



## CIVIL AVIATION ADVISORY PUBLICATION

### CAAP 54

### TRANSITION FROM AIS TO AIM

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#### 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 Yemen 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 Yemen, 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

and contribute to improved safety, increased efficiency and greater cost-effectiveness of the air navigation system.

## **2. STATUS OF THIS CAAP**

- 2.1 This is the first issue of CAAP 54– Transition from AIS to AIM, and dated January , 2019 and will remain current until withdrawn or superseded.

## **3. APPLICABILITY**

- 3.1 This guidance material applies to all AIS service providers within Yemen territorial airspace.

## **4. REFERENCES**

- 4.1 The **Global Air Navigation Plan** (Doc 9750) was developed as a strategic document to guide the implementation of CNS/ATM systems with respect to the **Global Air Traffic Management Operational Concept** (Doc 9854) and the Strategic Objectives of ICAO. The Global Air Navigation Plan (Doc 9750) contains near- and medium-term guidance on air navigation system improvements necessary to support a uniform transition to the air traffic management system envisioned in the Global Air Traffic Management Operational Concept (Doc 9854). Doc 9750, Chapter 1, Table 1-1, sets out 23 global plan initiatives (GPI); two are directly related to aeronautical information (GPI-18 – Aeronautical Information and GPI-20 – WGS-84) and many of the others have an indirect impact on the way aeronautical information will be exchanged in the future.
- 4.2 YEMEN PART VIII Sub part 2

## **TABLE OF Contents**

<b>1. PURPOSE</b>	<b>1</b>
<b>2. STATUS OF THIS CAAP</b>	<b>2</b>
<b>3. APPLICABILITY</b>	<b>2</b>
<b>4. REFERENCES</b>	<b>2</b>
<b>5. ABBREVIATIONS/ACRONYMS</b>	<b>4</b>
<b>6. GLOSSARY</b>	<b>5</b>
<b>7. WHY AERONAUTICAL INFORMATION MATTERS</b>	<b>6</b>
<b>8. THE OBJECTIVE OF THE TRANSITION TO AIM</b>	<b>6</b>
<b>9. WHAT WILL CHANGE</b>	<b>6</b>
<b>10. PHASE OF TRANSITION TO AIM</b>	<b>7</b>
<b>11. PHASE 1 — CONSOLIDATION</b>	<b>8</b>
<b>12. PHASE 2 — GOING DIGITAL</b>	<b>9</b>
<b>13. PHASE 3 — INFORMATION MANAGEMENT</b>	<b>9</b>
<b>14. AIM TRANSITION STEPS</b>	<b>10</b>
<b>15. IMPLEMENTATION MATRIX</b>	<b>11</b>

## **5. ABBREVIATIONS/ACRONYMS**

AICM	Aeronautical information conceptual model
AIM	Aeronautical information management
AIP	Aeronautical information publication
AIRAC	Aeronautical information regulation and control
AIS	Aeronautical information service
AIXM	Aeronautical information exchange model
AN-Conf/11	Eleventh Air Navigation Conference (2003)
ANSP's	Air Navigation Service Providers
ATM	Air traffic management
GPI	Global plan initiative
IM	Information management
IP	Internet protocol
PIB	Pre-flight information bulletin
RNAV	Area navigation
RNP	Required navigation performance
SARPs	Standards and Recommended Practices
WGS-84	World geodetic system-1984

## 6. GLOSSARY

### **Aeronautical data**

A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

### **Aeronautical information**

Information resulting from the assembly analysis and formatting of aeronautical data.

#### **\* Aeronautical information management (AIM)**

The dynamic, integrated management of aeronautical information services — safely, economically and efficiently — through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

#### **\* Database**

A large collection of data stored in structured digital format so that appropriate applications may quickly retrieve and update it.

*Note. — This primarily refers to digital data (accessed by computers) rather than files of physical records.*

#### **\* Data set**

Identifiable collection of related digital data.

#### **\* Information management (IM)**

The processes defined to ensure the collection, utilization and transmission of quality data that are tailored to the needs of each component of the air traffic management system.

#### **\* Interoperability**

The capacity for diverse systems and organizations to exchange information by transferring data and requesting remote services in a manner that requires the client system to have little or no knowledge of the unique characteristics of the server system.

#### **\* Metadata**

A structured description of the content, quality, condition or other characteristics of data.

