Federal Aviation Administration

Memorandum

Date: JUL 2 5 2006

To: The FAA Management Team

From: Marion C. Blakey, Administrator *Marion C. Blakey*

Subject: FAA Order 1375.1D Information/Data Management and FAA Data Governance Board

I am pleased to share with you the updated version of the FAA Order 1375.1D Information/Data Management. This order updates our data management strategy by establishing agency-wide policy and governance.

Information is a critical resource and must be managed accordingly. Data are the fundamental components of information and the essence of our information and operational systems. So I am asking each of you to fully implement the policy and programs in FAA Order 1375.1D.

Also, in accordance with this policy's guidance, please appoint a Designated Data Authority (DDA) to serve as a permanent member on the FAA Data Governance Board. I encourage careful selection of board members to ensure that information resources within your organization are effectively represented. Please identify your DDA and notify Dave Bowen, Assistant Administrator for Information Services and Chief Information Officer, within 14 days of this memorandum.

If you have any questions, please contact Dave Bowen (202) 493-4570 or Diana Young (202) 385-8056.

Thank you for your support and cooperation.

Attachment

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

ORDER 1375.1D

Effective Date: 7/25/06

SUBJ: Information/Data Management

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1. Purpose of this order: This order establishes an agency-wide Federal Aviation Administration (FAA) policy on information/data management and establishes the FAA Data Governance Board.

2. Who this order affects: Anyone who develops, manages, or otherwise maintains FAA information and data assets. Managers at all levels must ensure that information systems adhere to the information/data management requirements of this order.

3. Scope: This order applies to all shareable FAA information used to perform our mission. Shareable information is information that is collected, stored, processed, disseminated, or transmitted electronically across key interfaces. For the purposes of this order, the notion of key interface is adopted from the Department of Defense Architecture Framework:

> ... interfaces are defined by functional and physical characteristics that exist at a common boundary with co-functioning items and allow systems, equipment, software, and system data to be compatible. An interface may be designated as key when it spans organizational boundaries; is mission critical; there are capability, interoperability, or efficiency issues at that interface; or the interface is vulnerable or important from a security perspective.[1]

4. Explanation of changes: This revision:

a. Enlarges the scope of the order to include information as well as data. Information is the lifeline of any business decision, operation, function, or system. Data are the fundamental components of information. The quality and reliability of data directly influence the decisions, operations, and functions of the FAA. Due to external influences and internal changes, there is an increased emphasis on information rather than "just" data, and technological advances have increasingly blurred the distinction between data and information.

Note: From this point forward, references to data include both data and information.

b. Prescribes a data standardization process that accommodates both National Airspace System (NAS) operational data and all other FAA data.

c. Establishes an FAA Data Governance Board (Board) to implement the policy described herein. (See Appendix A.).

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[1] Department of Defense, Architecture Framework, Version 1.0, Volume I: Definitions and Guidelines; 9 February 2004

d. Introduces the need for an information stewardship policy to be defined by the Board.

5. Background: The FAA is a data-driven organization that depends on vast amounts of information to safely manage air traffic, regulate the aviation industry, and conduct its administrative processes. The FAA's Data Management Strategy of September 21, 1999, first outlined the agency's approach to efficiently and effectively manage data. FAA Order 1375.1C established the concepts of the 1999 strategy as an ongoing program to manage FAA data. The order also supported the "information goal" of the FAA Information Technology (IT) Strategy of September 22, 1999, which is to make reliable information available quickly. Both of these strategies identified data management as essential to the long-term performance of the FAA's mission and functions and the successful implementation of key initiatives to modernize the NAS and improve safety, security, and administrative and mission support information systems.

The 1999 strategy specified two parallel data standardization processes, one for NAS operational data and one for other types of FAA data. The strategy focused initially on the NAS because of its mature configuration management practices. The NAS Configuration Control Board (NAS CCB) chartered the NAS Information Architecture Committee (NIAC) in 2001. The NIAC was responsible for developing data exchange standards for the NAS. The NIAC implemented a repeatable process and guidelines for registering, approving, and managing standardized descriptions (metadata) of information shared among NAS applications. Candidate and standardized data descriptions are maintained in an International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Standard 11179-based FAA Data Registry tool. Using the individual data standards is prescribed by policy documents, notably FAA-STD-060, Data Standard for the NAS, and FAA-STD-025, Preparation of Interface Documentation. NIAC's work with the NAS operational data showed that FAA could tailor a single data standardization process to accommodate all FAA data.

The importance of FAA data management continues to rise. Recent initiatives that have prompted this revision of Order 1375.1 include:

- Renewed emphasis on NAS modernization and agile responses to requests for information;
- Movement toward net-centricity and Web services technologies;
- Legislative mandates for interagency resource sharing and data quality assurance;
- Homeland Security policy directives on data sensitivity and security; and
- Creation of an FAA Enterprise Architecture and Data Reference Model consistent with the Office of Management and Budget (OMB) requirements.

The revision responds to these initiatives by addressing the kinds of governance necessary to assure the FAA stakeholders that the data and metadata they need will be visible, accessible, understandable, and trusted. It also establishes a governance board that will supplant NIAC and play an agency-wide role.

6. Definitions: Appendix B defines the terms used in this order.

7. Authorities: Appendix C contains public laws, Executive orders, Federal regulations, and orders that are related to management of FAA data.

8. Policy:

a. FAA information is an enterprise resource that must be managed from an enterprise perspective. Put another way, the FAA will treat its data as agency-wide assets and not as items defined by, and embedded in, individual programs. The lines of business/staff offices (LOBs/SOs), as stewards of agency data, are responsible for the timeliness, accuracy, understandability, availability, and security of the data under their stewardship.

b. The FAA will maintain an Enterprise Data Management Program. The program invokes the principles of information stewardship as well as data architecture, data registration, data standardization, data certification, and data life-cycle management.

c. Data management, especially data standardization, enables many information technology cost control activities, such as consolidating applications and servers.

d. The Enterprise Data Management Program and its products will provide a framework to guide, support, and promote integrating data management principles systematically into the FAA's new and evolving information systems and processes.

