Digital Data Sets

UAE Regulatory Approach
&
Implementation Assessment

Workshop on the Implementation of Annex 15, 16th Edition & PANS AIM

Cairo, Egypt, 22 January 2019

Amendment 40 to ICAO SARPS AIS: A conceptual groundwork for AIM

The amendment presents a major restructuring of Annex 15 and related documents in order to support the incorporation of new technical requirements and how to manage Aeronautical Information (AI).

The technical component of the amendment includes as follows:

➤ The scope, role and functions of AIM;

➤ The products and services (revised terminology) within an AIM environment and the associated update mechanism;

➤ The split of data collection vs. provision (end-products);

➤ Focus on Quality:

    (1) DQR are expanded i.e. adding four (4) to the existing three (3) parameters & consolidated from other Annexes in "one stop shop" (PANS-AIM),
    (2) New "tools" to strengthen quality at origination/collection i.e. Aeronautical Data Catalogue,
    (3) Better identification of roles and AI provision responsibilities in the context of transition AIS2AIM.

➤ Promotes Digital Data sets: A interim step from eAIP (self-contained) to digital (d)AIP (sets of data).

➤ Publication of Differences: Although PANS do not carry the status afforded to SARPS, States are expected to publish in their AIPs an up-to-date list of significant differences between their procedures and the related PANS.

Amendment 40 to ICAO SARPS AIS: Implementation Task List

ICAO State Letter outlined the implementation task list and the impact assessment high level guidance that States should follow in relation to Amendment 40 to Annex 15.

The general strategy is two-folded as follows:

(1) Transposing the new/modified ICAO provisions into national regulations and,

(2) Assessing the implementation impact of the technical content of Annex 15/PANS-AIM specifications.

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Regulatory approach essential steps for States:

➤ Establishment of a national implementation plan considering the new and modified provisions;

➤ Drafting of the modification(s) to the national regulations;

➤ Official adoption of the national regulations & MoC;

➤ Filling of State differences with ICAO, if applicable;

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Implementation technical impact assessment:

➤ Financial impact reflecting the investment in equipment and resources depending on respective State AIM development status;

➤ Technical impact analysis by introducing the digital datasets;

➤ Efficiency impact in providing data in digital form with automated exchange and minimizing human interventions;

➤ Training of ops staff in the use of the new provisions
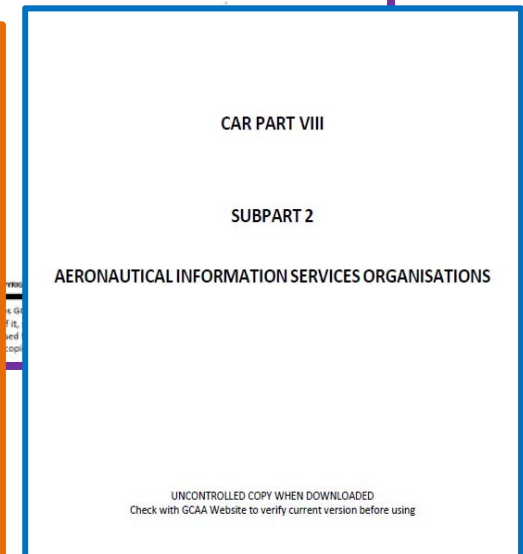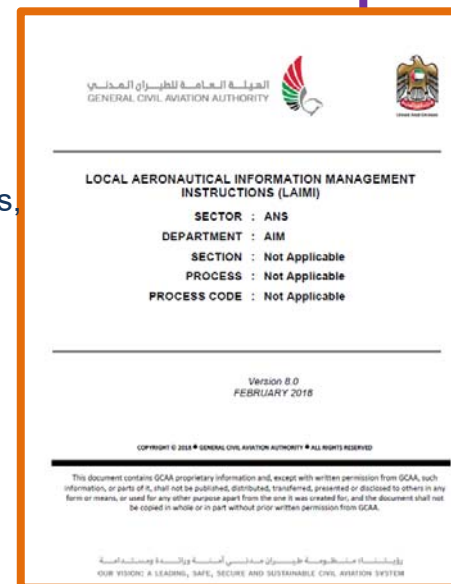
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UAE AIM Regulatory Approach: Rule & Instruction documents

UAE AIM activity is regulated through a number of documents containing local instructions (LAIMI), AIM certification & operations (CAR Part VIII, Subpart 2), Exposition of AIM compliance with all regulatory obligations, etc.

