Contractors' representatives are authorized to participate in interface control activities on their behalf.

(4) Additional members. Additional members are determined by the Chairperson.

d. ICWG Meetings. ICWG members review interface requirements, develop interface control plans, resolve interface problems, obtain approval of interface control documentation, and coordinate other interface control activities as required. The ICWG Secretariat shall provide an agenda to the affected ICWG members at least five (5) working days prior to a meeting. He/she is responsible for the meeting minutes, including the recording of action items, commitment dates, and interface agreements.

e. ICWG Activities.

(1) Endorsing Interface Control Agreements. Interface requirements are documented in IRD's, and interface designs are documented in ICD's. The ICWG shall review and endorse all interface documentation between project managers. After the IRD or ICD is baselined, any subsequent interface revision (IR) in accordance with FAA-STD-025 will be reviewed and endorsed by the ICWG members prior to submittal through NCP process to the appropriate CCB for approval.

(a) IRD's. All new or revised IRD's submitted to the SE CCB shall be developed for baselining as follows:

1. The Interface Management Group (IMG) in Systems Engineering, comprised of Systems Engineering or Program Management, shall evaluate NAS requirements and designate IRD authors. This group shall identify the need for interface documentation and schedule its development.

2. The author shall obtain an end item number from the IMG.

3. The author shall develop the draft IRD and supporting case file, conduct table-top review meetings and coordinate NAS requirements with participating organizations prior to submitting the proposed IRD to the IMG for ICWG processing.

4. The IMG shall provide an ICWG package, consisting of the draft IRD, schedule of ICWG meetings, and any outstanding issues requiring resolution.

5. The ICWG members shall meet and resolve comments on the proposed draft document. Comments shall be solicited via clearance record procedures from the specified

"must reviewers."

6. After resolution of all comments, the ICWG shall endorse the document by completing the "approval signature" block on the IRD. This endorsement signifies that the document represents an agreement and that:

(aa) The interfacing requirements have been reviewed by Systems Engineering and that they will meet the intent as specified in the subsystem functional specification and NAS-SS-1000.

(bb) The interfacing requirements and characteristics are compatible.

(cc) No change which affects interface compatibility will be made to a requirement without coordination and agreement between the participating project managers.

(dd) The IRD meets the format and content requirements of FAA-STD-025.

(b) ICD's. All new or revised ICD's submitted to the project manager shall be developed for baselining as follows:

1. The project manager of the interfacing subsystem that is more mature in development shall be responsible for directing that subsystem contractor in the implementation and operation of the ICD/ICWG in accordance with FAA-STD-021.

2. The project manager of the interfacing system that is less mature in development shall be responsible for directing that subsystem contractor to support the ICD/ICWG activities in accordance with FAA-STD-021.

3. When the interfacing system that is less mature in development, is out of phase contractually, that project manager shall support the activities of the ICD/ICWG himself/herself.

4. When the ICD is submitted by the contractor and approved by the project managers, it is submitted to the Program CCB for baselining.

(2) Resolving Interface Incompatibilities. Interface incompatibilities may result from nonavailability of interface data, inadequate interface data, or discrepancies in interface data. The ICWG shall coordinate the resolution of each interface incompatibility. The required solution may involve hardware/software requirements causing revisions to IRD's.

(a) Interface Data Unavailable or Inadequate. ICWG members shall cooperate in the exchange of interface data needed for IRD preparation and notify the IMG whenever nonavailability of adequate data impacts IRD development schedules. The IMG shall coordinate with the participating project managers to establish an action plan for obtaining the required interface data. When it is necessary to prepare an IRD prior to obtaining adequate data:

1. The document originator shall identify each incomplete requirement and recommended action required for completion.

2. The responsible ICWG member will prepare an IR in accordance with FAA-STD-025 when data is available and the incompatibility is resolved.

(b) Discrepant Interface Data. ICWG members shall notify the IMG when the information contained in the interface control documentation differs from the actual requirement or incorrectly defines the interface (e.g., end item does not comply with the IRD; hardware responsibility has changed). The IMG shall coordinate with the participating project manager to establish an action plan and recommended disposition for correcting the discrepancy.

(3) Determining Required Interfaces. The need for new or revised IRD's may be generated by the introduction of new hardware/software or by engineering change proposals to existing systems. Interfaces which are candidates for interface control will be identified through review of the system documentation and associated NCP's. The IMG shall:

(a) Verify that the total interface impact has been identified on the NCP.

(b) Submit formal request for new IRD's or ICD's as necessary.

(c) Define and coordinate resolution of related problems.