9. Policy Implementation:

The FAA Data Governance Board (Board): This order establishes the Board as the body responsible for creating and administering the agency-level processes needed to promote and sustain successful data management practices in the FAA's emerging net-centric environment; developing and coordinating data exchange standards; and maintaining the corporate data management tools and services. The Board will:

a. Promote data management practices that comply with legislative mandates and guidelines.

b. Manage standard descriptions of FAA data, except for standard descriptions of NAS operational data that are managed by the NAS CCB. The Board is a mandatory reviewer in the configuration management process to ensure compliance with FAA data management requirements.

c. Define and promote an information stewardship policy that addresses the multiple dimensions of stewardship, including strategic, tactical, operational, and technical components. (See Appendix D, Information Stewardship.)

d. Provide direction and guidance in information quality practices that support the levels of quality assurance needed within the agency.

e. Engage in conflict resolution as needed for issues related to the FAA Data Management Program and FAA data.

f. Control the configuration of corporate data management tools and services, such as the Enterprise Data Architecture, the FAA Data Registry, Web services registration processes and guidelines, data exchange schema registration guidelines, and agency-wide data classification schemes and taxonomies.

g. Act in a manner consistent with the OMB and Department of Transportation (DOT) Enterprise Architecture frameworks and related requirements.

h. Review and analyze all Exhibit 300 Capital Asset Plans[2] for IT investments, specifically Exhibit 300 Part II Section II.A, Enterprise Architecture: Data; and provide the FAA Enterprise Architecture representative to the FAA Joint Resources Council (JRC) with technical analysis and comments as required to enable the JRC to make technically and programmatically sound investment decisions.

10. Program Objectives: Future aviation depends on modernized and highly unified services to maintain safe, secure, and efficient flight in the face of current and future challenges in the global aviation system and the aviation industry. In view of the critical nature of the FAA's mission, the quality and reliability of its information and information systems are of the utmost importance. Data are the fundamental components of information and are considered critical resources. To ensure the quality and reliability of the data resources, data must be understood by all areas requiring the data.

Data must be consistently described or standardized to support uniform identification, definition, classification, management, protection, and interchange of data elements, and other data concepts. Data standardization supports the sharing and exchange of data throughout the agency, as well as with other agencies, the international aviation community, and public citizens. Therefore, data standardization is the cornerstone of the information infrastructure that supports the systems and the overall mission of the FAA.

The objectives of the Enterprise Data Management Program are to:

- Promote FAA data as a sharable corporate resource;
- Improve data quality, reliability, and data sensitivity classification;
- Resolve data inconsistencies and redundancies;
- Reduce translation/transformation requirements; and
- Reduce development and maintenance costs.

11. Responsibilities: Effective data management depends on organizations that acquire, develop, own, operate, or replace the agency's information systems. Each LOB/SO should have a person or persons who understand and manage that organization's data needs and environment. The FAA LOBs/SOs will comply with this order and carry out responsibilities as follows:

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[2] See Office of Management and Budget Circular A-11, Part 7, Section 300

a. Each member of the Administrator's Management Team will:

(1) Implement the FAA Enterprise Data Management Program within his or her respective organization according to the requirements of this order, in a manner consistent with annual appropriations.

(2) Appoint, in writing to the Office of Information Services AIO-1, one or more designated data authorities (DDA) as a permanent member of the Board for his or her LOB/SO. The DDA is responsible for implementing data management within the LOB/SO. The DDA should be a senior manager or executive. Those SOs with few information systems may choose to consolidate this function under one DDA for several SOs. AIO will work with each LOB/SO to determine a mutually agreed upon structure to implement this provision.

b. The Assistant Administrator for Information Services and Chief Information Officer (AIO): AIO is the lead office for creating and maintaining the FAA Enterprise Data Management Program. The program promotes sound data management practices around the maintenance of existing (legacy) data and development of new data. The LOBs/SOs support the program incrementally, as resources can be planned for in a manner consistent with annual appropriations. AIO-1 will:

(1) Act as a Board co-chair to cooperatively lead the Board in implementing the principles of the Board charter. AIO-1 may appoint a designee.

(2) Provide an Executive Secretary for the Board.

(3) Provide enterprise data management tools required to implement the program.

(4) Appoint the FAA Data Registrar.

(5) Appoint the FAA Enterprise Data Architect.

(6) Direct the implementation within the FAA of the ISO/IEC Standard 11179, Information Technology – Metadata Registries (MDR), and other related standards.

(7) Coordinate for or represent the FAA on all metadata-related matters except those data issues expressly identified by the Administrator.

(8) Sponsor and fund a training program for information stewardship and data management skills.

c. The Associate Administrator for Aviation Safety (AVS-1) or designee will act as a Board co-chair to cooperatively lead the Board in implementing the principles of the Board charter.

d. The Chief Operating Officer (COO ATO) or designee will act as a Board co-chair to cooperatively lead the Board in implementing the principles of the Board charter.

e. Each DDA will:

(1) Serve as the LOB/SO manager for organizational data management.

(2) Serve as a permanent member of the Board and actively participate in the operations of the Board.

(3) Designate information stewards with appropriate authorities and levels of expertise to represent their respective segment of the business. Those SOs with few information systems may choose to consolidate some of the functions with other SOs.

(4) Ensure that resources are available to accomplish all aspects of the FAA Enterprise Data Management Program.

(5) Promulgate and enforce corporate data standards and the FAA Enterprise Data Architecture.

(6) As part of early system planning, use the FAA Enterprise Data Architecture to identify the program's high-level data entities as well as entity relationships and key interfaces.

(7) As part of system requirements and design phase activities, use the FAA Enterprise Data Architecture as a source for describing system data requirements and any logical data modeling conducted for the investment program, system, or major system modification.

