

## **NAS CONFIGURATION MANAGEMENT DOCUMENT MANAGEMENT STRATEGY**

### **STATEMENT OF THE ISSUE**

Today's FAA configuration management (CM) processes focus on supporting NAS Systems Engineering/NAS Modernization efforts. This focus results in the management of NAS baseline documents associated to the NAS and its supporting systems. CM stakeholders need ready access to current documentation to execute change management, status accounting and other CM activities that directly support National Airspace System (NAS) planning and operational decision making. However, the state of FAA's current NAS baselined documents is less than ideal:

- Accessing documentation from some information sources is cumbersome, time consuming and costly.
- Documents are stored and maintained in many "islands" across the agency, including the Document Control Center (DCC), other libraries, and various source provider locations.
- Most documentation remains paper-based. This complicates the agency's ability to successfully implement a National Automated NAS Change Proposal (NCP) processing capability.
- Acceptance, delivery, conversion, and presentation of documentation in electronic format are done inconsistently due to a lack of corporate guidelines and standards.
- Current CM guidance is insufficient to ensure consistent document management practices and interoperability among automated document management tools and repositories.
- Expanding document access through electronic means present new information security challenges that have not yet been addressed in the agency.

Recent public law and federal regulations in the area of paperwork management emphasize the need to reduce the cost of collecting and managing information while improving the integrity and efficiency of government operations. United States Code 44, Chapter 35 "Coordination of Federal Information Policy" requires that federal agencies "*establish goals for improving information resources management's contribution to program productivity, efficiency, and effectiveness, methods for measuring progress towards those goals, and clear roles and responsibilities for achieving those goals.*" The Paperwork Reduction Act of 1995 requires that each agency "*increase program efficiency and effectiveness, and improve the integrity, quality and utility of information to all users within and outside the agency.*"

Electronic documents will be critical to the automation of the National Automated NCP Processing capability now being developed as well as to address other CM stakeholder needs. Moreover, the FAA needs a corporate strategy to establish a new and more responsive document management environment that enhances CM activities, supports FAA operations, and facilitates decision making. This document attempts to address this need.

### **IMPACT ON FAA OPERATIONS**

Current paper-based CM processes are costly, time consuming and not responsive to CM stakeholder needs. Some NCPs have taken months, sometimes years, to complete. Volumes of paper documents are reproduced to support CCB meetings - the cost of paper alone is staggering.

NAS program and operational management demands timely, accurate and reliable information. The management of baselined documentation has a direct impact on NAS program schedules, cost, and service delivery.

Having the right document at the right time can be vital. Just ask Aspen Airport officials, where air traffic controllers did not have an important warning against nighttime bad-weather landings. Although not an issue directly related to the NAS configuration, this somber example demonstrates how important the right document version can be to FAA's business. We must do a better job managing our documentation. As the FAA CM information management vision clearly states, we need *"An FAA CM information environment that provides CM Stakeholders timely access to accurate, reliable, and cost effective CM information needed to support operations and decision making."*

## **TARGET DOCUMENT MANAGEMENT ENVIRONMENT**

### ***Information Management Perspective***

CM stakeholders need an environment where NAS baselined documents are:

- Accessible to those CM stakeholders who need them,
- Indexed to facilitate simple and efficient retrieval,
- Traceable to related documents, to ensure that the impacts of proposed changes are well understood,
- Traceable to related CI types which they describe and represent,
- Stored securely to ensure information integrity; prevent unauthorized access, modification or distribution; and promote management accountability,
- Available in standardized electronic format to facilitate automated NCP processing, traceable document redlining, content analysis, and other CM stakeholder requirements,
- Soundly managed according to CM and document management principles, and
- Acquired and accepted in standard digital data formats to facilitate life-cycle document management.

### ***Technology Perspective***

The target document management environment will be distributed in nature. This will include a network of Program Support Libraries (PSLs); each managed by one or more solution providers. This will promote OPI accountability for assigned documents while allowing the broadest possible access to legitimate stakeholders. Each system node will utilize document management software to facilitate the creation, modification, version control, and other life-cycle maintenance of their documents. The design will provide secured access to only those with "need to know" using a "vault" capability. Each solution provider/OPI shall maintain a combination of automated and paper versions of NAS baselined documents under their primary cognizance to satisfy internal and external stakeholder needs.

### ***Initial Priorities***

Since ACM-1 has directed that the agency implement a national automated NCP processing capability, the first priority should be an initial design solution that facilitates access to NCP reference documentation.

## **PROPOSED DESIGN AND IMPLEMENTATION STRATEGIES**

The following strategies are proposed to make this vision a reality.

- Create the blueprint for a national automated document repository system for NAS baselined documentation.
- Establish a methodology to index, name and structure document libraries.
- Define and communicate PSL design and operational guidelines.
- Migrate from paper to paper/electronic media and ultimately to full electronic media.
- Transform the DCC into a corporate “CM information broker.”
- Address Information Security Concerns.
- Ensure compliance with existing FAA and other federal paperwork management law and regulations;

The following paragraphs provide further amplification on these strategies.