The initial review conducted to the following set of necessary updates e.g.:

➢ List of services enlarged with digital datasets (*upon implementation*)

➢ Replace new terms e.g. AI Package vs. AI Product;

➢ Reconsider all paragraph references from Annex 15, PANS-AIM, Doc. 8126;

➢ Reassess the location/paragraphs for Data Quality Requirements (DQR) per PANS-AIM Data Sets Catalogue;

➢ Revise the specs for NOTAM in line with Annex 15 updates, adding specification for Datasets, Pre/Post Flight Info updates, in CAR part VIII, Subpart 2;

➢ Add in LAIMI processing instructions for (AIP) Data Set, re-examine GCAA Website/Portal procedures, re-think the reciprocal exchange of SWIM services, etc.

AERONAUTICAL INFORMATION MANAGEMENT
AIR NAVIGATION SERVICES
GCAA - SZC

For internal use only

LOCAL AERONAUTICAL INFORMATION MANAGEMENT INSTRUCTIONS (LAIMI)

SECTOR : ANS
DEPARTMENT : AIM
SECTION : Not Applicable
PROCESS : Not Applicable
PROCESS CODE : Not Applicable

Version 8.0
FEBRUARY 2018

CAR PART VIII

SUBPART 2

AERONAUTICAL INFORMATION SERVICES ORGANISATIONS

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Check with GCAA Website to verify current version before using

UAE AIM Regulatory Approach: Strategy updates

UAE AIM policy regarding the transition from AIS to AIM is contained in the CAAP 54.
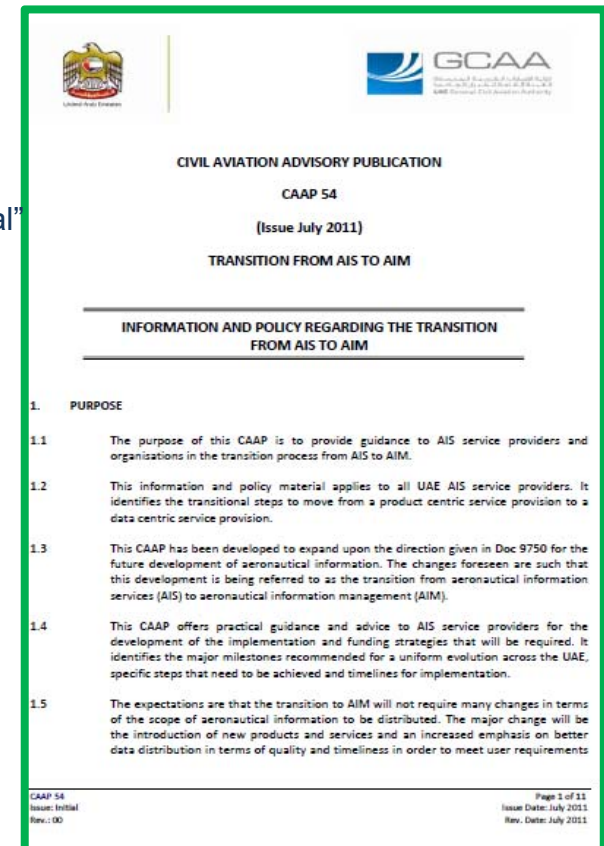
The national plan is originated by the Regulator and it identifies the major milestones for an <u>uniform</u> AIM evolution across UAE.

GCAA Regulator is engaged for updating the Information Management (IM) phase with the new step(s) of "Datasets".

The Regulator strategic engagement should trigger the direction of UAE AIM "operational" implementation.