(8) As part of deploying, evaluating, or retiring phases of the system development life-cycle, provide feedback to the FAA Enterprise Data Architect on the system's entities and relationships to aid in ensuring completeness in the Enterprise Data Architecture.

f. The FAA Data Registrar is responsible for administering FAA data standards. The registrar has decision authority over draft and final data standards within the FAA Data Registry. The FAA Data Registrar will:

(1) Provide overall technical direction of the data registry operations following ISO/IEC 11179 and the data registry policies and procedures.

(2) Promote reusing and sharing metadata in the data registry within and across functional areas and among external interested parties (for example, International Civil Aviation Organization (ICAO)).

(3) Represent the FAA metadata management interests within international and interagency data standards committees and organizations.

g. The FAA Enterprise Data Architect is responsible for the FAA Enterprise Data Architecture. The FAA Data Architect will:

(1) Lead development and review of the FAA Data Reference Model, including its data architecture, in coordination with OMB Federal Enterprise Architecture requirements and related guidance from the DOT Enterprise Architecture. The FAA Enterprise Data Architect will work directly with the FAA Enterprise Architect.

(2) Coordinate with and support LOB/SO activities relating to further development and use of the FAA Data Reference Model.

(3) Coordinate mapping of Data Reference Model logical entities (or other artifacts) with the FAA Enterprise Architecture artifacts, including their enumerated processes and systems (or applications).

12. Key Infrastructure: The following are some of the enabling mechanisms that will be used to implement the key components of the Enterprise Data Management Program, which include data registration, data standardization, and data certification.

a. The FAA Enterprise Architecture. The FAA Enterprise Architecture is a set of models, principles, and strategic objectives used for IT planning and portfolio management and supports impact assessment, tradeoff analysis, and tactical reaction. The FAA's Enterprise Architecture is developed in accordance with the OMB Federal Enterprise Architecture and the DOT Enterprise Architecture Framework.

b. The FAA Enterprise Data Architecture. The FAA Enterprise Data Architecture is part of the FAA Enterprise Architecture and provides the blueprint of the information requirements of the agency. It is a model representing data objects that are important to an enterprise. It further articulates the relationships between data objects and the principles and guidelines governing their design and evolution over time. It is also a key component of the FAA's compliance with the OMB Federal Enterprise Architecture Data Reference Model.

c. The FAA Data Registry. The FAA Data Registry is the official source of the FAA data standards. The data registry is the enabling mechanism for data element standardization and registration. Core data elements are standardized through an FAA data standards initiative. They are those data elements that are shared across organizational lines, support mission-critical functions, or represent the greatest data needs of the agency and its customers. The data registry adheres to industry and international standards and will interface with the FAA Enterprise Data Architecture and the FAA Enterprise Architecture.

Marion C. Blakey

Marion C. Blakey
Administrator

APPENDIX A. Charter for the FAA Data Governance Board

1.0 Introduction

1.1 Purpose: This charter establishes the FAA Data Governance Board (Board) as the body responsible for creating and administering the processes needed to promote and sustain successful data management practices in the FAA's emerging net-centric environment, developing and coordinating data exchange standards, and maintaining the FAA Enterprise Data Architecture.

1.2 Background: The NAS Configuration Control Board (NAS CCB) chartered the National Airspace System (NAS) Information Architecture Committee (NIAC) in 2001 as the FAA's committee responsible for developing data exchange standards for NAS information. In the ensuing years, NIAC implemented and maintained FAA-STD-060 Data Standard for the NAS, an automated repository called the FAA Data Registry, a set of documented procedures, and over a hundred individual approved data exchange standards for use by software developers. Several recent initiatives, notably a renewed focus on NAS modernization; the creation of an FAA Enterprise Architecture Program, including an Enterprise Data Architecture; and the FAA's movement toward a net-centric information environment that will require FAA-wide data management, prompted the need to establish a governance board to supplant the NIAC and play an agency-wide role. The Board is part of the implementation of FAA Information/Data Management Order 1375.1, as revised.

1.3 Scope: The FAA can be viewed as having three communities of interest:

- NAS Operations: time-sensitive, safety critical information used to provide separation of aircraft (e.g., the position of aircraft in the sky and communications between pilots and controllers).
- Mission Support: relatively static information used to support NAS operations or provide other FAA unique services (e.g., the condition and position of navigational aides and copies of aircraft inspection reports).
- Administrative: all information used to perform the general business functions of the FAA (e.g., payroll, human resources, and accounting).

Information in the first community, and to a lesser extent in the second community, is specified in the NAS interface requirements documents that are configuration managed by the NAS CCB. The Board's charter includes management of shareable data in all three information communities, with particular emphasis on data to be exchanged by future FAA applications. For a complete list of items for which the Board is responsible, see section 5.0 of this charter.

Data standards address information components (e.g., data elements and objects, data models and eXtensible Markup Language (XML) schemas, and data standards registries) for information shared among FAA organizations and with FAA stakeholders. For components under the purview of the NAS CCB, the Board will provide recommendations for the disposition of proposed data standards and will direct its recommendations to the NAS CCB; otherwise the Board will act as approval authority of the proposed standards.

The focus of the FAA's Enterprise Data Management Program and data standardization is **not** to impose restrictions on how systems and applications are developed or how they must use business data. Nor is it the intent of the program to require system owners to retrofit data standards in existing applications. The objective of data management is to build the essential framework necessary to effectively share FAA data resources and ensure the quality and security of the agency's data – it is not to control the data resources themselves. The framework is built upon clear definition of data using standard metadata and metadata management principles. Developing standard metadata is, in essence, detailing information specifications that, once reviewed and accepted, become the data standards.

