INTERNATIONAL CIVIL AVIATION ORGANIZATION

CAR/SAM REGIONAL PLANNING AND IMPLEMENTATION GROUP

(GREPECAS)

REPORT OF THE TWELFTH MEETING OF THE AERONAUTICAL INFORMATION MANAGEMENT SUBGROUP

(AIM/SG/12)

FINAL REPORT

(Lima, Peru, 23 to 27 November 2009)

Prepared by the Secretariat

November 2009

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HISTORY OF THE MEETING

ii.1 Place and Duration of the Meeting

The Twelfth Meeting of the GREPECAS Aeronautical Information Management Subgroup (AIM/SG/12) was held in Lima, Peru, from 23 to 27 November 2009.

ii.2 Opening Ceremony

Mr. Franklin Hoyer, ICAORD, Lima Office, welcomed the participants and wished them success in the meeting.

He also acknowledged the presence of Mr. David Lewtas, Chief Aeronautical Information Unit, MET/AIM Section, ICAO Headquarters in Montreal, and highlighted the importance of his participation, since, in addition to his advices, he provided the Meeting the possibility of obtaining first-hand information on the activities carried out and foreseen by the AIS-AIM/SG.

Finally, Mr. Raúl Martínez, AIM Regional Officer of the ICAO NACC Office and Secretary of the AIM Subgroup, explained the agenda and the documentation to be used during the meeting.

ii.3 Organization, Officers and Secretariat

Mrs. Noemí Carta, Chairperson of the AIM Subgroup, presided over the meeting.

Mr. Raúl Martínez acted as Secretary of the Subgroup, assisted by Mr. Alberto Orero, AIM Regional Officer of the ICAO SAM Office.

ii.4 Working Languages

The working languages of the meeting were English and Spanish. The documentation was presented in both languages.

ii.5 Agenda

The following agenda was adopted:

Agenda Item 1: Follow-up actions adopted by the GREPECAS/15 and AIM/SG/11 Meetings

1.1 Review of the actions adopted by the GREPECAS/15 Meeting in reference to the AIS/SG/11 Meeting report.

1.2 Actions adopted by the Air Navigation Commission in reference to the GREPECAS/15 Meeting report regarding actions of the AIM/SG/11.

Agenda Item 2: Review of the AIM Subgroup Contributory Bodies Reports

2.1 Report of the Fourth Meeting of the AIM Quality Management Task Force (AIM/QM/TF/4) and follow-up on the initiative to develop an implementation plan for AIM services quality systems.

2.2 Report of the Tenth Meeting of the Aeronautical Information Management Training Task Force (AIM/TRAIN/TF/10).

2.3 Report from the Rapporteur on the Aeronautical Information Management Electronic Aeronautical Charts Task Force Meeting (AIM/e-MAP/TF/1) jointly with the Aeronautical Charts Group Meeting of the PAIGH.

Agenda Item 3: Planning of the Transition from AIS to AIM

3.1 Report of the Second Meeting of the Study Group for the Transition from AIS to AIM.

3.2 Roadmap for the transition from AIS to AIM.

3.3 Follow-up on the CAR and SAM Seminars on AIXM.

3.4 Guidance for the implementation of a GIS system related to Aeronautical Information and Aeronautical Charts.

Agenda Item 4: Review of the AIM Implementation Process

4.1 Review of compliance by Spanish speaking States on the requirement of publication for the Integrated Aeronautical Information Package (IAIP) in English.

4.2. Update of the reclassification of the “U” deficiencies using SMS methodology as a means for risk assessment in its last version and incorporation of information sources validated by IATA and IFALPA to the GREPECAS GANDD.

4.3 Guidance for implementation of the NOTAM Contingency Plan.

4.4 Follow-up on the implementation of e-TOD; results of the AIS-AIM/SG/1 discussions.

Agenda Item 5: Review of Administrative Aspects of AIM Subgroup

5.1 Review of the Terms of Reference and Work Programme of the AIM Subgroup and their task forces based on the performance approach adopted by GREPECAS.

5.2 Consideration of restructuring the AIM Subgroup. Substitution of the AUTO/TF with the creation of AIM-IT/TF (AIM-Information Technology Task Force)

Agenda Item 6: Other issues according to the AIM/SG Terms of Reference

6.1 New improved version of the AIP Audit tool (AZ version 2.5) and its application in the quality processes.

ii.6 Attendance

The Meeting was attended by 43 participants from 10 States members of the Subgroup, 10 Contracting States, located or having territories in the CAR/SAM Regions, as well as observers of 2 International Organizations and 2 service providers. A list of participants is shown in page iii-1.

ii.7 List of Documentation

WORKING PAPERS				
Number	**Agenda Item**	**Title**	**Date**	**Prepared and Presented by**
WP/01	---	Draft Agenda, Working Method and Schedule of the Meeting	04/09/09	Secretariat
WP/02	1.1	Review of the GREPECAS Valid Conclusions and Decisions in the AIS/MAP Field	22/10/09	Secretariat
WP/03	1.2	Actions taken by the Air Navigation Commission	22/10/09	Secretariat
WP/04	2.1	Report of the Fourth Meeting of the Quality Management Task Force (AIM/QM/TF/4)	21/10/09	Rapporteur
WP/05	2.2	Report of the Tenth Meeting of the Aeronautical Information Management Training Task Force (AIM/TRAIN/TF/10)	03/11/09	Rapporteur
WP/06	2.3	Report of TC Project ICAO/IPGH for production of VFR electronic charts	04/11/09	Rapporteur
WP/07	3.1	Second meeting of the study group for the transition from AIS to AIM (AIS-AIM/SG – ICAO HQ)	09/11/09	Secretariat HQs
WP/08	3.2	Roadmap for the Transition from AIS TO AIM	21/09/09	Secretariat HQs

WORKING PAPERS				
Number	**Agenda Item**	**Title**	**Date**	**Prepared and Presented by**
WP/09	3.3	CANCELLED	--	--
WP/10	3.4	Guidance for the implementation of a GIS SYSTEM	21/09/09	Secretariat
WP/11	4.1	Follow-up to Standard 3.6.1 of Annex 15	12/11/09	Secretariat
WP/12	4.2	Update on the re-classification of "U" deficiencies using the latest version of the modified SMS risk assessment methodology, and incorporation of sources of information validated by IATA and IFALPA into the GREPECAS GANDD	26/10/09	Secretariat
WP/13	4.3	Proposal for a guide for NOTAM Contingency Plan implementation	27/10/09	Secretariat
WP/14	4.4	CANCELLED	--	--
WP/15	5.1	Global and Regional Air Navigation Plan – Performance-Based Approach (PBA) for the Terms of Reference (TORs) and Work Programme of the AIM/SG	12/10/09	Secretariat
WP/16	5.2	Creation of the Information Technology Task Force (IT/TF)	02/11/09	Secretariat
WP/17	3.2	ICAO Documents supporting execution of the Roadmap to transit to AIM implementing available AIS/MAP SARPS - only in English Language	21/10/09	Cuba
WP/18	2.2	Guidance manual for the implementation of a quality management system for the AIS/MAP of AIM, Part 4 – selection, competence, training and requalification of AIS/MAP personnel	07/10/09	Rapporteur of the Training Task Force
WP/19	2.2	CAR/SAM AIM course - module contents programme study	07/10/09	Rapporteur
WP/20	2.2	Project manual on human factors principles in AIM	07/10/09	Rapporteur
WP/21	2.2	Technical-English language training programmes for the AIS/MAP personnel	07/10/09	Rapporteur
WP/22	5.1	Terms of reference and work programme of the AIM Subgroup	11/11/09	Secretariat
WP/23	4.4	Follow up of e-TOD implementation e-TOD	11/11/09	Chile
WP/24	6.1	AIP AUDIT	11/11/09	Chile
WP/25	4.1	IAIP in English language	11/11/09	Chile
WP/26	4.3	NOTAM Contingency Plan **(only in Spanish)**	23/11/09	Chile and Ecuador

INFORMATION PAPERS				
Number	**Agenda Item**	**Title**	**Date**	**Prepared and Presented by**
IP/01	--	General information	25/08/09	Secretariat
IP/02	--	List of Working and Information Papers	04/09/09	Secretariat
IP/03	3.4	Acquisition process and implementation of a Geographical Information System (GIS) **(only in Spanish)**	08/10/09	Uruguay
IP/04	--	CANCELLED	--	--
IP/05	4	QMS Seminar/Workshop	28/10/09	Secretariat
IP/06	6.1	New improved version of AIP Audit and its application in quality processes **(only in Spanish)**	12/11/09	Ecuador

ii.8 **Draft Conclusions, Draft Decisions and Decisions**

The AIM Subgroup records its action in the form of Draft Conclusions, Draft Decisions and Decisions as follows:

***Draft Conclusions**:* *Conclusions that require approval by GREPECAS prior to their implementation.*

***Draft Decisions**:* *Decisions that require approval and adoption by GREPECAS prior to their implementation*

Decisions: *Decisions that deal with matters of concern to the Contributory Body.*

ii.8.1 **List of Draft Conclusions**

ii.8.2 **List of Decisions**

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Agenda Item 1: Follow-up actions adopted by the GREPECAS/15 and AIM/SG/11 Meetings

1.1 Review of the actions adopted by the GREPECAS/15 Meeting in reference to the AIS/SG/11 Meeting report

1.1.1 Under this Agenda item, and following procedures established for review of the relevant matters dealt with within the AIM Subgroup, which are then reviewed by GREPECAS, the Meeting examined a summary of the actions taken by GREPECAS/15 Meeting for the corresponding follow-up by the Subgroup.

1.1.2 In accordance with the GREPECAS Procedural Handbook, a uniform classification to reflect the situation of the conclusions and decisions was established. These conclusions and decisions shall be examined at each meeting, in order to keep them updated and reduced in number, based on the progress achieved.

1.1.3 After reviewing and updating the list of valid conclusions for presentation to GREPECAS/16, the Meeting considered pertinent to update them, according to the indications in **Appendix A** to this part of the Report. It should be highlighted that in several Conclusions, dates for implementation were set, for actions to be taken by CAR/SAM States.

