



**Twentieth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/20)**  
 Salvador, Brazil, 16 – 18 November 2022

**Agenda Item 2: Global and Regional Developments**  
 2.3 Progress Report on Programs and Projects

**AIS/AIM PROGRAM REVIEW**

(Presented by the Secretariat)

<b>EXECUTIVE SUMMARY</b>	
This Working Paper refers to the activities in the area of Aeronautical Information Management (AIM/AIS), with respect to the CAR/SAM Regions.	
<b>Action:</b>	Suggested actions are presented in Section 4.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> <li>• Air Navigation Capacity and Efficiency</li> <li>• Environmental Protection</li> </ul>
<i>References:</i>	<ul style="list-style-type: none"> <li>• Global Campaign for NOTAM Improvements</li> <li>• Doc. 8126 – AIS Manual</li> <li>• Nineteenth Meeting of GREPECAS (GREPECAS/19)</li> <li>• SAM/AIM/14 follow-up meeting</li> <li>• AIM TF 04 Meeting</li> <li>• e-PPRC/04 meeting</li> <li>• AIS Documentation in Draft</li> </ul>

**1. Introduction**

1.1 ICAO has worked on updating the AIS documentation in order to make it available to the aeronautical community and support the transition from AIS to AIM.

1.2 The Secretariat has followed up on the NOTAM Global Campaign, as well as Conclusion 19/3 of GREPECAS 19.

1.3 At the regional level, the Secretariat has followed up on the recommendations and conclusions of meetings at the regional level.

1.4 Likewise, the Secretariat has delivered or plans to deliver courses and workshops to generate and strengthen capacities in the AIS/AIM area.

1.5 Additionally, the Proposal for the Seventh Edition of the Global Air Navigation Plan includes a modification of the basic constituent elements (BBB) related to AIS/AIM.

## 2. Análisis

2.1 ICAO is in the process of reviewing and updating the documents related to AIS, in order to support the Transition from AIS to AIM. In relation to this task, the following has been communicated:

- a) Document 8126 – AIS Manual: Completed Parts I, II, III and IV; Available only in English;
- b) Doc 9839 – AIS Quality Management System Manual; Under review;
- c) Doc. 9991 – AIS Personnel Training Manual; Draft version under review

2.2 As a follow-up to the NOTAM Global Campaign, the NAM/CAR/SAM Workshop on NOTAM has been held. This event was delivered in a hybrid format, from September 7 to 9, and was attended by 21 Delegates in presence format, and 100 delegates in virtual format. ICAO Headquarters (Dr. Alexander Pufahl), EAD Group and M-AIS participated as speakers.

2.3 The meeting should also note that ICAO, through the GAT, has developed courses:

- a) Aeronautical Information Quality Management (AIQM):  
<https://igat.icao.int/ated/TrainingCatalogue/Course/5639> or [5582](https://igat.icao.int/ated/TrainingCatalogue/Course/5582)
- b) Data-Centric Aeronautical Information System Operations (AIS OPS):  
<https://igat.icao.int/ated/TrainingCatalogue/Course/5640> or [5605](https://igat.icao.int/ated/TrainingCatalogue/Course/5605)
- c) AIM – OPS NOTAM WORKSHOP: Creating a high quality NOTAM

2.4 The Seventh Edition of the GANP includes modification in the BBB related to AIS/AIM. Additionally, the mapping, which includes this edition of the GANP, between the BBBs and the PQs of the USOAP Program should be considered. In this regard, this mapping would facilitate the monitoring of the implementation status of the BBBs applicable to AIM in the States.

2.5 The Secretariat has monitored, at the regional level, all issues related to AIS and the Transition from AIS to AIM, the results of which are shown below.

### CAR Region

2.6 With the objective of completing the implementation of the ICAO Roadmap for the transition from AIS to AIM, as well as the application of Amendment 41 to ICAO Annex 15 and the following Amendment (42), the reference framework will indicate the methodology and procedures that must be applied to implement the AIM and manage the information in the electronic and digital environment of the Data Sets, such as the new version of the Aeronautical Information Services Manual cited in paragraph 2.1, aiming to reinforce AIM processes and procedures, aligned with the Global Air Navigation Plan (GANP) in its latest edition.

2.7 Most of the States of the NACC Region have provided information on the progress regarding the three Phases of the Roadmap, in each of the 21 steps, as well as the current implementation status of said steps for the transition to AIM, being compiled in Excel tables for registration and analysis and evaluation of the assistance requirements to the States, by the Regional Office.

2.8 Additionally, the AIM Collaborative Plan for the CAR Region provides guidelines to States for the implementation of the 21 steps of the Roadmap, as well as the related requirements from Annex 15 and the PANS – AIM, which will be represented in the monitoring website (under development), through tables and graphs that express the progress of each State.

2.9 States that have not yet provided their information are encouraged to do so as soon as possible, since the active participation of all States, which may or may not be reflected in all States of the Region, through the AIM Website which will be available soon.

2.10 In addition to what was mentioned in paragraph 2.1, ICAO maintains its commitment to publish the guides that complement some of the most important Steps for the transition to AIM:

Manual	Availability
Doc. 9839 (including steps P-01, P-02, P-17 y P-18)	draft version
Doc. 9991 (including step P-16)	
Aeronautical Information Exchange Model (including steps P-08, P-09, P10 y P-19)	Pending by IM Panel
electronic AIP, (including steps P-11, and P-15 y P-20)	
SWIM Manual, Doc. 10039 - draft, not edited	draft version
Doc. 9881 Manual eTOD - Cancelled	Pending by IM Panel
Waiting for a new TOD Manual (including steps P-13 y P-14)	

2.11 As soon as the **CAR AIM Tracking website** is activated, States are expected to actively participate and share their information to the AIM TF and the ICAO Secretariat. This site will also contain guides to support the transition to AIM. It is estimated that a preview of the CAR AIM Tracking Website will be presented during this Meeting.

2.12 The urgent demand for the implementation of Digital Data Sets, the Data Catalog and the Aeronautical Information Exchange Standard Model (AIXM) should be accelerated to achieve information management in an electronic format that is essential for exchanging data and building an environment for SWIM.

2.13 On the other hand, the Secretariat once again urges the States to complete the Phases of the Roadmap, specifically the implementation and certification of the QMS/AIM, for those that have not yet completed it. Also, to support and actively participate in the revised **AIM Collaborative Plan for the CAR Region (Appendix E)**.

2.14 Additionally, the Data Sets and Electronic Aeronautical Charts Workshop was held with the following topics:

- Digital data set and Aeronautical Information Exchange Model (AIXM)
- Impact of digitization on AIM
- Implementing AIM 2.0 and beyond
- Building System Wide Information Management (SWIM) on a solid foundation of AIM
- Introduction to electronic charts (Phase 3 Information Management – Step 20)
- Aeronautical Cartography (Annex 4)
- Geographic Information Systems (GIS) and AD Databases, Obstacles/Terrain Points of Navigation (Nav)
- Importance of Doc 8168 - PANS OPS

2.15 Considering that the delay in the implementation of phase 2 of the Roadmap from AIS to AIM has a direct impact on the implementation of SWIM, the Secretariat considers keeping the Conclusion valid: NACC WG 06/06 “IMPLEMENTATION OF DIGITAL DATA SETS ( Digital Data Sets - DDS), OF THE e-AIP AERONAUTICAL DATA AND INFORMATION EXCHANGE MODEL (PANS AIM)” from the Working Group Meeting for the NACC Region (August 30 to September 1, 2022), with an estimated date for the implementation of the Transition to AIM no later than the end of 2025, for the CAR Region.

### SAM Region

2.16 In the SAM Region, a follow-up teleconference of the SAM/AIM/14 Recommendations has been held. Follow-up has been given on the following topics:

- a) Implementation of SNOWTAM
- b) Implementation of the QMS/AIS-AIM
- c) Planning for the implementation of Phase 2 of the Transition Roadmap from AIS to AIM (Elements of Module B1-DAIM)
- d) Follow-up to the NOTAM Global Campaign in the SAM Region

2.17 In **Appendices A, B, C, and D** you can find the follow-up tables for each of the topics mentioned, indicating that the progress presented is from the e-CRPP/4.

2.18 Additionally, in line with the creation of capacities for the Transition from AIS to AIM, the SAM Region plans to deliver the following courses:

- a) Course on Aeronautical Information Exchange Standard Model
- b) Course in electronic AIP.
- c) Coordination of ATS/AIS/MET Services: Coordination and Contingency Plans

## **3. Conclusions**

3.1 The Secretariat accompanies the implementation of Phase 2 of the AIS Roadmap in order to specify the Aeronautical Information Management in an electronic environment and prepare the enablers, from the AIM area, for the System-wide information management (SWIM).

3.2 The Secretariat, once again, would like to draw the Meeting's attention to the importance of observing the deadline of GREPECAS Conclusion 19/03 (2024) in order not to delay the implementation of SWIM.

3.3 Additionally, the Meeting may consider and highlight the importance of betting on the creation of capacities to manage all aeronautical information in an electronic environment. Training is one of the fundamental pillars to implement all the steps of the Transition Roadmap from AIS to AIM, and thus finally implement SWIM.