Data standards assign clear, unambiguous meaning and representation to each information / data artifact. The metadata is captured in a structured, consistent manner based on an internationally accepted standard, International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Standard 11179 – Information Technology - Metadata Registries. The metadata is centrally stored in a data registry. The data standards are then available for use in interface requirements documents, interface control documents, and other requirements. The key is to describe once and then reuse the approved description to effect consistent, reliable data requirements, application development, data production, and data exchange that meet the FAA's business needs.

The Board will provide the governance needed to manage enterprise net-centric data sharing, including standards and mechanisms for registering and accrediting web services and web service registry taxonomies. It will monitor and review FAA activities in national and international data harmonization initiatives such as the National Spatial Data Infrastructure (Executive Order 12906), the Aeronautical Information Conceptual/Exchange Model (AICM/AIXM), and the Commercial Aviation Safety Team/International Civil Aviation Organization (ICAO) Common Taxonomy Team (CICTT). The Board will also be responsible for configuration management of the FAA Enterprise Data Architecture and will operate as a forum for addressing issues relating to data standards and information engineering.

1.4 Authority: The FAA Administrator, in accordance with FAA Order 1375.1 Information/Data Management, authorizes the Board. The Board will act as a pre-screening organization for proposed new data standards and proposed changes to existing data standards that come before the NAS CCB. The Board will act as approval authority for proposed new data standards and proposed changes to existing data standards not managed by the NAS CCB. The Board will review its activities periodically and revise the charter accordingly.

2.0 FAA Data Governance Board Responsibilities: The Board will have the following responsibilities:

2.1 Approve and implement Board operating procedures and any changes to the procedures;

2.2 Review and analyze all NAS change proposals (NCPs) relating to NAS data standards and provide the NAS CCB with technical analysis and pre-screening reviews, as required, to enable

the NAS CCB to make a technically/programmatically sound decision on the NCP;

2.3 Review and analyze all change proposals relating to data standards for which the NAS CCB is not responsible and approve or disapprove the proposals;

2.4 Develop processes for collaboratively defining and validating common data specifications and for registration and management of these specifications. Specifically, address the organization, collection, quality assessment, standards, stewardship or ownership, and disposition of metadata. Metadata is defined as the descriptive information contained in an individual data standard, namely the data's definition, structure, content, unit of measure, format, usage context or namespace, etc. (Note: Metadata is data *about* data.);

2.5 Recommend government, commercial, and international data standards for use in the FAA;

2.6 Baseline, and manage changes to those baselines, items and products for which the Board is responsible, including the FAA Enterprise Data Architecture, the FAA Data Registry and associated processes, web services registration conventions, etc. (see section 5.0);

2.7 Review and analyze all Exhibit 300 Capital Asset Plans[3] for information technology (IT) investments, specifically Exhibit 300 Part II Section II.A, Enterprise Architecture: Data, and provide the FAA Enterprise Architecture representative to the FAA Joint Resources Council (JRC) with technical analysis and comments as required to enable the JRC to make technically and programmatically sound investment decision;

2.8 Establish, as needed, working groups to address specific information engineering issues, such as web services and namespace management, to develop and maintain other associated products as outlined in this charter, and to develop change proposals to support the creation or modification of data standards. Working groups will be individually chartered through a "Terms of Reference (ToR)" process in which a draft ToR is created and submitted to the Board for approval;

2.9 Facilitate the exchange of information engineering theory and practice through conferences and workshops that bring together information engineering practitioners and others to share technical expertise and experience;

2.10 Communicate the activities, standards, and status of FAA information management to FAA organizations, other government agencies, and appropriate national and international aviation bodies such as the ICAO, EUROCONTROL, and the RTCA, Inc.[4]; and

2.11 Facilitate the uniform implementation of Presidential and legislative mandates relating to information management.

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[3] See Office of Management and Budget Circular A-11, Part 7, Section 300

[4] RTCA, Inc was founded in 1935 as Radio Technical Commission for Aeronautics. It has since officially adopted the business name of RTCA, Inc.

3.0 FAA Data Governance Board Participants: The participants of the Board will be as follows:

3.1 Co-chairpersons: FAA Order 1375.1, Information/Data Management, as revised, assigns co-chairperson authority to the following:

- Associate Administrator for Aviation Safety or designee
- FAA Chief Operating Officer, Air Traffic Organization or designee
- Assistant Administrator for Information Services and Chief Information Officer or designee

The co-chairpersons will share equal responsibility for managing the Board.

3.2 Permanent Members: Permanent members represent various FAA organizations and are empowered to speak and act for those organizations in matters relating to FAA data standards.

Permanent members will be, at a minimum, all DDAs or designees and will ensure the interests of the following organizations are covered:

- Aviation Policy, Planning and Environment
- Office of Civil Rights
- Office of Communications
- Financial Services and Chief Financial Officer
- Office of Government and Industry Affairs
- Office of Human Resource Management
- Information Services and Chief Information Officer
- International Aviation
- Regions and Center Operations
- Security and Hazardous Materials
- Airports
- Aviation Safety
- Commercial Space Transportation
- Air Traffic Organization Business Units as designated by the Chief Operating Officer
- Air Traffic Technical Operations Services
- Office of Chief Counsel

3.3 Executive Secretary: The Office of Information Services, Information Management Division, will provide the executive secretary and will oversee the coordination of Board activities.

4.0 FAA Data Governance Board Administration: The executive secretary will be responsible for scheduling and conducting Board meetings as approved by the co-chairpersons and for coordinating the administrative tasks of the Board in accordance with the operating procedures.

5.0 FAA Data Governance Board Recommendations and Decisions: The co-chairpersons will make final decisions based on permanent members' recommendations. Decisions may be preceded by a period of collaborative discussion.