1.2 Actions adopted by the Air Navigation Commission in reference to the GREPECAS/15 Meeting report regarding actions of the AIM/SG/11

1.2.1 In adherence to the procedures established for the review of the pertinent items dealt with within the AIM Subgroup and hereafter reviewed by GREPECAS, the ICAO Air Navigation Commission (ANC) and the Council, if applicable, the Meeting took note of a summary of actions taken by GREPECAS/15 Meeting, and of the review of said report by the ANC, for its corresponding follow-up by the Subgroup.

1.2.2 In this sense, the ANC Working Group on Strategic Review and Planning (ANC WG/SRP) examined the GREPECAS/15 Report and the conclusions and decisions that might require actions from the Commission and/or Council, including those that could bear repercussions in other regions.

1.2.3 It took note that GREPECAS, with the help of its contributory bodies, had examined Caribbean and South American (CAR and SAM) Regions' air navigation topics, with the aim of improving air navigation, facilities, services and procedures planning, as well as fostering their application, and that since in GREPECAS/15 Report there is no action requiring a specific attention from the ICAO Council, the Air Navigation Commission had not presented to Council the GREPECAS/15 Report. After reviewing and updating the list of valid conclusions for presentation to GREPECAS/16, the Meeting considered pertinent to update them, according to the indications in **Appendix B** to this part of the Report.

1.2.4 Once the revision of the above was finished, the Meeting had the opportunity to receive comments by C/AINF Unit, MET AIM Section, who made reference to the content of GREPECAS Conclusion referred to AIS, especially Conclusion 14/40 related with the compliance of e-TOD SARPs. He informed the meeting of a proposal presented through SL AN 2/2.2 – 09/13 referred to amendment of Annex 15, Chapter 10. In response to this letter, ICAO received comments from the States and International Organizations enabling that the ANC complete a final review planned for January 2010. Basically this proposal for amendment to Annex 15, Chapter 10, reduces the cost of obstacle data collection for the Areas 2 and 3. In this response, no significant changes were proposed for Areas 1 and 4.

1.2.5 In this same context, and in relation to AIRAC System Data, the Meeting was informed about the availability of additional guidance material in the ICAO website: *http://www2.icao.int/en/anb/met-aim/aim/Pages/AIRACAdherence.aspx*, MET/AIM Section related to AIRAC adherence.

APPENDIX A

REVIEW OF THE LIST OF GREPECAS OUTSTANDING CONCLUSIONS IN THE AIS AREA

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 13/51 APPLICATION OF THE HUMAN FACTORS PRINCIPLES TO AERONAUTICAL INFORMATION MANAGEMENT That, considering the evolution of aeronautical information management, its level of automation, its effect on operational procedures, and its direct relevance to flight operations safety, the AIS/MAP Subgroup: a) take the necessary steps to develop human factors principles for aeronautical information management and for their application in the respective AIS/MAP services; b) develop a manual containing guidelines on human factors for aeronautical information management, and an implementation plan, based on the relevant ICAO documentation. The aforementioned manual and plan will be presented to the GREPECAS/14 Meeting; and c) schedule, in coordination with ICAO Regional Offices and the States/Territories and International Organizations, activities aimed at teaching and analysing the repercussion of human factors on the new air navigation systems.	AIM/SG a) Completed b) Completed c) Completed	Will be discussed under the corresponding agenda item GREPECAS/15 Meeting Conclusion was completed	Completed

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 14/36 REQUIREMENTS FOR THE IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEMS FOR AIM IN THE CAR/SAM REGIONS That the States and Territories of the CAR/SAM Regions, bearing in mind the advantages offered by the standardized application of guidelines and procedures for the implementation of quality management systems in their AIM services, adopt and apply: a) Part–4 of the *Guidance Manual for the Implementation of an AIM Quality Management System for the CAR/SAM Regions* related to the selection, proficiency, training and qualification of personnel of the Aeronautical Information Service as presented in **Appendix N** to this part of the report. b) the procedures of verification and validation of aeronautical data contained in **Appendix O** to this part of the Report, which will be included in the contents of the Guidance Manual for the Implementation of an AIM Quality Management System; c) the procedures to conduct quality audits in the AIM areas (see **Appendix P** to this part of the Report), in order to ensure effective development of this process in the CAR/SAM Regions in accordance with the AIS Quality Guidance Manual; and d) the necessary resources and mechanisms to ensure the activation of a lead auditor team to ensure the performance of quality audits in the AIM services of the CAR/SAM Regions.	CAR/SAM States and Territories	The CAR and SAM Regional Offices will request CAR/SAM States and Territories to report on this matter. Regarding d) it was considered that there is an auditor figure within QMS.	Completed
CONCLUSION 14/37 CONSOLIDATION OF THE CAR/SAM DIGITAL VFR AERONAUTICAL CHARTS PROJECT That ICAO NACC and SAM Regional Offices work in a coordinated manner to achieve the CAR/SAM Digital VFR Aeronautical Charts Project by the end of 2008: a) with PAIGH, in order to foster the production of VFR digital aeronautical charts on a common standards and procedures basis; and b) through the establishment of an ICAO technical co-operation programme funding mechanism.	ICAO	Technical Cooperation project underway for CAR and SAM Regions.	Completed

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 14/38 AIP AUDIT ASSISTANT (AAA) PROCESS INTEGRATION INTO THE CAR/SAM AIS That States/Territories/International Organizations: a) consider integrating AAA, which can be downloaded for free from website ***http://www.eurocontrol.int/aim/public/standard_page/tools_aaa.html***, into the CAR/SAM AIS so as to improve the AIP production process through the assessment and application of AAA during an experimental period; and b) develop a report on its use, shown in the **Appendix S** to this part of the Report, to be presented to the NACC and SAM Regional Offices by 31 January 2008	CAR/SAM States and Territories	AAA application underway for assessment and use. Tool AAA was replaced by tool AZ.	Completed
CONCLUSION 14/39 ACTIONS FOR THE USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR AIM SERVICES IN THE CAR/SAM REGIONS That taking into account the appropriateness of evolving towards the concept of digital aeronautical information management by electronic means in the CAR/SAM Regions, and that the use of Geographic Information Systems (GIS) could contribute directly and positively with these requirements by the end of 2008: a) CAR/SAM States and Territories consider the implementation of Geographical Information Systems (GIS) for AIM services as automated support for the electronic display of AIP and aeronautical chart information, and take action to permit training of AIS personnel on the practical management of GIS in order to facilitate the implementation and operation of these systems in their AIS services; and b) the NACC and SAM Regional Offices take the necessary action to consider, within relevant regional technical co-operation projects, the implementation requirements of Geographic Information Systems (GIS) as automated support for the activities of AIM services in the CAR/SAM Regions in direct support of CNS/ATM.	CAR/SAM States and Territories ICAO	Technical cooperation projects that include this matter are being integrated in both the CAR and SAM Office. Secretariat has prepared general guidelines for implementation of a GIS System in AIS.	Completed

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 14/40 COMPLIANCE WITH SARPS CONTAINEDIN CHAPTER 10 OF ICAO ANNEX 15 (ELECTRONIC TERRAIN AND OBSTACLE DATA) That the States and Territories of the CAR and SAM Regions, with a view to ensuring the provision of electronic terrain and obstacle data, take action in order to: a) include in their planning as soon as possible, the implementation of all required procedures to ensure that electronic terrain and obstacle data be provided in the period between 20 November 2008 (Annex 15, 10.6.1.1) and 18 November 2010 (Annex 15, 10.6.1.2), respectively, as established; b) ensure effective compliance of item a), through the establishment of a team of specialists in charge of the development of corresponding technical studies on this matter; c) put into practice an action plan oriented towards the collection of sets of electronic terrain and obstacle data for their classification, storage and availability in digital databases in accordance with the contents and structure specified in Appendix 8 to ICAO Annex 15; and d) ensure availability of electronic terrain and obstacle data of the State's national territory through coordination with national geographic institutes to have aeronautical Visual (VFR) Flight Charts available in digital format at scales between 1:250,000 and 1:1,000,000, respectively	CAR/SAM States and Territories d) the date of application of Area 2 has been modified with SL AN/2.2-09/13.	The associated action plans have not yet been received at the ICAO Offices. a) has been modified with SL AN/2.2-09/13 and is subject to review by the ANC.	Valid Finalized

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 14/41 CAR/SAM FASID TABLE AIS-4 That in compliance with CAR/SAM/3 RAN Recommendation 12/5, and based on the work carried out on this matter by both NACC and SAM Regional Offices and GREPECAS, and considering also that this is an operational requirement for the CAR/SAM Regions: a) the CAR/SAM States that have not yet done so, submit information to the ICAO Regional Offices for FASID Table AIS-4 as presented in **Appendix T** to this part of the Report; b) with that information, the ICAO NACC and SAM Regional Offices make the proposal for amendment to incorporate FASID Table AIS-4 - *Requirements for Integrated Aeronautical Information Package at International Airports* into the contents of Doc 8733, *CAR/SAM Air Navigation Plan, Volume II, FASID* by the end August 2007; and c) concerned ICAO Regional Offices take the necessary action to ensure that CAR/SAM States comply with updating and maintaining the information in the FASID Table AIS-4.	CAR/SAM States and Territories	Some CAR States have not yet sent the required information.	Valid
CONCLUSION 15/26 TRAINING SEMINARS/WORKSHOPS IN SUPPORT OF THE TRANSITION FROM AIS/MAP TO AIM That ICAO be urged to assist States/Territories with conducting at least 2 seminars and/or workshops on matters related to AIM transition and to include said events in technical cooperation projects that ICAO Regional Offices are carrying out in support of air navigation services.	CAR/SAM States and Territories ICAO	CAR and SAM States have shown interest, but there are no projects yet to support the holding of Seminars.	Completed