**4. Suggested actions**

4.1 The Meeting is invited to:

- a) note the information contained in the Working Paper;
  - b) review the Appendices and, if necessary, update them;
  - c) urge States to complete the process of implementing the elements of B1-DAIM and thus complete Phase 2 of the Roadmap; and
  - d) consider other actions.
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## APPENDIX A

**Follow-up to the Implementation of the Quality Management System in the AIS-AIM Processes, in the SAM Region**

<i>N°</i>	<i>States</i>	<i>Implemented action</i>	<i>Implementation date</i>	<i>Comments</i>
1	Argentina	They have formed a work team with all the areas involved. They have conducted tests both at airports where snow occurs and at airports that can be affected by heavy rain.	4 November 2021	There is confusion among some users due to the issuance of SNOWTAM in Airports that do not have snow events. <b>The new SNOWTAM format should be more socialized.</b> <b>NOTAM Bank migrates to CADAS</b>
2	Brazil	It has worked in a coordinated manner with all the areas involved, has issued an AIC-A 16/21 in relation to the GRF and a regulatory framework will be issued on the new SNOWTAM format.	4 November 2021 <b>1 July 2022</b>	Alternative System Differences will be communicated RCR – SNOWTAM does not have the same efficiency to inform They are going to publish SNOWTAM
3	Bolivia	Not actions were reported.	4 November 2021	The ANSP is ready to issue SNOWTAM in its new format. <b>The instructions, procedures and workshops have been carried out.</b>
4	Chile	<ul style="list-style-type: none"> <li>✓ It was included in the field training guidelines that each AD carries out annually.</li> <li>✓ DAP 15 00 regulations were updated, which is about to be published, in which the new format that will govern from November 4 was included.</li> <li>✓ A workshop will be held for all field managers during the months of October and November; this is included in the annual training plan.</li> </ul>	4 November 2021	Attached as evidence: <ul style="list-style-type: none"> <li>• TSV Guidelines (AIS) of the year 2020 which was applied in 2021 due to the pandemic.</li> <li>• Annual training plan 2020, which due to a pandemic is being applied in 2021.</li> <li>• Updated the National Regulations and the Procedure</li> <li>• SNOWTAM issuance course and procedure were carried out</li> <li>• In May 2022, the second course was held for the Staff.</li> </ul>
5	Colombia	Given the geographical location of the State, in Colombia, SNOWTAM information is not published. In compliance with what was agreed in the Virtual Mission with the ICAO Secretariat, the difference will be published in the AIP/COL part GEN-1.7. In the same way, we remain attentive to coordinate with the MET and ATS	Work is being done on the ponding. <b>Argentina will share its procedures in this case.</b>	Taking into account that the Virtual Mission was recently received and attended to, no action related to what was agreed and projected has yet been carried out.  Differences will be published

N°	States	Implemented action	Implementation date	Comments
		providers, the measures that replace or complement the notification of poor braking (if it occurs) due to a flooded runway or when its effectiveness is degraded.		
6	Ecuador	Recurring NOTAM course prepared pending execution November 2021.	January 2022 Implemented. November 2021	This course will include SNOWTAM topic Letters of Agreement with Quito and Guayaquil
7	Guyana	They have updated the system – The Focal Point for the GRF is creating a Table of Responsibility for all parties involved. The AIS has not yet defined a policy regarding the issuance of SNOWTAM in its new format	Not foreseen implementation date	
8	Panama	A workshop on SNOWTAM was held in October 2019, to the NOTAM staff. The State participated in a webinar on runway conditions.	There is no implementation date for now, for this year; possibly for the first quarter of the next year 2022.  The Circular is in process for the Signature of the Director of the AAC Meetings with Tocumen S.A. Instructive talk for AIS and ATC personnel. It is scheduled for April	Participation in the training that has prepared the AGA part.  Participation in the workshops that will prepare the air navigation services involved in this issue.  They will publish differences in relation to the format (they will use NOTAM not SNOWTAM) because the system and the template is not adapted to the new format  Tests for preparation and dissemination have already been carried out.
9	Paraguay	Paraguay has worked jointly in the regulatory area with the service provider. The new SNOWTAM format has been included in the State Standards.	4 November 2021 Implemented Procedures will be reviewed and an in situ inspection is foreseen	Technicians from the aerodrome operator, AGA and AIM waiting to participate in the GRF course
10	Peru	No differences were registered in the Regulation of Peru, the format was included in the amendment of RAP 315.	IV Quarter of 2021	It was included in the new edition of RAP 315 amendment 2, approved pre-publication, pending publication. On 28 October was published and became effective on 4 November 2021.

<i>N°</i>	<i>States</i>	<i>Implemented action</i>	<i>Implementation date</i>	<i>Comments</i>
				Differences will be published by the system (AMHS) All the trainings have been carried out at the national level.
11	Surinam	Not actions werereported	Without a defined date	
12	Uruguay	A work committee was formed with all the areas involved.	Without an stablished implementation date	A working committee was formed with all the areas involved They are not applying it but they have trained all the staff. They depend on the migration to AMHS. They alternatively implemented the issuance of warnings through the ATS.
13	Venezuela	Not actions were reported	Without an stablished implementation date	The regulator held a workshop on SNOWTAM for NOF staff Differences published by NOTAM were forwarded because the system is not ready. AGA keeps all the training records in this regard. IDS has been requested to update the new format.

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## APPENDIX B

## Follow-up to the Implementation of the Quality Management System in the AIS-AIM Processes, in the SAM Region

<i>N°</i>	<i>States</i>	<i>QMS/AIM implementation status</i>	<i>Certification date</i>	<i>Follow-up audit</i>	<i>Foreseen recertification</i>
1	Argentina	The workshops regarding the 2015 version began and they will review the Quality Manual.	Not Certified There is no certification date. They do not have the project approved The ANSP has just started the process		
2	Brazil	Recertified in 2021.	Certified	March 2022	2024
3	Bolivia	The latest inspections of the DGAC to the service provider indicate that the progress achieved in the certification is 60%. They do not yet have Certification Audits planned, but they do have Second Party Audits. Has submitted a Corrective Action Plan with a Certification Pre-Audit date for March 2023.	Not Certified	No	No
4	Chile	The Recertification process was carried out in June 2021.	Certified	June 022	August 2024
5	Colombia	The Colombian AIS Service is ready for certification. It depends on the Senior Management. They could certify in mid-2022. The resources would be available in mid-2022.	Not Certified		
6	Ecuador	Work with the Planning area in order to seek to	Not Certified		

N°	States	QMS/AIM implementation status	Certification date	Follow-up audit	Foreseen recertification
		complete the implementation process for the AIM, MET and ETAC areas. They had outlined a first stage, but they cannot specify dates or current status due to the pandemic situation.	Without a possible date		
7	Guyana	Continue working in the documentation but without finalizing the implementation.	Not Certified Without a possible date		
8	Panama	Due to the pandemic, the Internal Audits and the Re-certification Audit could not be carried out, but they maintained all the standards of the QMS applied to the AIS/AIM processes. They have awarded a Certifying Agency to Carry out the Certification Audit.	Opportunity to enhance the certification..		December 2022
9	Paraguay	Paraguay was re-certified in December 2020.	Re-certified	ANSP foreseen for Nov and Recertification for the Legal Area in December 2021	December 2023
10	Peru	Paraguay was re-certified in December 2020. It has a quality system of the Aeronautical Information Service ISO 9001:2015, recertified since 2019 with validity until 05/30/2022. Training continues.	Certified	Inform	Mid 2022
11	Suriname	NIL	Not Certified		
12	Uruguay	Uruguay had the Recertification audit in July 2021	Not Certified	July 2022	July 2024

<b>N°</b>	<b>States</b>	<b>QMS/AIM implementation status</b>	<b>Certification date</b>	<b>Follow-up audit</b>	<b>Foreseen recertification</b>
13	Venezuela	Venezuela has made progress in the revisions of the documentation and procedures, as well as in the adaptation to the requirements of the 2015 version of the ISO 9001 Standard. The progress reported is 85%.	Not Certified. Seek for certification in 2022.		

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## APPENDIX C

**Table: Monitoring of the implementation of the e-AIP, DDS, Information Exchange Models and Data catalogues**

N°	States	Action Plan	Implementation Status			
			DDS	Exchange model	e-AIP	Data catalogues
1	Argentina				Licenced	Coordination with EANA S.E.
2	Brazil	- - By the end of the third quarter of 2022, we will make the e-AIP available; - By the end of the second semester of 2022, we will make available digital data packages, according to Amendment 01 - Doc 10066.	70%	100%	80%	100%
3	Bolivia	No progress has been made on these issues due to the change of provider				
4	Chile	There is a project presented which will be evaluated by the end of May for its inclusion in the Preliminary Project of the 2023-2024 budget				
5	Colombia	- By the end of the second quarter of	80%	80%	90%	80%

N°	States	Action Plan	Implementation Status			
			DDS	Exchange model	e-AIP	Data catalogues
		2022, we will make the e-AIP available; - By the end of the fourth semester of 2022, we will make available digital data packages, according to Amendment 01 - Doc 10066.				
6	Ecuador	The acquisition of a System with AIXM is planned for the second half of 2022	Not available	Not available	At the moment it is available in HTML and PDF format under Eurocontrol standard	It is available in Excel format, it is estimated that they will be available for the first semester of 2022; 75%
7	Guyana					
8	Panama	- The DDS workshops are expected to start in the third quarter of 2022. - Regarding the data catalogs, we are waiting for the AISR to inform us of the dates of the seminar-workshop.	Without developments	100%	100%	Without developments
9	Paraguay		---		--	
10	Peru	With the signing of the Contract for the acquisition of the Integrated	0% They will send the information evaluated for	0%	10%	0%