### ***Create the blueprint for a national automated document repository system for NAS baselined documentation.***

A distributed document management architecture will be designed. It will leverage existing automated agency resources to be successful (e.g. AOS and AML), providing the framework within which solution providers can establish and connect their piece of the system to the agency’s corporate system. Integrating such activities into an agency-wide document management system will require some assessment of existing automated tools, libraries, and lessons learned.

This effort will require an assessment of the existing document universe and document ownership (OPI assignment) to estimate processing and storage requirements. Once approved, this design will provide the blueprint for solution providers to establish their electronic PSL(s). It will also provide the foundation for PSL operational guidelines.

The initial design will include a centralized repository to address the FAA’s first priority - to establish a corporate repository of NAS support and reference documentation necessary to support anticipated NCP processing requirements during the next 12-18 months. A migration plan will then be proposed that will provide the necessary steps to incrementally build the corporate distributed PSL repository system.

### ***Define and communicate PSL design and operational guidelines.***

Although FAA 1800.66 provides guidance for PSLs, greater specificity is needed to ensure consistency and interoperability. PSLs will be orchestrated through a common technology interface, providing users a similar look and feel that facilitates timely document location and retrieval. The guidelines will focus on the management of CM baselined documentation, leveraging the best practices now employed by agency service providers. These guidelines would include, but not be limited to:

- the minimum set of documentation to be maintained (both in paper and electronic format);
- a corporate methodology to index, name and number documents and structure libraries to facilitate document retrieval and library interoperability;
- assignment of responsibility for the physical management of document master copies and as well as overall accountability for managing changes to such documentation. This will include an evaluation/validation of current assignments now captured in DOCCON;
- library maintenance;

- electronic formats to facilitate NCP processing and agency-wide access to documentation; and
- CM document management principles and best practices.

***Develop a plan to migrate from paper to paper/electronic media and ultimately to full electronic media.***

Electronic versions of documentation will be essential to support automated NCP processing and other CM-related CM activities. However, this strategy does not preclude the maintenance of paper in the short and intermediate-term as many field organizations still require paper. It is proposed that the FAA:

- Draft electronic media guidelines and/or standards for baselined documents created or modified by the agency.
- Promote wider use of electronic document management tools to create, modify, and secure electronic documentation.
- Define how paper will be managed in this environment, including document ordering and distribution.
- Consider CDRL standards and/or guidelines for NAS system documentation.

As we accept product baseline data and documentation from our vendors, should we require one or more required, preferred, or “acceptable” media formats for these deliverables? The costs and benefits must be considered in both the architecture design and the PSL guidelines. In reality, we know that our vendors use information technology to create product baseline and other CM related information. We need to determine the best strategy to leverage this reality.

***Transform the DCC into a corporate “CM information broker” activity.***

The DCC’s role will transition from the “central repository” of all historic hard-copy documents to that of corporate “CM information broker” for CM baselined documentation and related information.

It is envisioned that CM baselined documents shall be maintained at the source – the responsible OPI. This responsibility will include the provision of necessary hardware and software to establish the library and the administrative support to maintain it. PSL responsibility shall also include provision of such documentation, either in paper or electronic form, to those valid stakeholders requiring access. This includes copying, distribution, etc.

In our new distributed information environment, seamless and transparent access to needed documentation will not happen by itself. The DCC will work with PSLs to facilitate access to the CM stakeholder community, providing advice, consultation and policy guidance when needed. The DCC will also serve as the corporate librarian, working with PSLs to make sure the critical links between tools, web pages and other electronic sources are well established and routinely maintained.

### ***Address Information Security Concerns***

Information security has renewed importance and visibility throughout the FAA (and rightly so). As the FAA continues to migrate to a more prominent electronic environment, the agency will enjoy greater efficiencies and economies. However, potential vulnerabilities will increase. The documentation related to one system carries with it a certain level of sensitivity. Some systems (or facility layouts) may carry greater sensitivity than others. The entire set of NAS documentation has an even greater level of sensitivity. Typically, the owner of information products is in the best position to properly categorize these sensitivities. The appropriate level of safeguards (e.g., use of passwords, strong passwords, encryption or other safeguards) will then be considered.

Agency processes for classifying such sensitivities are still evolving. As we design this distributed document management infrastructure, we must address such security issues and augment PSL guidelines to assign responsibility to ensure security vulnerability assessments are conducted, safeguards designed, implemented and maintained. Consistent with the Computer Security Act of 1987 (40 U.S.C. 759), we must afford security protections commensurate with the risk and magnitude of the harm resulting from the loss, misuse, or unauthorized access to or modification of information collected or maintained by the agency. Privacy and freedom of information requirements should also be addressed, as applicable.

### ***Ensure compliance with existing FAA and other federal paperwork management law and regulations.***

We must ensure that the paperwork reduction and management goals set forth by public law and government regulation are addressed.