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 15/27 ADOPTION OF THE DRAFT STRATEGY FOR THE TRANSITION TO AIM That CAR/SAM States adopt the first version of the *"Draft Strategy for the Transition to AIM"* prepared by the AIM/QM/TF. *Note: The document mentioned in the above conclusion will be available on the NACC Regional Office website **www.mexico.icao.int**, soon; this will be informed to States through a letter and messages to the respective AIM (AIS/MAP) Areas.*	CAR/SAM States and Territories	The Roadmap for transition from AIS to AIM has been presented by ICAO Headquarters.	Completed
CONCLUSION 15/28 PRIORITY IN THE APPLICATION OF MEASURES FOR THE MIGRATION FROM AIS/MAP TO AIM SERVICES That civil aviation authorities of CAR/SAM States, Territories, and International Organizations assign high priority to the implementation of the Standards and Recommended Practices (SARPs) contained in Annex 4 and Annex 15, and that: a) the Secretariat of the AIM/SG prepare a survey on the status of implementation of ICAO SARPs in the AIM field (AIS/MAP) and send it to CAR/SAM States, Territories and International Organizations; b) States, Territories, and International Organizations send their replies to the accredited CAR and SAM Regional Offices not later than **31 December 2009;** and c) if no answer is received by the date mentioned in item b), the respective SARPs be considered as NOT IMPLEMENTED.	CAR/SAM States and Territories	The survey referred in a) will be developed before GREPECAS/16 for its submission to this Meeting.	Valid

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 15/29 DATE OF AIRAC SYSTEM That States, Territories and International Organizations of the CAR/SAM Regions: a) publish an AIC each year that includes AIRAC based on effective dates of the aeronautical integrated documentation package, which includes the AIRAC system application in support of efficient use of the mentioned system, as well as the important impact that the system has on operational safety; b) publish aeronautical information that introduces significant changes impacting air navigation systems at least 56 days prior the effective date; and c) notify the NACC and SAM ICAO Regional Offices of the total implementation of the AIRAC system not later than 31 July 2010.	CAR/SAM States and Territories	The extension for compliance of c) is proposed.	Valid
CONCLUSION 15/30 APPLICATION GUIDANCE OF THE HUMAN FACTORS PRINCIPLES IN AIS/MAP That States/Territories/International Organizations adopt, as Part 5 of the "Guidance Manual for the implementation of a Quality System in the CAR/SAM AIS/MAP", the "Application Guidance of the Human Factors Principles in AIS/MAP"	CAR/SAM States and Territories	AIM/QM/TF has completed and presented the human factors manual to AIM/SG/12 to be submitted to GREPECAS/16 Meeting.	Completed

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 15/31 RESTRICTED ACCESS IN AREAS WHERE AERONAUTICAL INFORMATION/DATA IS MANAGED IN WEB SERVERS AND NOTAM AND GIS DATA BASES That CAR/SAM States/Territories/International Territories take the following steps to protect the security of essential and critical information in the AIS/MAP and NOTAM areas by establishing: a) restricted access in spaces reserved for communications, data base servers and any other essential and critical information exchange equipment; and b) sufficient information technology firewalls in system data bases, network accesses and any other means that could permit alteration of sensitive information, which could turn into a safety risk.	CAR/SAM States and Territories	It is expected that in the survey to States, actions taken by States on this matter, are identified	Valid
CONCLUSION 15/32 FOLLOW-UP ON THE DEVELOPMENT OF MODELS FOR THE EXCHANGE OF INFORMATION/AERONAUTICAL DATA FOR AIM That States, Territories, International and Organizations follow-up on the development of models for the exchange of information/aeronautical data for AIM in which ICAO has participation.	CAR/SAM States and Territories	AIM/SG/12 Meeting was informed that an amendment to Annex 15, and associated guidance material containing information on the data exchange models is being prepared.	Valid

CONCLUSION	PARTY RESPONSIBLE FOR FOLLOW-UP	FOLLOW-UP ACTION	REMARKS
CONCLUSION 15/33 ACTIONS BY STATES FOR THE INTRODUCTION OF THE e-AIP DIRECTED TO AIXM That CAR/SAM States/Territories and International Organizations, when considering the management concept for aeronautical information through electronic means, provide the necessary training to AIS/MAP (AIM) personnel in the management of information technology systems and in the Aeronautical Information Exchange Model (AIXM), in order to become familiar with the essential and critical electronic data management characteristics, as background towards the preparation of an e-AIP.	CAR/SAM States and Territories	AIM/SG/12 Meeting was informed that an amendment to Annex 15, and associated guidance material containing information on the data exchange models and e-AIP is being prepared.	Valid

APPENDIX B

ACTION TAKEN BY THE AIR NAVIGATION COMMISSION ON THE GREPECAS/15 REPORT CONCERNING THE ACTIONS ADOPTED BY THE AIM/SG/11 MEETING

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of the Conclusion/Decision	Follow-up action	To be initiated by	Deliverable	Target date
C 15/2 A, D	**EXTENSION OF E-TOD PROVISION IMPLEMENTATION DATES**	That ICAO consider extending the implementation dates to meet e-TOD requirements, as follows: a) Areas 1 and 4 to 2010; and b) Areas 2 and 3 to 2013.	Follow up by ICAO Headquarters By the date of the AIM/SG/12, the ANC had not yet decided on this matter.	ICAO Headquarters.	Publication of e-TOD data for areas 1,2,3 and 4 (Annex 15, Chapter 10 and App.8).	31 December, 2013
C 15/26 A, D	**TRAINING SEMINARS/ WORKSHOPS TO SUPPORT THE TRANSITION FROM AIS/MAP TO AIM**	ICAO is urged to support States in the conduction of at least 2 seminars and/or workshops on matters related to AIM transition, and that such events be incorporated, inasmuch as possible, to the technical cooperation projects that ICAO Regional Offices are carrying out in support of air navigation services.	Coordinate seminars with the States and Territories concerned States have not proposed for holding of seminars.	ICAO Lima and Mexico Regional Offices.	Seminars coordinated and scheduled.	December 2009
C 15/27 A, D	**ADOPTION OF THE DRAFT STRATEGY FOR THE TRANSITION TO THE AIM**	That CAR/SAM States support the first version of the "Draft Strategy for the Transition to the AIM", developed by the AIM/QM/TF.	State Letter Publication of AIM Roadmap has finalized.	ICAO Lima and Mexico Regional Offices, States.	Draft strategy for the transition to the AIM, adopted by the States.	31 December, 2009
C 15/28 A, D	**PRIORITY IN THE IMPLEMENTATION OF MEASURES FOR THE**	That the civil aviation authorities of the CAR/SAM States/Territories and International Organisations assign high	Survey to the States.	ICAO Lima and Mexico Regional	Status of implementation of SARPs	31 May 2010.

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of the Conclusion/Decision	Follow-up action	To be initiated by	Deliverable	Target date
	MIGRATION FROM THE AIS/MAP SERVICE TO THE AIM	priority to the implementation of the standards and recommended practices (SARPs) of Annex 4 and Annex 15, and: a) that the AIM/SG Secretariat prepare and send to CAR/SAM States, Territories, and International Organisations a survey to know the level of implementation of the ICAO SARPs in the AIM area (AIS/MAP); b) that the States, Territories, and International Organisations send their responses to the accredited CAR and SAM Regional Offices no later than 31 May 2010; and c) that, if no answer is received on the date mentioned in paragraph b), the respective SARPs be considered as **NOT IMPLEMENTED**.	The date 30 March 2010 is being proposed.	Offices.	Annexes 4 and 15.	
C 15/29 A, D	**AIRAC SYSTEM DATES**	That CAR/SAM States /Territories /International Organisations: a) publish once a year an AIC that includes the effective AIRAC dates of the integrated aeronautical information documentation package, as well as AIRAC system implementation details, in support of the effective use	State Letter sent by the Lima and Mexico Regional Offices. The date 30	CAR/SAM States, Territories, and International Organisations.	Publication of the AIRAC AIC by the States, Territories, and International Organisations.	31 July, 2010

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of the Conclusion/Decision	Follow-up action	To be initiated by	Deliverable	Target date
		of said system, and the significant impact the system has on safety; b) publish, more than 56 days in advance to the effective date, the aeronautical information that introduces significant changes that have a big impact on air navigation systems; and c) inform the ICAO NACC and SAM Regional Offices about the total implementation of the AIRAC system, no later than 31 July 2010.	March 2010 is being proposed.			
C 15/30 A, D	**GUIDE FOR THE IMPLEMENTATION OF HUMAN FACTOR PRINCIPLES IN AIS/MAP SERVICES**	That the States /Territories /International Organisations adopt the *"Guide for the implementation of human factor principles in AIS/MAP Services"* as Part 5 of the "*guide for the implementation of a quality system in CAR/SAM AIS/MAP services"*.	State Letter sent by the Lima and Mexico Regional Offices Completed	CAR/SAM States, Territories, and International Organisations.	Implementation by the States, Territories, and International Organisations of the Guide for the implementation of human factor principles in AIS/MAP services.	Completed
C 15/31 A, D	**RESTRICTED ACCESS TO AREAS IN WHICH AERONAUTICAL INFORMATION/DATA IS MANAGED ON WEB SERVERS AND NOTAM AND GIS DATABASES**	That CAR/SAM States /Territories /International Organisations take the following action to safeguard the security of essential and critical information in the AIS/MAP and NOTAM areas. a) establish restricted access to airspaces reserved for communication equipment, database servers, and any	State Letter sent by the Lima and Mexico Regional Offices.	CAR/SAM States, Territories, and International Organisations.	Actions to safeguard the security of essential and critical AIS/MAP and NOTAM information.	31 December, 2010

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of the Conclusion/Decision	Follow-up action	To be initiated by	Deliverable	Target date
		other equipment for the exchange of essential and critical information; and b) establish sufficient firewalls in database systems, network access, and any other computer means through which sensitive information can be altered and safety compromised.				
C 15/32 A, D	**FOLLOW UP ON THE DEVELOMENT OF MODELS FOR THE EXCHANGE OF AERONAUTICAL INFORMATION/DATA FOR AIM**	That the States/Territories/ International Organisations do the follow up on the development of the aeronautical information/data exchange models for AIM services in which ICAO participates.	State Letter sent by the Lima and Mexico Regional Offices Annex 15 SARPs on data exchange models are being developed.	CAR/SAM States, Territories, and International Organisations.	Review of information about AICM and AIXM.	31 December, 2009
C 15/33 A, D	**ACTIONS FOR THE INTRODUCTION OF BASIC ELEMENTS RELATED TO THE e-AIP CONCEPT**	That CAR/SAM States/Territories and International Organisations, taking into account the concept of electronic management of aeronautical information in the CAR/SAM Regions, provide the necessary training for AIS/MAP (AIM) staff on the management of IT systems and on the aeronautical information exchange model (AIXM), in order to acquire knowledge concerning the electronic management of ordinary, essential, and critical data in preparation for an e-AIP.	State Letter sent by the Lima and Mexico Regional Offices.	CAR/SAM States, Territories and International Organisations.	Training programme for the personnel on computer systems.	31 December, 2010

Agenda Item 2: Review of the reports of the AIM Subgroup contributory bodies

2.1 Report of the Fourth Meeting of the AIM Quality Management Task Force (AIM/QM/TF/4) and follow-up on the initiative to develop a plan to implement a quality system in AIM services (*[1])

2.1.1 The Fourth Meeting of the AIM Quality Management Task Force (AIM/QM/TF/4) was held in Quito, Ecuador, from 20 to 24 April 2009, with the participation of 22 delegates from 9 States and 1 international organization.

