International Civil Aviation Organization

Fifth Meeting of MID Region AIM Database Task Force
Fourth Meeting of MIDANPIRG AIM Sub-Group

MIDAD TF/5 and AIM SG/4
(Cairo, Egypt, 13-15 February 2018)

Agenda Item 5: AIM Planning and Implementation in the MID Region

UPDATE TO GUIDANCE FOR AIM PLANNING AND IMPLEMENTATION IN THE MID REGION (MID DOC 008)

(Presented by the Secretariat)

SUMMARY

This paper presents an updated version of the Guidance for AIM planning and implementation in the MID Region (MID Doc 008), for review by the meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/16 Report
- State Letter Ref.: AN 8/4 – 17/133 dated 30 April 2017

1. INTRODUCTION

1.1 The meeting may wish to recall that MIDANPIRG/16, through MIDANPIRG Conclusion 16/10, endorsed the "*Guidance for AIM Planning and implementation in the MID Region*" as the MID Doc 008.

2. DISCUSSION

2.1 As a follow-up action to the MIDANPIRG Conclusion 16/10, the ICAO MID Office issued State Letter Ref.: AN 8/4 – 17/133 dated 30 April 2017, encouraging States to use the guidance available in the MID Doc 008 in their AIM planning and implementation; and send their feedback about the Document for further update/improvement.

2.2 The meeting may wish to recall that the AIM SG/2 meeting (Cairo, Egypt, 15-18 May 2017) agreed that additional guidance related to the eANP Volume III Tables and in particular B0-DATM 3-1 "*Provision of AIS/AIM products and services based on the Integrated Aeronautical Information Database (IAID)*" should be included in the Guidance for a better and harmonized understanding. Accordingly, the meeting urged States to review the MID Doc 008 and provide their input/comment to the ICAO MID Office, no later than 1 November 2017. Only one feedback received from UAE.

2.3 An updated version of the MID Doc 008 is at **Appendix A**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to review and provide comment/input to the MID Doc 008, at **Appendix A**.

MIDAD TF/5 & AIM SG/4-WP/7
Appendix A

MID Doc 008

INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG)

GUIDANCE FOR AIM PLANNING AND IMPLEMENTATION IN THE MID REGION

EDITION FEBRUARY, ~~2017~~2018

(1.0.1)

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RECORD OF AMENDMENTS

Edition Number	Edition Date	Description	Pages Affected
0.1	1 September 2015	Initial draft version	All
0.2	7 October 2015	Inputs incorporated by AIM SG/2	All
0.3	April 2016	Change in Doc title; improving order and content of chapters; States comments considered; Reviewed by MSG/5	All
0.4	November 2016	Review by ANSIG/2	All
1.0	February 2017	Endorsed by MIDANPIRG/16	All
1.0.1	February 2018	AIM SG/4	All

TABLE OF CONTENTS

FOREWARD

The "Guidance for AIM Planning and Implementation in the MID Region" has been developed to harmonize transition from AIS to AIM in the MID Region and to addresses Global and Regional issues related to planning and implementation of Aeronautical Information Management. This Regional AIM Guidance material explains concept and operational elements of AIM; outlines the Regional and National AIM Roadmaps; and provides guidance and tools for their implementation at the Regional and National levels.

This Document consolidates updates and supersedes all previous guidance materials on the AIM implementation in the MID Region (National AIM Roadmap Template, Regional AIM Roadmap, etc.). The "Guidance for AIM Planning and Implementation in the MID Region" will be reviewed and updated, whenever deemed necessary, by the AIM Sub-Group.

First edition of the Document, developed by the ICAO MID Regional Office, was endorsed by MIDAPIRG/16 (Kuwait, 13-16 February 2017).

The Document was prepared in accordance with ICAO provisions related to AIM, including~~,~~ Global ATM Operational Concept, ~~the~~ Global Air Navigation Plan, Aviation System Block Upgrades (ASBU) methodology, MID Region Air Navigation Plan and the MID Region Air Navigation Strategy~~, in addition to the twelfth Air Navigation Conference (AN Conf/12) Recommendation 3/8 related to AIM~~. States are ~~invited~~ recommended to ~~take necessary measures to implement provisions of~~use this document and notify their experiences and practices related to transition from AIS to AIM.

Note - Provisions of this document are recommended practices and do not – under any circumstances – substitute/replace any of the ICAO SARPS related to AIS/AIM (e.g. Annex 15).

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ABBREVIATIONS AND ACRONYMS

The abbreviations and acronyms used in this document along with their expansions are given in the following List:

AI	Aeronautical Information
AICM	Aeronautical Information Conceptual Model
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical Information Services
AIS-AIM SG	AIS to AIM Study Group
AIM	Aeronautical Information Management
AIM SG	Aeronautical Information Management Sub-Group
AIXM	Aeronautical Information Exchange Model
AN-Conf/11	Eleventh Air Navigation Conference
AN-Conf/12	Twelfth Air Navigation Conference
ANP	Air Navigation Plan
ANSP	Air Navigations Services Provider
ASBU	Aviation System Block Upgrade
ATM	Air Traffic management
eAIP	electronic Aeronautical Information Publication
eANP	electronic Air Navigation Plan
eTOD	electronic Terrain and Obstacle Data
GANP	Global Air Navigation Plan
GANR	Global Air Navigation Report
GIS	Geographic Information System
GML	Geography Markup Language
IM	Information Management
IMP	Information Management Panel
ISO	International Organization for Standardization
MET	Meteorology
MIDAD	MID Region AIM Database

MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
MIL	Military
MSG	MIDANPIRG Steering Group
PBN	Performance-Based Navigation
QMS	Quality Management System
RWY	Runway
SARPs	Standards and Recommended Practices
SMART	Specific, Measurable, Achievable, Relevant and Timely
SWIM	System Wide Information Management
TORs	Terms of Reference
UML	Unified Modeling Language
WGS-84	World Geodetic System-1984
XML	Extensible Markup Language

CHAPTER 1: ICAO AIM CONCEPT

INTRODUCTION

1.1 The Eleventh Air Navigation Conference (AN-Conf/11) held in Montréal, 22 September to 3 October 2003, endorsed the Global ATM Operational Concept (Doc 9854) and recognized that, in the global air traffic management (ATM) system environment envisioned by the operational concept, aeronautical information service (AIS) would become one of the most valuable and important enabling services. As the global ATM system foreseen in the operational concept was based on a collaborative decision-making environment, the timely availability of high-quality and reliable electronic aeronautical, meteorological, airspace and flow management information would be necessary. Some recommendations of AN-Conf/11 addressed the importance of aeronautical information in particular.