N°	States	Action Plan	Implementation Status			
			DDS	Exchange model	e-AIP	Data catalogues
		Aeronautical Information System in June 2021, Peru through the AISP is in the process of implementing the eAIP, which will be made available in the last quarter of 2022, fulfilling the requirements established in the documents of our Regulation, Annex 15, PANS AIM and its amendments respectively.	the four parameters			
11	Surinam					
12	Uruguay	Waiting for the results of the conversations to implement actions after the migration to the AMHS (August 2022)				
13	Venezuela	The State will send the files at the end of the meeting	25%		100% Implemented and updated	25%

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## APPENDIX D

Follow-up to the NOTAM Global Campaign in the SAM Region

States	Region	NOTAM				
		Total	Old	Old (%)	Very old	Very old (%)
Argentina	SAM	863	52	6 5.5	91	10.5 0.3
Bolivia (Plurinational State of)	SAM	89	18	20.2 9.5	19	21.3 -7.9
Brazil	SAM	331	5	1.5 -21.1	0	
Chile	SAM	528	3	0.6 -6	0	
Colombia	SAM	209	31	14.8 8.5	45	21.5 -2.3
Ecuador	SAM	40	3	7.5 7.5	1	2.5 -20.2
Guyana	SAM	1	0		0	
Panama	SAM	22	7	31.8 24.1	4	18.2 10.5
Paraguay	SAM	22	0		0	
Peru	SAM	120	8	6.7 2.9	28	23.3 -1
Suriname	SAM	7	0		0	
Uruguay	SAM	72	1	1.4 1.4	3	4.2 -0.5
Venezuela (Bolivarian Republic of)	SAM	80	12	15 0.1	6	7.5 1.1

**Figure 1: Trends of old and very old NOTAM in the SAM Region**

### Trend Analysis by Region

Select a region, or click **WORLD** for all:

- WORLD
- APAC
- ESAF
- EUR/NAT
- MID
- NACC
- SAM**
- WACAF

#### Total NOTAM

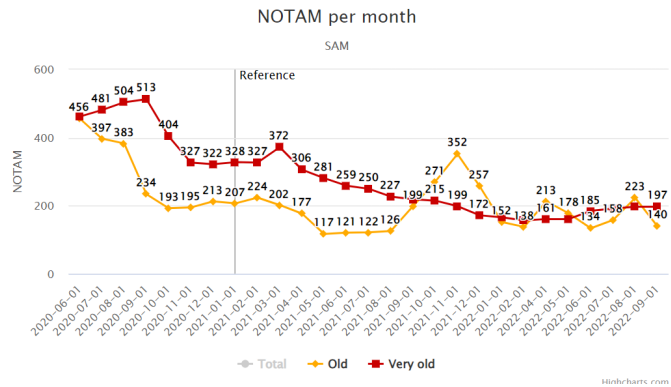
2384

#### Old NOTAM

140 (5.9%)

#### Very Old NOTAM

197 (8.3%)





**APPENDIX E**  
**NACC REGIONAL PLAN FOR COLLABORATIVE AERONAUTICAL INFORMATION MANAGEMENT (AIM)**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**



**NACC REGIONAL PLAN FOR COLLABORATIVE AERONAUTICAL INFORMATION MANAGEMENT (AIM)**

Version 1.6, July 2022 (Rev)

**AERONAUTICAL INFORMATION MANAGEMENT TASK FORCE  
(AIM TF)**

**Disclaimer:**

This Plan recognize the development made by Ms. Ying Zhou, Associate Officer  
ATM/AIM ICAO APAC and all ICAO Staff involved  
Reviewed by Costa Rica (Bernardita Mora)



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## 1. SCOPE OF THE PLAN

### Plan Structure

1.1 Air Traffic Management (ATM) implies the best integration of real-time, historical and prospective data and information, and the management, sharing and distribution of that data to shareholders. Information Management is based on the strategic and tactical provision of quality assured and timely operational data in support of ATM operations.

1.2 The Seamless ATM Plan references different flight levels. The upper level is from global perspective, which is guided mainly by references to the Global Air Navigation Plan (GANP 6<sup>th</sup> Edition, Doc 9750), the Global ATM Operational Concept (Doc 9854) and the Global Aviation Safety Plan (GASP). Beneath it is regional planning, primarily provided by the NACC Plan and needs to be framed with an awareness of the ATM system as a whole and its purpose of Information Management within ATM system for Collaborative Aeronautical Information Management (hereinafter referred to as the 'Plan') and other guidance materials, to define goals and means of meeting State planning objectives.

1.3 The Plan addresses the full range of ATM, Users and Stakeholders, and was developed as part of a suite of NACC AIM Plans, thus, it should not be considered in isolation. The word 'States' in the Plan also includes the Territories.

1.4 There are three major areas of AIM Principles:

- a) People (human performance, ensure complete understanding of AIM concepts including training of relevant staff, common procedures based on a Regional Operational Concept, etc.)
- b) Facilities (physical equipment, Data-sharing), Technology
- c) Aeronautical Information and Data sets

### Plan Review

1.5 The Seamless ATM performance framework focuses on technological and human performance within Aviation System Block Upgrade (ASBU) elements. ASBU Block 0 modules contain technologies, systems and procedures which are available from 2013. However, the Plan also has references to ASBU modules in Blocks 1, 2 and 3, which will be available from 2019, 2025 and 2031 respectively.

1.6 ASBU focuses on the initial introduction of digital processing and management of information. On the process of transition from AIS to AIM, aeronautical information exchange model (AIXM), migration to electronic Aeronautical Information Publication (eAIP), better quality (QMS) and availability of data should be under consideration and in usage. Therefore, the Plan needs to be updated and take into account ASBU modules in Blocks 0, 1, 2 and 3 as well as BBBs.

1.7 The Plan requires regular updating to keep current with aviation system changes. It is intended that AIM TF conduct and coordinate a complete review every three years (or a shorter period determined by the AIM TF) of the Plan to align with the recent review cycle of the GANP. The Plan and its subsequent revisions should be endorsed by AIM TF to the NACC WG.

## **2. OBJECTIVES**

### **Plan Objective**

2.1 The objective of the Plan is to facilitate the improvement and harmonization of the AIM for the implementation interoperable AIM systems in support to Seamless ATM operations in the NACC Region, by developing and deploying AIM solutions capable of ensuring safety and efficiency of air transport throughout the Region in accordance with the SWIM requirements.

2.2 Noting that more complex and costly challenges of implementing the digitally based AIM environment expected under Amendment 40 to Annex 15, the Plan provides a framework for a transition to a collaborative AIM environment, in order to meet future global and regional performance requirements, including PANS AIM (Doc. 10066).

### **Guidance for the Transition from AIS to AIM**

2.3 The Plan provides a framework for the transition to a collaborative Regional AIM environment, in order to meet current and future global and regional performance requirements and it is neither isolated, nor conflicts with other plans or strategies it is well referenced in conjunction with other previous ones.

## **3. EXECUTIVE SUMMARY**

### **Driving Force for Collaborative AIM**

3.1 AIM is envisaged as one of the most valuable and important enabling services in ATM operational concept. To satisfy new requirements of ATM, which is based on a collaborative decision-making environment, AIS has to transit to a broader concept of AIM, which provides aeronautical data and information in digital and electronic formats and is displayed graphically and geodetically, complies with ISO Quality requirements and international standards and formats for exchanges, that is accessible system-wide by all stakeholders and almost real-time, given its data-centric nature as opposed to the product-centric nature of the previous concept of AIS.

3.2 Due to economic and efficiency drivers, GREPECAS has foreseen an increasing need for States work together, which may develop into joint or shared operations, such as sub-regional Aeronautical Information Publications (AIPs Trinidad and Tobago for ECAR States, Curaçao for Netherland Territories and COCESNA for Central American States), AIM training and aeronautical databases. Moreover, it is recognized that collaboration between States inevitably improves the harmonization and interoperability of systems – it is a key basis of Seamless ATM.

3.3 Collaboration is especially important for small, less resourced States and Territories as the technical challenges increase and the maintenance of technical competency and systems becomes more difficult. In this way, Collaborative AIM is expected to benefit all States and Territories, from the most vulnerable to the better resourced, as the latter will have assurance that increasingly interconnected smaller States will also be able to fulfil their international obligations.

3.4 AIM is one of the foundation elements that supports other aspects of the current and future aviation systems dependent of data in electronic and digital formats, and as such requires a high priority. GREPECAS agreed that the transition from AIS to AIM should receive the highest priority, yet many States are lagging in their implementation of this key element. Collaboration in the provision of aeronautical information and data will benefit States facing resource challenges, and benefit the broader NACC Region

through the overall improvement in the availability, timeliness and quality of aeronautical information and shared aeronautical information databases, and collaborative efforts in AIM training.

3.5 Based on safe, efficient air transport is the Aeronautical Information Management (AIM) of each State, which collates, maintains and publishes aeronautical data and information of lasting character essential to air navigation, including details of regulations, procedures and other data and information pertinent to the operation of aircraft within the area of responsibility of the State.

