Maintenance Management

Information Exchange Model (MMIXM)

Primer

MMIXM Development Team

**Version 1.1.1**

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Prepared for:

**Federal Aviation Administration**

**NAS Integration Support Group, Operations Support**

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# Introduction

This document is intended to introduce FAA Maintenance stakeholders to the Maintenance Management Information Exchange Model (MMIXM), including context, scope, and current status of development. The target audiences for the MMIXM Primer are FAA operations and maintenance stakeholders that publish or consume maintenance data or intend to do that in the future.

This document will be updated as MMIXM evolves. The *Maintenance Management Information Exchange Model (MMIXM) Modeling Guidance* document is also included in version 1.1.1.

# Introduction to MMIXM

## What is MMIXM?

MMIXM is an information exchange model intended to capture the current and future data exchange requirements of FAA maintenance systems and stakeholders. MMIXM will be used to exchange information between systems within the FAA Operations & Maintenance (O&M) environment by leveraging concepts similar to those of the System Wide Information Management (SWIM) concept, i.e., harmonized data exchange between numerous disparate systems. An information exchange model is necessary to enable this integration and provide the architecture for data exchange between different systems.

## MMIXM Drivers

The FAA’s Technical Operations Services unit (AJW Tech Ops) is responsible for developing the definition, justification, and implementation of MMIXM as a NAS Maintenance data standard. The FAA is responsible for the maintenance of National Airspace System (NAS) facilities and equipment. This involves field technicians, certifications and training, asset management, resource allocation and planning, schedules, monitoring and logging activities. Numerous standalone systems and databases are used to manage these different facets of the FAA O&M environment. The coordination and data exchange between these systems is still largely a manual process. The development of MMIXM is driven by the desire within the FAA to integrate and streamline the way data is exchanged between these systems, using automation to assist stakeholders with coordination.

# MMIXM v1.1.1 Overview

## MMIXM v1.1.1 Resources

MMIXM v1.1.1 includes User/Schema Documentation, the Logical Model, and the Physical Model. The following summarizes the names and descriptions of the documentation:

* MMIXM User/Schema Documentation
  + Folder name: *Schema Documentation/*
* MMIXM Logical Model
  + Filename: Logical Model/MMIXM\_LogicalModel\_v1.1.1.eap
* MMIXM Physical Model
  + Folder name: *Schemas/*

Current dissemination of MMIXM status updates and deliverables are through email to identified FAA Maintenance System stakeholders. Stakeholders can also receive updates and explore the entire MMIXM model (including user-friendly HTML documentation) via the MMIXM website (<https://www.mmixm.aero/>). To be included in future MMIXM releases and/or outreach efforts, please contact MMIXM support at MMIXM-Support@dot.gov.

## MMIXM v1.1.1 Scope

MMIXM v1.1.1 includes enhanced support for operational status monitoring information. In addition, it continues to focus on a subset of NAS systems and their requirements. These requirements include the following concepts and types of information:

* Asset Information
* Monitoring
* Qualifications (includes specifically Credentials and Certifications)
* Event Logging
* Reference Material

MMIXM v1.1.1 was released in response to stakeholder feedback associated with MMIXM schema compatibility with Java JAXB. The following changes were made to MMIXM v1.1.1 to ensure the MMIXM schemas could be used with JAXB:

* An 'include' for measures.xsd was added to the base.xsd schema.
* The 'import(s)' in all of the xsd files were replaced with an 'import' of either base.xsd or feat.xsd.

Based on this stakeholder feedback, MMIXM added JAXB to the pre-release testing process to ensure future schemas are compatible with this technology.

Future versions of MMIXM will increase in scope and include additional systems/concepts.

## MMIXM v1.1.1 Key Points

MMIXM remains in an early phase of development. During this time stakeholder review and feedback are necessary in order to progress the model and ensure all stakeholder data exchange requirements are addressed in future versions of the model. The following key points highlight the progress of the model and where it would be beneficial for stakeholders to focus their review:

* Asset Information
  + The model accounts for operationally deployed assets, along with inventoried assets, in the Asset package of the model. These include operational assets that are in the Facility, Service and Equipment Profile (FSEP) database, as well as assets managed by the Logistics Center Support System (LCSS) and Life Cycle Asset Tracking System (LCATS). Additional stakeholder engagement is needed to fully understand the data exchange requirements and ensure needs are addressed.
* Monitoring
  + The Monitoring package captures data exchange requirements for Enterprise Service Monitoring (ESM) as well as monitoring requirements for Terminal Flight Data Manager (TFDM). It also incorporated the message structures for status monitoring of various FAA SWIM Services.
* Qualifications
  + The Qualifications package captures the data exchange requirements for the integration of CMRIS-CTS, Air Traffic Safety Oversight Service (AOV), and Remote Monitoring and Logging System (RMLS) information.
* Event Logging
  + The RMLS system contains logging information required for other systems and expected to be exchanged in the future. The EventCoordination package considers the exchange of RMLS logging information. Currently the model only includes base RMLS information; additional understanding of the requirements and what consumers need is required.
* Reference Material
  + The model currently supports the exchange of reference material associated mostly with assets. Information exchanged includes author, date, and electronic location of reference material.

Please refer to Appendix A to understand which MMIXM packages are relevant to the various in-scope FAA maintenance systems.

# Future Versions of MMIXM

The MMIXM Logical Model is being developed iteratively based on the needs of the FAA maintenance community and therefore over time the concepts will evolve and mature throughout the model.

# References

Maintenance Management Information Exchange Model (MMIXM) Data Model Description Document. (v1.0.0) – 1 September 2017

# Appendix A: MMIXM v1.1.1 In-Scope Systems

Table 1-MMIXM v1.1.1 In-Scope Systems

|  |  |
| --- | --- |
| ***Systems to be included in MMIXM v1.1.1 (some systems may be limited in scope)*** | ***Description*** |
| Facility Service Equipment Profile (FSEP) | The inventory of assets that the FAA owns, maintains, certifies, inspects and coordinates. |
| Remote Monitoring and Logging System National Logging Network (RMLS NLN) | Collects, retrieves and reports information pertaining to maintenance related events. |
| Air Traffic Safety Oversight Service (AOV) | Establishes safety standards and provides independent oversight of the Air Traffic Organization, including management of technician credentials. |
| Automated Inventory Tracking System (AITS) | System of record for personal property and project material asset management across the FAA. |
| Comprehensive Management Resource Information System (CMRIS) | Manages the official records for FAA personnel certifications. MMIXM will focus on technician certifications that are provided by the Certification Tracking System (CTS) module. |
| Logistics Center Support System (LCSS) | LCSS is a non-NAS IT procurement to re-engineer and automate the FAA's logistics management processes. |
| Life Cycle Asset Tracking System (LCATS) | Customized bar coding scanning software system which allow vendors and technicians to provide equipment information through a handheld device. |
| Enterprise Service Monitoring (ESM) | Monitoring and control functions for managing failure modes, service degradation, service level agreements, and quality of service. |
| Terminal Flight Data Manager (TFDM) | TFDM is the surface management solution for NextGen. Only the monitoring requirements for TFDM are considered in this version of the schemas. |