(4) Status of ICWG Activities. The IMG is responsible for the preparation, maintenance, and distribution of ICWG status reports. These reports provide pertinent information to the ICWG members and the FAA on ICWG and related activities. A separate report should be maintained for each of the following:

(a) Current status of all authorized IRD's and ICD's and associated NCP's, revisions, and action items.

(b) Interface problems and associated action plans, disposition, and schedule.

f. Resolution of Disputes. In the event that ICWG members are unable to agree on interpretation of the interface control agreement requirements, or the interface requirements/characteristics, the problem shall be referred to the ICWG Chairperson. If resolution cannot be achieved at the ICWG, the problem shall be referred to the NAS Interface Management Group for disposition, with involvement by representatives from the appropriate organizations.

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APPENDIX 8.

CONFIGURATION AUDITS

1. PURPOSE. The purpose of this appendix is to provide the FAA guidance in the planning and conducting of formal configuration audits.

2. SCOPE. This information is supplemental to MIL-STD-1521. It provides the FAA with a definition of roles and responsibilities and a brief overview of an FCA and a PCA.

3. CONFIGURATION AUDITS. Audits as described in chapter 6, paragraph 66b, are used to verify the quality of the products prior to design approval and production authorization. The requirement for an FCA and a PCA must be called out in the contract SOW and the accompanying contract data requirements list. If it is not, the audit is an FAA task without contractor support unless the contract is modified.

4. ROLES AND RESPONSIBILITIES. The FAA must carry the lead role and bear the ultimate responsibility for performance and certification of the audit. Configuration audits should be conducted for the FAA, by the FAA. The extent to which a contractor is responsible for or participates in configuration audit efforts depends on the contractual requirements that have been imposed by the FAA.

a. FAA Program/Project Office. The primary responsibility for imposing the requirement and assuring the conduct of configuration audits rests with the program/project office. Responsibilities include scheduling, coordinating, and conducting the configuration audit. The project office should also ensure that CM audits are addressed in each contract SOW and that appropriate Contract Data Requirements List (CDRL) and Data Item Descriptions (DID) are included and tailored to a particular project. Ensuring that an audit is planned, scheduled, and conducted in consonance with other acceptance activities is also a program office responsibility. This includes provisions for allocating sufficient resources and time for this activity and ensuring that the task appears within program management planning documentation as a recognized activity/event. Resolution of subsystem performance deficiencies discovered through a configuration audit is a program/project office responsibility working in coordination with the QRO. The Program Management Office (PMO) and contracting officer have the final approval of the audit.

b. The Contractor. The role of the contractor in the conduct of configuration audits must be defined through contract work statement. FAA-STD-021 and/or MIL-STD-1521 are relevant standards calling for contractor participation in the conduct of configuration audits (FCA's and PCA's). However, the contractor work statement should be more specific than just naming the relevant standards. For example, the contractor CM plan should be required to contain a section addressing configuration audits, and major acquisitions should require a separate FCA/PCA plan in addition to the CM plan. Items discussed in these plans may include, but are not limited to:

(1) Schedules and agenda for the audit activity (FCA and PCA) and any preliminary meetings.

(2) Detailed list of proposed FCA and PCA tasks in accordance with the requirements of the standard(s) invoked.

(3) Outline of the audit in terms of location, available material, participants, assumed FAA role, etc.

(4) Reporting, including plan for recording and addressing discrepancies.

(5) List of material/documentation to be used and/or made available during each audit.

(6) Checklist of specific things to examine/verify during the conduct of each FCA and PCA task.

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5. FUNCTIONAL CONFIGURATION AUDIT. An FCA should assess the functionality of a system as embodied in its controlling baselines (specifications). It should also address upward and downward requirements traceability between baselined A-level (functional) and B-level (allocated) specifications. The traceability should be established for every CI comprising the system's configuration. If a design baseline exists (C-level specifications), it too should be added to the traceability requirement. An FCA should render an assessment as to whether subsystem specifications at the functional, allocated, design, and "as-built" levels are consistent with each other. An FCA should use the results of tasks performed by Quality Assurance (QA), Testing and Evaluation (T&E), and Independent Validation and Verification (IV&V) organizations to facilitate the overall conduct of an FCA and to avoid duplication of efforts.

a. Scheduling. An FCA depends on documentation availability and the completion of project/contractor testing at the CI level. An FCA should be done incrementally as documentation and test requirements for each of the CI's have been met. The time that is required to conduct an FCA for a given CI will depend on many factors, including: the complexity and criticality of the CI and the subsystem being audited; whether it is hardware and/or software; the contractor's role; and the availability of a requirements traceability matrix.

b. Required Material. Required material will vary from subsystem to subsystem. Consideration should be given to constraints such as contractor proprietary data rights and contract provisions that do not require drawings and data packages to be delivered with the subsystem. This situation is likely when hardware CI's are COTS items. The following list indicates the types of data, information, and documents that are required (or desired) for the support of an FCA:

(1) Contractor CDRL's:

(a) Specifications (system/segment, development, and product).

