Aeronautical Information Services

Update on Aeronautical Information Exchange Model (AIXM)

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Aviation Information World – Forecasting the Future
Content

- AIXM versions in use
- New ICAO SARPS – data sets
- Change Control Board activity
Some dates…

- **October 1997**
  - Aeronautical Information Conceptual Model (AICM) 1.0 as entity-relationship model

- **April 1998**
  - Aeronautical Information Exchange Model (AIXM) 1.1 based on SQL transactions on a reference relational model

- **March 2002**
  - AIXM 3.1 – first XML based version

- **October 2002**
  - AIXM 3.3 – first implementation in the European AIS Database

- **November 2005**
  - AIXM 4.5 – second version for EAD
AIXM 4.5

- Published: 2005
  - Entity/Relationship
  - Custom XML schema
  - Core AIP data
- Usage:
  - European AIS Database (EAD) and European national systems
  - Around 20 other AIS national systems worldwide
First AIXM Conference

• April 2006, FAA HQ
AIXM 5.0

- Published: MAR 2008
- UML Model
- GML Schema
- Full AIP/NOTAM data
  - Including obstacle, airport mapping, etc.
- Metadata
- Extensibility
- Usage:
  - Partially, by FAA and NGA
AIXM 5.1

- Published: FEB 2010
- Update of AIXM 5.0
  - Usage/availability model
  - Notes vs. descriptions
  - Other adjustments to facilitate Digital NOTAM encoding
- Usage
  - see AIXM Wiki (www.aixm.aero/wiki)
    - Data Sources
AIXM 5.1.1 (minor update)

- Published: April 2016
- First version released by the new CCB!
- Minor Update of AIXM 5.1
  - Migration to Sparx EA
  - Alignment with GML 3.2.1
  - Small corrections UML/XSD
- Usage
  - Recommended for new projects only
  - Fully forward/backwards compatible with AIXM 5.1 (mapping scripts provided)
New AIXM web site

- **AIXM versions**
  - 4.5, 5.0, 5.1/5.1.1
- **Usage/Implementation**
  - Coding Guidelines
  - Business Rules
  - Digital NOTAM
- **Support**
  - Wiki
  - Training
  - Open source
  - Commercial products
  - AIXM Viewers
- **Governance (CCB)**
- **Library**
Content

• AIXM versions in use
• New ICAO SARPS – data sets
• Change Control Board activity
New Annex 15 and PANS-AIM

• A real milestone for the global AIS transition from paper to digital data!
  – Data sets (AIP, Terrain, Obstacle, Airport Mapping, Instrument Flight Procedures)
  – Possibility to eliminate AIP pages if the corresponding data set is provided (waypoints, routes, airspace, etc.)

• State Letter in preparation
Use of AIXM

• **AIP Data Set**
  – AIXM 5.1 Coding guidelines in development
  – Including data verification/validation rules
  – Including sample data set(s)

• **Airport Mapping Data Set**
  – ED-99A/DO-272A Mapping Guidelines for AIXM 5.1 available
    (http://www.aixm.aero/sites/aixm.aero/files/imce/library/ed99atoaixm5.1mappingv0.6.doc)

• **Obstacle Data Set**
  – AIXM 5.1 coding guidelines / data verification guidelines to be further developed (see eTOD Manual from EUROCONTROL)

• **Instrument Flight Procedures Data Set**
  – Will probably need AIXM 5.2 for complete coverage
ICAO IMP

• **WG “Services”**
  – Concept for Information Services (Draft)
    • Aeronautical Information Publication (AIP) Service
    • Flight Procedure Information Service
    • Aerodrome Mapping Information Service
    • Obstacle Information Service

• **Matching the ICAO Data Sets**

• **Awaiting the finalization of the IMP work**
  – AIXM 5.x data sets as payload
  – See if any AIXM improvements are necessary in order to fully support the deployment of such services
Content

• AIXM versions in use
• New ICAO SARPS – data sets
• Change Control Board activity
AIXM CCB

- **AIXM Change Control Board**
  - Established based on the ICAO AIS-AIMSG recommendations
  - In close contact with the ICAO IMP
    - CCB process to be aligned with eventual IMP decisions
  - Membership implies acceptance of the Charter
    - [http://www.aixm.aero/page/governance](http://www.aixm.aero/page/governance)
  - Current situation
    - 64 members
      - including FIXM & WXXM observers
    - FAA & Eurocontrol ensuring the secretariat and support

[Chart showing distribution of members]
CCB Mandate

Protect investments

Ensure progress
CCB Process

Problem

ISSUE

Create

Open

In Progress

Closed

CHANGE PROPOSAL

Solution

Create

Draft

Submitted

Approved

Rejected

Resolved

Sub-task

Abandoned
(no solution)
AIXM Release Plan

• Minor Release - AIXM 5.1.1
  – Published April 2016
  – 15 changes, solving 17 issues in full, 1 partially
    • 1 issue closed without change
  – Still to finalize
    • Temporality Concept clarifications (no real changes!)
    • Feature Identification and Reference clarifications (no real changes!)
AIXM Release Plan

• **[2018] Regular Release - AIXM 5.2**
  – 58 issues already open in JIRA (23 still to be confirmed)
    • *more issues expected to be raised in the coming months*
  – expected work areas
    • *PBN procedures and other SID/STAR/IAP issues*
    • *route data*
    • *vertical reference systems*
    • *alignment of definitions*
    • *additional items required by ICAO SARPS changes*
    • *support for latest airport mapping specs*
    • *seaplane landing area*
    • *AIP mapping gaps*
    • *additional data items coming from various regions (US, Europe, etc.), if relevant for international use*
      – Otherwise -> regional extension
    • *support for OCAS (Obstacle Collision Avoidance System)*

• **AIXM CCB Meeting in Brussels, 5-7 Dec 2016**
AIXM interoperability issues

• **Difficulties identified by implementers**
  – Different UUID for same feature in different systems
  – Limited set of TimeSlices in different systems
  – Lat/Long versus Long/Lat
  – Extension schemas not available
  – Etc.

• **Dedicated AIXM CCB telcons**
AIXM interoperability issues

- **Way forward**
  - Define minimal interoperability rules for specific scenarios
    - AIS publishing data under ICAO SARPS (including provision of data to DAT providers or to another ANSP)
    - Hub scenario (EAD, other regional implementations)
    - Data originator(s) to/from ANSP (particular case – procedure designer, airport data originator)
    - AIS to ATC (adaptation data, including cross-border data), flight simulator

- Issues which might concern other XMs (such as unique identification) will be also raised in the IMP
Conclusions

• 3 versions in use (4.5, 5.0, 5.1)
• AIXM 5.1.1 available – minor release
  – Suggested for new projects and maintenance of extensions
  – Fully backwards / forward mapping with AIXM 5.1 supported with scripts
• AIXM 5.2 – regular release (2018)
• Focus on the development of coding guidelines, interoperability scenarios and data verification rules/services