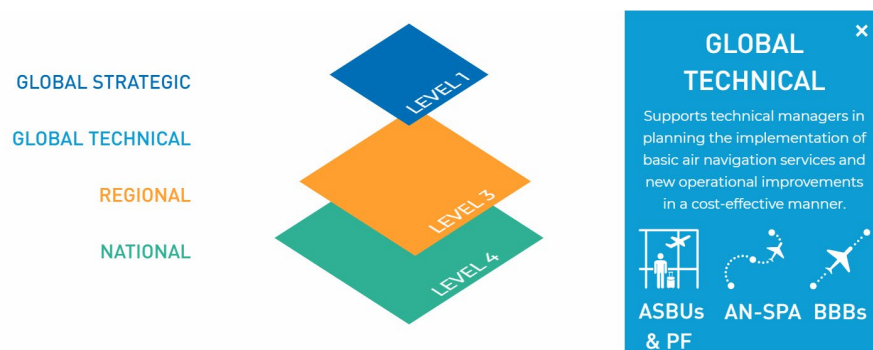
#### 4. BACKGROUND INFORMATION

##### GANP Principles

4.1 The content of the GANP 6<sup>th</sup>. Ed. is organized into a multilayer structure with each layer tailored to different audiences. This allows for better communication with both high-level and technical managers with the objective that no State or stakeholder is left behind. The four-layer structure is made up of global (strategic and technical), regional and national levels, and provides a framework for alignment of regional, sub-regional and national plans. The four-layer structure facilitates decision making by providing a stable strategic direction for the evolution of the air navigation system and, at the same time, timely relevance in the technical content. (Visit <https://www4.icao.int/ganportal/> )

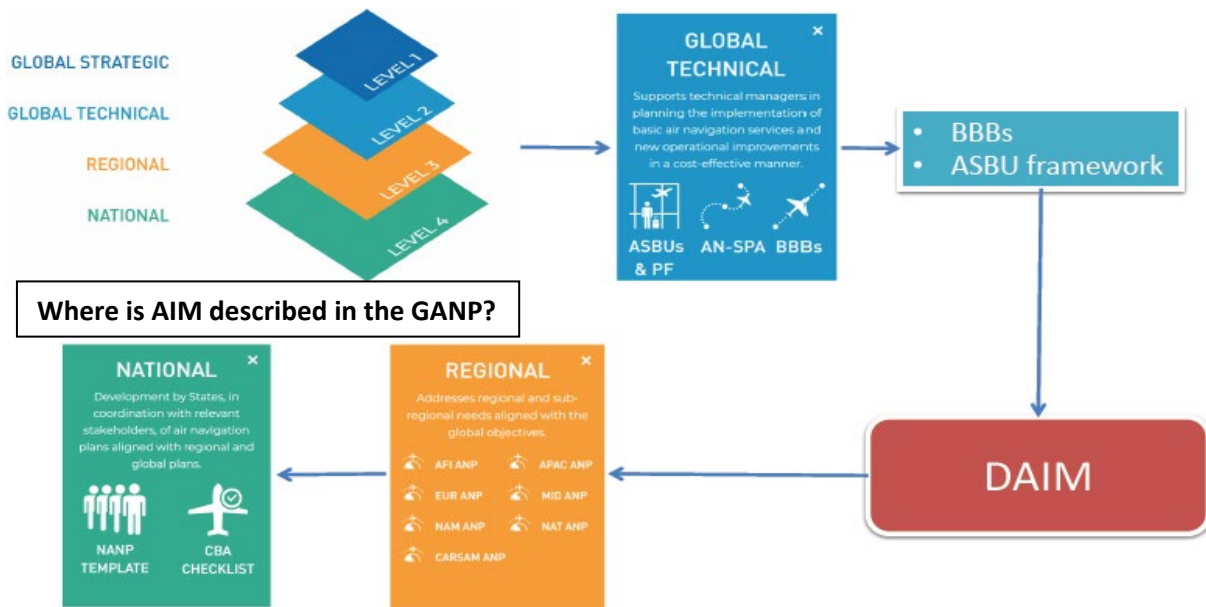


4.3 The GANP provides a path to the safe, orderly and efficient evolution through the BBB and ASBU frameworks. Obligations in terms of the provision of essential air navigation services have been reflected in the BBB framework to ensure a robust baseline for the evolution. The evolutionary transformation reflected in the different steps of the conceptual roadmap is also reflected in the ASBU framework to ensure the interoperability of systems, harmonization of procedures and a harmonized approach to the modernization of the global air navigation system. New users, operations and roles, and all stakeholders are part of this structured transformation.



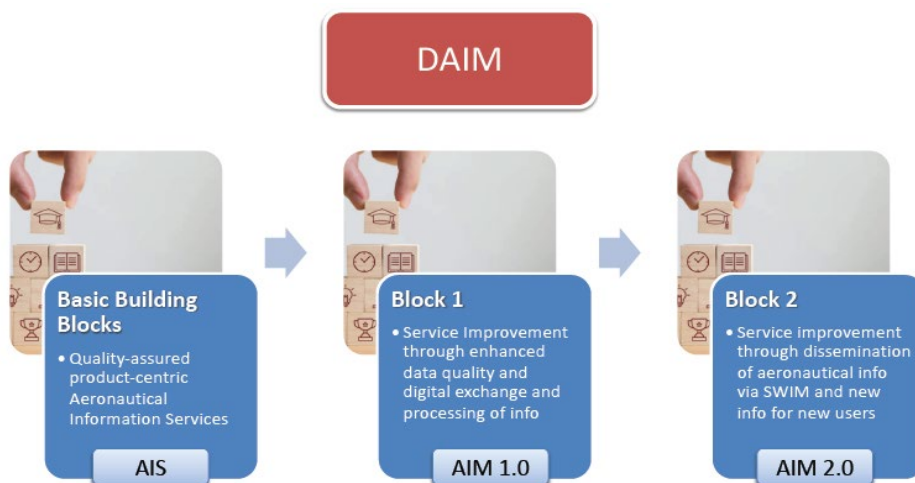
4.4 Air navigation is under the constant change that leads it to transform itself to meet imminent challenges, which is why the aviation industry needs to ensure its position at the forefront of innovation by

adopting an increasingly cross-domain and global perspective. There is much at stake for the global economy and for citizens if the modernization of the global air navigation system does not continue.



### Aviation System Block Upgrades (ASBU)

4.5 At the Global level, ICAO started the ASBU initiative as a programme framework that developed a set of aviation system solutions or upgrades intended to exploit current aircraft equipage, establish a transition plan and enable global interoperability. ASBU consist a suite of modules organized into flexible and continue building blocks, where each module represents a specific, well bounded improvement. The building blocks could be introduced and implemented in a State or a Region depending on the need and level of readiness, while recognizing that all the modules are not required in all airspaces.

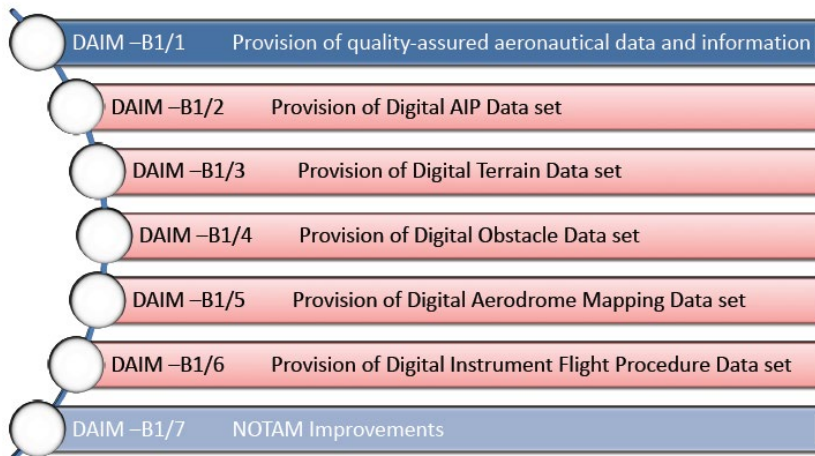


4.6 ASBU describes a way to apply the concepts defined in the Doc 9854, with the goal of implementing regional performance improvements, and is used in the new edition of the GANP to guide implementation. Since the Air Navigation Conferences (AN-Conf. /12 and 13) it was agreed that ASBU and the associated technology roadmaps are integral parts of the GANP new 6<sup>th</sup> Ed. and a valuable implementation tool kit.

4.7 ASBU is heavily dependent on AIM, as AIM is a critical prerequisite for the implementation of many current or future ATM or Air Navigation concepts that relies on the accuracy, integrity and timeliness of data.

4.8 In the AIM field domain, the main ASBU blocks which are relevant with Seamless ATM are as follows:

- B0-DAIM Service Improvement through Digital Aeronautical Information Management (AIM). A key strategy activity during Block 0 from 2013 until past 2019 that included the initial introduction of digital processing and management of information/data, through AIS/AIM implementation, use of aeronautical information exchange model (AIXM), migration to electronic aeronautical information/data publication (eAIP) and better quality (QMS) and availability of data.
- B1-DAIM Service Improvement through Integration of all Digital AIM Information (2019-2025): ATM Information Reference Model (AIRM) integrates all ATM information/data and other Information/data Users (using UML, GML/XML), and implements information/data management with exchange data models: common formats are AIXM, FIXM, WIXM and internet protocols.
- B1-SWIM Performance Improvement through the application of SWIM applications and infrastructure (2019-2025): standard data models, internet-based protocols to maximize interoperability. Most of the air ground data exchanges will remain based on point-to-point communication.
- B2-SWIM Enabling Airborne Participation in Collaborative ATM through SWIM (2025-2031): aircraft as a fully connected information node in SWIM and collaborative ATM processes – exchange of data. DAIM in Block 1:



4.9 The Basic Building Block (BBB) framework outlines the foundation of any robust air navigation system. It is nothing new but the identification of the essential services to be provided for international civil aviation in accordance with ICAO Standards. These essential services are defined in the areas of **Information Management (AIM)**, Air Traffic Management (ATM), Search and Rescue (SAR), Meteorology (MET) and Aerodromes (AGA). In addition to essential services, the BBB framework identifies the end users of these services as well as the assets (Communications, Navigation, and Surveillance (CNS) infrastructure) that are necessary to provide them.