(b) Interface Control Documents (ICD).

(c) Manuals.

(d) Drawings.

(e) Test Plans/Procedures.

(f) CM plan.

(g) FCA plan, if major acquisition.

(h) Others depending on contract CDRL list.

(2) Procurement Package/Specifications IRD's.

(3) Relevant QRO audit reports.

(4) List of contract changes and disposition thereof.

(5) Test data and test reports.

(6) Schedules of all test activities for all CI's, including integration and acceptance test schedules.

(7) Any IV&V reports or SOW's concerning IV&V activities.

(8) Minutes of any prior technical review; e.g., SDR, PDR, CDR.

(9) Program CCD log relative to the subsystem from project inception.

(10) Records of all updates to CDRL documentation.

(11) Complete list of successfully accomplished functional test categorized according to the availability of recorded test data (by CI).

(12) Complete list of functional tests yet to be conducted (by CI).

(13) Preproduction and production test results (hardware CI's).

(14) For Government-furnished software/hardware, list of relevant PTR's and HDR's.

(15) Analysis/simulation results of performance parameters that cannot be tested realistically.

(16) List of NCP's, if any.

(17) Configuration status accounting data and reports.

c. FCA Checklist. MIL-STD-1521 provides several checklists to be tailored to each particular subsystem's audit.

d. FCA Findings. If FCA findings identify significant deficiencies, the subsystems functional configuration integrity is in question and the project managers must rectify them through the contractor. If, however, no deficiencies of consequence are identified, the subsystems functional configuration is adequate for baselining purposes.

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6. PHYSICAL CONFIGURATION AUDIT. A PCA requires access to the "as-built" hardware and software. PCA assessments should establish that the "as-built" CI's are accurately and completely defined by their documentation, and that the C-level specification documentation conforms to the "as-built" CI's. The significance of this specification-to-CI comparison is to establish that the C-level specifications (if available) are sufficiently detailed so as to be useful and representative of that which has been built. A PCA conducted on software CI's normally will be of greater complexity and difficulty than for hardware CI's because the "as-built" software has various representations. A PCA of software CI's must assess the conformance of all the representations of each CSCI i.e., the specification, list, source code, and possibly others such as object code. Additionally, a PCA conducted on CSCI's should also examine the media carrying the actual CSCI's to ensure identification and traceability from release-to-release and from version-to-version through appropriate marking/labeling. The PCA should ensure that all of the subsystems' CI's are identified consistently within a hierarchical framework. Moreover, there should be a configuration index of all CI's that can be verified against the physical items. For software, this verification should include ensuring that the source code representation of each CSCI carries the identification contained in the index and that the index is complete and accurate.

a. Scheduling. A PCA should be scheduled near the acceptance of the first article, and concurrent with or after the FCA. The availability of, and access to, each CI (hardware or software) is necessary for a PCA.

b. Required Material. All of the material noted in paragraph 5b is required for the PCA as well as the FCA. Also, the "as-built" CI's are required to be available for examination. In the case of software CI's this will include the source code, object code, and the media carrying the code. Software media identification and correlation with the source and object code are important considerations during a PCA of a software CI.

c. PCA Checklist. MIL-STD-1521 provides several checklists to be tailored to each particular subsystem's audit.

d. PCA Findings. See FCA findings in paragraph 5d.

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7. EVALUATING CONFIGURATION AUDIT FINDINGS. The findings from conducting an FCA and PCA will provide the basis for assessment of the integrity of the NAS subsystem's CI's. An audit should establish whether or not the subsystem has configuration deficiencies that require attention. It is through the rectification of any identified deficiencies that the audit serves to be an effective management tool.

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8. NOTIFICATION OF AUDIT FINDINGS. The FAA provides formal acknowledgment to the contractor of the accomplishment of each audit after receipt of audit minutes. The FAA establishes the adequacy of the contractor's review performance by notification of:

a. Approval to indicate that the review was satisfactorily completed.

b. Contingent approval to indicate that the review is not considered accomplished until the satisfactory completion of resultant action items.

c. Disapproval to indicate that the review was seriously inadequate.