### **ANTICIPATED ROADBLOCKS TO SUCCESS**

ACM is not the OPI for all CM documentation, so it does not have full authority and responsibility for the physical maintenance of CM baselined documents. The value of these initiatives must be clear and compelling to stakeholders to ensure needed resources are invested where needed. Active CMSG support is critical to making this strategy real in the agency because:

- The "corporate good" of these initiatives may increase individual program costs in the short term. The agency must weigh and agree that this "corporate good" outweighs short term program goals.
- It will take time to implement these initiatives to minimize program impact to pursue these "corporate good" initiatives.
- "Bubble" resources will be required to initially design and implement this strategy. Additional information technology investment is also anticipated.

### **NEXT STEPS**

Upon approval of this strategy by ACM-1 and the CMSG, the CM IRMT will develop a detailed plan of action to incrementally establish this PSL infrastructure. Initial emphasis will focus on supporting incremental rollout of the National Automated NCP Processing Capability (eDMS) now under development and implementation.

## APPENDIX A - BACKGROUND

### *Some history on FAA Document Management*

Improving the way we manage documents is not a new concept to the FAA. In 1994, the Systems Engineering Group (ASE-600) sponsored the Automated Documentation development and Maintenance (ADDM) initiative. The initial objective of ADDM was an integrated document management program to replace existing paper-intensive NAS documentation with electronic (on-line) documentation. This included a recommendation to develop guidelines for NAS Documentation Standards. Given the state of information technology at that time, ADDM proved quite costly and did not make it past the drawing board.

The need for NAS electronic documentation remains. Current information technologies provide a host of powerful automated tools that facilitate the creation, maintenance and sharing of documents. The Internet provides a powerful complement to the FAA's existing information infrastructure. Many of our vendors now use these technologies to create the documents we now baseline in the NAS. We need to leverage this work, establish standards where needed, and provide the corporate infrastructure to ensure that such documentation can be easily located, accessed, used, and managed.

### *Document Management - a NAS CM Perspective.*

The CM National Procedures (FAA 1800.66), under the section "National CM Information Management System," highlight the major sources of CM documentation in the agency. This includes the Document Control Center (DCC) and other stakeholder/source provider PSLs. This broad guidance defines the types of documentation that should reside in each PSL as well as other information requirements.

The DCC continues to be *the* central resource for historical NAS technical documentation. The DCC stores and indexes its inventory of NAS-related information, which includes specifications, FAA Standards, and NAS interface documents. Documents are stored in hardcopy format. There are three categories of NAS baselined documentation.

- NAS-level documentation, which includes the DD-1000, SD-1000
- System and sub-system documentation (e.g., specs) under the purview of the IPTs
- Operational documentation (e.g., Technical Instructions and Maintenance Manuals (under the purview of AOS
- Site specific documentation under the purview of the regions. Regional Configuration Control Boards (RCCB) shall be responsible for controlling changes to site-specific regional transition plans and drawings, facility as-built equipment layout drawings, critical power panel designations, and regional unique equipment, as identified in the approved RCCB Charter.

DOCCON has a document ordering capability where CM stakeholders can order copies of documents from the DCC. However, the DCC is only one source of agency documentation.

The most current NAS baselined documentation resides in several physical locations - namely service provider locations. This makes sense. The organizations designated as OPIs for such documentation are in the best position to determine the reliability, availability, maintainability as well as currency, and integrity of the information. ACM has done some preliminary work to develop a web-based document ordering system to replace the DOCCON document ordering subsystem. In addition, the NASI/NASDOCS site on the ASD web page provides access to numerous standards and NAS-level documents.

### ***Program-Level Document Management Activities***

Positive progress has been made by several FAA organizations in the document management arena. The Operational Support Office (AOS) has converted maintenance manuals and technical instructions into electronic format and has posted them on the FAA Intranet. The FAA Logistics Center (AML) has digitized many documents as well. IPTs are using PDF representations of documents to speed NCP processing while the Office of System Architecture and Investment Analysis (ASD) and the Air Traffic System Requirements Service (ARS) are using tools to manage requirements. Although these are all very positive steps, they need to be better orchestrated to satisfy CM stakeholders requirements.

### ***Current Agency CM Policy and Guidance***

According to the current CM policy and procedures, acquisition organizations and IPT's shall provide the NAS Operational Support Organization (AOS) with detailed documentation describing the operational baseline at the time of commissioning. This documentation consists of the contractually agreed to as-built lists, updated to reflect the configuration at the time of commissioning, and the serialization/revision/version status listings of all hardware, software, and firmware. This documentation is in addition to the functional, allocated, and product configuration documentation maintained by the IPT. IPT's and other solution providers must also ensure that sites and field offices receive the contractually provided manuals. Documentation describing the operational baseline must be maintained as long as the system is operational in the NAS. The NAS-MD-001 reports approved baselined documentation, the responsible CCB for such documents and the Office of Primary Interest (OPI).