



International Civil Aviation Organization

MIDANPIRG AIM Sub-Group

Second Meeting (AIM SG/2)
(Kish Island, Iran, 31 August-2 September 2015)

Agenda Item 4: Performance Framework for AIM implementation in the MID Region

DEVELOPMENT OF THE MID DOC “MID REGION GUIDANCE FOR AIM IMPLEMENTATION”

(Presented by the Secretariat)

SUMMARY
This paper presents draft MID Doc “MID Region guidance for AIM implementation”.
Action by the meeting is at paragraph 3.
REFERENCES
- MIDANPIRG/15 Report

1. INTRODUCTION

1.1 MIDANPIRG/15 (Bahrain, 8-11 June 2015) agreed that the plans, procedures, guidance materials, etc. related to the Middle East Region be published as MID Doc. List of endorsed/published MID Docs which are available on the ICAO Secure Portal (RO_MID) at https://portal.icao.int/RO_MID/Pages/MIDDocs.aspx are as follows:

Serial	Title
Doc 001	MIDANPIRG Procedural Handbook
Doc 002	MID Air Navigation Strategy
Doc 003	MID Region ATM Contingency Plan
Doc 004	MID High Level Airspace Concept
Doc 005	MID SSR CMP
Doc 006	MID Region AIDC-OLDI Implementation Guidance
Doc 007	MID Region PBN Implementation Plan

2. DISCUSSION

2.1 AIM implementation has always been a challenge for the States in the transition from AIS to AIM. Further to the AIS/MAP TF/6 Draft Conclusion 6/1, a survey was carried out in 2011 related to the transition from AIS to AIM. The majority of States that have replied to the questionnaire confirmed that they are encountering/expecting some difficulties during the transition from AIS to AIM, inter alia, **lack of detailed ICAO guidance material.**

2.2 The meeting may wish to recall that, the AIM SG/2 reviewed the survey carried out in April 2014 to identify the main difficulties faced by States for the development/update of their AIS National Plans and highlighted that, many States confirmed the need for support/assistance for the development/update of their National AIM Plans/Roadmaps and for the AIM implementation.

2.3 ICAO MID Regional Office has been involved and provided support a number of initiatives to assist States with the implementation of AIM and development of National AIM Implementation Plan/Roadmap:

- MID AIM Seminar (Cairo, Egypt, 21-23 October 2008);
- Survey/Analysis on difficulties faced by States in the transition from AIS to AIM (2011);
- MIDAD Project;
- ICAO EUR/MID AIM/SWIM Seminar (Istanbul, Turkey, 14-17 May 2013);
- Establishment of AIM Sub-Group by MIDANPIRG/14 (Jeddah, Saudi Arabia, 15-19 December 2013) with new TORs
- development of the *MID Region AIM Implementation Roadmap*;
- development of the *National AIM Implementation Roadmap Template*;
- defining clear elements for the B0-DATM together with their indicators, metrics and targets, through the MID Region Air Navigation Strategy;
- assistance missions to States;
- an Interregional Seminar (SIP) on “Service Improvement through Integration of Digital AIM, MET and ATM Information” to be held in 2017 is being planned; and
- development of draft MID Doc 00X “*MID Region guidance for AIM implementation*” (in progress)

2.4 In this regard, a recent support to AIM Implementation in the MID Region has been the development of a Regional Guidance Material on the AIM Implementation. MID Doc 00X “*MID Region guidance for AIM implementation*” is 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 and provides guidance and tools for their implementation at the National level.

2.5 The AIM guidance material is prepared in accordance with ICAO provisions related to AIM, 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.

2.6 The 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 MID Region Guidance for AIM Implementation will be reviewed and updated by the AIM Sub-Group.

3. ACTION BY THE MEETING

3.1 The meeting is invited to review and update the draft MID Doc 00X “*MID Region guidance for AIM implementation*” at **Appendix A**.



AIM SG/2-WP/5
APPENDIX A

MID Doc 00x

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

MID REGION GUIDANCE FOR AIM IMPLEMENTATION

EDITION **SEPTEMBER, 2015**

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontier or boundaries.