High level aspects to be covered:

➢ Implementation of Datasets seen as interoperability scenario;

➢ Include in UAE SWIM services portfolio;

➢ Impact study on cost-recovery (financial) mechanism;

➢ Staff planning & training;

➢ Envisaged for 2019 - 2021 plan (mindful of SARPS applicability Nov. 2018)

CIVIL AVIATION ADVISORY PUBLICATION

CAAP 54

(Issue July 2011)

TRANSITION FROM AIS TO AIM

INFORMATION AND POLICY REGARDING THE TRANSITION FROM AIS TO AIM

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1. **PURPOSE**

1.1 The purpose of this CAAP is to provide guidance to AIS service providers and organisations in the transition process from AIS to AIM.

1.2 This information and policy material applies to all UAE AIS service providers. It identifies the transitional steps to move from a product centric service provision to a data centric service provision.

1.3 This CAAP has been developed to expand upon the direction given in Doc 9750 for the future development of aeronautical information. The changes foreseen are such that this development is being referred to as the transition from aeronautical information services (AIS) to aeronautical information management (AIM).

1.4 This CAAP offers practical guidance and advice to AIS service providers for the development of the implementation and funding strategies that will be required. It identifies the major milestones recommended for a uniform evolution across the UAE, specific steps that need to be achieved and timelines for implementation.

1.5 The expectations are that the transition to AIM will not require many changes in terms of the scope of aeronautical information to be distributed. The major change will be the introduction of new products and services and an increased emphasis on better data distribution in terms of quality and timeliness in order to meet user requirements

CAAP 54
Issue: Initial
Rev.: 00

Page 1 of 11
Issue Date: July 2011
Rev. Date: July 2011

UAE AIM Technical Approach: Implementation Assessment (general)

As foundation, UAE AIM has determined as follows:

➢ Its AIXM 5.1-based system should enable the provisions of all Datasets with exception of digital Terrain data;

➢ But, based on data exchange experience, AIXM 5.x alone cannot ensure the system interoperability!

➢ Non-coordinated AIXM 5.x systems i.e. no common set of BRs, non-shared encoding rules, etc. is harming the interoperability;

➢ Across UAE, one major challenge is the system interoperability between ANSPs/Airports and UAE AIM due to different level of automation i.e. from manual to fully automated processes;

➢ A "phased approach" i.e. a gradual implementation starting with new AIP dataset should be envisaged.

➢ It is recognized that Datasets implementation should enforce the system to system interoperability i.e. SWIM services/infrastructure as the appropriate solution.

➢ Consider a "transition period" for provisions of eAIP in parallel with AIP and ETOD Datasets based on an assessment (survey/questionnaire)

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UAE AIM Technical Approach:
AIP Dataset Implementation Assessment (deep-dive)

Cross-border data duplication: FIR BDRY significant points, FIR geographical borders, common route segments, navigational aid for procedures that extend in the neighbouring State airspace (authoritative source, single source, data harmonization).

Information inconsistency: AIP Data Set is described in two places in PANS-AIM i.e. paragraph 5.2.1.1.3 (AIP sub-sections) vs. 5.3.3.1.1 (Data subjects & properties). By comparing & x-check both information are not in sync.

AIP Data Set or Data Sets: *"When it is not possible to provide a complete AIP data set, the data set(s) that are available should be provided"* (Annex 15, paragraph 5.3.2.2). The grouping of the available data sub-set should follow a certain criteria, like for example, logical grouping (all inter-related ENR data type, AD related data, etc.) or a particular mapping of AIP sections (GEN 2.5, ENR 2.1, ENR 4.4, AD 2.19, etc.).

Delivery mechanism: There is no guidance in the delivery solutions (manual processing of existing data, queries?) or (most preferably!) SWIM service on AIS website and WFS interface (expose current export HMI, push/pull interfaces, ICD, etc.) including service description, discoverability, user management, security thru Internet Protocols.

Data Set Format: There is no specific recommendation for an AIXM version best suitable to digital datasets exchange. A new AIXM version might introduce new data items, additional properties to existing data items, different coding capabilities such as a new type of timeslice, etc.

Provision and Update Process: States have the option either to re-issue the complete data set or to publish an update that contains only the differences (AIXM Temporality Concept supports both options). The provision of just listing the differences puts the effort of compiling the actual data set on the end-users which would become increasingly complex. As common sense, it is safer to provide a complete/consolidated data set after a certain period e.g. annually.