1.2 Information management provides accredited, quality-assured and timely information used to support ATM operations. Information management will also monitor and control the quality of the shared information and provide information-sharing mechanisms that support the ATM community (ICAO DOC 9854 – *Global ATM Operational Concept*).

~~1.2~~1.3 Aeronautical Information Management (AIM) ~~during its evolution has been defined as~~is the provision of the right Aeronautical Information (quality assured), at the right place (through digital exchange), and at the right time (timeliness). ICAO Annex 15 defines AIM as the *dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.*

~~1.3~~1.4 The Twelfth Air Navigation Conference (AN-Conf/12) held in Montréal, 19 to 30 November 2012, through Recommendations 3/7 and 3/8, supported and pushed:

- Transition from AIS to AIM by implementing a fully automated digital aeronautical data chain;
- Implementing necessary processes to ensure the quality of aeronautical data; and
- Engage in intraregional and interregional cooperation for an expeditious transition from AIS to AIM in a harmonized manner and to using digital data exchange and consider regional or ~~subregional~~sub regional AIS databases as an enabler for the transition from AIS to AIM information from the origin to the end users

TRANSITION FROM AIS TO AIM

ICAO Roadmap for the transition from AIS to AIM

~~1.4~~1.5 The aeronautical information/data based on paper and telex-based text messages can not satisfy anymore the requirements of the ATM integrated and interoperable system. AIS is required to evolve from the paper product-centric service to the data-centric aeronautical information management (AIM) with a different method of information provision and management.

~~1.5~~1.6 ICAO published in 2009 the "*Roadmap for the transition from AIS to AIM*". 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). It identifies the major milestones recommended for a uniform evolution across all regions of the world and specific steps that need to be achieved for implementation.

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Note – Development of a Global AIM Implementation Strategy by ICAO is in progress.

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~~1.6~~1.7 The Roadmap envisaged the transition into three phases and twenty one steps. Three phases of action are envisaged for States and ICAO to complete the transition to AIM:

– *Phase 1 — Consolidation*

Phase 1 is the pre-requisite for the transition from AIS to AIM (implementation of the current SARPs). In Phase 1, QMS implementation is still a challenge for some States.

Commented [AN1]: UAE commented to list challenges and address solution. Some texts in this regard is added to Chapter 3 (QMS)

– *Phase 2 — Going digital*

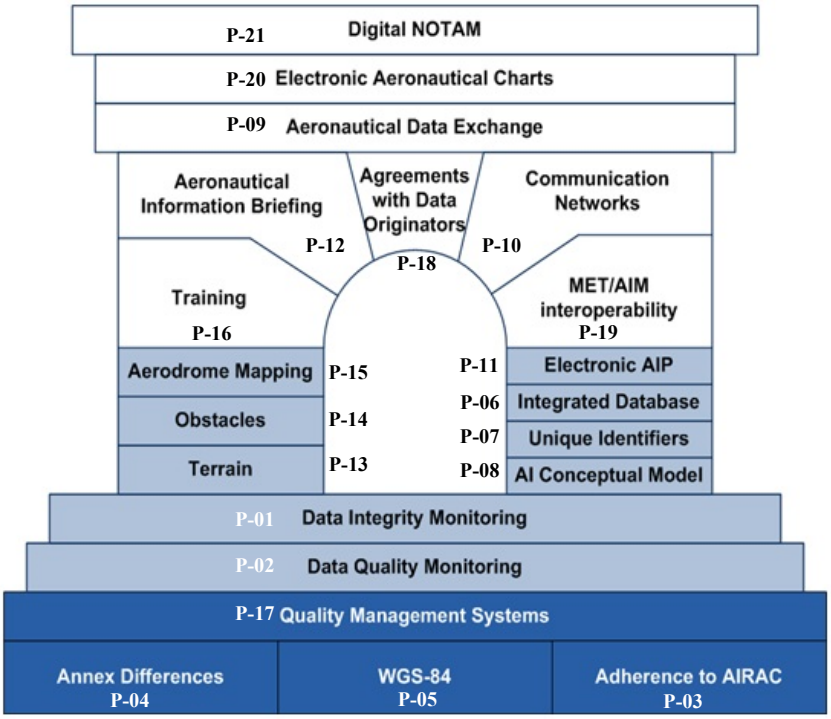
Main components of the Phase 2 are:

- Data-driven processes for the production of the current products;
- Introduction of structured digital data from databases into AIS/AIM processes;
- Introduction of highly structured databases and tools such as GIS;
- Electronic Terrain and Obstacle Datasets; and
- Implementation of aeronautical information conceptual model (AICM).

– *Phase 3 — Information management*

Main components of the Phase 3 are:

- Enabling AIM functions to address the new requirements of the Global ATM Operational Concept in a net-centric information environment;
- Transfer of information in the form of digital data based on the established databases; and
- Aeronautical data exchange model ensuring interoperability between all systems.



Positioning of the 21 steps of the roadmap in the three phases

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AIS-AIM Study Group

~~1.7~~1.8 The Air Navigation Commission in 2008 agreed to the establishment of AIS-AIM SG in order to assist with the development of:

– A global strategy/roadmap for the transition from AIS to AIM;

– SARPs and guidance material related to the provision of a standard AICM and standard AIXM to enable the global exchange of data in digital format; and

– Other SARPs, guidance material and training material necessary to support AIM implementation.

~~1.8~~1.9 Some achievements of the AIS-AIM Study Group have been as follows:

– ICAO Roadmap for transition from AIS to AIM;

– Amendments to Annex 15:

  o Amendment 36: New provisions related to the operational use of the public Internet; volcanic ash deposition; QMS; use of automation enabling digital data exchange; eAIP; NOTAM Format; and eTOD.