Summary of the Fourth Meeting of the AIM/QM/TF

2.1.2 The Meeting reviewed the status of implementation of the Quality Management System in CAR/SAM AIS/MAP services, based on data derived from the reporting forms sent to the States by the ICAO NACC and SAM Regional Offices, where a total of 14 responses were received. Information from previous QM/TF meetings served to complete this analysis. The Meeting also discussed the criteria, benefits and connection between the Quality Management System and the Safety Management System (SMS) being implemented in air traffic services.

2.1.3 The Meeting also discussed the *Main changes to the ISO 9001:2000 Standard and the ISO 9001:2008 Standard*, which contained the objectives of the revision of the Standard by ISO and the extent of these changes, and concluded that ISO 9001:2008 did not introduce new requirements and was only modified to clarify some items in the text, and to make it more compatible with ISO 14001:2004 and the recent "Environmental Management Systems". Under this same agenda item, Chile presented WP/11, *Refresher workshop for the requalification of personnel according to the ISO 9001:2008 Standard*.

2.1.4 The participants discussed their experiences regarding the aeronautical data verification and validation activities carried out by the CAR/SAM AIS/MAP services that have already implemented the Quality Management System.

2.1.5 The Meeting reviewed the methodology used to assess the efficiency of aeronautical information processes in the AIS/MAP of Cuba, which described the experience and methods used in the follow-up, monitoring and measurement of the quality process, according to the requirements of the ISO 9001:2000 Standard. The presentation also covered the validation method and the recording systems used for data analysis, as well as the assessment of customer satisfaction, the evaluation of audit results, and the controls of the final analysis of these data and tools.

[1] (*) The Final Report of each Task Force (*only in Spanish version*), the Plan for the implementation of principles on human factors for AIM (*only in Spanish version*), the Guidance Manual for the Implementation of Quality Assurance Management for the AIS/MAP in the CAR/SAM-Part 4 – Rev. 2009, the Manual on Human Factors for the AIS (Ecuador) (*only in Spanish version*), the Manual on the job training (OJT/AIM-Colombia) (*only in Spanish version*), and the Guidance for the AIM Course (*only in Spanish version*) are available in the Web page of GREPECAS - Meetings - 2009 – AIM/SG/12.

2.1.6 In order to give continuity to the work on human factors, the Rapporteur presented the Meeting with a draft Plan for the Implementation of Principles on Human Factors. The Meeting emphasized that the execution of the "Draft Implementation Plan", was mainly based on the implementation of training courses on Human Factors, using as a reference the "*Guide for the application of Principles on Human Factors in AIS/MAP"*, considered as Part 5 of the Guidance Manual for the Implementation of a AIS/MAP Quality Management System for the CAR/SAM Regions, adopted by GREPECAS/15 through its Conclusion 15/30. The Meeting also felt the need to develop a Training Programme on Human Factors to achieve its objectives.

2.1.7 The Meeting reviewed the Terms of Reference and Work Programme of the QM/TF, adopted by the AIM/SG/11 meeting. Following the aforementioned analysis, the Meeting agreed to submit to the AIM/SG the Work Programme with the modifications made.

2.1.8 In turn, the Secretary of the AIS-AIM Study Group (AIS-AIMSG) from ICAO Headquarters informed the Meeting that this study group was developing an AIS quality manual. The Meeting agreed that the material developed by the AIM QMS/TF would be sent to the AIS-AIMSG for its consideration and inclusion in the ICAO quality manual. It was noted that coordination between the GREPECAS AIM SG and the AIS-AIMSG would be conducted by members participating in the two groups.

2.1.9 After reviewing the report presented by the AIM/QM/TF, the Meeting agreed on the following:

DRAFT
CONCLUSION 12/1 PLAN FOR THE IMPLEMENTATION OF PRINCIPLES ON HUMAN FACTOR FOR AIM

That States/Territories/International Organizations, in support of GREPECAS Conclusion 15/30 *"Guide for the application of principles on human factors in AIS/MAP"*, adopt the "Plan for the implementation of principles on human factors for AIM" (*).

DECISION 12/2 RECORDS USED FOR THE VERIFICATION AND VALIDATION OF AERONAUTICAL DATA IN CAR/SAM AIS/MAP SERVICES

Send, through the Secretariat of the AIM Subgroup, by way of reference, the records being used by AIS/MAP services in CAR/SAM States that have implemented a quality management system, so that the task force associated to this topic may be aware of the same and may use them when preparing its guides, and develop criteria for the QM/TF for the improvement of such records, if necessary.

DRAFT
CONCLUSION 12/3: APPROVAL OF UPDATES TO THE GUIDANCE MANUAL FOR THE IMPLEMENTATION OF A QUALITY MANAGEMENT SYSTEM ORIENTED TO THE AERONAUTICAL INFORMATION MANAGEMENT (AIM)

That States/Territories/International Organization, approve the revisions to the Guidance Manual for the Implementation of a Quality Management System considering the transition from AIS to the Aeronautical Information Management (AIM), contained in the Appendix to this working paper.

DECISION 12/4 OPERATION OF THE CONTRIBUTORY BODIES OF THE GREPECAS AIM SUBGROUP

That the AIM Subgroup assist and/or re-structure the Automation Task Force and the Electronic Aeronautical Charts Task Force, assigning new tasks as needed.

2.2 Report of the Tenth Meeting of the Aeronautical Information Management Training Task Force (AIM/TRAIN/TF/10) (*)

2.2.1 The Tenth Meeting of the Aeronautical Management Training Task Force (AIM/TRAIN/TF/10), was held in the COCESNA/ICCAE premises in San Salvador, El Salvador, from 22 to 26 June 2009, with the participation of 6 delegates from 5 States, one representative from the *Comisión Ejecutiva Portuaria Autónoma* (CEPA) and two delegates from the Central American Air Navigation Corporation (*Corporación Centroamericana de Servicios de Navegación Aérea* - COCESNA).

Summary of the Tenth Meeting of the AIM/TRAIN/TF

2.2.2 The Meeting approved the revised version 2009 of the Guidance Manual for the Implementation of a Quality Management System for AIS/MAP services in the CAR/SAM Regions, in its Part 4 – Selection, Competence, Training and Re-qualification of Aeronautical Information Service personnel (*).

2.2.3 The Meeting reviewed again the proposed training guide for the AIM course presented at the AIM/TRAIN/TF/9 meeting, taking into account some aspects for its update, including the need to consult its coding, since there was no certainty as to the origin of the AIS/024 nomenclature. It also considered the need to accommodate the AIS/MAP personnel training in the CAR/SAM Regions, based on the knowledge, skills and capabilities required for the AIS-AIM transition.

2.2.4 The Meeting also analysed the training programmes on human factors for AIM in the CAR/SAM Regions, and decided to include a training Programme on Human Factors in the training programmes for AIS/MAP personnel.

2.2.5 It also reviewed the profile of the course entitled Safety Awareness and Human Factors, provided at the ICCAE, for the development of the course on Human Factors. Ecuador presented a "Manual on Human Factors for the Aeronautical Information Service" (*), which was available to CAR/SAM States.

2.2.6 Taking into account the current requirements of Annex 15, paragraph 3.6.1, and in view of the documentation available for fulfilling this task, the AIM/TRAIN/TF/10 meeting deemed it advisable to recommend the AIM Subgroup to propose the application of the guidelines and training programmes contained in Doc. 9835 AN/453 for training AIS-MAP personnel in the English language.

2.2.7 The Meeting was also apprised of the processes for training AIS personnel in Colombia, and was presented with a report on the on-the-job training "Manual on Aeronautical Information Management (OJT/AIM) in the AIS/Colombia" (*), which could be adopted by the AIS CAR/SAM organizations.

2.2.8 The Meeting reviewed the terms of reference, level of compliance and implementation of the AIM/TRAIN work programme.

2.2.9 Finally, the Meeting took note that the AIS-AIMSG was developing guidance material on AIS training. Consequently, the Meeting agreed that the material developed by the AIM TRAIN/TF should be sent to the AIS-AIMSG for its consideration and appropriate inclusion in the ICAO training guidance material where appropriate. It was noted that coordination between the GREPECAS AIM SG and the AIS-AIMSG would be conducted by members participating in the two groups.

2.2.10 After reviewing the report presented by the AIM/TRAIN/TF, the Meeting agreed to the following:

DRAFT
CONCLUSION 12/5 CAR/SAM TRAINING GUIDE FOR THE AIM COURSE

That the AIM Subgroup:

a) propose to GREPECAS the adoption of the "CAR/SAM Training Guide for the AIM Course" (*);

b) coordinate with the ICAO NACC and SAM Regional Offices and the national and regional training centres, for the distribution of the guide to serve as a reference in the development of modules for the CAR/SAM AIM course; and

c) consider, within the Roadmap for AIS-AIM transition, the initiation of AIM training course based on this reference guide, starting in 2011.

DRAFT
CONCLUSION 12/6 CAR/SAM MANUAL ON HUMAN FACTORS IN THE AERONAUTICAL INFORMATION MANAGEMENT (AIM)

a) Submit the Manual on Human Factors in the Aeronautical Information Service to the consideration of GREPECAS; and

b) Take into account this manual for the implementation of training programmes for AIS/MAP personnel.

DRAFT
CONCLUSION 12/7 REFERENCE FOR THE DEVELOPMENT OF TRAINING PROGRAMMES IN TECHNICAL ENGLISH LANGUAGE FOR AIS/MAP PERSONNEL IN CAR/SAM STATES

That CAR/SAM States, Territories and International Organisations consider Doc 9835 AN/453 – *Manual on the Implementation of ICAO Language Proficiency Requirements,* as a reference when formulating their training programmes in the English language, adapting it as necessary based on the performance requirements for AIS personnel, in support to the ATM Operational Global Plan.