RECORD OF AMENDMENTS

Edition Number	Edition Date	Description	Pages Affected
0.1	1 September 2015	Initial version	All

TABLE OF CONTENTS

FOREWARD	6
Abbreviations and Acronyms	7
CHAPTER 1 – ICAO AIM Concept.....	9
Introduction.....	9
Transition from AIS to AIM.....	9
ICAO Roadmap for the transition from AIS to AIM.....	9
AIS-AIM Study Group	11
Information Management Panel (IMP).....	11
CHAPTER 2 – AIM Implementation in the MID Region	12
Introduction.....	12
MID Region AIM Implementation Roadmap	12
Methodology for assessing and reporting the progress of transition from AIS to AIM	14
Global Air Navigation Report	14
Regional Performance Dashboard	14
MID eANP.....	14
CHAPTER 3 – ASBU Methodology and AIM/SWIM related ASBU Modules	22
ASBU Methodology	22
MID Region Air Navigation Strategy.....	22
Block 0 AIM related Module	22
B0-DATM Implementation.....	22
<i>Aeronautical Information Exchange Model (AIXM)</i>	24
<i>electronic AIP (eAIP)</i>	25
<i>Quality Management System (QMS)</i>	26
<i>World Geodetic System-1984 (WGS-84)</i>	26
<i>electronic Terrain and Obstacle Dataset (eTOD)</i>	26

AIM/SWIM related Modules	27
CHAPTER 4 – AIM National Planning and Implementation.....	29
National Planning/Business Plan	29
Air Navigation Deficiencies.....	29
Human Resource and Training	29
APPENDICES	30
Appendix A – National AIM Implementation Roadmap Template.....	31
Appendix B – Sample State’s Corrective Action Plan.....	33
References.....	34

FOREWARD

The MID Region Guidance for AIM Implementation has been developed in 2015 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 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 MID Region Guidance for AIM Implementation will be reviewed and updated, whenever deemed necessary, by the AIM Sub-Group.

First version of the guidance material, consolidated by the ICAO MID Regional Office, was reviewed by **AIM SG/2** meeting and endorsed by **MSG/5 meeting**.

The AIM guidance material was prepared in accordance with ICAO provisions related to AIM, 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 to take necessary measures to implement provisions of this document and notify their experiences and practices related to transition from AIS to AIM.

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 Standards Organization
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 Aeronautical Information Management (AIM) during its evolution has been defined as the provision of the right Aeronautical Information (quality assured), at the right place (digital), 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 The Twelfth Air Navigation Conference (AN-Conf/12) held in Montréal, 19 to 30 November 2012, through Recommendation 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 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 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 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.

1.6 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.

– *Phase 2 — Going digital*

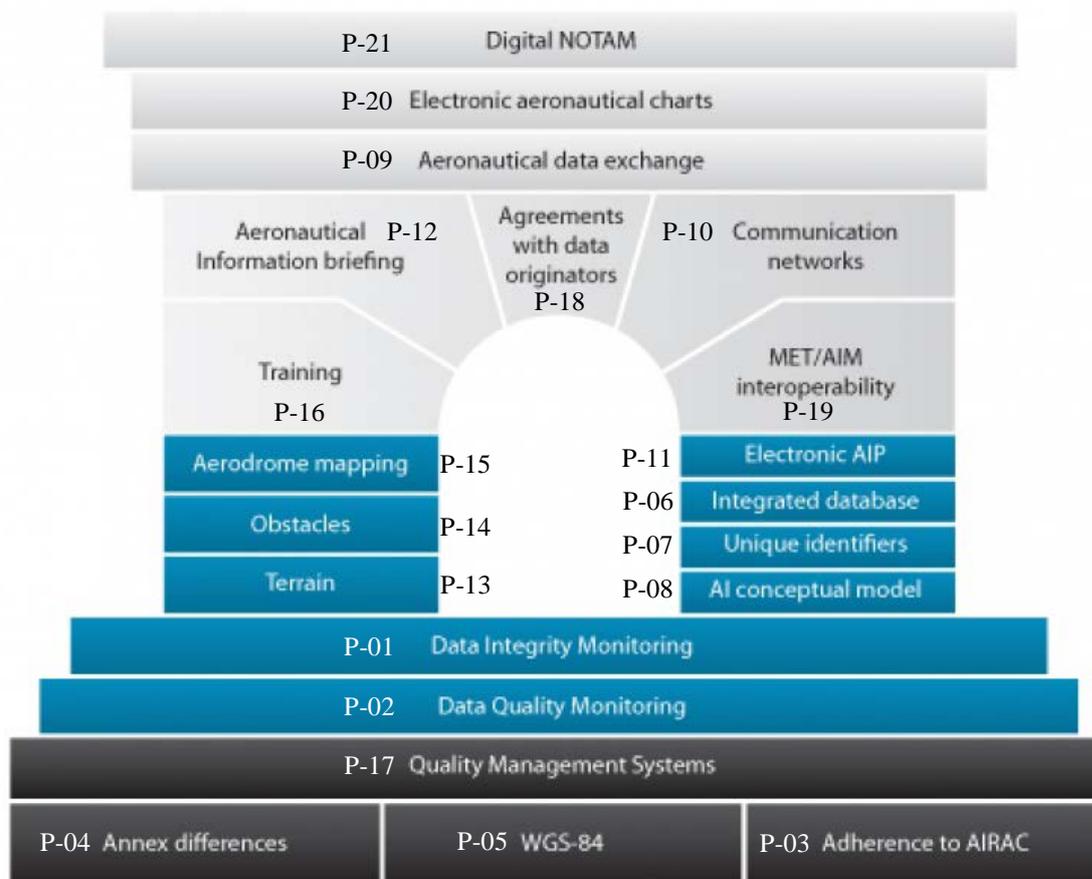
Main components of the Phase 2 are:

- 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

AIS-AIM Study Group

1.7 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 Some achievements of the AIS-AIM Study Group are:

- ICAO Roadmap for transition from AIS to AIM;
- Amendments to Annex 15:
 - 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 XX: 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).
- Development of Aeronautical Data Catalogue (in progress)
- Development of PANS AIM (in progress)
- Development of Training Manual, Quality Manual, update of AIS Manual (Doc 8126) (in progress)

1.9 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 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). 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

AIM IMPLEMENTATION IN THE MID REGION

INTRODUCTION

2.1 Since the introduction of the Aeronautical Information Management, numerous Regional initiatives have been carried out to facilitate and assist MID States with the implementation of AIM. Some of the initiatives are, but not limited, as follows:

- MID AIM Seminar (Cairo, Egypt, 21-23 October 2008)
- Survey on difficulties faced by States in the transition from AIS to AIM (2011)
- MIDAD Project
 - o Initial MIDAD Study (carried out in 2011)
 - o MIDAD Detailed Study (ongoing)
 - o Establishment of MIDAD SG*/STG/TF
- ICAO EUR/MID AIM/SWIM Seminar (Istanbul, Turkey, 14-17 May 2013)
- Regional initiative to assist States with the development of AIM National Plans/Roadmaps
- Establishment of AIM Sub-Group by MIDANPIRG/14 (Jeddah, Saudi Arabia, 15-19 December 2013) with new TORs
- MID Region AIM Implementation Roadmap

MID REGION AIM IMPLEMENTATION ROADMAP

2.2 AIM SG/1 meeting (Cairo, Egypt, 6-8 May 2014) with a focus on the implementation of phase II of the Roadmap for the transition from AIS to AIM, developed “MID Region AIM implementation Roadmap”. The MSG/4 meeting (Cairo, Egypt, 24-26 November 2014) endorsed the “MID Region AIM implementation Roadmap” and invited States to take into consideration the Roadmap in planning for the transition from AIS to AIM in a prioritized manner.

MID REGION AIM IMPLEMENTATION ROADMAP

	2014				2015				2016				2017				2018				Priority	Remarks
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
AIXM	Yellow	Orange	Green	Green	Green	Green	1	The target is to have 60% by 2015, 80% by 2017 and 100% by 2019														
eAIP	Yellow	Orange	1	The target is to have 60% by 2016, 70% by 2018 and 100% by 2020																		
Terrain A-1	Yellow	Orange	2	The target is to have 50% by 2015, 70% by 2018																		
Obstacle A-1	Yellow	Orange	2	The target is to have 40% by 2015, 60% by 2018																		
Terrain A-4	Yellow	Green	2	The target is to have 50% by 2015, 100% by 2018																		
Obstacle A-4	Yellow	Green	2	The target is to have 50% by 2015, 100% by 2018																		
Terrain A-2a	White	Yellow	Orange	Orange	Orange	Orange	3	The target is to have 30% by 2017, 50% by 2018														
Obstacle A-2a	White	Yellow	Orange	Orange	Orange	Orange	3	The target is to have 30% by 2017, 50% by 2018														
Data Quality Monitoring	Yellow	3	Target for 2018: To be implemented by 50% of the States that have implemented QMS at least for the segment originator-AIS (excluding the segment AIS-End user)																			
Data Integrity Monitoring	Yellow	3																				
Agreement with data originators	Yellow	3	Target for 2018: 50% of the States that have implemented QMS																			
Terrain and Obstacle for Areas 2b, 2c, 2d and 3	White	4	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	White	4	Optional based on the States’ decision to be reflected in the States’ national Regulations and AIM National Plans, in accordance with operational needs																			