- Amendment 37: Annex 15 restructuring; Chapter 1 (General), Chapter 2 (Responsibilities and functions) and Chapter 3 (Aeronautical Information Management) introduced in Nov 2014;
- Amendment 40: Chapters 4 (Scope of AI and data), Chapter 5 (AI Products and services) and Chapter 6 (AI updates) instead of current Chapters 4-11 (in progress, applicability date would be November 2018).

– ~~Development of n~~New PANS AIM (in progress, applicability date would be November 2018)

– Development of Aeronautical Data Catalogue (in progress; Appendix A to the new PANS AIM)

– Development of Training Manual, Quality Manual, update of AIS Manual (Doc 8126) (in progress)

~~1.9~~1.10 AIS-AIMSG/12 was the last AIS-AIMSG held in Montreal, Canada from 19 to 23 October 2015. Materials related to the AIS-AIM SG including the meetings' Study Notes, Information Papers and Summary of Discussions are available on the ICAO AIM website at:

http://www.icao.int/safety/ais-aimsg/Pages/default.aspx

Information Management Panel (IMP)

~~1.10~~1.11 The Air Navigation Commission in 2014 agreed to the establishment of the Information Management Panel (IMP) to elaborate on necessary concepts and develop a global and interoperable approach to ensure effective management of information within the global air navigation system. The IMP will undertake tasks relating to the global transition from AIS to AIM, based upon Recommendations 3/1, 3/2, 3/3 and 3/9 of the Twelfth Air Navigation Conference in 2012 (AN-Conf/12).

~~1.11~~1.12 Four (4) Working Groups were established to undertake tasks of the Panel:

- Information Services and NOTAM
- Information Architecture & Management
- SWIM Awareness & Communication
- SWIM Governance

~~1.12~~1.13 Materials related to the IMP including the meetings' Working/Information Papers and Reports are available on the ICAO AIM website at:

http://www.icao.int/airnavigation/IMP/Pages/default.aspx

CHAPTER 2

REGIONAL AIM PLANNING

REGIONAL ROADMAP FOR AIM IMPLEMENTATION

2.1 Having Phase I of the transition from AIS to AIM mostly completed in the MID Region, the current focus should be the implementation of phase II and III of the Roadmap for the transition from AIS to AIM ~~to prepare further transition to Phase III in a timely manner~~. Accordingly, States should take into consideration the "MID Region AIM Implementation Roadmap" in planning for the transition from AIS to AIM in a prioritized manner.

MID REGION AIM IMPLEMENTATION ROADMAP

	Related Steps	2016		2017		2018		2019		2020		2021		2022		Priority	Remarks
		1	2	1	2	1	2	1	2	1	2	1	2	1	2		
AIXM	P07, P08															**1**	Target: 80% by 2018
eAIP	P11															**1**	Target: 80% by 2020
Integrated Aeronautical Information Database	P06															**2**	
Aeronautical Data Exchange	P09															**2**	
Interoperability with MET	P19															**3**	
Aeronautical Information Briefing	P12															**3**	
Agreement with data originators	P18															**1**	
Data Quality Monitoring	P01															**1**	
Data Integrity Monitoring	P02															**1**	
Terrain A-1	P13															**2**	Target: 70% by 2018
Obstacle A-1	P14															**2**	Target: 60% by 2018
Terrain A-4	P13															**2**	Target: 100% by 2018
Obstacle A-4	P14															**2**	Target: 100% by 2018
Terrain A-2a	P13															**2**	
Obstacle A-2a	P14															**2**	
Training	P16															**1**	Continuous
Communication networks	P10															**3**	
Digital NOTAM	P21															**3**	
Electronic Aeronautical Charts	P20															**3**	
Terrain and Obstacle for Areas 2b, 2c, 2d and 3	P13, P14															**3**	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs
Aerodrome Mapping	P15															**3**	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs

***White**: Planning* ***Light Green**: Initial/On-going Implementation* ***Dark Green**: Implemented (Performance Target achieved)*

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CHAPTER 3

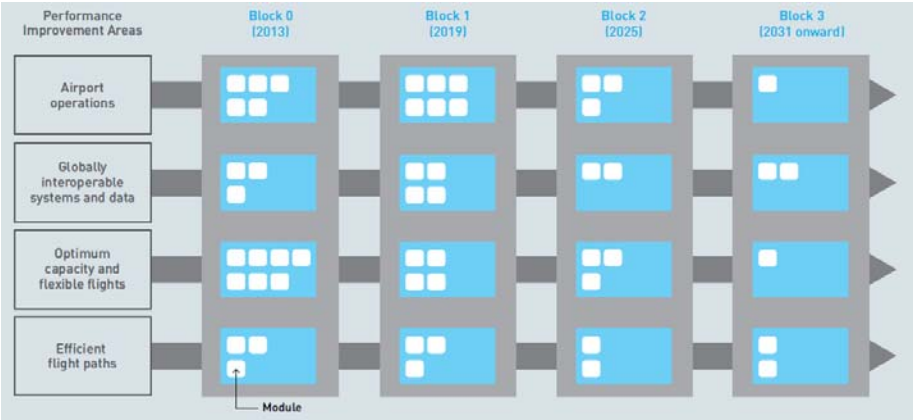
ASBU METHODOLOGY AND THE MID AIR NAVIGATION STRATEGY (AIM/SWIM RELATED ASBU MODULES)

ASBU METHODOLOGY

3.1 ICAO introduced the Aviation System Block Upgrades (ASBU) methodology in the fourth edition of the Doc 9750 (Global Air Navigation Plan), endorsed by the ICAO Assembly in 2013 (further revised by Assembly 39 in 2016), as a systemic manner to achieve a harmonized implementation of the air navigation services. An ASBU designates a set of improvements that can be implemented globally from a defined point in time to enhance the performance of the ATM system.

3.2 The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives. The Block Upgrades are organized in six-year time increments starting in 2013 and continuing through 2031 and beyond.

3.3 ASBU methodology defines improvements, through modules, over four blocks in four performance improvements areas:



MID REGION AIR NAVIGATION STRATEGY

3.4 Revised MID Region Air Navigation Strategy (MID Doc 002) was endorsed by the MIDANPIRG/16 meeting to introduce Block 0 ASBU Modules implementation priorities, elements, indicators and targets for the MID Region. It recognizes ~~11~~ 12 (out of 18) Block 0 Modules as priority 1 in the MID Region (for more information refer to the MID Doc 002 in the ICAO Secure Portal at: https://portal.icao.int/RO_MID/Pages/MIDDocs.aspx).