5.1 Data Exchange Standards

5.1.1 The Board is authorized, in accordance with section 1.4 of this charter, to pre-screen case files written to establish or modify NAS data standards that are to be submitted to the NAS CCB for consideration as NCPs. The co-chairpersons may render a decision on a developed case file in one of the following ways:

- Approve the pre-screen review as written and forward the developed case file for processing.
- Recommend disapproval of the case file with reasons clearly stated and justified in the case file form and forward the case file for processing.
- Defer action on the pre-screen review pending the availability of additional information, returning the case file package to the responsible working group or originator, and describing the need for further information to complete the action by a specific due date.

5.1.2 The co-chairpersons will approve, disapprove, or defer action on proposals to add, change, or modify standards for data not covered by section 5.1.1 of this charter.

5.2 The FAA Data Management Infrastructure and Services: The co-chairpersons will approve, disapprove, or defer action on proposals to add, change or modify the following items:

5.2.1 The FAA Enterprise Data Architecture: Architecture is defined as "the structure of the components, their relationships, and the principles and guidelines governing their design and evolution over time."[5] The Enterprise Data Architecture provides a common context for FAA data to be understood and gradually integrated. It is subject-oriented, meaning that each subject area represents business objects and events that are important to FAA functions. The Enterprise Data Architecture provides structure and guidelines for data that enable key FAA business objectives. It further encompasses the activities of defining, structuring, and documenting the data resource, as well as maintaining its quality.

The Enterprise Data Architecture is one of the key components enabling the FAA to manage its data more effectively. It contributes to practicing sound data management for the FAA and meeting the data-oriented requirements of the agency's mission and functions. It is being used as a tool in the FAA Information/Data Management Program, supporting data standardization, data requirements analysis and design in FAA programs and projects, metadata management, and life-cycle management of data as an asset. It also has a role in data quality initiatives.

[5] Institute of Electrical and Electronics Engineers, IEEE 610.2

The Board will baseline and subsequently manage the configuration of the EDA, including subject areas, objects, definitions, names, and entity-relationship diagrams.

5.2.2 The FAA Data Registry: The FAA, like many other Federal agencies, has adopted the international standard ISO/IEC Information Technology – Metadata Registries – 11179 parts 1 through 6 as the foundation of its data standardization efforts. The purpose of the ISO/IEC 11179 standard is to support the identification, definition, registration, classification, management, standardization, and interchange of data elements and to promote the sharing and exchange of data throughout the international community.

"An ISO/IEC 11179 metadata registry is a tool for the management of shareable data; a comprehensive, authoritative source of reference information about data. It supports the standardization and harmonization processes by recording and disseminating descriptions of data, which facilitates data sharing among organizations and users. It provides links to documents that refer to specific data elements, value domains, and classification schemes and to information systems where those objects are used. When used in conjunction with a database, the registry enables users to better understand any information obtained from the database.

A registry does not contain data itself. It contains the metadata that is necessary to clearly describe, inventory, analyze, and classify data. It provides an understanding of the meaning, representation, and identification of units of data. This international standard identifies the information elements that need to be available for determining the meaning of data to be shared between systems."[6] The FAA Data Registry is ISO/IEC 11179 compliant and is the authoritative source for FAA data standards.

The Board will manage the configuration of the FAA Data Registry, including content, user interface and portal, documentation, hardware, and software.

5.2.3 Data Standardization Process Documents: The existing NAS Data Standardization Procedures document contains the procedures and conventions for initiating, developing, approving, registering, and maintaining NAS data standards in the FAA Data Registry as items under NAS configuration control. The procedures support FAA data standardization as established by FAA Order 1375.1, Information/Data Management Policy as revised. Use of these procedures will improve the consistent and uniform identification and standardization of data. The Board will revise this document to include procedures for processing data standards not covered by the NAS CCB and subsequently maintained.

The Board will be responsible for managing these documents.

5.2.4 The FAA Data Classification Schemes and Taxonomies: Data classification schemes are arrangements or divisions of data objects into groups based on characteristics that the objects have in common, e.g., origin, composition, structure, application, and function. The Enterprise Data Architecture is the official classification scheme that outlines and organizes the agency's

[6] ISO/IEC Technical Reference 20943-3 Information Technology — Procedures for achieving metadata registry content consistency

data based on subject areas, subdivisions of the subject areas (entities), and relationships. The Enterprise Data Architecture is translated into the FAA Data Registry as a hierarchical template that provides for common identification of data and is used as a basis for naming data artifacts in the FAA Data Registry.

Taxonomies are ordered, hierarchical classification systems where the information is grouped according to presumed natural relationships, with the resulting catalogs used to provide conceptual frameworks for discussion, analysis, or information retrieval. They essentially establish a common language for communities of interest. For example, the international aviation safety community has been working on taxonomies to support sharing and analysis of aviation safety data, including phases of flight, occurrence categories (accidents and incidents), aircraft identification groupings, and air carrier identification.

The Board will manage the processes by which classification schemes and taxonomies are registered and maintained in the FAA Data Registry.

5.2.5 The FAA Lexicon: The lexicon is a collection of FAA-approved vocabulary terms and definitions maintained in an Internet-accessible database that can be browsed by anyone and updated by authorized users. The lexicon allows users to propose new terms and definitions (or revisions to existing definitions) and submit them to the Board for review and approval, and it maintains information about the status of those terms as they advance through the review and approval process. It also accommodates duplicate terms with different definitions as used within different contexts, although the practice will be to harmonize such terms wherever possible. A lexicon is essential to (1) preventing misinterpretation, (2) describing requirements consistently, and (3) creating meaningful names for metadata. The lexicon improves the ability of users to search the Enterprise Architecture, requirements databases, and the FAA Data Registry for information.

The Board will promote the establishment of an FAA lexicon and will manage the configuration of the lexicon's content, including terms, definitions, context, version, and conventions for usage.

5.2.6 Web Services Registration Guidelines: The new model for distributed computing is XML web services. Web services perform well-defined tasks that are independently managed (self-contained) and are designed to interact with other software. Unlike a web site or a desktop application, a web service provides no direct user interface. Using the most common technologies, such as XML, HyperText Transfer Protocol (HTTP), Web Service Description Language (WSDL), and Simple Object Access Protocol (SOAP), organizations are able to provide a high level of interoperability and application integration.