2.3 Report of the Rapporteur of the Task Force on Electronic Aeronautical Charts in Aeronautical Information Management (AIM/e-MAP/TF/1), together with the meeting of the PAIGH Aeronautical Charts Group (*)

2.3.1 The AIM/SG/12 Meeting took note of a meeting held in Santiago, Chile, on 10–13 March 2009, with the participation of 7 delegates invited by the PAIGH from Argentina, Colombia, Ecuador, Mexico, Panama, Paraguay and Uruguay, and 4 special guests of the General Direction of Civil Aviation of Chile, 12 technical speakers from the Aerial Photography Service of the Chilean Air Force, and the Head Coordinator of the working group, geographer Viviana Barrientos Lardinois.

2.3.2 The AIM/SG/12 Meeting, taking into account that the tasks entrusted to the eMAP/TF had not been completed, and in light of the developments presented by the Secretary of the AIS-AIM Study Group (AIS-AIMSG) of ICAO Headquarters in this respect, agreed on the need to review the ToRs and the tasks of this working group. The results of the review appear under item 5 of this report.

Agenda Item 3: Planning of the Transition from AIS to AIM

3.1 Regarding the report of the First and Second Meeting of the AIS-AIM Study Group held in ICAO Headquarters, the Secretariat presented additional and updated information on the recent work carried out by said study group (AIS-AIMSG). The meeting was informed about the origin of the group, its composition, tasks and deliverables and the availability of information on the AIS-AIMSG website at: **http://www2.icao.int/en/ais-aimsg**. The meeting noted the Summary of Discussions (SOD) of the AIS-AIMSG/2 meeting held in Montreal from 10-13 November 2009 and the follow-up actions detailed in the SOD, on these matters. The Meeting recognised that significant activity was underway in the AIS-AIMSG to develop new SARPs to Annexes 4 and 15 and global guidance material to support the transition to AIM. The Secretariat in support to the work of this Study Group, undertook to provide the AIS-AIMSG with guidance material on AIS quality management and training developed by the GREPECAS AIMSG for possible inclusion in global guidance material.

Roadmap for the transition from AIS to AIM

3.2 To supplement the "Roadmap for the Transition from AIS to AIM", the Secretariat presented additional information on the same. The meeting was informed of the function of Roadmap and the critical importance of AIM to the Global Air Navigation Plan (Doc 9750) and the future air traffic management system envisioned in the Global Air Traffic Management Operational Concept (Doc 9854). The Meeting was apprised of the roadmap "steps", and recognised, in particular, that Phase 1 – "Consolidation" required the implementation of the existing SARPs in order to build a solid foundation for the transition to AIM. Emphasis was made on the need to have a Spanish version of the Roadmap as soon as possible and, in this regard, the translations prepared by Cuba and Uruguay were to be forwarded to ICAO for assessment, and placed on the web sites of the CAR and SAM Offices as draft translations. The Spanish version of the referred Roadmap has already being placed at the ICAO Headquarters webpage.

3.3 The Meeting recognised the need for the aeronautical community and especially, the Civil Aviation Administrations, to support the transition from the AIS to the AIM, given its important role and contribution to the ATM Operational Concept, which basically relies on data, like many other users. On this respect, and with regard to this recognition, COCESNA informed the meeting on their support to a CAR regional project which is in process of creation, and is oriented to PBN implementation of States integrating such project.

3.4 These new services provided by AIM are based on traditional AIS safety information including information services that support the efficiency of aeronautical systems, and the capacity and performance requirements of existing and future ATM operational services. The Roadmap described in **Appendix A** to this working paper seeks to provide more specific and detailed information about the directives provided in Doc 9750 *Global Air Navigation Plan* for the development of Aeronautical Information Management.

3.5 The roadmap for the transition from AIS to AIM was developed by ICAO in consultation with the AIS-AIM Study Group--made up by experts from various States from all over the world--, and submitted its results to the Air Navigation Commission (ANC). This work is addressed in more detail in the ICAO directives to States for the implementation of aeronautical information management (AIM) to reflect and emphasised the importance of the evolution.

3.6 The roadmap offers practical guidance and advice to regional planning groups and States regarding the implementation and funding strategies that will be required for the global plan initiatives related to aeronautical information. It also identifies the major milestones recommended for a uniform evolution across all regions of the world, as well as the specific steps to be achieved and the timetable for implementation. The AIM Performance Framework Form (PFF) contained in **Appendix B** to this part of the report identifies specific initial steps to be taken by CAR/SAM States and Territories. Accordingly, the Meeting formulated the following draft conclusion:

DRAFT
CONCLUSION 12/8 ROADMAP FOR THE TRANSITION FROM AIS TO AIM

That CAR /SAM States and Territories:

a) Consider the guidelines, steps and timeline for the Transition from AIS to AIM presented in the "**Roadmap for the transition from AIS to AIM**";

b) inform the corresponding ICAO Regional Office progress and/or difficulties on the implementation of SARPs associated to the implementation guide, not later than **5 May 2010;**

c) develop the corresponding AIM air navigation regional plans with the related PFFs and with the Regional Plans as a reference, according to GREPECAS conclusion 15/1 in its paragraphs a) and b), and in the AIM Roadmap; and

d) Inform to the ICAO CAR/SAM Regional Offices on the progress of the implementation requested in the above paragraph, **no later than 29 October 2010**.

3.7 Regarding the availability of ICAO documentation in Spanish, the Meeting agreed that, in order to meet the new requirements emanating from the Global Air Traffic Management Operational Concept, Aeronautical Information Services should transit to Aeronautical Information Management, and its data-oriented approach. There is a need in many States to fully understand this complex transition in the Spanish language.

3.8 The Roadmap for the transition from AIS to AIM highlights the main steps to be achieved during the three stages, where each step will require the implementation of projects covering two types of activities:

a) ***Development of Standards.*** The development of new standards often lies on the critical path of the transition. Amendments to ICAO Standards and Recommended Practices (SARPs) are required for uniform implementation of the transition to AIM in all States. Actions related to the establishment of these standards in Annexes to the Chicago Convention and in guidance material will be led by the ICAO Secretariat with the support of States and International Organizations.

b) ***Implementation of Standards.*** Implementation of Standards allowing the transition to AIM will be the responsibility of States. The roadmap will provide a description of projects that States may have to consider accomplishing the transition. Guidance material will be issued by ICAO to assist in the implementation.

3.9 Regarding the application of the standards, it specifies that this will be the responsibility of the States, but ICAO will develop guidance material to assist in their application. The proposed amendments to Annexes 15 and 4, as well the guidelines, some of which are of crucial importance, are only available in English.

3.10 As an example of guidelines that existed only in the English language, the Meeting cited Doc 9881, which is the only explanatory text that the States have for complying with the standards contained in Chapter 10 of Annex 15 and in Chapters 5 and 20 of Annex 4. These standards are of a high technical complexity and require an in-depth study and a correct interpretation for their implementation, making it difficult for Spanish-speaking States to understand them. In this sense, the Meeting noted that other Regions of the world that use different ICAO official languages are facing the same problem.

3.11 Something similar occurs with the "Roadmap for the transition from AIS to AIM". This roadmap has been developed to address specifically and in greater detail the directives contained in Doc 9750 for the future development of aeronautical information, serving as a practical guide for regional planning groups and the States for the development of the implementation and financing strategies that will be needed for the Global Plan initiatives concerning aeronautical information.

3.12 Finally, the Meeting felt that, in absence of a translated version of documents of such importance, the Spanish-speaking States could not properly interpret their contents in order to adopt and apply these standards, thus hindering their implementation. Accordingly, it formulated the following draft conclusion:

DRAFT
CONCLUSION 12/9 AVAILABILITY OF DOCUMENTATION IN SPANISH

That GREPECAS propose to ICAO Headquarters the need to give priority, to the extent possible, to translating into Spanish the texts that are available only in English and that are of crucial importance for complying with ICAO SARPs, with a view to the AIS-AIM transition.

3.13 Furthermore, the Meeting was informed that the Federal Aviation Administration (FAA) had sponsored the eight meeting of the *Global Aeronautical Information Management Consortium*, which was held in Orlando, Florida, in March 2009.The meeting reckoned with the participation of 20 delegates from the following States and International Organisations: Australia, Canada, China, United States, ICAO, Jamaica, Japan, South Africa and Venezuela.

3.14 The agenda of this meeting included a revision of the activities carried out within the framework of ICAO through the AIS-AIM Study Group; CANSO Study Group, and the Seminar on Global ATC held in Amsterdam; the Fourth Annual AIXM Conference (Washington), a review of the Conclusions of the Global Congress (2006); review of the results of the congress held in Singapore (2008); the planning of congresses foreseen to be held in South Africa, and the Global Congress, foreseen to be held in China in 2010; as well as on digital NOTAMs; AIXM, Next Generation; e-Tod; and presentation of related technical matters.

3.15 The presentations made during the meeting are shown in the web page of the SAM Office: **www.lima.icao.int/edocuments/ais.**

3.16 The Meeting took note that ICAO, through the meetings of the CAR/SAM Regional Planning and Implementation Group (GREPECAS) and, more specifically, the meetings of the Aeronautical Information Management Subgroup (AIM/SG), had expressed the need to implement geographical information systems as a tool to support AIM units. Consequently, action should be taken to obtain this service promptly, as a starting point for the transition from the traditional format to the digital handling of aeronautical information.

3.17 In view of the above, the AIS GIS guidelines has been developed to ensure the implementation of a GIS containing AIP information, digital images, digital terrain models (DTM), census data, etc., in order to have a GIS allowing for the analysis of aeronautical information/data, with the guarantee of quality-assured information/data in terms of precision, validity, and accuracy, and the data validation process itself, as required by the applicable ICAO standards.

3.18 The AIM/SG/11 Meeting noted that ICAO should continue promoting the implementation of automated systems in AIM services in the CAR/SAM Regions to allow for the electronic production and processing of AIP information and aeronautical charts, and the IAIP as a whole, based on a common platform or model for the exchange of electronic aeronautical data.

3.19 To this end, the Meeting agreed that consideration should be given to the need for States to use geographical information systems (GIS) in AIM services, which would contribute to achieve the objective of digitally processing the aeronautical information.