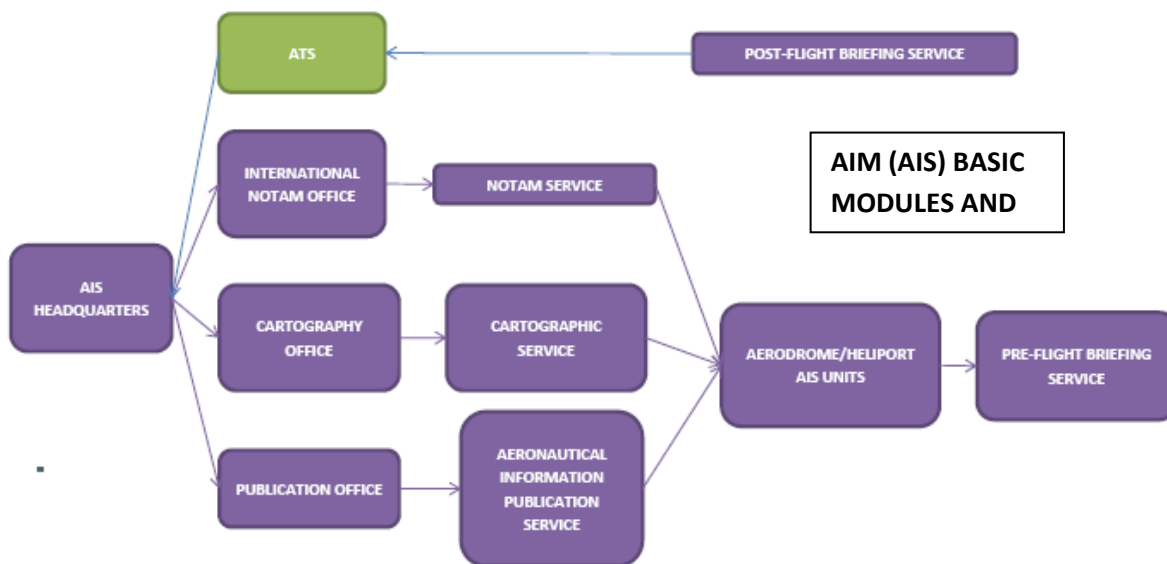
4.10 In order to ensure the provision of seamless air navigation services based on the deployment of interoperable systems and harmonized procedures, States need to leverage the implementation of the BBBs through their national air navigation plans as a strategic part of their national aviation planning framework. This will also pave the way for the future implementation of air navigation improvements to increase the quality of the services and meet the performance expectations of the aviation community.

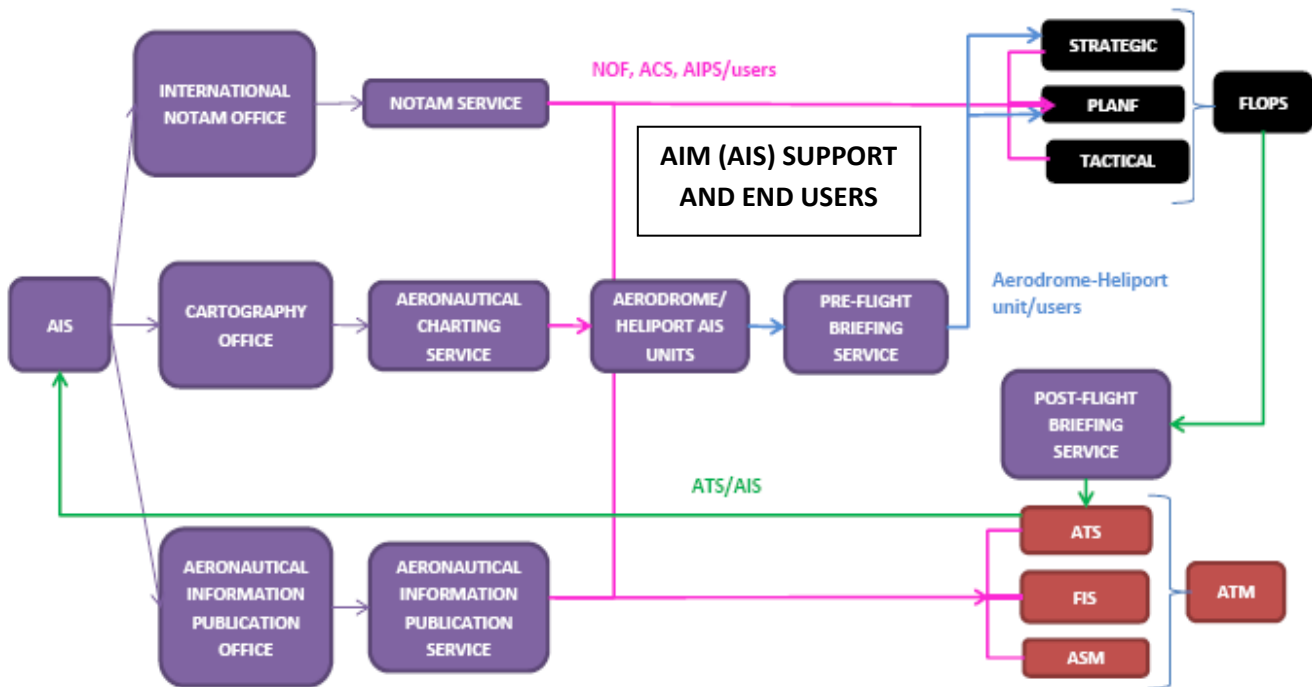
4.11

4.12 The BBB is considered an independent framework and not a block of the ASBU framework as they represent a baseline rather than an evolutionary step. This baseline is defined by essential services recognized by ICAO Member States as necessary for international civil aviation to develop in a safe and orderly manner. Once these essential services are provided, they constitute the baseline for any operational improvement.

4.13 The BBB framework will be updated every two years taking into account amendments to ICAO provisions. Although an initial draft of the BBB framework is presented online, the BBBs will be included in a web-based application in a format similar to the ASBU framework, in the GANP Portal:

<https://www4.icao.int/ganportal/BBB>





## 5. AIS-AIM ROADMAP PHASES AND STEPS

5.1 According to AIS-AIM Roadmap, there are three phases and 21 steps. Failure to take action on any of these steps would increase the duration of the transition and negatively affect the enabling role of AIM. The three phases, according to the AIS-AIM Transition Roadmap, are as follows.

- Phase 1– **Consolidation**. Quality Management System (QMS), is a prerequisite for commencement of the transition from AIS to AIM. In this phase, States were expected to enhance the quality of their existing AIS products, attach great importance to AIRAC adherence and WGS84 implementation and publish their Differences related to ICAO Annexes (AIP and/or electronically).
- Phase 2 – **Going Digital**, In this phase, States were expected to create national or regional database to produce existing products and services with better quality and availability, such as the delivery of eAIP, eTOD, etc.
- Phase 3 – **Information Management**. This is the final phase in the evolution to AIM, is also known as SWIM. Keywords of this phase are integration, collaboration, and self-regulation. For all of the information domains, a range of supporting information applications will be discoverable and made available to all authorized users on the SWIM network.

5.2 **Phase 1 - Consolidation and Phase 2 – Going digital**, are important preparatory phases of the final transition to AIM. Consolidation is the main theme of Phase 1, whereas Phase 2 is the step to going digital, when information is increasingly being managed and exchanged digitally. **Phase 2 can be characterized as being the most critical in the transition, and should be kept as short as possible.**

The 21 steps and deadline for implementation are shown below:

ROADMAP PHASE	ROADMAP STEPS	DEADLINE
PHASE 1	P-03 — AIRAC adherence monitoring	November 2010
	P-04 — Monitoring of States' differences to Annex 4 & 15	
	P-05 — WGS-84 implementation	
	P-17 — Quality	
PHASE 2	P-01 — Data quality monitoring	November 2013
	P-02 — Data integrity monitoring	
	P-06 — Integrated aeronautical information database	
	P-07 — Unique identifiers	
	P-08 — Aeronautical Information Conceptual Model (AICM)*	
	P-11 — Electronic AIP	
	P-13 — Terrain	
	P-14 — Obstacles	
PHASE 3	P-09 — Aeronautical data exchange	November 2016
	P-10 — Communication networks	
	P-12 — Aeronautical information briefing	
	P-16 — Training	
	P-18 — Agreements with data originators	
	P-19 — Interoperability with meteorological products	
	P-20 — Electronic aeronautical charts	
	P-21 — Digital NOTAM	

5.3 The main regional priorities for AIM implementation requirements are:

- a) Establishment of AIM either as a separate entity within or, ideally, separated from the civil aviation administration in accordance with the guidance provided in ICAO Doc 8126 – AIS Manual Chapter 3
- b) Implementation of Quality Management Systems for aeronautical information
- c) Establishment of formal agreements between AIM providers and aeronautical data originators specifying the content, quality, maintenance and timing of provision of aeronautical data that is required to be promulgated in AIP, and the quality management process that shall be applied
- d) Implementation of internet-accessible electronic AIP generated from a digital database of aeronautical information

*Note: some existing aeronautical information products may not be suitable for migration into digital datasets*

- e) The taking of all necessary measures to develop and implement AIM training programs for AIS personnel, including training in digital data management, and end-to-end quality management processes
- f) Provision of full access to the relevant ICAO Annexes and Documents to all personnel having responsibility for the origination, reception, management and/or distribution of aeronautical information and aeronautical data

## 6. AIM TRANSITION GUIDANCE

6.1 The latest Meeting of the AIM Task Force (AIM TF 02, Miami, United States, August 2018), recognized that the lack of AIM transition guidance plan material was a matter of significant concern to State Administrations. There had been delays in the production of global ICAO guidance documents, those of most immediate significance being the PANS AIM (Doc. 10066), AIS Manual updated Doc. 8126 (four

Volumes), the new Doc. 9839 Quality Manual (unedited) and Doc. 9991 AIS Training Manual (unedited). That Meeting agreed to continue to work on Regional AIM transition guidance material for key AIM transition steps from the ICAO Roadmap for Transition from AIS to AIM.