~~BLOCK 0 AIM RELATED MODULE~~

B0-DATM IMPLEMENTATION

3.5 Block 0 contains 18 Modules and serves as the enabler and foundation for the envisioned future aviation systems. B0-DATM is a priority 1 ASBU Module in accordance with the MID Region Air Navigation Strategy (MID Doc 002). MID Doc 002 defines the B0-DATM as follows:

Description and purpose

The initial introduction of digital processing and management of information, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical information exchange model (AIXM), migration to electronic aeronautical information publication (AIP) and better quality and availability of data**.**

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	N	Y	Y	Y

Applicability consideration:

Applicable at State level, with increased benefits as more States participate

B0 – DATM: Service Improvement through Digital Aeronautical Information Management			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
National AIM Implementation Plan/Roadmap	All States	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	90% by Dec. 2018
AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	80% by Dec. 2018
eAIP	All States	Indicator: % of States that have implemented an IAID driven AIP Production (eAIP) Supporting Metric: Number of States that have implemented an IAID driven AIP Production (eAIP)	80% by Dec. 2020
QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	90% by Dec. 2018
WGS-84	All States	Indicator: % of States that have implemented WGS-84 for horizontal plane (ENR, Terminal, AD) Supporting Metric: Number of States that have	Horizontal: 100% by Dec. 2018 Vertical:

Commented [AN4]: UAE Comment: KPIs to be re-defined as States' KPIs instead of Region's KPIs
Answer: appropriate KPI for States (called compliance criteria) were put in the "Methodology …" of chapter 5 (to be discussed)

Commented [AN5]: UAE comment: to use "Horizontal Reference System" or "Horizontal Datum" instead of "Horizontal Plane".
Same thing for the vertical one

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		implemented WGS-84 for horizontal plane (ENR, Terminal, AD) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	90% by Dec. 2018
eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	Area 1 : Terrain: 70% by Dec. 2018 Obstacles: 60% by Dec. 2018 Area 4: Terrain: 100% by Dec. 2018 Obstacles: 100% by Dec. 2018
Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	90% by Dec. 2018

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Aeronautical Information Exchange Model (AIXM)

3.6 The objective of the Aeronautical Information Exchange Model (AIXM) is to enable the provision in digital format of the aeronautical information that is in the scope of Aeronautical Information Services (AIS)~~The aeronautical information exchange model (AIXM) is designed to enable the management and distribution of aeronautical information services data in digital format. AIXM takes advantages of established information engineering standards and supports current and future aeronautical information system requirements~~. The following main information areas are in the scope of AIXM:~~The major tenets are~~:

- Aerodrome/Heliport including movement areas, services, facilities, etc.
- Airspace structures
- Organisations and units, including services
- Points and Navaids
- Procedures
- Routes
- Flying restrictions

~~a) an exhaustive temporality model, including support for the temporary information contained in NOTAM;~~

~~b) alignment with ISO standards for geospatial information, including the use of the geography markup language (GML);~~

~~c) support for the latest ICAO and user requirements for aeronautical data including obstacles, terminal procedures and airport mapping databases; and~~

~~d) modularity and extensibility.~~

~~3.7 AIXM covers the ICAO requirements for the "data necessary for the safety, regularity and efficiency of international air navigation", existing industry standards (e.g. ARINC 424) and emerging data needs. It has constructs for: aerodromes, navigation aids, terminal procedures, airspace and route structures, ATM and related services, air traffic restrictions and other data.~~

~~3.8 AIXM has two components:~~

~~a) The AIXM UML Model provides a formal description of the information.~~

~~b) The AIXM XML Schemas are an encoding format for aeronautical data.~~

3.7 AIXM 5 takes advantages of established information engineering standards and supports current and future aeronautical information system requirements.

Note - More information on AIXM could be found at: www.aixm.aero

electronic AIP (eAIP)

~~3.7~~3.8 The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper. When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet. When provided, the information content of the eAIP and the structure of chapters, sections

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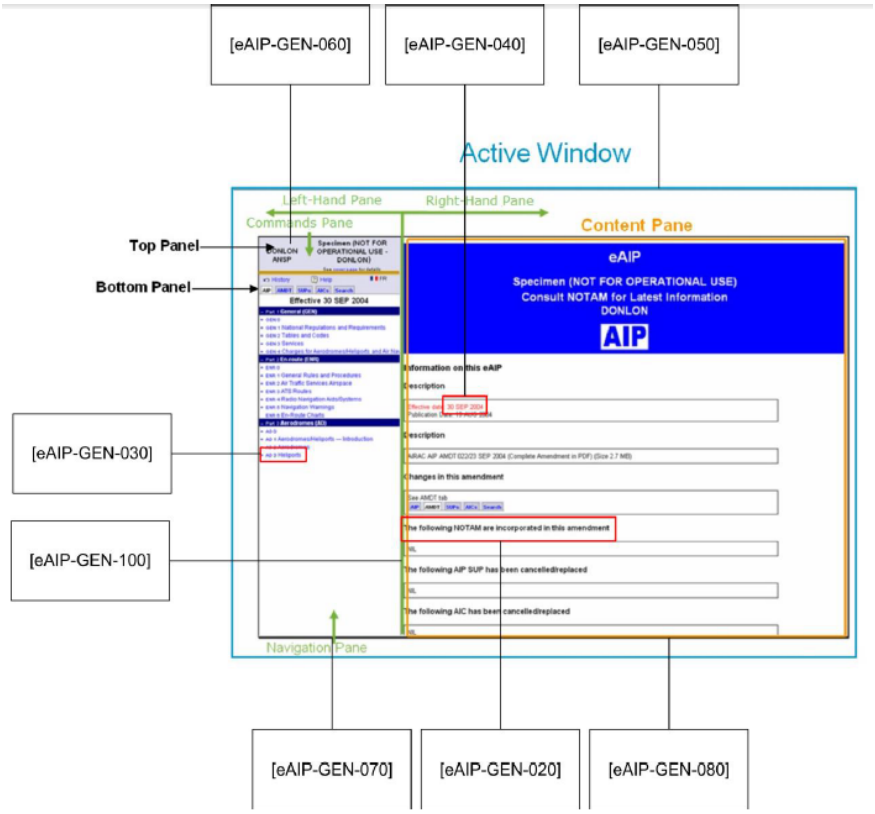
and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.