White: Not started Yellow: Initial Target Orange: Intermediate Target Green: Target for full implementation

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

2.3 “Methodology for assessing and reporting the progress of transition from AIS to AIM” 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 the purpose of Global Air Navigation Report, Regional Performance Dashboard, MID eANP, etc.

2.4 MIDANPIRG/15 meeting (Bahrain, 8-11 June 2015) reviewed a draft Methodology for reporting and assessing the progress related to the transition from AIS to AIM, developed by AIM SG/1, as an initial MID Regional framework for monitoring the progress achieved for the AIM transition.

Global Air Navigation Report

2.5 In light of all important safety and efficiency goals, set forth by the Global Safety plan and the Global Air Navigation Plan, ICAO has sought to drive improved accountability and transparency with respect to how the global network is succeeding against its strategic goals. Global Air Navigation Report was introduced in 2014, on an annual basis, to begin measuring global aviation’s progress against its consensus-driven ASBU, Performance-based Navigation (PBN), AIM and other efficiency priorities. The Global Air Navigation Report can be accessed through ICAO Website at:

http://www.icao.int/airnavigation/Documents/ICAO_AN%20Report_EN_final_30042014.pdf

Regional Performance Dashboard

2.6 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).

2.7 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).

2.6 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>.

MID eANP

2.7 Further to the 12th Air Navigation Conference (AN-Conf/12) Recommendation 6/1 [Regional performance framework – planning methodologies and tools] regarding the alignment of regional air navigation plans (ANP) with the Fourth Edition of the Global Air Navigation Plan (GANP) (Doc 9750), the ICAO Council approved the new eANP Template (Volumes I, II and III) and corresponding procedure for amendment on 18 June 2014 (202nd session, fourth meeting). MIDANPIRG/15 reviewed and endorsed the MID eANP VOL I, II and III which is available on the ICAO Secure Portal at: <https://portal.icao.int/space/anp/Pages/Home.aspx>

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

I. Introduction

Transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM) is a high-priority area for air navigation progress. This is a strategic positioning initiative to drive the delivery of improved aeronautical information in terms of quality, timeliness and the identification of new services and products to better serve aeronautical users (ICAO Global Air Navigation Report-2014). This methodology aims to develop a method and plan for the reporting by the States on the progress achieved for transition from AIS to AIM, based on the ICAO Roadmap for Transition from AIS to AIM.

II. Need for reporting and assessing the progress related to the 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). Data gathered would have a number of uses, inter alia:

- **ICAO monitoring functions:** a purpose of this Methodology is to meet the ICAO monitoring requirements related to air navigation planning and implementation. Reporting and monitoring results will be analyzed by ICAO and aviation stakeholders and then utilized in developing the annual Global Air Navigation Report, as well (ICAO DOC 9750).
- **Global Air Navigation Report (GANR):** all or part(s) of data would be reflected in the Global Air Navigation Report (GANR). The report results will provide an opportunity for the world civil aviation community to compare progress across different ICAO Regions in the establishment of air navigation infrastructure and performance-based procedures (ICAO DOC 9750).
- **Regional Performance Dashboards:** all or part(s) of data would be reflected in the Regional Performance Dashboards.

III. Methodology approach

Main approach of this Methodology in data collection and reporting is quantitative, based on the SMART rule. All Elements and Metrics/Indicators used for reporting should be Specific, Measurable, Achievable, Relevant and Time-bounded. Moreover, the Methodology has to reflect 4Ws (Why, What, Who and When) related to each Element. Accordingly, some steps of the ICAO Roadmap for the transition from AIS to AIM (i.e. P-02 Data integrity monitoring, P-07 Unique identifiers, P-08 AICM, P-10 Communication networks, P-16 Training and P-19 Interoperability with meteorological products) are not considered for reporting purposes, whereas they are already part of other steps and/or measurement of which could not be carried out in a quantitative manner.