UAE AIM Technical Approach:
ETOD and AMDB Datasets Implementation Assessment (deep-dive)

General: There are no significant changes (area definition, collection surfaces, data quality requirements and product specs) introduced by the revised Annex and new PANS-AIM

Data Provision (generally): Among the three datasets, Terrain and Aerodrome Mapping information had never a "dedicated" section within the AIP i.e., both information were not part of the AIP, but Obstacles only. Therefore, initial data and provisions may a challenge for States, especially for AMDB dataset.

Unclear Obstacle Data Set Provision: AIP sections ENR 5.4, AD2.10 and AD 3.10 may be left blank with a reference to data availability. PANS-AIM preferred to simply copy-paste the existing text related to ETOD from "old" Annex 15 without clarifying the "link" between obstacles data areas and the respective AIP sections. Consequently, it is not clear which data set would be fulfilling State compliance for Aerodrome/Heliport obstacles? Are the Area 2 and 3 or only Area 2? If only Area 2, would the minimum of Area 2a + T/O flight path area + OLS obstacle data be sufficient?

UAE AIM Technical Approach:
IFP Dataset Implementation Assessment (deep-dive)

General: The implementation of IFP dataset will be the most demanding process for AIS among the five DS accomplishments. Although is totally "new world" for the scope of Annex 15 and for the AIM day to day job, the guidance material dedicated in PANS-AIM is the shortest amongst the "text" dedicated to the five (5) datasets.

Implementation Challenges:

- By structure, IFP was never, in essence, within AIM domain (just publication/charting assignments);

- AIXM 5.x model does partially cover IFP dataset elements i.e. procedure coding only! A new AIXM extension to capture IFP dataset should be necessary for capturing e.g. FAS data block for SBAS and GBAS procedures, other FMS requirements related to PBN procedures, charting notes, etc.

- IFP content is a mix of charting elements required by PANS-OPS for procedure promulgation as well as Procedure Designer (specific) data, typically parameters/entry data information. This type of information (free text or non-AIM related) is not "digitisable" or to a certain extent only.

- There is no Obstacle requirement in the IFP DS, but PANS-OPS & Annex 4 publication/charting respectively clearly requires the design expert to identify for charting purpose, the obstacle(s) considered critical for the respective procedure;

Conclusions

➢ The guidance material in Doc. 10066 PANS-AIM in respect of Aeronautical Data Catalogue/Digital Data Sets implementation is considered as **insufficient** due to several "open questions";

➢ Most challenging topics are AIP and IFP Data Sets respectively.

➢ Provision of an AIP <u>sub</u>-dataset is recognized, however there is no PANS-AIM guidance on the logical grouping of the subjects. A random selection would be resulting for end-user/consumers in a useless dataset.

➢ IFP dataset content should also attempt to support Charting generation as one of many endeavors in the effort of providing a data-driven charting solution.

➢ Not all details are clear in respect of the "legacy" Obstacle Dataset provision i.e. former Annex 15, Chapter 10 specs versus new Annex 15, Chapter 5 and PANS-AIM requirements;

➢ Neither Annex 15, nor PANS-AIM provide any further details on digital datasets format and delivery method from AIM (modern) perspective. The options are paper or electronic distribution only, which both are <u>not</u> really a "*full move into an automated data-centric environment*"!

➢ Digital Datasets file have to be "self-contained" product i.e. full data without any AIXM type of references (parent/child relationship).

➢ Technical challenges for delivery mechanism: Metadata (so far missing) at the timeslice level.

➢ Suitable format AIXM 5.1. (1): The initial and subsequent files every cycle should be BASELINE. Once AIP SUPP (tempo three month+) information is added, timeslice should change to SNAPSHOT.

➢ Additional workload, modified processes and workflow are required to change in order to capture AIP SUPP information.

➢ Full compliance with Annex 15/PANS-AIM on 8 Nov 2018 i.e. notification to ICAO of differences in GEN 1.7 is not realistic.

Thank you