Note 1 - This composite electronic document is named "Electronic AIP" (eAIP) and may be based on a ~~format that allows for~~ digital data exchange format (e.g. AIXM).

Note 2 - The eAIP is not intended to support the Digital Notice to Airmen (NOTAM) process, as Digital NOTAM require a database of aeronautical information and are, therefore, not reliant on the eAIP.

~~3.8~~3.9 Aeronautical data and aeronautical information within the AIPs, AMDTs and SUPs should be made available, as a minimum, "in a way that allows the content and format of the documents to be directly readable on a computer screen".

~~3.12 General requirements associated with the **display of the eAIP** are reflected below:~~



~~3.9~~3.10 The eAIP, as a minimum, should have help and search facility and provide history of current and previous amendments to users. It should also include a table of content. Format, display and content requirement for AIP Pages, AIP SUP, AIP Amendment and AIC should be in accordance with Annex15, Doc 8126 and other related SARPs.

Note 3 – More guidance material on the specifications of eAIP could be found in the EUROCONTROL Specifications for the electronic Aeronautical Information Publication (eAIP).

Quality Management System (QMS)

~~3.10~~3.11 Quality management systems shall be implemented and maintained encompassing all functions of an aeronautical information service. The execution of such quality management systems shall be made demonstrable for each function stage.

Note 1 - An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.

~~*Note 2 – Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839).*~~

Note ~~3~~2 - Necessary measures should be taken for the signature of formal arrangements concerning data quality between AIS/AIM and the data originators, commensurate with the Aerodrome operators, Air Navigation Service Providers (ANSPs) and the Military Authority.

3.12 QMS implementation is still a challenge for some States. The challenges may include: Lack of adequate guidance material, lack of necessary competency (need for training), financial resources, etc.

Note 3 - Manual on the Quality Management System for Aeronautical Information Services (Doc 9839) – Draft provides guidance on QMS implementation based on a stepwise approach (project-based).

World Geodetic System-1984 (WGS-84)

~~3.11~~3.13 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

~~3.12~~ WGS-84 for Enroute and Terminal areas as well as aerodromes and Geoid Undulation shall be introduced in the published coordinates in AIP ~~in the following sections:~~

~~a) Horizontal:~~

~~o Enroute~~

~~o Terminal~~

~~o Aerodrome~~

~~b) Vertical:~~

~~o Geoid Undulation~~

Note - Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System - 1984 (WGS-84) Manual (Doc 9674).

electronic Terrain and Obstacle Dataset (eTOD)

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~~3.13~~3.14 eTOD is an electronic set(s) of terrain and/or obstacle data for the defined coverage areas and with the defined data specifications to fulfill the needs of electronic air navigation applications for digital data. The coverage areas for sets of electronic terrain and obstacle data shall be specified as:

— Area 1: the entire territory of a State;

— Area 2: within the vicinity of an aerodrome, subdivided as follows;

— Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists.

— Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;

— Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and

— Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest;

— Area 3: the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway centre line and 50 m from the edge of all other parts of the aerodrome movement area.

— Area 4: The area extending 900 m prior to the runway threshold and 60 m each side of the extended runway centre line in the direction of the approach on a precision approach runway, Category II or III.

~~3.14~~3.15 Electronic terrain data shall be provided for Area 1 and 4. The obstacle data shall be provided for obstacles in Area 1 higher than 100 m above ground.

Note 1 - Comprehensive guidance material concerning eTOD is contained in Annex 15; the Guidelines for electronic terrain, obstacle and aerodrome mapping information (Doc 9881) and the EUROCONTROL Terrain and Obstacle Data Manual.

Note 2 – Description and method of obtaining of the eTOD should be defined in AIP GEN 3.1.6.

AIM/SWIM RELATED MODULES

3.16 Performance Improvement Area 2 (Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management) focuses on ASBU Modules which mainly support Collaborative Decision Making (CDM) through Information Management (i.e. Aeronautical Information, MET, Flight and Flow, etc.) in a SWIM environment. PIA 2 includes 11 Modules over 4 blocks as follows.

Note – Information on SWIM could be found in the ICAO Manual on System Wide Information Management (SWIM) Concept (DOC 10039).~~:~~

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PERFORMANCE IMPROVEMENT AREA 2: GLOBALLY INTEROPERABLE SYSTEMS AND DATA – THROUGH GLOBALLY INTEROPERABLE SYSTEM WIDE INFORMATION MANAGEMENT			
BLOCK 0 (2013)	***BLOCK 1 (2018)***	***BLOCK 2 (2023)***	***BLOCK 3 (2028)***
B0-FICE Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	**B1-FICE** Increased Interoperability, Efficiency and Capacity though FF-ICE, Step 1 application before Departure	**B2-FICE** Improved Coordination through multi-centre Ground-Ground Integration: (FF-ICE/1 and Flight Object, SWIM)	**B3-FICE** Improved Operational Performance through the introduction of Full FF-ICE
B0-DATM Service Improvement through Digital Aeronautical Information Management	**B1-DATM** Service Improvement through Integration of all Digital ATM Information		
	B1-SWIM Performance Improvement through the application of System-Wide Information Management (SWIM)	**B2-SWIM** Enabling Airborne Participation in collaborative ATM through SWIM	
B0-AMET Meteorological information supporting enhanced operational efficiency and safety	**B1-AMET** Enhanced Operational Decisions through Integrated Meteorological Information (Planning and Near-term Service)		**B3-AMET** Enhanced Operational Decisions through Integrated Meteorological Information (Near-term and Immediate Service)

CHAPTER 4

AIM NATIONAL PLANNING AND IMPLEMENTATION

AIM NATIONAL PLANNING

4.1 States should focus on the implementation of phase II and III of the ICAO Roadmap for the transition from AIS to AIM and take into consideration the "MID Region AIM implementation Roadmap" in planning for the transition from AIS to AIM in a prioritized manner

4.2 States are required to develop/update their National AIM Implementation Roadmap on an annual basis (by end of December), using the Template at **Appendix A** (National AIM Implementation Roadmap Template) and provide their feedback, lessons learned and difficulties to the ICAO MID Office for further assistance, as necessary.