3.20 Taking into account that the GREPECAS/14 meeting adopted Conclusion 14/39 "***Actions for the use of geographical information systems (GIS) in AIM services in the CAR/SAM Regions***", and precisely to support the actions mentioned in the aforementioned conclusion, the Meeting reviewed and adopted the "General Guidance for the Implementation of a GIS System in AIM", which appears in **Appendix C** to this part of the report.

3.21 In agreement with the above, the meeting considered the following draft conclusion:

DRAFT
CONCLUSION 12/10 GENERAL GUIDANCE FOR THE IMPLEMENTATION OF A GIS SYSTEM IN AIM

That GREPECAS approve as vital importance to support ICAO SARPs, the application of the **General Guidance for the Implementation of a GIS System in AIM**, towards to achieve the transition from AIS to AIM in the States, Territories and International Organizations of the CAR/SAM Regions.

3.22 Finally, the Meeting took note of the presentation made by Uruguay regarding the acquisition and implementation of a geographical information system (GIS) in the Aeronautical Information Service of Uruguay, and the results obtained to date. The full report submitted to the AIM/SG12 meeting appears in **Appendix D** to this part of the report.

3.23 The paper also outlined the procedures and steps to be followed in the implementation of a GIS system designed to provide operational aeronautical information products. The Meeting recognised this as valuable guidance material and the Secretariat undertook to evaluate the material for inclusion in the Aeronautical Chart Manual (Doc 8697). The Meeting was polled on the number of State participants currently using GIS and seven States indicated this utilisation.

3.24 The meeting received a presentation by Mr. Antonio Nicoletti, from the Italian Company IDS (Systems Engineering) with the title "Aeronautical Management and Production systems: technological progress in the last years (GIS and not only GIS)" which dealt with matters such as ICAO and EUROCONTROL reference guidelines. On the other hand, it presented important aspects of the management and production in AIM and the relevance of the tools, such as GIS, oriented towards aeronautical information management, receiving some representative examples.

Roadmap for the Transition from AIS to AIM

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Roadmap for the Transition from AIS to AIM
NOT FOR SALE

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

FOREWORD

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

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

This roadmap offers practical guidance and advice to regional planning groups and States for development of the implementation and funding strategies that will be required for the global plan initiatives related to aeronautical information. It identifies the major milestones recommended for a uniform evolution across all regions of the world, specific steps that need to be achieved and timelines for implementation.

This publication is intended to serve as a strategic positioning initiative to drive the continuing improvement of aeronautical information services in terms of quality, timeliness and the identification of new services and products to better serve aeronautical users. It sets a baseline for establishing strategies and other initiatives to advance the AIM objectives globally and should place the future AIM in a position to better serve airspace users and ATM in terms of their information management requirements.

The expectations are that the transition to AIM will not require many changes in terms of the scope of aeronautical information to be distributed. The major change will be the introduction of new products and services and an increased emphasis on better data distribution in terms of quality and timeliness in order to meet user requirements and contribute to improved safety, increased efficiency and greater cost-effectiveness of the air navigation system.

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GLOSSARY

TERMS

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

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

[1]***Aeronautical information management (AIM).*** The dynamic, integrated management of aeronautical information services — safely, economically and efficiently — through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

[1]***Database.*** A usually large collection of data stored in structured digital format so that appropriate applications may quickly retrieve and update it.

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

[1]***Data set.*** Identifiable collection of related digital data.

[1]***Digital***. Involving or relating to the use of computer technology or digital communications.

[1]***Information management (IM).*** The processes defined to ensure the collection, utilization and transmission of quality data that are tailored to the needs of each component of the air traffic management system.

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

Note.— This is usually achieved by common understanding of the semantics, the syntax and the protocols for the exchange of data.

[1]***Metadata***. A structured description of the content, quality, condition or other characteristics of data.

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

1. Not an official ICAO definition (used in the context of this document only).

ABBREVIATIONS/ACRONYMS

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

PART I

ROADMAP OVERVIEW

WHY AERONAUTICAL INFORMATION MATTERS

1. The Eleventh Air Navigation Conference (AN-Conf/11) held in Montréal in September 2003 endorsed the operational concept 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.

2. In June 2006, a Global AIS Congress was held in Madrid, Spain. The event was facilitated by the European Organisation for the Safety of Air Navigation (EUROCONTROL) in partnership with ICAO. The Congress considered the essential role of AIS in the evolving world of ATM. It noted that computer-based navigation systems, and area navigation (RNAV), required navigation performance (RNP) and ATM requirements introduced a need for new corresponding AIS requirements for quality and timeliness of information. The role of AIS would therefore need to transition to an information management service, changing duties, responsibilities and scope to satisfy these new requirements and to cope with and manage the provision of information.

3. The Congress supported the recommendations of AN-Conf/11 dealing with aeronautical information and began to define a future high-level view as to the shape, nature and content of a strategy for the evolution from traditional product-centric AIS to the enlarged scope of data-centric aeronautical information management (AIM). Realizing the safety-critical nature of aeronautical information and in order to prevent diverging developments in the future, the Congress agreed that ICAO should take the lead at the global level with regard to the transition from AIS to AIM. Accordingly, the Congress developed ten recommendations calling for ICAO action or support from States and international organizations.

4. In September 2007, the 36th Session of the Assembly recognized the need to support the recommendations of the Congress and called for further coordination with States and international organizations.

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

HOW INFORMATION IS DISTRIBUTED TODAY

6. We are in the age of the Internet, satellite navigation and computer networks, yet our approach to aeronautical information distribution is still based on paper charts, paper documentation and telex-based text

messages. Systems exist in isolation. Much of the data is entered more than once in different computers using a keyboard rather than by file transfer or database transactions.

7. Better aeronautical information is essential if we are to have an integrated and interoperable ATM system that enables air navigation service providers to safely handle more traffic in the same amount of space during the same amount of time. Such a system would effectively link the full range of services from airspace design to flight planning, airport operations planning and flight separation assurance while continuing to maintain the safety and security of the travelling public and lessening the environmental impact on the planet and its population.

8. Better aeronautical information is essential if we are to have a flexible ATM system that reduces costs and environmental impacts while improving access to congested airspace and remote airports in developing countries. Such a system would allow planners and decision makers to make the right decisions for the development of new tools and techniques based on accurate information available on time and in the right place.

9. Better aeronautical information is essential if we are to have a system that empowers airspace users by giving them a greater role in shaping the ATM system, and by helping them understand their options and make informed decisions while maintaining public safety and minimizing the impact on the environment. Such a system would be focussed on users' needs.

10. Corrupt or erroneous aeronautical information has the potential to adversely affect the safety of satellite navigation, just as corrupt or malfunctioning navigation aids adversely affect the safety of ground-based navigation.

11. These improvements are central to the Global Air Traffic Management Operational Concept and justify by themselves the name change from AIS to AIM that identifies the new focus on all aspects related to proper information management as opposed to the traditional way of focusing on the provision of standard products to the pilot only.

THE OBJECTIVE OF THE TRANSITION TO AIM

12. Recommendation 1/8 of AN-Conf/11 clearly stated the objective for global aeronautical information as follows:

> That ICAO, when developing ATM requirements, define corresponding requirements for safe and efficient global aeronautical information management that would support a digital, real-time, accredited and secure aeronautical information environment.

13. The Global Air Traffic Management Operational Concept, which had been developed to be visionary in scope and not constrained by the level of technology available at the time, was also endorsed by AN-Conf/11.

14. Much has been done in the community, and the technology has become more mature and more widely deployed. However, some regions are more advanced than others and the need for the adoption of global Standards is becoming more evident now than it was in 2003. Present and future navigation systems and other air traffic management systems are data-dependent. All require access to global, broad-based aeronautical information of a considerably higher quality and in a more timely manner than is generally available today. The provision of aeronautical information is a core element of air navigation services.

15. To satisfy new requirements arising from the Global Air Traffic Management Operational Concept, aeronautical information services must transition to a broader concept of aeronautical information management, with a different method of information provision and management given its data-centric nature as opposed to the product-centric nature of AIS. Roles and responsibilities may need to be adapted as the transition progresses.

WHAT WILL CHANGE

16. The Global Air Traffic Management Operational Concept defines seven interdependent concept components that will be integrated to form the future ATM system. They comprise airspace organization and management, aerodrome operations, demand and capacity balancing, traffic synchronization, conflict management, airspace user operations and ATM service delivery management.

17. The management, utilization and transmission of data and information are vital to the proper functioning of these components. The exchange and management of information used by the different processes and services must ensure the cohesion and linkage between these seven concept components. Figure 1 illustrates how information management is at the core of air navigation services.

Users

18. The provision of aeronautical information today is mainly focussed on the requirements of pre-flight briefing. The provision of aeronautical information tomorrow will address the requirements of all components of the ATM system for all phases of flight.