Web services must be capable of providing versioning, security, reliability, and availability. Web services registration conventions will provide the necessary guidance to establish a web service.

The Board will develop and manage web services registration processes and guidelines.

5.2.7 XML Schema Registration Guidelines: The World Wide Web Consortium (W3C) XML Schema Definition Language is an XML language for describing and constraining the content of XML documents. The schema can provide a standard definition and validation method for exchanging data. It allows a useful level of constraint checking to be described and implemented for a wide spectrum of XML applications.

The FAA is participating on a committee to formalize an international data exchange model using XML schemas for aeronautical data. Other models are in progress to develop standard XML structures for all FAA data.

Registration of all XML schemas used for exchanging data is an important activity to support interoperability in a net-centric environment.

The Board will develop and manage XML schema registration processes and guidelines.

5.2.8 Information Stewardship: Peter Block[7] explains: "Stewardship is the willingness to be accountable for the well-being of the larger organization by operating in service…." In other words, stewardship denotes a culture where all internal divisions of the enterprise exist to perform specific tasks and functions as contributors to ensure the future of the total organization. Information stewardship is "the willingness to be accountable for a set of business information for the well being of the larger organization by operating in service, rather than control of those around us".[8] There are multiple dimensions to stewardship: (1) strategic – accountable for information policy and planning, (2) tactical – accountable for the definition of business data, (3) operational – accountable for the content of business data, and (4) technical – accountable for the technical infrastructure supporting the processing of information requirements.

The FAA is a very large and complex business and requires a careful implementation of all aspects of stewardship to ensure successful data management throughout the agency. Further, this requires a full partnership with business and operational and technical organizations in the agency. FAA information stewardship will require assignment of appropriate stewards, at all levels, and assembly of an active stewardship council, which will be a working group under the Board.

The Board, fulfilling the strategic dimension of stewardship, will develop criteria required for identifying business stewards, operational custodians, and system managers as defined in FAA Order 1375.1, Information/Data Management, as revised. The Board will develop and maintain operating procedures for managing the stewardship program.

6.0 Changes to the Charter: Changes to the Board charter may be caused by Presidential and legislative mandates or government wide initiatives that have a direct impact on the information and data management practices within the FAA. For example, the current Presidential

[7] Stewardship; Peter Block, 1993
[8] Improving Data Warehouse and Business Information Quality, Larry P. English, 1999

Management Agenda is very focused on interagency resource sharing, including the sharing of data and metadata.

There are also legislative mandates that impact data management practices, such as Section 515 of the Treasury and General Government Appropriations Act FY2001 (P.L. 106-554), also known as the Information Quality Act. Homeland Security Presidential Directive - 12 has specific data management implications related to the classification of data sensitivity that must also be addressed in FAA data management practices.

The charter will be changed only with the approval of the FAA Administrator, upon recommendation of the Board.

APPENDIX B. DEFINITIONS

Communities of Interest: "Communities of Interest are collaborative groups of user who require a shared vocabulary to exchange information to in pursuit of common goals, interests, and business objectives. With the context on the DRM they may include LOBs within the government and external organizations that are dedicated to the support of business functions." Source the Federal Enterprise Architecture – Data Reference Model (DRM). When viewed in terms of the FAA, NAS Operations, Mission Support and Administration are considered communities of interest.

Core Data Elements: Data elements that are shared across organizational lines, support mission critical functions, or represent the greatest data needs of the agency and its customers.

Data: Data are representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by human or automated means. Data are the fundamental components of information.

Data Element: A basic unit of identifiable and definable information that occupies the space provided by fields in a record or blocks on a form. A data element has an identifying name and value or values for expressing specific facts.

Data Life-Cycle Management: The span of interest and associated processes for data. It encompasses creation through implementation to destruction of the agency's data resource. Thoughtful planning is required for the business use, retention, and expiration of data. The key elements of the life-cycle process are:

(1) Data Definition and Standardization: Implementing a data standardization initiative by identifying critical data for standardization and using established standards for new data development, with formal change control procedures for established standards. Through standardization, the agency is able to establish an enterprise wide understanding of common data.

(2) Data Architecture and Data Flows: Understanding the agency's data and information chains that provide that data. This involves knowing what data the agency controls, where the data come from, how the data are used to support the mission, and who the customers are for the data.

(3) Data Registration and Publication: Data registration is the process by which data standards are managed, from creation through evaluation and acceptance, implementation, and maintenance until retirement. This involves identifying the data produced/used by the agency's information systems, describing and cataloging data elements, assigning an unambiguous identifier to each data element in a way that makes the assignment available to interested users, and administering formal change control procedures for registered data.

The FAA Data Registry (FDR) is the official source of the agency's data standards. The FDR is an International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Standard 11179 compliant, web-enabled system that provides ready access to the agency's standards. The IT project teams are required to check the FDR for existing standards that are applicable to their project. If the data standards exist, the team is to incorporate the standards in their system development work. In the event that relevant standards are not found, the team is to engage in the development of applicable data standards (item # 4 below).

(4) Data Certification: This primarily involves researching and verifying that existing data sources cannot satisfy data needs, and that the data adhere to established standards and architecture. The intent is to reduce redundant data and unnecessary system development.

(5) Data Quality Assurance: For legacy data this involves improving data quality when there is a clear benefit in terms of system efficiency or return on investment. For new data development this involves engineering data quality into the development of new information systems and supporting processes.

(6) Data Retirement: Retiring obsolete and redundant data where economically feasible. By eliminating these data deficiencies, the agency's data quality increases and realizes greater system efficiencies.

Data Management: The function of managing data used in manual or automated information systems. It includes the activities of strategic data planning, data element standardization, information management control, and data synchronization (e.g., arranging data to indicate coincidence or coexistence, data quality assurance, and database development and maintenance).