IMPLEMENTATION OF A SYSTEM FOR AIRAC ADHERENCE MONITORING

4.3 Operationally significant changes to the AIP, listed in Annex 15, Appendix 4 shall be published in accordance with AIRAC procedures and shall be clearly identified by the acronym — AIRAC.

4.4 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a NOTAM called "Trigger NOTAM" shall be originated giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement.

4.5 The Trigger NOTAM shall be issued as soon as possible, preferably at the publication date of the AIRAC AIP Amendment or the AIP Supplement. This NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid for a period of fourteen days.

4.6 The text in Item E) should start with the words 'TRIGGER NOTAM' (followed only in the case of an AIP Amendment by the abbreviation PERM), the reference number of the published AIP Amendment or AIP Supplement concerned, the effective date and a brief description of its contents.

4.7 Trigger NOTAM shall be issued in the appropriate NOTAM series, according to the information to be promulgated and shall follow the normal NOTAM procedures.

Example:

Q) HECA/QARTT/I/BO/000/999
A) HECC B) 1704270000 C) 1705102359
E) TRIGGER NOTAM – PERM AIRAC AIP AMDT 4/17 WEF 27 APR 2017.
IMPLEMENTATION OF NEW ATS ROUTE UL111.

Note – the term 'PERM' is inserted in Item E) to stress that Item C) contains an artificial end-date and that the information is of a permanent nature.

4.8 When information has not been submitted by the AIRAC date, a NIL notification

shall be originated and distributed by NOTAM or other suitable means, not later than one cycle before the AIRAC effective date concerned.

4.9 Implementation dates other than AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work and/or for updating of navigation databases.

4.10 Information provided under the AIRAC system in paper copy form shall be distributed by the AIS unit at least 42 days in advance of the effective date with the objective of reaching recipients at least 28 days in advance of the effective date. Information provided as electronic media, concerning the circumstances listed in Annex 15, Appendix 4 shall be distributed/made available by the AIS unit so as to reach recipients at least 28 days in advance of the AIRAC effective date.

Recommendation *– Whenever major changes are planned and where advance notice is desirable and practicable, information provided as electronic media should be distributed/made available at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.*

4.11 AIS/AIM units should:

1) raise the awareness of the Data Originators regarding the AIRAC provisions; and

2) include necessary procedures related to AIRAC adherence in the arrangement with the Data Originators.

4.12 States should implement a system for AIRAC adherence monitoring and report on annual basis (by 31 December) to the ICAO MID Regional Office the case(s) of late publication of aeronautical information of operational significance and non-adherence to the AIRAC provisions. **Appendix B** could be used as a monitoring and reporting tool in the AIRAC adherence.

4.13 List of AIRAC effective dates for 201~~7~~8 to 2021 is as follows:

~~2017~~	2018	2019	2020	2021
~~05 January~~	04 January	03 January	02 January	28 January
~~02 February~~	01 February	31 January	30 January	25 February
~~02 March~~	01 March	28 February	27 February	25 March
~~30 March~~	29 March	28 March	26 March	22 April
~~27 April~~	26 April	25 April	23 April	20 May
~~25 May~~	24 May	23 May	21 May	17 June
~~22 June~~	21 June	20 June	18 June	15 July
~~20 July~~	19 July	18 July	16 July	12 August
~~17 August~~	16 August	15 August	13 August	09 September
~~14 September~~	13 September	12 September	10 September	07 October
~~12 October~~	11 October	10 October	08 October	04 November
~~09 November~~	08 November	07 November	05 November	02 December
~~07 December~~	06 December	05 December	03 December	30 December
			31 December	

AIR NAVIGATION DEFICIENCIES

4.14 A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

4.15 Priority for action to remedy a deficiency is based on the following safety assessments:

'U' priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions. Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

'A' priority = Top priority requirements necessary for air navigation safety. Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

'B' priority = Intermediate requirements necessary for air navigation regularity and efficiency. Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

4.16 MIDANPIRG is responsible to identify and address specific deficiencies in the air navigation field and to facilitate the development and implementation of an action plan by States to resolve identified deficiencies, where necessary.

4.17 States are required to use the MID Air Navigation Deficiency Database (MANDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies, including the submission of a specific Corrective Action Plan (CAP) for each deficiency. Each State MANDD Focal Point is given the required credential and MANDD is accessible at: http://www.icao.int/mid

4.18 A Sample State's Corrective Action Plan (CAP) is provided as Appendix C for assistance to States in developing their CAPs for the Air Navigation Deficiencies.

4.19 States are required to submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDD.

HUMAN RESOURCE AND TRAINING

4.20 Within the context of the established quality management system, the competencies and the associated knowledge, skills and abilities required for each function shall be identified, and personnel assigned to perform those functions shall be appropriately trained. Processes shall be in place to ensure that personnel possess the competencies required to perform specific assigned functions. Appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

Note - Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (Doc 9991).

CHAPTER 5

REPORTING AND MONITORING

MID eANP VOLUME III

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5.1 The status of implementation is reported and monitored by the AIM Sub-Group and through the B0-DATM Tables contained in the MID eANP Volume III. the MID eANP is available on the ICAO MID website at: http://www.icao.int/MID/Pages/MIDeANP.aspx

REGIONAL PERFORMANCE DASHBOARD

5.2 The 38th Assembly approved the Regional Performance Dashboards. The Dashboards aim to provide a glance of both Safety and Air Navigation Capacity and Efficiency strategic objectives, using a set of indicators and targets based on the regional implementation of the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan (GANP).

5.3 ICAO introduced the Regional Performance Dashboards as a framework of nested reporting of results with an increased focus on implementation. The initial version of the dashboard shows the globally agreed targeted performance at the regional level and contains graphics and maps with a planned expansion to include regionally agreed targets and the Aviation System Block upgrades (ASBU) Block 0 Modules (i.e. AIM National Plan/Roadmap, AIXM, eAIP, eTOD, WGS-84 and QMS).