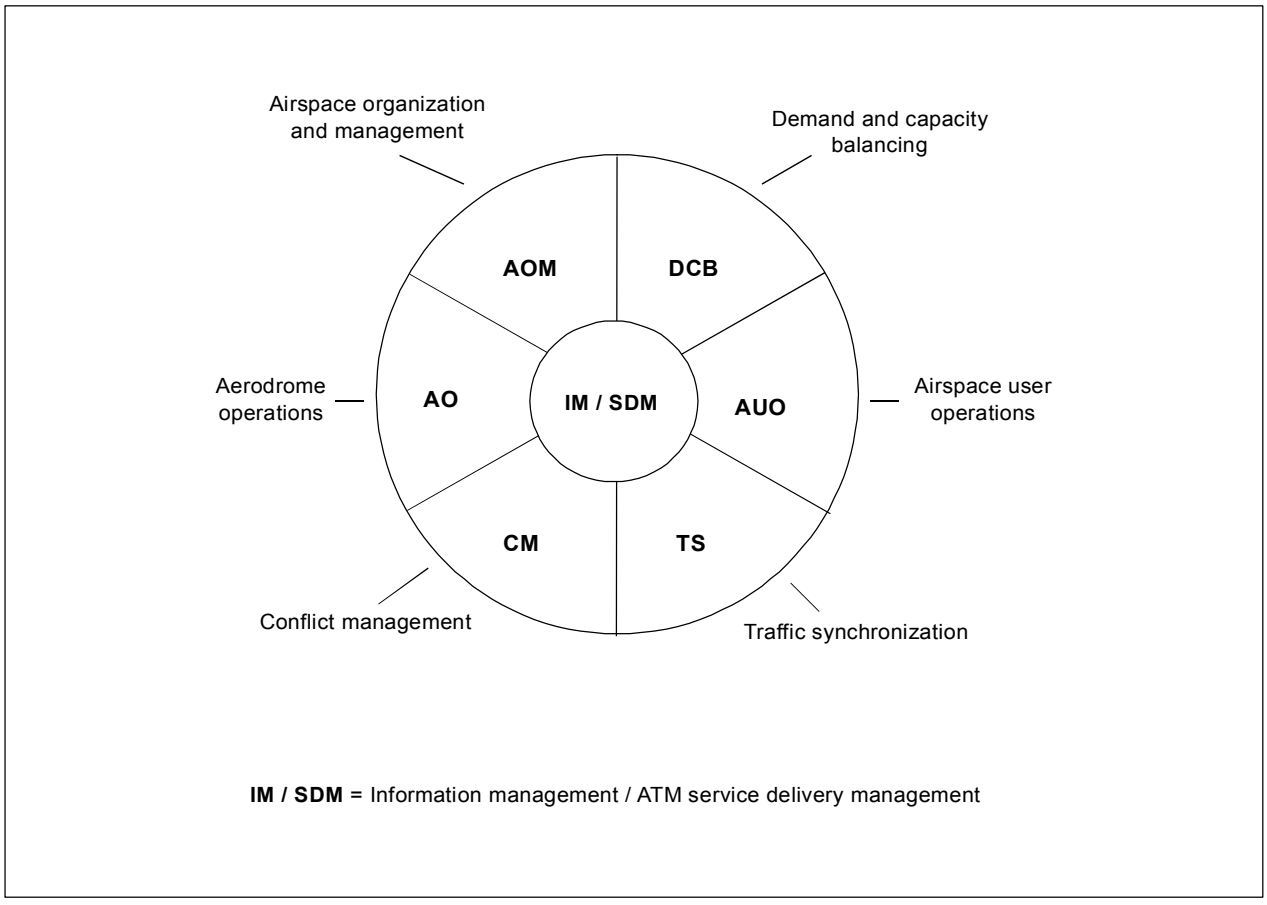


Figure 1. Information Management as a component of the future ATM Operational Concept

Data

19. The shift from standardizing products to standardizing data will enable more freedom in the definition of future products while maintaining a high degree of quality, integrity and coherency of the information contained in these new products.

20. The biggest change in the transition to AIM will be the increased use of computer technology in the management of information, with an increased emphasis on the digital form of data that will drive all processes for the management of information.

21. Both graphical and text products will be based on the same underlying, standard definition of geo-referenced atomic data. The definition of a Standard for an aeronautical data exchange model will ensure standardized interfaces between the computers of both providers and users of data. This will enable the definition of new products where both text and graphics will be presented in a more readable form. This will enable the definition of new services where the same information will be made available in the decision support tools for all ATM components.

22. The current Standard in Annex 15 — *Aeronautical Information Services* is centred on products and does not provide specifications required for digital data exchange. A central element in the transition to AIM will be the precise standardization of atomic data elements in terms of field names, field types and field definitions. This will be provided in the form of an aeronautical data dictionary (also called metadata registry). Furthermore, the definition of standard structured groupings of fields by features, attributes and associations is necessary. This will be provided in the form of a Standard for an aeronautical information conceptual model. Finally, the mechanisms to maintain an up-to-date data set across different components would need to be agreed upon; this will be provided in the form of a Standard for an aeronautical data exchange model. The evolution of these models will be organized at the global level to ensure continuity in the services in a way that allows innovation and new requirements to be taken into account.

23. By using this approach, the definition of the data products is decoupled from the definition of the end-products. The end-user applications, which make use of the information transferred in the form of data sets, do not rely exclusively on the structure and format of the messages but are free to transform the data and combine it with other data to construct the final view appropriate for the end-user.

Products

24. Pre-flight information bulletins are often loaded with information not relevant to the flight because of the limited filtering capabilities that the current NOTAM format has. Pre-flight bulletins are often also difficult to read and interpret because of the lack of graphical capabilities of the current NOTAM format. New products combining textual and graphical information will need to be specified.

25. Electronic chart displays are becoming easier and cheaper to install in the cockpit and their functionality is increasing. It is likely that they will progressively complement some paper charts and will replace others, which will require updated Standards and symbols for electronic display capabilities.

26. The future capabilities of transferring digital data between the air and the ground will be used for providing new products such as in-flight information bulletins by uploading aeronautical and meteorological information directly aboard aircraft during all phases of flight.

27. The AIM concept requires that all aeronautical information, including that currently held in aeronautical information publications (AIPs), be stored as individual standardized data sets to be accessed by user applications. The distribution of these data sets will define the new services provided by the future AIM. This will constitute the future integrated aeronautical information package that will contain the minimum regulatory requirement to ensure the flow of information necessary for the safety, regularity and efficiency of international air navigation.

Static versus dynamic information

28. Stability is essential for proper planning of airspace operations. Examples of changes that must be announced well in advance are:

- the installation or decommissioning of ground-based air navigation aids;
- the opening of a new aerodrome for international flight operations;
- airspace danger and restricted areas; and
- the route structure for major traffic flows.

29. Events of short duration or with little advance notice are inevitable occurrences. These events must be announced quickly in a manner that is comprehensible by the different components of the ATM system.

30. In an interoperable environment based on data Standards, these two types of information will be transferred by common networks under the same data exchange mechanisms using the same data Standard definitions.

AIRAC cycle

31. It is expected that the need for aeronautical data to become effective on internationally agreed upon common dates will remain. Coordination and planning constraints require major changes to be announced well in advance and introduced only at regular intervals.

32. The quality and integrity requirements of databases will define new roles for human intervention such as verification, monitoring and correction before releasing new data.

33. The current cycle is essentially based on the maximum expected time for postal delivery of the paper products. The distribution of data products through data networks will not suffer from the same delay in delivery and shorter cycles will become possible to better match users' needs. Transitioning to a modern distribution mechanism will mean that the specifications for new concepts of operation need not be constrained by a 28-day cycle. The future ATM system will be free to identify a better cycle that will adequately balance the need for improved reactivity with the need for advance planning.

EIGHT GUIDING PRINCIPLES FOR THE TRANSITION TO AIM

34. The projects undertaken to achieve the steps identified in the roadmap must be specified and conducted in accordance with the following eight guiding principles. The transition from AIS to AIM will have to:

a) comply with the process for amendments to the Annexes to the Convention on International Civil Aviation;

b) support or facilitate the generation and distribution of aeronautical information which serves to improve the safe and cost-effective accessibility of air traffic services in the world;

c) provide a foundation for measuring performance and outcomes linked to the distribution of quality-assured aeronautical information and a better understanding of the determinants of ATM, safety and effectiveness not related to the distribution of the information;

d) assist States in making informed choices about their aeronautical information services and the future of AIM;

e) build upon developments in States, international organizations and industry and acknowledge that the transition to AIM is a natural evolution rather than a revolution;

f) provide over-arching and mature Standards that apply to a wide range of aeronautical information products, services and technologies;

g) be guided by the *Global Air Navigation Plan* (Doc 9750) and ensure that all development is aimed at achieving the ATM system envisaged in the *Global Air Traffic Management Operational Concept* (Doc 9854); and

h) ensure, to the greatest extent possible, that solutions are internationally harmonized and integrated and do not unnecessarily impose multiple equipment carriage requirements for aircraft or multiple systems on the ground.

THE ROADMAP TO AIM

35. The purpose of this roadmap is to develop the AIM concept and associated performance requirements by providing a basis upon which to manage and facilitate, on a worldwide basis, the transition from AIS to AIM. The roadmap is based on what we know today but has been developed with sufficient flexibility for the new concepts that will emerge from future research.

36. Three phases of action are envisaged for States and ICAO to complete the transition to AIM:

Phase 1 — Consolidation
Phase 2 — Going digital
Phase 3 — Information management

37. The roadmap must proceed with caution when advocating more sophisticated information management initiatives to ensure that they do not impede the obligations of States to correct infrastructure and other deficiencies already identified.

38. In the **first phase**, existing Standards will need to be refined and strengthened and their implementation in all States ensured. This will concern mainly:

– quality requirements;

– AIRAC adherence;

– the implementation of the adopted standard reference system for coordinates (World Geodetic System-1984); and

– the provision of terrain and obstacle data.

The projects in the first phase will be conducted to identify potential gaps in order to focus on near-term work programme activities.

39. In the **second phase**, the introduction of database-driven processes will improve the value of current products by improving their quality and availability for current users. This will concern mainly the creation of a national database or regional databases to produce the existing products and services, but with better quality and availability. The global deployment of new, already well-specified products such as the electronic AIP will also be

initiated. The projects in the second phase will be conducted to enhance the quality and availability of existing products in the medium-term work programme activities.

40. In the **third phase**, new products and services will be developed. Quality control and staff training and planning will be applied to current and new products and services. This will support a new AIM function for air navigation service providers enabling the provision of the new data that will be required by the future ATM components. The projects in the third phase will be conducted to serve new users and to promote continuous improvement by the research community.

41. The roadmap will identify the main steps to be achieved in the three phases. Each step will require projects of two types of activities: one will be the development of the Standards required and the other will be the implementation in States of those Standards.

a) ***Development of Standards.*** The development of new Standards often lies on the critical path of the transition. Amendments to ICAO Standards and Recommended Practices (SARPs) are required for uniform implementation of the transition to AIM in all States. Actions related to the establishment of these Standards in Annexes to the Convention on International Civil Aviation and in guidance material will be led by the ICAO Secretariat with the support of States and international organizations.

b) ***Implementation of Standards.*** Implementation of Standards allowing the transition to AIM will be the responsibility of States. Guidance material will be issued by ICAO to assist in the implementation.

42. Part II of the roadmap lists numerous steps of varying complexity. Some will result in the establishment of new databases or the expansion of existing ones. Others will seek to foster better data and technical Standards for gathering information and data protection. Still others will focus on obtaining consensus on the indicators and determinants of quality aeronautical information. Almost all of the projects will involve collaborative efforts with key stakeholders at the national, regional and inter-regional levels. Securing stakeholder participation at the outset of the process and maintaining it throughout the project implementation phase are critical to ensuring that outcomes are relevant and practical and contribute to improving the efficiency and safety of air travel and of the ATM system.