6.2 The AIM TF will contribute to update the Status for Aeronautical Information Management (AIM) in the NACC Region by adding a new information on an AIM Tracking website, Interim example is the AIM Transition Guidance from EUROCONTROL, which emphasizes four priority steps from AIM transition roadmap, they are:

- a) P-17 – Quality
- b) P-16 – Training
- c) P-18 – Agreements with data originators
- d) P-11 – Electronic AIP

## 7. EMPHASIS ON THE FOUR AIM TRANSITION STEPS PRIORITIES

7.1 The transition **Step P-17** – Quality is one of the four steps in AIM Transition Phase 1 – Consolidation. Along with the other Phase 1 transition steps, P-17 – Quality is a prerequisite for commencement of the transition from AIS to AIM. In this phase, States were expected to enhance the quality of their existing AIS/AIM products.

7.2 The transition **Step P-16** – Training is one of the eight steps in AIM Transition Phase 3 – Information Management. The training of personnel will be adapted to the new requirements on skill and competencies introduced by the transition to AIM; the successful Quality Management System (QMS) also deeply relies on the motivation of personnel. Training Needs Analysis (TNA) and TNA developing process are important. For transition from AIS to AIM, both tailored training based on each Contracting States and systematic and collaborative training among Contracting States in NACC region are all necessary.

7.3 The transition **Step P-18** – Agreements with Data Originators is one of the eight steps in AIM Transition Phase 3 – Information Management. While the NACC Region's current focus is on implementation of Phases 1 and 2, it is recognized that formal agreements between stakeholders in the aeronautical information chain are a critical component of robust end-to-end quality management. Step P-18 is one of four complementary Roadmap steps related to the quality management of aeronautical data: P-17 – Quality, P-01 – Data Quality Monitoring, P-02 – Data Integrity Monitoring and P-18 – Agreements with Data Originators. Data of high quality can only be maintained if the source material is of good quality. States will be required to better control relationships along the whole data chain from the producer to the distributor. This may take the form of template service level agreements with data originators, neighboring States, information service providers or others.

7.4 The transition **Step P-11** – eAIP is one of the nine steps in AIM Transition Phase 2 - Going Digital. The electronic version of the AIP is defined in two forms: a printable document and one that can be viewed by web browsers.

## 8. REPORTS OF AIM TASK FORCE (AIM TF)

### AIM Transition Information Sharing Website

8.1 In discussing Regional AIM transition progress, during the ANI WG 05 Meeting it was important to consider the need to design an AIM implementation tracking website. While the AIM Transition Table provides information on progress within the Phases, it does provide information on the current status and challenges being faced by States, and the proposal for an AIM tracking website will share experience

among States.

8.2 That, AIM TF 03 Meeting, agrees to facilitate a project by ICAO NACC to develop a website for the sharing of information related to the implementation of Aeronautical Information Management steps defined in the ICAO Roadmap for Transition from AIS to AIM. Facilitation includes:

- a) States require providing punctually all information and data to AIM TF that is needed in order to be reflected in the AIM TRACKING WEBSITE about the States Status
- b) Providing a coordination point for the contact details of the **AIM TRACKING WEBSITE** administrator. Assisting in the development of a list of items for inclusion in the AIM TRACKING WEBSITE
- c) Promoting the AIM TRACKING WEBSITE as a valuable resource for NACC States Administrations undertaking or planning to undertake AIM transition and implementation projects
- d) Encouraging discussion of issues raised in the AIM TRACKING WEBSITE and lessons learned at AIM TF meetings
- e) Providing a summary of information shared through the AIM TRACKING website, and providing hyperlink(s) to the AIM TRACKING website, in AIM TF meeting reports

### **Cooperation on AIM Training**

8.3 Information was provided by a group of States to AIM TF highlighting the need for cooperation among Contracting States in NACC Region regarding AIM implementation, in particular training for static and dynamic data management in AIXM environment, eAIP and Quality Management System.

8.4 Some States and International Organizations informed that they were developing a Standard AIS Training Package, and was open to opportunities for collaboration and technical assistance in AIM transition, and they had provided assistance to other States in AIS training, and AIM automation system and Quality Management System implementation, in cooperative activities through the other organizations including industry partners, and the International Federation of Aeronautical Information Management Associations (**IFAIMA**).

8.5 Regional cooperation in AIM training will be important to ensure harmonized implementation throughout the Region.

### **Establishment of a separate AIS unit or department**

8.6 AIM TF reported that based on observations from visits to different States' AIS services and AIM meetings, it appeared that in some States, the AIS was not established as a separate unit but as part of Air Traffic Services or Communication, Navigation, and Surveillance organizations. In many cases, ATC staff worked as AIS officers, working for both AIS and ATS. The view of the AIM TF was that it was more appropriate that AIS should be established as a separate unit or department within its organization, with its personnel and management focused wholly on AIS/AIM as mentioned in Annex 15 and Doc 8126.

### **Delayed delivery of ICAO guidance documents**

8.7 The following guidance material supporting the ICAO Roadmap for Transition from AIS to AIM was being developed by the ICAO AIS-AIM Study Group (AIS-AIM/SG):

- Annex 15

- Annex 4
- Annex 5
- PANS AIM – Doc 10066 (new)
- PANS OPS – Doc 8168 (3 Volumes)
- Doc 8126 – AIS Manual (updated on four volumes);
- Doc 9839 – Quality Manual (unedited);
- Doc 9991 – AIM Training Development Manual (unedited);
- Doc 9881 – eTOD/AMDB Manual (require final validation and editing);
- Doc 9674 – WGS-84 Manual (require update);
- Doc 8697 – Charting Manual (require update);
- Doc 9855 – Guidelines on the use of the Public Internet for Aeronautical Applications (require update);

Doc 10055 - Manual on Notification and Publication of Differences

- Doc 8400 – ICAO Abbreviations and Codes (PANS-ABC – update) and
- AIM Concept (unedited)
- Plus others ...

8.8 Delivery of the above documents had been further delayed beyond the latest advised time frame. The latest information from ICAO Headquarters was that most of these documents were undergoing final drafting and/or editing, but publication dates had not yet been finalized.



8.9 Other documents that were updated or released Annex 15 – Aeronautical Information Services, and the new Procedures for Air Navigation Services – Aeronautical Information Management (PANS-AIM).

## 9. CURRENT SITUATION

Implementation analysis for States' transition from AIS to AIM

This information should be updated.

9.1 The performance objectives of the NACC Seamless ATM Plan included the expectation that Phases 1 and 2 of the Roadmap for Transition from AIS – AIM would be completed in a new agreed date by AIM TF. The regional implementation of Phase 1- Consolidation of the Roadmap is summarized as follows:

- 100 % had completed AIRAC (P-03) implementation
- 95 % had completed Monitoring of Annex differences (P-04) implemented
- 100 % had completed WGS-84 (P-05) implemented
- 86 % had completed Quality (P-17) implemented

Regional implementation of Phase 1 and 2 were summarized as follows:

- Under development

9.2 **Figure 2** below indicates that many States are lagging in their implementation for transition from AIS to AIM. (Date last amended in May 2019)

- Under development

**Figure 2:** Regional AIM Implementation Status - Phase 1 and 2 Implementation in Progress

## 10. A FRAMEWORK FOR AIM QUALITY MANAGEMENT SYSTEM (QMS).

10.1 Annex 15 provides that States must establish a quality system and put in place quality management procedures at all stages (receiving and/or originating, collating or assembling, editing, formatting, publishing, storing and distributing) of the aeronautical information and data process. The quality system must be documented and demonstrable for each function stage, ensuring that the organizational structure, procedures, processes and resources are in place in order to detect and remedy any information and data anomalies during the phases of production, maintenance and operational use. Explicit in such a quality management regime is the ability to trace all information and data from any point, back through the proceeding processes, to its origin.

10.2 The transition step P-17 – Quality is one of the four steps in AIM Transition Phase 1 – Consolidation. Along with the other transition steps, P-17 – Quality is a prerequisite for commencement of the transition from AIS to AIM. In this phase, States were expected to enhance the quality of their existing AIS products. Some States have made efforts to try to improve their products despite not having a QMS and do so by adhering to the formats established in Doc. 8126.

10.3 However, there had been delays in the production of new global ICAO Doc 9839 *Quality Manual*. AIM TF noted that any independently developed Quality Manual could risk encouraging States to implement AIM in ways that may be divergent from anticipated global guidance.

10.4 The Plan provides a Sample Quality Manual in the NACC Region. Framework of AIM Quality Management of CAR Region (Sample) is shown in this document.

## 11. KNOWLEDGE AND SKILLS NEED TO BE TRAINED AIM STAFF.

11.1 There are many new kinds of knowledge concerned with AIM transition process, inter alia, AICM/AIXM, data quality/originators, DNOTAM, eAIP, eTOD, Aeronautical Mapping Database (AMDM), Weather eXchange Model (WXXM), Aeronautical Information (AIS/ARO) briefing, eCharts. Besides, skills and competencies also need to be improved for AIS staff members in these new fields of knowledge.