IV. Data collection strategy

In order to avoid confusion using numerous reporting forms for data collection from States, the data collection intended by this Methodology would be carried out through current data collection tools (i.e. eANP Tables, etc.). Special excel sheets in support of the collection of data may be used, if needed

V. Structure of the Methodology Plan

The structure of the Methodology Plan consists of the following elements:

- 1- Element (Phase/Step/Step No.): refers to the Phase number (1-3), Step and Step number (1-21) of the ICAO Roadmap for transition from AIS to AIM. Some steps of the ICAO Roadmap for the transition from AIS to AIM (i.e. P-02, P-07, P-08, P-10, P-16 and P-19) are not considered for reporting purposes, whereas they are already part of other steps and/or measurement of which could not be carried out in a quantitative manner.
- 2- Metric/Indicator: refers to the status of compliance/implementation of step and could be e.g. FC: Fully Compliant; PC: Partially Compliant; NC: Not Compliant; FI: Fully Implemented; PI: Partially Implemented; NI: Not Implemented and N/A: Not Applicable.
- 3- Source of data (How to collect data): the main tool for the collection of data would be eANP Tables. Special excel sheets in support of the collection of data may be used, if needed.
- 4- Who will collect data: data should be collected by ICAO HQ/ICAO Regional Office.
- 5- When to collect data: data for each report would be collected in December.
- 6- Year of publishing Report: the year, on which the Reports (Global Air Navigation Report & Regional Performance Dashboard) would be published.
- 7- Remarks: any additional information, e.g. in case of status of implementation is PC; list of sub-elements that have been implemented.

VI. Methodology plan for annual reporting

Element (Phase/Step/Step No.)		Metric/ Indicator	Source of data (How to collect data)	Who will collect data*	Year of the Report	Remarks	
1		2	3	4	5	6	
Phase 1							
AIRAC adherence		P-03	FC/NC	eANP	ICAO HQ/RO	2014	
WGS-84 implementation		P-05	FC/PC/NC	eANP	ICAO HQ/RO	2014	
QMS		P-17	FC/NC	eANP	ICAO HQ/RO	2014	
Phase 2							
Data quality monitoring		P-01	FI/NI	TBD	TBD	TBD	
Data integrity monitoring		P-02	N/A	N/A	N/A	N/A	
Integrated aeronautical information database	AIXM-based AIS Database	P-06	FI/NI	eANP	ICAO HQ/RO	2015	<i>Structured Aeronautical Information Database with digital exchange capabilities (e.g. AIXM)</i> Ongoing
	Implementation of IAID		FI/PI/NI	TBD	TBD	TBD	
Unique identifiers		P-07	N/A	N/A	N/A	N/A	Linked to P-06
Aeronautical information conceptual model		P-08	N/A	N/A	N/A	N/A	Linked to P-06
Electronic AIP		P-11	FI/NI	eANP	ICAO HQ/RO	2015	Ongoing-2015
Terrain	Area 1	P-13	FC/NC	eANP	ICAO HQ/RO	2015	Ongoing-2015
	Area 4	P-13	FC/PC/NC	eANP	ICAO HQ/RO	2015	<i>In case of PC, list name of ADs</i> Ongoing-2015
	Area 2a	P-13	FC/PC/NC	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>
	Take-off flight path	P-13	FC/PC/NC	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>

Element (Phase/Step/Step No.)	Metric/ Indicator	Source of data (How to collect data)	Who will collect data*	Year of the Report	Remarks	
1	2	3	4	5	6	
area An area bounded by the lateral extent of the aerodrome obstacle limitation surfaces	P-13	FC/PC/NC	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>
Area 1	P-14	FC/NC	eANP	ICAO HQ/RO	2015	Ongoing-2015
Area 4	P-14	FC/PC/NC	eANP	ICAO HQ/RO	2015	<i>In case of PC, list name of ADs</i> Ongoing-2015
Area 2a	P-14	FC/PC/NC	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>
Obstacles 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	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>
penetrations of the aerodrome obstacle limitation surfaces	P-14	FC/PC/NC	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of ADs</i>
Aerodrome mapping	P-15	FI/PI/NI	TBD	TBD	TBD	<i>In case of PC, list name of ADs</i>
Phase 3						
Aeronautical data exchange	P-09	FI/PI/NI	TBD	TBD	TBD	<i>In case of PC, list name of Units (Data Originators/Users)</i>
Communication networks	P-10	N/A	N/A	N/A	N/A	N/A