Data Registry: A tool that supports the registration and standardization of data elements and other administered components by recording and disseminating data standards, which facilitates data sharing among organizations and users. A data registry provides users of shared data a common understanding of a data element's meaning, attributes, and unique identification. Approved data standards in the registry will be used by information systems developers to enable data sharing.

Data Reference Model: The Office of Management and Budget is instituting a Data Reference Model as part of its Federal Enterprise Architecture (FEA) requirements, which will further define data management requirements in the Federal government as they relate to requirements for information sharing, categorization, and search ability of government information, per subsection 207(d) of the E-Government Act of 2002, and the Capital Planning, Investment and Control process.

Data Standardization: Process of requiring application of an approved, uniform definition and representation to a data element or entity.

Designated Data Authority: A senior FAA management official, appointed in writing by a Management Team member, who is responsible for the Data Management Program within their organization.

Developer or Developing Organization: An organization with primary responsibility for developing or acquiring an information system. If a contractor develops a system, the FAA organization responsible for that contract is the developing organization.

Enterprise Architecture: The FAA Enterprise Architecture provides an explicit description of the current and desired relationships among business and management processes and information technologies within the FAA. The Enterprise Architecture consists of business process models, technical reference models, and systems models and is directly supported by the FAA Enterprise Data Architecture.

By aligning Enterprise Data Architecture subject areas with the business and management processes of the Enterprise Architecture, an enterprise perspective of the agency's information/data requirements is established. This provides a better understanding of where the common data requirements are through the agency. From this, the FAA can identify opportunities to eliminate redundant data and systems.

Enterprise Data Architecture: The FAA Enterprise Data Architecture is part of the FAA Enterprise Architecture and provides the blueprint of the information requirements of the agency. It provides a common context for FAA's data resource. The Enterprise Data Architecture consists of agency data models that are subject oriented. This means that each subject area represents business objects and events that are important to FAA functions. Specific data are then articulated for each of the subject areas.

Enterprise Data Management Program: The FAA Enterprise Data Management Program is a comprehensive set of policies, procedures, governance processes, and tools established to manage FAA data resources. It entails a global view of data management beyond organizational boundaries.

Federal Enterprise Architecture: A set of interrelated "reference models" designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps and opportunities for collaboration within and across agencies. Collectively, the reference models comprise a framework for describing important elements of the FEA in a common and consistent way. Through the use of this common framework and vocabulary, IT portfolios can be better managed and leveraged across the federal government. The five FEA reference models are: Performance Reference Model (PRM), Business Reference Model (BRM), Service Component Reference Model (SRM), Technical Reference Model (TRM), and Data Reference Model (DRM).

Information. Any communication or representation of knowledge such as facts, data, or opinions in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual form. Data processed in such a way that it can increase the knowledge of the person who receives it. Information is the output, or finished goods, of information systems.

Information System. A discrete set of information resources, either in stand-alone or networked configurations, that is organized for the collection, processing, maintenance, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual. Information systems are of two types:

a. General Support Systems. Interconnected information resources that are under the same direct management control and share common functionality, e.g., telecommunications and networks.

b. Major Application Systems. Systems that require special management attention because of their importance to the agency's mission; their high-maintenance, development, or operating costs; or their significant role in dealing with the agency's programs, finances, property, or other resources.

Information Stewardship: An organizational approach to establishing accountability for a set of business information for the wellbeing of the larger organization.

Information Stewards: The FAA information stewards are agency individuals with statutory or operational authority for specified information and responsibility for establishing clear definition and standards, including the controls for its generation, collection, processing, dissemination, and disposal. They are responsible for establishing the rules for appropriate use and protection of the information, even when the information is shared with other organizations. There are four FAA groups of stewards:

a. The FAA Data Governance Board is accountable for shaping and implementing information policy and program development to increase the efficiencies and effectiveness of the agency's data.

b. Business Stewards are business process experts who understand the rules, regulations and other requirements associated with specific business processes in the FAA. They are subject matter experts, from the actual business areas, that are responsible for the clear, concise definition and representation of business data sourced and used within their functional area.

c. Operational Custodians are operations experts involved in the daily execution of FAA operations. Operational stewards are frontline supervisors and workers performing specific business functions and include knowledge workers, information producers, and data custodians.

d. System Managers are information technology experts. Technical stewardship involves all technical and mechanical infrastructure needed to support the ongoing business operations. From an information or data standpoint, it includes all direct and indirect information processing facilities, equipment, and personnel. All information systems personnel have stewardship

accountability for providing high quality systems, methodologies, technologies, and data management practices.

Information Systems Security Manager: A full-time Federal employee who is responsible for ensuring the appropriate operational security posture is maintained for an information system or program within a single line of business (LOB) and staff office (SO).

Information Technology: As defined by the Clinger-Cohen Act of 1996, the term information technology, with respect to an executive agency, means any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency.

Legacy Data: This refers to data contained in a legacy information system, which is any system that is operational as opposed to under development.

Life-cycle: There are two categories of life-cycle:

a. Data. The stages through which data evolves characterized by creation or collection, processing, dissemination, use, storage, and disposition.

b. Information System. The phases through which an information system evolves, including initiation, development, operation, termination, and decommissioning.

Management Team: The FAA Management Team consists of the FAA executive leadership, chaired by the Administrator. Membership includes the Deputy Administrator, Chief Operating Officer, Assistant and Associate Administrators, Chief Counsel, and other staff members as designated by the Administrator.

Metadata: Metadata includes information that describes the characteristics of data; data or information about data; and descriptive information about an organization's data activities, systems, and holdings.

National Airspace System (NAS) Operational Data: NAS operational data are data shared among NAS applications and specified in interface requirements documents and interface control documents that are managed by the NAS Configuration Control Board.