11.2 States have finished many tasks during the transition process from. However, AIS staff training is to some extent lagging, in most cases, due to a lack of financial resources to train the personnel constantly. Another factor may be that there are not always enough personnel available to cover the operational positions, so the preparation/updating of personnel may take several years.

11.3 Organizations that provide AIM training are generally based on standard curricula. It often does not respond to the real needs of AIM providers for updates and is further exacerbated when AIM service providers are not aware that they can request adjustments to the curricula based on their needs.

## **12. PERFORMANCE IMPROVEMENT PLAN PHASE I**

12.1 ICAO's No Country Left Behind (NCLB) Initiatives determined that ICAO itself should provide more direct assistance to developing countries by playing a more active coordination role between States and by helping to generate the political will needed for States to pool resources, participate in regional efforts, earmark voluntary funds and build capacity. The NCLB campaign was endorsed to help coordinate and publicize any Organization wide activities consistent with these priorities. Now it was changed by the new NACC Systemic Assistance Programme (SAP)

12.2 Sharing of information on ATM system resources and constraints across regions on a real time basis is a long term requirement. In the process of AIS-AIM transition, communication, collaboration, and co-operation are very important. AIS – AIM shall work in partnership, even with its users, other AIM actors, regulators, etc.

### **Performance Improvement Plan**

*Note: prior to implementation, the applicability of Performance Based Improvement Plan (GANP) should be verified by analysis of safety, current and forecast traffic demand, efficiency, predictability, cost effectiveness and environment to meet expectations of stakeholders.*

- Performance improvement Plan Phase I – expected implementation by November 2020
- Performance Improvement Plan Phase II – expected implementation by November 2025

### **Performance Based Improvement Plan Phase I**

12.3 All States should make relevant regulations and specifications. The Plan is on the basis of Joint Acceptance Plan, each State should make regulations and specifications, which have close interfaces with ICAO global guidance material, especially on the following issues:

- data or raw material originators (Letters of Agreement – LoAs)
- Quality Management System (QMS)
- digital NOTAM filing and submitting (DNOTAM)

### **To improve human performance**

12.4 The following should be established to support human performance in the delivery of Collaborative AIM.



- On the Human performance training is necessary including assessment and management of risk, the effective safety reporting culture, etc.
- Technical training, including AICM/AIXM, Data quality/originators, digital NOTAM, eAIP, TOD, AMDM, WXXM, FIXM, eCharts, etc.
- Qualification requirements, including personnel licenses, knowledge and capability, English proficiency requirement for: a) staffs concerning FPL, to avoid sound-like pronunciation and/or visual confusion on FPL. b) Staff preparing AIM products (Aeronautical Publications and NOTAMs) to avoid writing problems in the publications that may cause ambiguities or misconceptions.

**To establish a separate unit focused wholly on AIS/AIM.**

12.5 Considering the following-up work of the transition to AIM, it should be appropriate to establish according with Section 8, Paragraph 8.6 in this Plan, a unit that although within ANS, independent, with personnel and management focused totally on AIS-AIM.

**To develop a Regional web site to share information about AIM transition**

12.6 To develop AIM Transition Information Sharing Website, to help States get access to ICAO Portal at NACC AIM Tracking Website.

12.7 In order to provide information on progress within the 3 Phases of AIS to AIM, encourage discussion of issues concerned with the transition and lessons learned at AIM TF meetings, as well as the current status and challenges being faced by States, a regional AIM implementation tracking website is needed and is under development. Its scope would be limited to sharing of information on AIM transition activities and experiences. Registered users, being the nominated point-of-contact from each State or Administration, would have write-access permissions for sharing information, posting questions and providing answers or suggestions. The information shared on the website would be publicly available. After the fully construction of AIM transition information sharing website for States in NACC Region, States should be able to utilize the website.

12.8 Furthermore, in the process of transition from AIS to AIM, many documents are released by ICAO, CAR/SAM Air Navigation Planning and Implementation Regional Group (**GREPECAS**), AIM Task Force (**AIM TF**), International Federation of AIM Associations (**IFAIMA**), etc. In order to have a convenient access to acquire all related documents concerned with AIS-AIM transition, designated point-of-contact (PoCs) of States should be registered and qualified to access ICAO Portal AIM Tracking Website.

**To achieve Quality Management System (QMS) in CAR region**

12.9 According to Annex 15, the information management resources and processes established by an aeronautical information service shall be adequate to ensure the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the ATM system.

12.10 Quality Management Systems shall be implemented and maintained encompassing all functions of an aeronautical information service. The established QMS shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements for accuracy, resolution, and integrity and that the data traceability requirements are met through the provision of appropriate metadata. The system shall also provide

assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.

12.11 A Structure of Agreement on data provision will be important to provide guidance on Data Quality and Data Integrity Monitoring.

12.12 Moving to a data centric system, as distinct from product-centric, requires assurance of quality and integrity of data before and when it gets to the end-users. A key part of the information management system might be to manage noncertified aeronautical information and data that can potentially affect the safety of air navigation. For each Contracting State, management review is more difficult than annual internal audit; it is also hard to locate training organizations qualified to train AIM staff in quality management.

12.13 Regional collaborative quality assurance is needed, main task should be to review and update the quality management guidance and sample quality manual provided in the Guidance Manual for AIS in the NACC Region, data protection, automation, human factors considerations, etc.

### **13. PERFORMANCE BASED IMPROVEMENT PLAN PHASE II**

13.1 Utilize Aeronautical Information Exchange Model version 5.1 or later, through implementation of Phase 1 and 2 of the AIS-AIM Roadmap in adherence with ICAO and regional AIM planning and guidance material (ASBU Priority 1) and the BBBs, support ATM operations by digitally-based AIM.

13.2 Meteorological information clearly has and will continue to have great operational impact and importance for the safety and efficiency of the air transportation system. The derived meteorological products and services directly support the operational aspects of all phases of flight (Doc 8168 Vol. I, 2 and 3). To implement appropriate meteorological information reporting systems, providing observations, forecasts, warnings and alerts, and also providing information to meteorological authorities or offices where required.

#### **To implement collaborative training in CAR region regarding AIM implementation**

13.3 For most States, AIS is still paper based, desktop publishing, with limited digital data and quality assurance. On the process of AIS to AIM, the provision of aeronautical information should be data centric, quality assured, with single data source. State policies, regulatory oversight mechanisms, service level agreements, roles and responsibilities, data management tools, knowledge, and skills, etc., need to be modified. Evolution from paper-based systems to computerized data-based systems will occur over an extended period, with present and future styles of operation proceeding in parallel. Changing the presentation and source of information will bring its own challenges and will necessitate new skill development for all groups of users, from pilots to air traffic controllers to staff involved in producing the information.

13.4 The role of the human is especially important in delivering high quality and consistent services supporting collaborative AIM. Therefore, systematic, and regional cooperation in AIM training will be highlighted among ICAO Contracting States in NACC Region to ensure harmonized AIM implementation. States in the Region should establish an AIM TF working panel to analyses training demands for going to AIM collaboratively, design and develop training plans, courses, and curriculum, implement training, evaluate staff competency, training courses, plans and programs, etc. Deliver collaborative training for part of AIS staffs, improve the skills and competence, this part of AIS staffs may in turn train other AIS staffs and contribute to AIM implementation.

13.5 Collaborative training should be delivered, in particular, on static and dynamic data management in AIXM environment, e-AIP, Digital NOTAM and quality management system. Other knowledge, skills and competencies are suggested being delivered by each Contracting State.

#### **Further implementation of TOD**

13.6 The TOD is safe for air navigation, efficient for PBN and ATM operations, useful for airport planning, and supports automation.

13.7 It was essential for States to establish a system to provide data that was compliant with the ICAO SARPs for all areas, although it would take some time. Obstacles for Area 1 shall meet the accuracy requirement provided by ICAO SARPs. For the time being, the data for Area 2 (a, b, c and d) Area 3 and Area 4 would be provided by prioritizing airports, firstly for the airports that were regularly used for international civil aviation and then for other airports. Furthermore, in order to achieve global eTOD exchange, States should create national or regional database to produce existing products and services with better quality and availability.

13.8 Main challenges for TOD are costs, no or few training or supporting material, no clear allocation of responsibilities. **For the matter of costs, States in CAR region should apply incremental approach, split/share the costs between stakeholders per area of responsibility and adopt competitive procurement process and negotiation.** For the problem of no or few training or supporting material for the interpretation of data to be issued, regional workshops are expected to be delivered, experts (including from other regions) make presentations on eTOD, participants exchange experience and data providers present their offers. For no clear allocation of responsibilities, some departments delegates data collection to AIM, losing sight of the fact that AIM's job is to publish only data based on Annex 4. States in NACC Region may provoke discussion; specific Task Force between regulators should address this point. Besides, qualification standards for data providers are necessary, national regulation may engage into its implementation.

## **14. RESEARCH AND FUTURE DEVELOPMENT**

### **Co-operation on AIM Improvement**

14.1 To develop the tools and systems required to meet foreseeable long-term requirements, there is a need for States to undertake and co-operate on AIM Improvement. This includes major efforts to define concepts, to extend knowledge and invent new solutions to future AIM challenges, so these new concepts are selected and applied in an appropriate timely manner. Such efforts could be forged through collaborative partnerships between States, ANSPs, International Organizations, institutes of higher learning and specialized technical agencies. This concept is consistent with Seamless ATM Principle (Inter-regional cooperation ('clustering') for the research, development and implementation of ATM projects like UTM).