Element (Phase/Step/Step No.)	Metric/ Indicator	Source of data (How to collect data)	Who will collect data*	Year of the Report	Remarks
1	2	3	4	5	6
Aeronautical information briefing	P-12 FI/PI/NI	TBD	TBD	TBD	<i>In case of PC, list name of ADs</i>
Training	P-16 N/A	N/A	N/A	N/A	N/A
Agreement with data originators	P-18 FI/PI/NI	eANP	ICAO HQ/RO	2016	<i>In case of PC, list name of Data Originator(s)</i>
Interoperability with meteorological products	P-19 N/A	N/A	N/A	N/A	N/A
Electronic aeronautical charts	P-20 FI/NI	TBD	TBD	TBD	
Digital NOTAM	P-21 FI/NI	TBD	TBD	TBD	

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

** Data collection will be carried out by ICAO Headquarters and Regional Offices.*

VII. Data collection timeframe

Year of reporting	Element	Step No.	Remarks
2014	AIRAC adherence WGS-84 implementation QMS	P-03 P-05 P-17	Completed
2015	AIXM-based AIS Database Electronic AIP Terrain (Area 1 and Area 4) Obstacles (Area 1 and Area 4)	P-06 P-11 P-13 P-14	Ongoing
2016	Terrain (Area 2a) Obstacles (Area 2a) Agreement with data originators	P-13 P-14 P-18	
2017 +	TBD	TBD	

VIII. Finalization/Compliance Criteria

The Criteria by which finalization and compliance with the Metric (Step) can be realized.

Element (Step)	Finalization criteria or Implementation/Compliance Criteria (for the 2015-2016 Metrics)
AIXM-based AIS Database	National aeronautical data and information is stored and maintained in AIXM-based AIS database.
Electronic AIP	National AIP GEN 3.1.3 'Aeronautical publications' provides information about the availability of the National AIP in electronic format (eAIP)
Terrain Dataset Area 1	National AIP GEN 3.1.6 'Electronic terrain and obstacle' provides information on how the dataset can be obtained
Terrain Dataset Area 4	National AIP GEN 3.1.6 'Electronic terrain and obstacle' 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.
Terrain Dataset Area 2 ¹	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle’ 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 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.
Obstacle Dataset Area 1	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle provides information on how the dataset can be obtained
Obstacle Dataset Area 4	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.
Obstacle Dataset Area 2 ²	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle 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 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.
Agreement with data originators	TBD

¹ Data set requirements in accordance with Annex 15 (10.1.5)

² Data set requirements in accordance with Annex 15 (10.1.6)