Shareable Information: Shareable information consists of data that is not only capable of being shared but also eligible for sharing. Any data can be transmitted across interfaces but it is not always appropriate to do so due to privacy or security considerations. Therefore, shareable information must also be appropriate or eligible based on business qualification of the sensitivity data.

Standard Data Element: A data element that has been formally approved in accordance with the standardization procedures. Alternatively, standard data elements are data that have been coordinated through the standardization process and approved for use in information systems.

System Manager: The manager responsible for the organization that sets policy, direction, and manages funds for an information system. Systems under development are owned by the developing organization until accepted and authorized by the operating organization.

Web Services: Self-describing, self-contained, modular units of software application logic that provide defined business functionality. Web services are consumable software services that typically include some combination of business logic and data. Web services can be aggregated to establish a larger workflow or business transaction. Inherently, the architectural components of web services support messaging, service descriptions, registries, and loosely coupled interoperability.

XML Schema: EXtensible Markup Language, a specification of the World Wide Web Consortium (W3C), is a subset of Standard Generalized Markup Language that constitutes a particular text markup language for the interchange of structured data. An XML Schema represents a data structure and related information encoded as XML and used to pass information between systems.

APPENDIX C. AUTHORITIES

The following related publications were used to develop this order. This list is not exhaustive. Other Federal laws, regulations, and guidance not listed here, such as executive orders, may apply.

1. Clinger-Cohen Act (formerly known as Information Technology Management Reform Act, Division E), (P.L. 104-106).

2. Government Performance and Results Act, (P.L. 103-162).

3. Government Paperwork Reduction Act, (P.L. 104-13), as amended, 44 USC Chapter 31.

4. Government Paperwork Elimination Act, Title XVII, (P.L. 105-277).

5. Federal Information Security Management Act of 2002, December 17, 2002 (P. L. 107-347)

6. United States Code of Federal Regulations (CFR), Department of Transportation (DOT), 49 CFR, Part 1520, Protection of Sensitive Security Information.

7. Treasury and General Government Appropriations Act for Fiscal Year 2001, Section 515, (P. L. 106-554).

8. Executive Order 13011, Federal Information Technology.

9. Executive Order 12906, National Spatial Data Infrastructure.

10. OMB Circular A-130, Management of Federal Information Resources, 61 FR 6428.

11. OMB Circular A-16, Coordination of Geographic Information, and Related Spatial Data Activities.

12. OMB Memorandum M097-16, Subject: Information Technology Architectures.

13. FAA Order 1800.66, Configuration Management Policy.

14. FAA Order 1370.82, FAA Information Systems Security Program.

APPENDIX D. INFORMATION STEWARDSHIP

Information Stewardship. The notion of stewardship relates to an environment wherein all internal divisions of the enterprise exist and function as contributors to ensure the future of the total organization. Information stewardship is establishing accountability for a set of business information for the wellbeing of the larger organization. The FAA information stewards are agency individuals with statutory or operational authority over specified information and responsibility for establishing clear definitions and standards, including the controls for its generation, collection, processing, dissemination, and disposal. They are responsible for establishing the rules for appropriate use and protection of the information, even when the information is shared with other organizations. Information stewards work closely with Information System Security Managers (ISSMs) regarding the security requirements and security controls for the information systems where the information resides.

Dimensions of Stewardship. There are four dimensions of information stewardship:

(1) Strategic – accountability for shaping and implementing information policy and program development to increase the efficiencies and effectiveness of the agency's data, and for actively promoting the timely conveyance of data throughout the enterprise.

(2) Tactical - accountability for the definition of business data in coordination with the delivery of business functions.

(3) Operational - accountability for the content of business data in systems that directly support the daily production of FAA products and services.

(4) Technical - accountability for the technical infrastructure supporting the processing of information requirements.

The FAA Information Stewardship Roles. The FAA information stewards are grouped in four areas of expertise to ensure a comprehensive view of the agency's data requirements and resources. The FAA Data Governance Board will define the specific stewardship roles and duties as it develops the information stewardship policies within the agency. The general responsibilities by area are:

a. **<u>The FAA Data Governance Board</u>** is comprised of Designated Data Authorities as defined in section 11e of this order. The Board is responsible for the strategic dimension of stewardship.

b. **<u>Business Stewards</u>** are business process experts that understand the rules, regulations and other requirements associated with specific business processes in the FAA. Business stewards provide a tactical view of the agency. They are subject matter experts from the actual business areas who are responsible for the clear, concise definition and representation of business data produced and used within their functional area. The general responsibilities of business stewards include:

(1) Providing the support necessary to define and maintain the enterprise data architecture.

(2) Ensuring the integrity of processes in their area and the quality of processed and shared information.

(3) Providing complete definitions of FAA business data, including meaning, business rules, and sensitivity classifications.

(4) Enforcing data management policies and standards.

c. **Operational Custodians** are operations experts involved in the daily execution of the FAA operations. Operational custodians are frontline supervisors and workers performing specific business functions, including knowledge workers, information producers, and data custodians. The general responsibilities of operational custodians include:

(1) Be the subject matter expert for the data within the information systems assigned to them.

(2) Use and share data in accordance with all relevant data policies and standards.

(3) Create and deliver data to all customers, ensuring that it is accurate, complete, and timely.

(4) Support all appropriate project initiatives and ongoing stewardship program functions.

d. **System Managers** are information technology experts and provide the technical dimension of stewardship. Technical stewardship involves all technical and mechanical infrastructure needed to support the ongoing business operations. From an information or data standpoint, it includes all direct and indirect information processing facilities, equipment, and personnel. All information systems personnel have stewardship accountability for providing high quality systems, methodologies, technologies, and data management practices. The general responsibilities of system managers are:

(1) Maintain high quality systems, methodologies, technologies, and data management practices.

(2) Establish and maintain reliable processing environments that consistently meet the business information requirements of the agency and its customers.

(3) System managers, together with Information System Security Managers (ISSMs), protect data from unauthorized access and systems from attack.