### **NOTAM**

A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

*\* Not an official ICAO definition (used in the context of this document only)*

## **7. WHY AERONAUTICAL INFORMATION MATTERS**

- 7.1 High-quality aeronautical information is often cited as a pre-requisite for the development of the many new interoperable tools that future aircraft will YEMENry to improve their effectiveness in navigating safely and efficiently. These new tools will also be used by ATM systems to improve efficiency while maintaining safety. This will result in the provision of more services to more aircraft in the same airspace at the same time.

## **8. THE OBJECTIVE OF THE TRANSITION TO AIM**

- 8.1 Present and future navigation systems and other air traffic management systems are data-dependent. All require access to global, broad-based aeronautical information of a considerably higher quality and in a timelier manner than is generally available today. The provision of aeronautical information is a core element of air navigation services.
- 8.2 To satisfy new requirements arising from the Global Air Traffic Management Operational Concept, aeronautical information services must transition to a broader concept of aeronautical information management, with a different method of information provision and management given its data-centric nature as opposed to the product-centric nature of AIS. Roles and responsibilities may need to be adapted as the transition progresses.

## **9. WHAT WILL CHANGE**

- 9.1 The Global Air Traffic Management Operational Concept defines seven interdependent concept components that will be integrated to form the future ATM system. They comprise:
- a. Airspace organization and management,
  - b. Aerodrome operations,
  - c. Demand and capacity balancing,
  - d. Traffic synchronization,
  - e. Conflict management,
  - f. Airspace user operations, and
  - g. ATM service delivery management.
- 9.2 The management, utilization and transmission of data and information are vital to the proper functioning of these components. The exchange and management of information used by the different processes and services must ensure the cohesion and linkage between these seven concept components.

- 9.3 The provision of aeronautical information today is mainly focussed on the requirements of pre-flight briefing. The provision of aeronautical information tomorrow will address the requirements of all components of the ATM system for all phases of flight.
- 9.4 The biggest change in the transition to AIM will be the increased use of computer technology in the management of information, with an increased emphasis on the digital form of data that will drive all processes for the management of information.

## **10. PHASE OF TRANSITION TO AIM**

- 10.1 Three phases of action are envisaged for the transition to AIM:
- a. Phase 1 — Consolidation
  - b. Phase 2 — Going digital
  - c. Phase 3 — Information management
- 10.2 In the first phase, existing Standards will need to be refined and strengthened and their implementation ensured. This will concern mainly:
- a. Quality requirements;
  - b. AIRAC adherence;
  - c. The implementation of the adopted standard reference system for coordinates (World Geodetic System-1984); and
  - d. The provision of terrain and obstacle data.
- 10.3 In the second phase, the introduction of database-driven processes will improve the value of current products by improving their quality and availability for current users. The main focus is on the creation of a national database to produce the existing products and services, but with better quality and availability. The deployment of new, already well-specified products such as the electronic AIP will also be initiated.
- 10.4 In the third phase, new products and services will be developed. Quality control and staff training and planning will be applied to current and new products and services. This will support a new AIM function for air navigation service providers enabling the provision of the new data that will be required by the future ATM components.

## 11. Phase 1 — Consolidation

- 11.1 During Phase 1 of the transition to AIM, steps will be required to strengthen a solid base by enhancing the quality of the existing products.
- 11.2 Since the electronic AIP will have the exact same structure as the paper version, it is important that the ANSP's make every effort to issue their aeronautical information as specified in Annex 15.
- 11.3 The NOTAM system as it exists today requires ongoing upgrades to cope with new types of information (e.g. GNSS navigation) and to respond to the difficulties being reported by the users
- 11.4 Many ICAO chart types form an integral part of the AIP. Amendments to specifications are also envisaged for electronic chart display but most of the SARPs in Annex 4 — Aeronautical Charts will remain applicable after the transition to AIM. It is important that ANSP's comply with the existing Annex 4 SARPs.
- 11.5 The requirement to use a common horizontal, vertical and temporal reference system remains essential to facilitate the exchange of data between different systems. Therefore, the expression of all coordinates in the AIP and charts using WGS-84 is important and should be pursued.
- 11.6 Provision of terrain and obstacle data becomes applicable during Phase 1 of the transition and will be an important project to be conducted by airports.
- 11.7 Airports and ANSP's will implement and continuously improve their quality management system in view of its increasing importance for future products and services.
- 11.8 Adherence to the aeronautical information regulation and control (AIRAC) process must be emphasized. The quality of the future service to be provided under information management will rely on the proper mechanism for distribution and synchronization of information.