CHAPTER 3

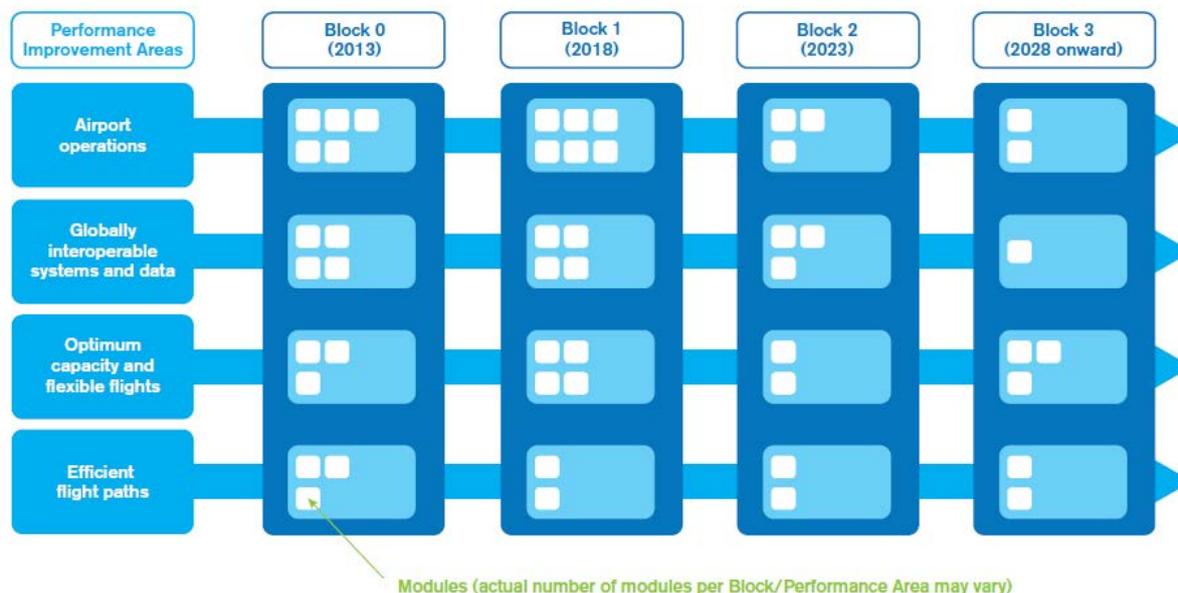
ASBU METHODOLOGY AND AIM/SWIM RELATED ASBU MODULES

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, 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 five-year time increments starting in 2013 and continuing through 2028 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 MID Region Air Navigation Strategy (MID Doc 002) was endorsed by the MSG/4 meeting (Cairo, Egypt, 24-26 November 2014) to introduce Block 0 ASBU Modules implementation priorities, elements, indicators and targets for the MID Region. It recognizes 11 (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
1- National AIM Implementation Plan/Roadmap	<i>All States</i>	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	80% by Dec. 2016 90% by Dec. 2018
2-AIXM	<i>All States</i>	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	60% by Dec. 2015 80% by Dec. 2017 100% by Dec. 2019
3-eAIP	<i>All States</i>	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)	60% by Dec. 2016 80% by Dec. 2018 100% by Dec. 2020
4-QMS	<i>All States</i>	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	70% by Dec. 2016 90% by Dec. 2018
5-WGS-84	<i>All States</i>	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (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	Horizontal: 100% by Dec. 2017 Vertical: 90% by Dec. 2018

6-eTOD	<i>All States</i>	<p>Indicator: % of States that have implemented required Terrain datasets</p> <p>Supporting Metric: Number of States that have implemented required Terrain datasets</p> <p>Indicator: % of States that have implemented required Obstacle datasets</p> <p>Supporting Metric: Number of States that have implemented required Obstacle datasets</p>	<p>Area 1 : Terrain: 50% by Dec. 2015, 70% by Dec. 2018 Obstacles: 40% by Dec. 2015, 60% by Dec. 2018</p> <p>Area 4: Terrain: 50% by Dec. 2015, 100% by Dec. 2018</p> <p>Obstacles: 50% by Dec. 2015, 100% by Dec. 2018</p>
7-Digital NOTAM*	<i>All States</i>	<p>Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p> <p>Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p>	<p>80% by Dec. 2016</p> <p>90% by Dec. 2018</p>

Aeronautical Information Exchange Model (AIXM)

3.6 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 major tenets are:

- 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.

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

electronic AIP (eAIP)