### **Consideration of future AIM development**

14.2 The following are possible areas that should be considered for future AIM development, in order to continue pursuance of Seamless ATM or UTM beyond ASBU Block 0 and Block 1 implementations and global interoperability:

- While the migration of text-based AIP information, TOD and other static data into digital databases was relatively straightforward, the migration of conventional instrument approach and landing charts to a digital form presented a significant challenge. There was no current capability available for the

automatic generation of conventional charts from digital data (eCharts).

- Due to technical limitations, SIGMETs and NOTAMs are transmitted in a format that is not considered, by some, to be user-friendly (CAPTIAL LETTERS, MISSING STRUCTURE, etc.). When the transmitted information includes long list of coordinates defining the affected area, it becomes a nightmare for aircrews to gain situational awareness on the position of the hazard.
- SIGMETs, NOTAMs and ASHTAMs are traditionally transmitted via alpha-numeric communication means which do not allow user-friendly presentation. It is recognized that these systems will have to be maintained for years to allow information flow to the low-end users, including aircraft in flight that do not have reception capability for graphical information, although advanced airspace users (e.g. large airlines) require the information in data formats that can be used in automated systems.
- Human factors are of key importance for Seamless ATM implementation. AIS Certification/Rating, AIS training documentation & facilitations, all need to be established and standardize.
- In order to provide quality assured data, safe and quick AIS service, effectively reduce AIS cost, we need to have Collaborative AIM Services in NACC Region. Each Contracting State might be facing the same problems: cross-border AIS service lack consistency and compatibility, data quality is not consistent in NACC Region, different data model and data exchange methods lead to the lack of system interoperability, too much manpower and material resources increase AIS service costs, etc.
- The establishment of a CAR AIS Database (CAD) is under AIM TF consideration. This aeronautical information database will base on SARPS, AICM/AIXM it may process “static and dynamic” data automatically, with system interoperation and in a centralized manner. The establishment of CAD may greatly enhance data availability, provide real time, quality assured AIS service, and improve the effectiveness of AIS operations towards SWIM.

## **15. MILESTONES, PRIORITIES AND ACTIONS**

### **Milestones**

15.1 In Section Performance Improvement Plan provides milestones and timelines for a number of elements in Performance Improvement Plan Phase I, wich came into effecti in December 2020.

15.2 States should have begun planning for the AIM specifications detailed in the Performance Improvement Plan beginning in 2020 to facilitate a smooth transition by the onset of Phase I.

15.3 Subject to future agreement by concerned parties, in Section Research and Future Development Possibilities, provides possible AIM improvements beyond 2020 until 2025. (CHECK THE DATE IS POSSIBLE TO EXTEND)

### **Priorities**

15.4 It is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers.

### **Actions**

15.5 This Plan necessitates several implementation actions. It is expected that each NACC State and Special Territories develop AIM material as part of their Seamless ATM Implementation Planning based

on applicable parts of the Implementation Guidance Material, and implementation progress be reported to GREPECAS.

15.6 GREPECAS and its contributory bodies, such as the ATM Program and the CNS Program are responsible for the oversight of air navigation issues within the NACC, so these bodies needed to be made aware of State implementation progress of Seamless ATM initiatives. GREPECAS and its contributory bodies need to manage the implementation of Seamless ATM through the ASBU framework and this Plan.

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**Appendix 1: AIS-AIM Transition Table and Graphics**

Reference on WP 12 Appendixes C (ANI WG 05) or later

**Under preparation by AIM TF**

Electronic AIP generated from a digital database of aeronautical information

State Name:

= No reports since AIM TF -- xxx

= progress reported

= amended progress reported

## Appendix 2: e-AIP

Under preparation

**Appendix 3 : Structure of Agreement on data provision**

**AGREEMENT ON DATA PROVISION**

**between**

***[The name of the entity receiving the aeronautical data and/or aeronautical information];***  
**(hereinafter “The Data Receiver”)**

**and**

***[The name of the entity providing the aeronautical data and/or aeronautical information]*** (Hereinafter “The Data Provider”)



## **1. Introduction**

### **1.1 Purpose and Scope**

The purpose of the letter of agreement is to establish the quality requirements from AIM for the provision of data. The procedures and arrangements described herein are binding on the parties to this letter of agreement.

### **1.2 Parties to the Agreement**

The parties of an agreement are XXXXX, hereafter referred to as XXXXX, and XXXXXXXX, hereafter referred to as XXXXXX. To define the responsibilities of each unit and thus achieve uniform application of procedures and functions.

### **1.3 Legal and Regulatory Basis**

1.4 A number of documents specify the legal and regulatory requirements for the origination, production, storage, handling, processing, transfer and distribution of aeronautical data and/or aeronautical information, they shall include but not exclusive the following OACI documents:

- a) Annex 4 – Aeronautical Charts
- b) Annex 5 – Units of Measurement to be used in Air and Ground Operations.
- c) Annex 11 – Air Traffic Services
- d) Annex 15 – Aeronautical Information Services e.
- e) Annex 14 – Aerodromes
- f) PANS AIM – Doc 10066

## **2. Services and Service Levels Required by Data Receiver (What is the meaning of this item?)**

### **3. Requirements for Data Provider**

#### **3.1 Data Changes Management**

Data Provider should follow the recommendations laid down in Chapter 6 of ICAO Annex 15 concerning the advance notice of major changes to the Data.

3.2 Data Compliance Requirement (guidance text would be helpful e.g. something like...this data submitted to AIM must contain XXXX, in xxx format).

3.3 Data Errors and/or Inconsistencies (a guidance text would be helpful, for example, something like this, in case of errors or inconsistencies, will be made an inquiry, and if necessary, the data will request again).

## **4. Coordination, Training, Data Compliance Checking**

When require, the above should be implemented between Data Provider and Data Receiver. (Is not clear this item, It ss necessary an example, maybe.)

### **5. Communications means**

5.1 Coordination between the parties shall be carried out by any of the following means: e-mail and telephone.

Organization	Phone	e-mail

6.6. Disclaimer

6.1 This letter of agreement and its subsequent amendments shall incorporate into the letter of agreement of each unit involved.

6.2 A hard copy or digital copy shall be in both units for their knowledge and application.

**6. Entry into Force and Termination**

6.1 This Agreement is valid from [enter validity from date] to [enter term date]

6.2 This Agreement shall enter into force upon signature by the parties, shall be reviewed every two years, and shall remain valid if neither party decides to rescind it.

**For the Data Receiver**

Name

Title

Date

Signature

**For the Data Sender**

Name

Title

Date

Signature

## Appendix – 4 Abbreviations and Acronyms

### ABBREVIATIONS AND ACRONYMS

To facilitate readability, abbreviations have been largely omitted throughout the document. Most abbreviations were defined when introduced. The following provides an alphabetic listing of all abbreviations.

AIM TF	AIM Task Force
A-CDM	Airport Collaborative Decision Making
ADS-B	Automatic Dependent Surveillance - Broadcast
AI	Aeronautical Information
AIC	Aeronautical Information Circular
AICM	Aeronautical Information Conceptual Model
AIM	Aeronautical Information Management
AIM/TF	Aeronautical Information Management Task Force
AIP	Aeronautical Information Publication
AIXM	Aeronautical Information eXchange Model
AIS	Aeronautical Information Service
AIM	Aeronautical Information Management
AFTN	Aeronautical Fixed Telecommunication Network
AIXM	Aeronautical Information eXchange Model
AIRAC	Aeronautical Information Regulation and Circular
AMDB	Aeronautical Mapping Database
ANSP	Air Navigation Service Provider
AOC	Airline Operations Centre
ASBU	Aviation system Block Upgrades
ASEAN	Association of Southeast Asian Nations
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service

ATC	Air Traffic Control
ATM	Air Traffic Management
ATMRPP	Air Traffic Management Requirements and Performance Panel
ATSA-SURF	Enhanced Traffic Situational Awareness on the Airport Surface
BBBs	Basic Building Blocks
CAD	CAR AIS Database
CANSO	Civil Air Navigation Services Organization
CCO	Continuous Climb Operations
CDM	Collaborative Decision Making
CDO	Continuous Descent Operations
CNS	Communication, Navigation, Surveillance
CRC	Cyclic redundancy check
DBMS	Database Management System
DSS	Decision Support System
eAIP	Electronic Aeronautical Information Publication
EFF	Electronic Flight Folder
EFOD	Electronic Filing of Differences
EUROCAE	European Council of Aerospace Engineering
ERAM	En-Route Automation Modernization
eTOD	Electronic Terrain and Obstacle Data
FMS	Flight Management System
GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GREPECAS	Asia Pacific Air Navigation Planning and Implementation Regional Group
IATA	International Air Transportation Association
ICAO	International Civil Aviation Organization
IFATCA	International Federation of Air Traffic Control Association
IFAIMA	International Federation of AIM Associations

IFR	Instrument Flight Rules
IM	Information Management
IP	Internet Protocol
ISO	International Standards Organization
JAP	Joint Acceptance Plan
KPI	Key Performance Indicator
MET	Meteorological Services
METAR	Aerodrome Routine Meteorological Report
NAS	National Airspace System
NCLB	No Country Left Behind
NOTAM	Notice To Airmen
PAIMS	Preferred Aeronautical Information Management Specifications
PIB	Pre-flight Information Bulletin
QA	Quality Assurance
QMS	Quality Management System
SARP	Standards and Recommended Practices
SESAR	Single European Sky Air Traffic Management Research
SIGMET	Significant meteorological weather phenomena
SWIM	System Wide Information Management
TIS-B	Traffic Information Services – Broadcast
TBO	Trajectory Based Operations
UAS	Unmanned Aircraft Systems
UTM	UAS Traffic Management
WXXM	Weather eXchange Model
XML	eXtensible Markup Language