## **12. Phase 2 — Going digital**

- 12.1 During Phase 2 of the transition to AIM, the main focus will be on the establishment of data-driven processes for the production of the current products. ANSP's that have not yet done so will be encouraged "to go digital" by using computer technology or digital communications and introducing structured digital data from databases into their production processes. The emphasis will, therefore, not be on the introduction of new products or services but will be on the introduction of highly structured databases and tools such as geographic information systems.

## **13. Phase 3 — Information management**

- 13.1 During Phase 3, steps will be taken to enable future AIM functions in Yemen to address the new requirements that will be needed to implement the Global Air Traffic Management Operational Concept in a net-centric information environment.
- 13.2 The digital databases introduced in Phase 2 will be used for the transfer of information in the form of digital data.
- 13.3 As new products are introduced, organizational changes will need to be made to implement better management of information in terms of:
- a. Staff planning and staff training;
  - b. Formalization of agreements with data providers to ensure a high degree of data quality;
  - c. Introduction of an extensive amount of explicit meta-information;
  - d. Impact on cost-recovery mechanisms; and
  - e. Explicit traceability of the changes to information and identification of liabilities.
- 13.4 ATM systems will require a common information reference model with quality procedures for the management of seamless information flow to ensure not only interoperability between States in the Middle eastregion but also interoperability between different systems within Yemen. New digital data products and services will be specified to serve these interoperability requirements.
- 13.5 The definition of new AIM data products and services will be based on requirements identified for each ATM component.

## **14. AIM TRANSITION STEPS**

- 14.1 A minimum list of major steps to achieve the transition to AIM is provided below. The transition to AIM will be effective at the global level when these steps have been achieved. The steps are to be taken as a checklist of high-level actions. Failure to take action on any of these steps would increase the duration of the transition and negatively affect the enabling role of AIM in the future ATM concept of operation.
- 14.2 The list may evolve during the transition, especially when we get closer to Phase 3. This CAAP will be updated with the further evolution of the overall ATM concepts and system requirements.
- a. STEP-01 — Data quality monitoring
  - b. STEP-02 — Data integrity monitoring
  - c. STEP-03 — AIRAC adherence monitoring
  - d. STEP-04 — Monitoring of differences to Annex 4 and Annex 15
  - e. STEP-05 — WGS-84 implementation
  - f. STEP-06 — Integrated aeronautical information database
  - g. STEP-07 — Unique identifiers
  - h. STEP-08 — Aeronautical information conceptual model (ICAO)
  - i. STEP-09 — Aeronautical data exchange
  - j. STEP-10 — Communication networks
  - k. STEP-11 — Electronic AIP
  - l. STEP-12 — Aeronautical information briefing
  - m. STEP-13 — Electronic terrain
  - n. STEP-14 — Electronic obstacles
  - o. STEP-15 — Aerodrome mapping
  - p. STEP-16 — Training
  - q. STEP-17 — Quality
  - r. STEP-18 — Agreements with data originators
  - s. STEP-19 — Interoperability with meteorological products
  - t. STEP-20 — Electronic aeronautical charts
  - u. STEP-21 — Digital NOTAM

## 15. IMPLEMENTATION MATRIX

PHASE	STEP	START DATE	END DATE
<b>PHASE 1</b>	STEP-01 — Data quality monitoring STEP-02 — Data integrity monitoring STEP-03 — AIRAC adherence monitoring STEP-04 — Monitoring of differences to Annex 4 and Annex 15 STEP-05 — WGS-84 implementation STEP-08 — Aeronautical information conceptual model (Database - ICAO) STEP-13 — Electronic terrain – Area 1 and 4 STEP-14 — Electronic obstacles – Area 1 and 4	<b>2019</b>	<b>2021</b>
<b>PHASE 2</b>	STEP-06 — Integrated aeronautical information database STEP-07 — Unique identifiers (Database - ICAO) STEP-11 — Electronic AIP STEP-12 — Aeronautical information briefing STEP-13 — Electronic terrain – Area 2 and 3 STEP-14 — Electronic obstacles – Area 2 and 3 STEP-16 — Personnel training STEP-17 — Quality Management STEP-18 — Agreements with data originators STEP-20 — Electronic aeronautical charts	<b>2022</b>	<b>2025</b>
<b>PHASE 3</b>	STEP-09 — Aeronautical data exchange - Global STEP-10 — Communication networks - enhanced STEP-15 — Aerodrome mapping STEP-19 — Interoperability with meteorological products STEP-21 — Digital NOTAM	<b>2025</b>	<b>2028</b>