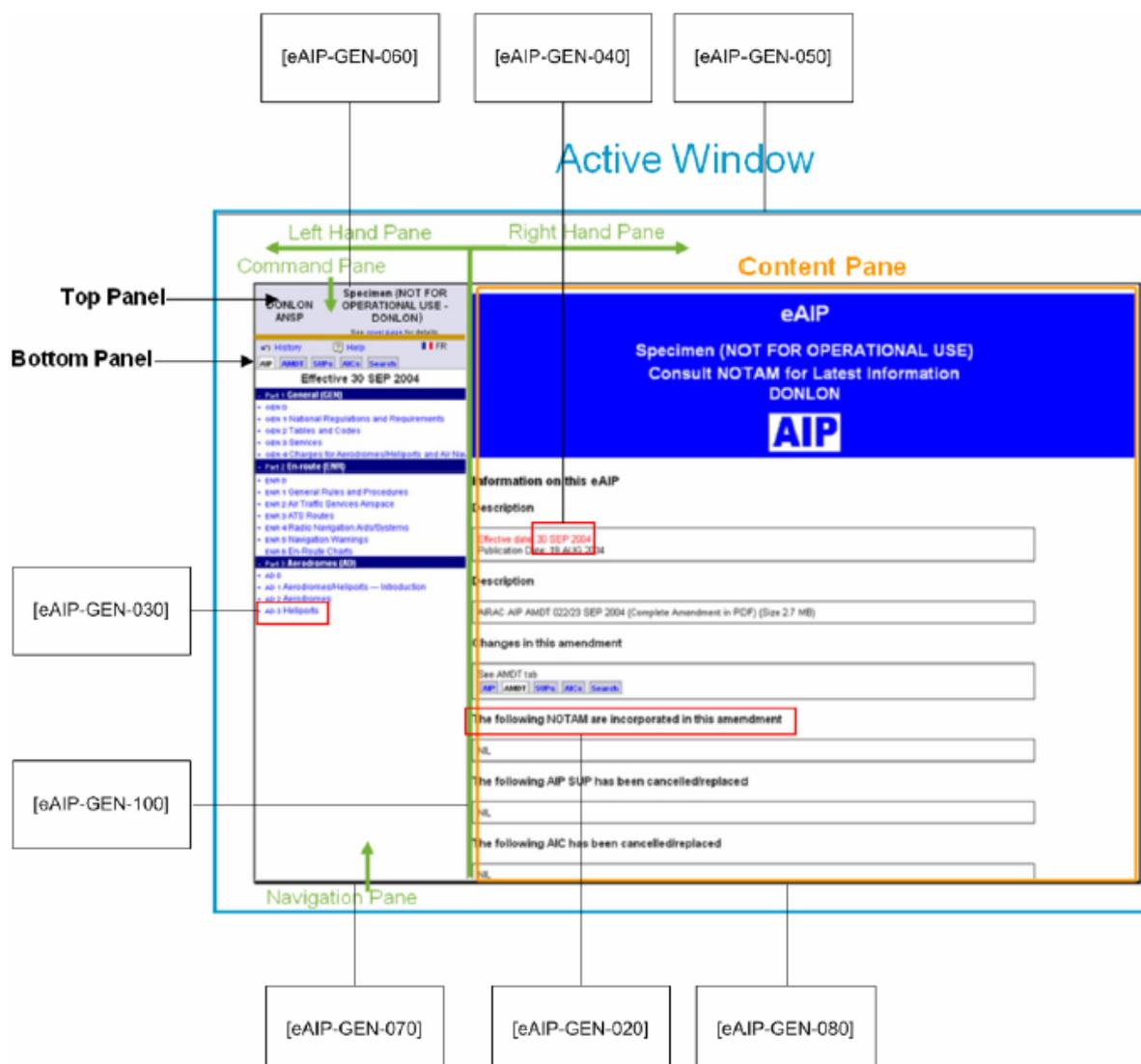
3.10 The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper. When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet. When provided, the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

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.

3.11 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:



3.13 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.

Quality Management System (QMS)

3.14 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 - 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.

World Geodetic System-1984 (WGS-84)

3.15 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.

3.16 WGS-84 shall be introduced in the published coordinates in AIP in the following sections:

- a) Enroute
- b) Terminal
- c) Aerodrome
- d) 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)

3.17 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.

3.18 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 - Comprehensive guidance material concerning eTOD is contained in Annex 15 and the Guidelines for electronic terrain, obstacle and aerodrome mapping information (Doc 9881).

AIM/SWIM RELATED MODULES

3.19 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:

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 through 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*****NATIONAL PLANNING/BUSINESS PLAN*****4.1 TBD***(Ref to Appendix A – National AIM Implementation Roadmap Template)****Air Navigation Deficiencies*****4.2 TBD***(Ref to Appendix B – Corrective action plan)****HUMAN RESOURCE AND TRAINING*****4.3 TBD**

APPENDICES

APPENDIX A

NATIONAL AIM IMPLEMENTATION ROADMAP TEMPLATE

Phase/Step	Step No.	Timeline												Start	End	Remarks	
		2014			2015			2016			2017						2018
Phase I																	
AIRAC adherence	P-03																
WGS-84 implementation	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 A-1	P-13																
Obstacle A-1	P-14																
Terrain A-4	P-13																
Obstacle A-4	P-14																
Terrain A-2	P-13																Please specify implementation of

APPENDIX B
SAMPLE STATE'S CORRECTIVE ACTION PLAN

DEFICIENCY DESCRIPTION		PRIORITY (U/A/B)
STATE'S COMMENTS/OBSERVATION		
CORRECTIVE ACTION(S) PROPOSED	ACTION OFFICE/BODY	DATE OF COMPLETION

References

- ICAO Annex 15 – Aeronautical Information Services
- ICAO Doc 9750 – Global Air Navigation Plan
- ICAO Roadmap for the transition from AIS to AIM
- EUROCONTROL Specifications for the electronic Aeronautical Information Publication (eAIP)
- 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>

- END -