5.4 For the first edition of the Regional Performance Dashboards, the implementation of 3 steps from Phase I of the ICAO Roadmap for transition from AIS to AIM (AIRAC, QMS and WGS-84) is monitored. The dashboard can be accessed on the ICAO website at: http://www.icao.int/safety/Pages/Regional-Targets.aspx.

5.5 It is agreed that in the expansion of the MID Regional Performance Dashboard, AIM National Roadmap, AIXM 5+, eAIP, eTOD Area 1 and 4 should be added to the MID Region Dashboard.

MID REGION AIR NAVIGATION REPORT

5.6 ~~MIDANPIRG/16 endorsed the first MID Region Air Navigation Report 2016.~~ The objective of the MID Region Air navigation Report is to monitor the status of implementation of the priority 1 ASBU Block 0 Modules in the MID Region as well as the outlook of ASBU implementation in 2020. The MID Region Air Navigation Report will be an annual document for reporting and monitoring the ASBU implementation in the MID Region. The Report is available on the ICAO MID Office website at: http://www2010.icao.int/MID/Pages/default.aspx

~~DEVELOPING A~~ METHODOLOGY FOR REPORTING THE PROGRESS OF AIM IMPLEMENTATION

5.7 "*Methodology for assessing and reporting the progress of transition from AIS to AIM*" (endorsed by MIDANPIRG/15) aims to develop a uniform method and plan for the reporting by the States on the progress achieved for the AIM transition, based on the ICAO Roadmap for

Transition from AIS to AIM. The ICAO air navigation planning and implementation performance framework requires that reporting, monitoring, analysis and review activities be conducted on a cyclical, annual basis (ICAO DOC 9750). The Methodology is used while collecting data for monitoring the progress achieved in the transition from AIS to AIM and for the purpose of Regional Performance Dashboard, MID eANP, etc.

~~5.8 MIDANPIRG/15 meeting (Bahrain, 8-11 June 2015) reviewed the draft Methodology for reporting and assessing the progress related to the transition from AIS to AIM, as an initial MID Regional framework for monitoring the progress achieved for the AIM transition.~~

METHODOLOGY FOR REPORTING AND ASSESSING THE PROGRESS RELATED TO THE TRANSITION FROM AIS TO AIM

Element (Phase/Step/Step No.)			Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1			2	3	4	5
Phase 1						
AIRAC adherence		P-03	FC/NC	- Implementation of a system for AIRAC adherence monitoring (compliance with annex 15 AIRAC provisions) (TBD) - AIRAC adherence monitoring questionnaire (???)	Block 0	
WGS-84 implementation		P-05	FC/PC/NC	National AIP GEN 2.1.3 'Geodetic reference datum' provides information about the implementation of WGS-84 in ENR, Terminal and AD	Block 0	
QMS		P-17	FC/NC	ISO 9001 Certification	Block 0	
Phase 2						
Data quality monitoring		P-01	FI/NI	QMS (P-17) and Agreement with data originators (P-18) is implemented (TBD)	Block 0	
Data integrity monitoring		P-02				*Linked to P-01*
Integrated aeronautical information database	AIXM-based AIS Database	P-06	FI/NI	National aeronautical data and information is stored and maintained in AIXM-based AIS database	Block 0	*Structured AI Database with digital exchange capabilities (AIXM 5.1)*
	Implementation of IAID		FI/PI/NI	Implementation of a database providing eAIP (text, tables and charts) and NOTAM, linked to the terrain/obstacles and aerodrome mapping datasets (TBD)	Block 1	
Unique identifiers		P-07				*Linked to P-06*
Aeronautical information conceptual model		P-08				*Linked to P-06*
Electronic AIP		P-11	FI/NI	National AIP GEN 3.1.3 'Aeronautical publications' provides information about the availability of the National AIP in electronic format (eAIP)	Block 0	
Terrain	Area 1	P-13	FC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained	Block 0	
	Area 4	P-13	FC/PC/NC or N/A	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset for specific CAT II/III RWY can be obtained. States should indicate in remarks the number of existing CAT II/III RWY. N/A	Block 0	*In case of PC, list name of CAT II/III ADs having the dataset*

Commented [AN6]: Finalization/Compliance Criteria be reviewed

Commented [AN7]: UAE Comment: ISO 9001 statement may be too prescriptive. In ICAO Annex 15, 3.7.3, the ISO 9000 series is indicated as a recommended practice, not a standard. Perhaps this particularity should be indicated here

Commented [AN8]: UAE Comment: This is a misleading guidance and a mix-up of the concepts. The aeronautical databases do not need to be AIXM-based. In fact, modelling a database from AIXM is over-prescriptive and cost ineffective, since AIXM evolves in time, which means the database would need to be aligned constantly. A database should be developed from the operational requirements and be performance-based, while the AIXM should be used only for the development of the exchange layers /

Element (Phase/Step/Step No.)			Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1			2	3	4	5
				for States with no CAT II/III RWY.		
	Area 2a	P-13	FC/PC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained. States should indicate in remarks the number of AD eligible for provision of Area 2 data~~. This number should come from the Regional~~(ref MID eANP Table AOP ~~I~~I-1~~) for aerodromes with one of the following designation:~~ ~~— RS: international scheduled air transport, regular use~~ ~~— RNS: international non-scheduled air transport, regular use~~ ~~— RG: international general aviation, regular use.~~	Block 0	*In case of PC, list name of ADs having the dataset*
	Take-off flight path area	P-13	FC/PC/NC	Same as Terrain Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
	An area bounded by the lateral extent of the aerodrome obstacle limitation surfaces	P-13	FC/PC/NC	Same as Terrain Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
Obstacles	Area 1	P-14	FC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained	Block 0	
	Area 4	P-14	FC/PC/NC or N/A	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset for specific CAT II/III RWY can be obtained. States should indicate in remarks the number of existing CAT II/III RWY. N/A for States with no CAT II/III RWY.	Block 0	*In case of PC, list name of CAT II/III ADs having the dataset*
	Area 2a	P-14	FC/PC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained. States should indicate in remarks the number of AD eligible for provision of Area 2 data~~. This number should come from the Regional~~(ref MID eANP Table AOP ~~I~~I-1~~) for aerodromes with one of the following designation:~~	Block 0	*In case of PC, list name of ADs having the dataset*

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Element (Phase/Step/Step No.)		Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1		2	3	4	5
			— RS: international scheduled air transport, regular use — RNS: international non-scheduled air transport, regular use — RG: international general aviation, regular use.		
	objects in the take-off flight path area which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area	P-14	FC/PC/NC	Same as Obstacles Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
	penetrations of the aerodrome obstacle limitation surfaces	P-14	FC/PC/NC	Same as Obstacles Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
Aerodrome mapping		P-15	FI/PI/NI	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained	Block 1	*In case of PC, list name of ADs having the dataset*
Phase 3						
Aeronautical data exchange		P-09	FI/PI/NI	Direct data exchange between AIS and data originators/users (TBD)	Block 1	*In case of PC, list name of Units (Data Originators/Users)*
Communication networks		P-10				
Aeronautical information briefing		P-12	FI/PI/NI	Provision of preflight aeronautical information briefing at the international aerodromes (TBD) Mandatory for international aerodromes contained in the Regional MID eANP Table AOP II-1 — for aerodromes with one of the following designation: — RS: international scheduled air transport, regular use — RNS: international non-scheduled air transport, regular use — RG: international general aviation, regular use.	Block 1	*In case of PC, list name of ADs providing AI briefing*

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Element (Phase/Step/Step No.)		Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1		**2**	**3**	**4**	**5**
Training	P-16				
Agreement with data originators	P-18	FI/PI/NI	Signed agreements between AIS and ANSPs (ATM, CNS, etc.), Aerodromes and Military	Block 0	*In case of PC, list name of Data Originator(s)*
Interoperability with meteorological products	P-19				*Linked to P-12*
Electronic aeronautical charts	P-20	FI/NI	National AIP GEN 3.2 'Aeronautical Charts provides information about the availability of the e-Aeronautical Charts	Block 1	
Digital NOTAM	P-21	FI/NI	TBD	Block 1	

FC: Fully Compliant; PC: Partially Compliant; NC: Not Compliant; FI: Fully Implemented; PI: Partially Implemented; NI: Not Implemented; N/A: Not Applicable

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APPENDICES

APPENDIX A: NATIONAL AIM IMPLEMENTATION ROADMAP TEMPLATE

Commented [AN9]: Updated National Roadmap Template (by AIM SG/3) was inserted

STATE	
DATE	

Phase/Step	Step No.	Timeline							Start	End	Remarks
		2016	2017	2018	2019	2020	2021	2022			
Phase I											
AIRAC adherence	P-03										
WGS-84	P-05										
QMS	P-17										
Phase II											
Data Quality Monitoring	P-01										
Data Integrity Monitoring	P-02										
AIXM	P-06										
Unique identifiers	P-07										
Aeronautical Information Conceptual Model	P-08										
eAIP	P-11										
Terrain Area 1	P-13										
Obstacle Area 1	P-14										
Terrain Area 4	P-13										
Obstacle Area 4	P-14										
Terrain Area 2	P-13										Please specify implementation of Area 2a, 2b, 2c and/or 2d
Obstacle Area 2	P-14										Please specify implementation of Area 2a, 2b, 2c and/or 2d
Terrain Area 3	P-13										

Obstacle Area 3	P-14												
AD Mapping	P-15												
Phase III													
Aeronautical data exchange	P-09												
Communication networks	P-10												
Aeronautical information briefing	P-12												
Training	P-16												
Agreement with data originators	P-18												
Interoperability with METproducts	P-19												
Electronic aeronautical charts	P-20												
Digital NOTAM	P-21												

Legend		Not Started
		In Progress
		Implemented

APPENDIX B: AIRAC ADHERENCE MONITORING

YEAR: ……..~~2016~~			**STATE: …….**		
AIRAC EFF Date	**AIRAC AMDT Serial Number; or NIL Notification**	**AIRAC AMDT PUB/Distribution Date**	**Trigger NOTAM (Serial Number)**	**No change until 28 days after EFF Date? (Yes / No)**	**Remarks**
~~7 JAN 16~~	- AIRAC xx/~~16~~xx; or - NIL notification issued on …….				
~~4 FEB 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~3 MAR 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~31 MAR 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~28 APR 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~26 MAY 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~23 JUN 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~21 JUL 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~18 AUG 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~15 SEP 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~13 OCT 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~10 NOV 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				
~~8 DEC 16~~	- AIRAC xx/xx; or - NIL notification issued on …….				

APPENDIX C: SAMPLE STATE'S CORRECTIVE ACTION PLAN

DEFICIENCY DESCRIPTION		**PRIORITY** *(U/A/B)*
		RATIONALE *F:Financial, H:HR, S:State, O:Other*
STATE'S COMMENTS/OBSERVATION		
CORRECTIVE ACTION(S) PROPOSED	**ACTION OFFICE/BODY**	**DATE OF COMPLETION**

REFERENCES

- ICAO Annex 15 – *Aeronautical Information Services*
- ICAO ~~Doc~~ DOC 9750 – *Global Air Navigation Plan*
- ICAO DOC 9854 – *Global ATM Operational Concept*
- ICAO DOC 10039 – *Manual on System Wide Information Management (SWIM) Concept*
- ICAO Roadmap for the transition from AIS to AIM
- EUROCONTROL Guidelines – Operating procedures for AIS Dynamic Data (OPADD)
- EUROCONTROL Specifications for the electronic Aeronautical Information Publication (eAIP)
- EUROCONTROL Terrain and Obstacle Data Manual
- MIDANPIRG/15 Report
- MID Doc 002 – MID Region Air Navigation Strategy
- MSG/4 Report
- http://www.aixm.aero
- http://www.icao.int/airnavigation/Documents/ICAO_AN%20Report_EN_final_30042014.pdf
- http://www.icao.int/airnavigation/IMP/Pages/default.aspx
- http://www.icao.int/safety/ais-aimsg/Pages/default.aspx
- http://www.icao.int/safety/Pages/Regional-Targets.aspx.
- https://portal.icao.int/RO_MID/Pages/MIDDocs.aspx
- https://portal.icao.int/space/anp/Pages/Home.aspx

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