43. Accordingly, consultations through various ICAO working arrangements have been and will remain an ongoing feature of the roadmap. The input of and feedback from all players are key to ensuring that the roadmap contributes to better aeronautical information and a stronger ATM system for the air transport industry.

Phase 1 — Consolidation

44. During Phase 1 of the transition to AIM, steps will be taken to strengthen a solid base by enhancing the quality of the existing products. Fine-tuning and improvement of SARPs for existing products will continue to be conducted in the usual manner in order to respond to near-term user requirements.

45. Since the electronic AIP will have the exact same structure as the paper version, it is important that States make every effort to issue their aeronautical information as specified in Annex 15.

46. The NOTAM system as it exists today requires ongoing upgrades to cope with new types of information (e.g. GNSS navigation) and to respond to the difficulties being reported by the users. It is not clear at this time when and how the current NOTAM system will be changed. Research and trials are under way and their results will be addressed in Phase 3 of the transition to AIM or later. It is important to continue to improve the current SARPs related to NOTAM to better serve users' needs with the current products. It is also important for States to continue investing the time and effort necessary to comply with these SARPs.

47. Many ICAO chart types form an integral part of the AIP. Amendments to specifications are also envisaged for electronic chart display but most of the SARPs in Annex 4 — *Aeronautical Charts* will remain applicable after the transition to AIM. It is important that States comply with the existing Annex 4 SARPs.

48. The requirement to use a common horizontal, vertical and temporal reference system remains essential to facilitate the exchange of data between different systems. Therefore, the expression of all coordinates in the AIP and charts using WGS-84 is important and should be pursued during the first phase of the transition to AIM.

49. Provision of terrain and obstacle data becomes applicable during Phase 1 of the transition and will be an important project to be conducted by States. Feedback from States on the implementation experience may require adaptation of the relevant SARPs. Since these SARPs also relate to digital data set products, the achievement of these steps will also contribute to Phase 2.

50. Quality requirements on information are covered by current SARPs in terms of accuracy and integrity. The steps in Phase 1 aim to meet these requirements. Should the requirements prove difficult to implement, they would have to be reassessed to verify that the risk of harm to persons or damage to property for not achieving the requirements is reduced to, and maintained at or below, an acceptable level (definition of safety). In addition, States will implement and continuously improve their quality management system in view of its increasing importance for future products and services.

51. The requirement for States to adhere to the aeronautical information regulation and control (AIRAC) process must be emphasized. The quality of the future service to be provided under information management will rely on the proper mechanism for distribution and synchronization of information. Shorter response times will be required in the future and this can only be achieved if the current requirements can, at the very least, be met.

Phase 2 — Going digital

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

53. An aeronautical information conceptual model will provide guidance for States to implement such digital databases. Guidance material will include advice on a minimum data set to begin a phased development of the database.

54. Many States are already providing electronic equivalents of their AIPs, e.g. on CD or on the Internet. These electronic AIPs may be accessible for printing and/or for navigation via a web browser tool. Guidance material that will be based on existing best practices will be provided to States to ensure that new types of media will be harmonized for users.

Phase 3 — Information management

55. During Phase 3, steps will be taken to enable future AIM functions in States to address the new requirements that will be needed to implement the Global Air Traffic Management Operational Concept in a net-centric information environment.

56. The digital databases introduced in Phase 2 will be used for the transfer of information in the form of digital data. This will require the adoption of a Standard for an aeronautical data exchange model to ensure interoperability between all systems not only for the exchange of full aeronautical data sets, but also for short-term notification of changes.

57. As new products are introduced, organizational changes will need to be made to implement better management of information in terms of:

– staff planning and staff training;

– formalization of agreements with data providers to ensure a high degree of data quality;

– introduction of an extensive amount of explicit meta-information;

– impact on cost-recovery mechanisms; and

– explicit traceability of the changes to information and identification of liabilities.

58. ATM systems will require a common information reference model with quality procedures for the management of seamless information flow to ensure not only interoperability between States but also interoperability between different systems within the State. New digital data products and services will be specified to serve these interoperability requirements.

59. The definition of new AIM data products and services will be based on requirements identified for each ATM component. A structured approach to the development of these new requirements for AIM will be followed to ensure that any Standards recommended for AIM are derived from agreed information exchange models; these models will specify the minimum information required to support business services defined for ATM functions that are identified to fulfil desired outcomes in terms of performance requirements. This structured top-down approach of deriving specific data Standards from high-level objectives will ensure that the new requirements for States introduced in the transition to AIM will clearly relate to identified enablers for the future ATM system as illustrated in Figure 2.

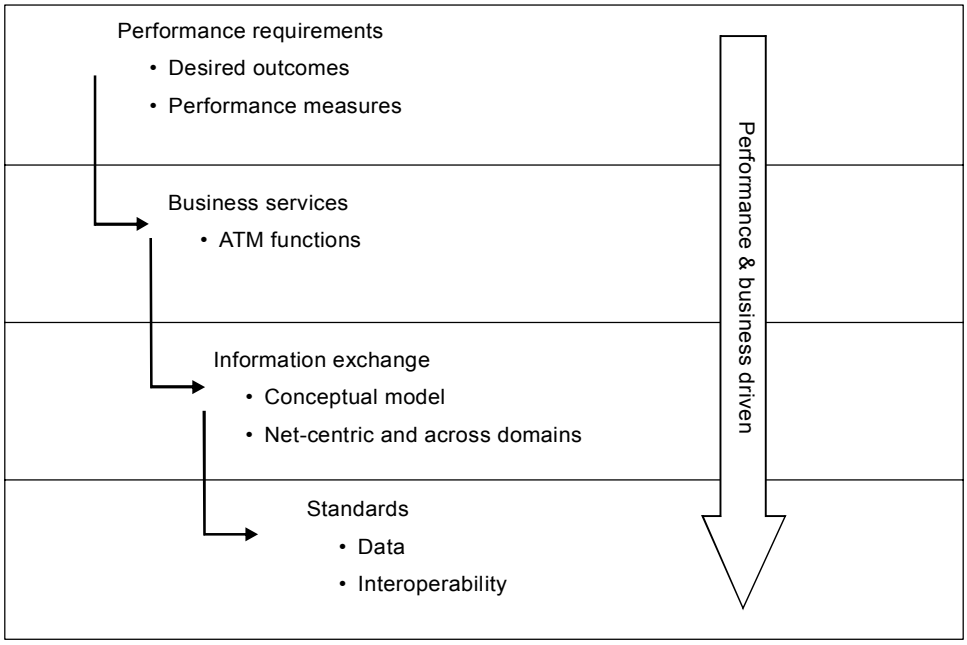


Figure 2. Performance-driven approach

The regional dimension

60. During the complex transition to AIM, industry, regulators, manufacturers, service providers and other organizations will need to work together to achieve the best results. In Europe, the SESAR Master Plan and the Single European Sky initiatives have assembled a multitude of partners to define a modernization programme to significantly reduce costs and increase service capabilities. In the United States, the NextGen programme is also under way to modernize the national air transportation system to allow increased capacity and reliability, while improving safety and security and minimizing the environmental impact of aviation. In many parts of the world, States are grouping their resources to introduce new equipment and new structures for the provision of common services over their common airspace.

61. These are only three of the many examples of modernization programmes that are under way in different regions of the world. All initiatives are primarily directed towards improving safety and security and minimizing the environmental impact of aviation. They all seek a more efficient and reliable exchange of information between the various components of the future ATM system. They refer to new concepts such as system-wide information management, increased automation for collaborative decision-making, better integration of systems, and 4-D trajectory.

62. These initiatives are all using the Global Air Traffic Management Operational Concept as a guide to ensure a common reference and are referring to the Global Air Navigation Plan as a common planning framework. All of these initiatives need some assurance of stability in the development of new techniques. This is the purpose of the Global Air Navigation Plan and this roadmap.

63. This roadmap provides a structured framework for States to plan and to monitor their progress with reference to other States in the same region and across regions of the world and supports regional and national plans to implement the transition to AIM.

64. It is not the intention that this roadmap be used alone to formulate a national or a regional plan. Neither milestones nor description of deliverables are provided in the roadmap since these will be included through the usual planning process.

PART II

ROADMAP STEPS

INTRODUCTION

1. This roadmap provides the strategic direction and major principles for the transition to AIM. The three phases introduced in Part I need not be followed in a waterfall approach; for example, steps may be taken to introduce the digital elements even though the consolidation steps have not all been finalized. Similarly, it is not necessary that all steps for going digital be achieved before introducing new measures related to information management. The phases, however, give an indication of how to address the transition.

2. A minimum list of major steps to achieve the transition to AIM is provided in Part II. A broad positioning of the steps in relation to the three phases is also provided in Figure 3. The transition to AIM will be effective at the global level when these steps have been achieved. Most steps in Phases 2 and 3 of the transition require new Standards and Recommended Practices to be adopted at the global level; an indication of the time required for these new texts to be available is provided in Part III.

STEPS

3. The steps listed in Part II constitute a minimum list of areas of activities for States to coordinate the transition to AIM between themselves and with ICAO. The steps are to be taken as a checklist of high-level actions. Failure to take action on any of these steps would increase the duration of the transition and negatively affect the enabling role of AIM in the future ATM concept of operation.

4. The list may evolve during the transition, especially when we get closer to Phase 3. This roadmap will be updated with the further evolution of the overall ATM concepts and system requirements.

P-01 — Data quality monitoring
P-02 — Data integrity monitoring
P-03 — AIRAC adherence monitoring
P-04 — Monitoring of States' differences to Annex 4 and Annex 15
P-05 — WGS-84 implementation
P-06 — Integrated aeronautical information database
P-07 — Unique identifiers
P-08 — Aeronautical information conceptual model
P-09 — Aeronautical data exchange
P-10 — Communication networks
P-11 — Electronic AIP
P-12 — Aeronautical information briefing
P-13 — Terrain
P-14 — Obstacles

P-15 — Aerodrome mapping
P-16 — Training
P-17 — Quality
P-18 — Agreements with data originators
P-19 — Interoperability with meteorological products
P-20 — Electronic aeronautical charts
P-21 — Digital NOTAM

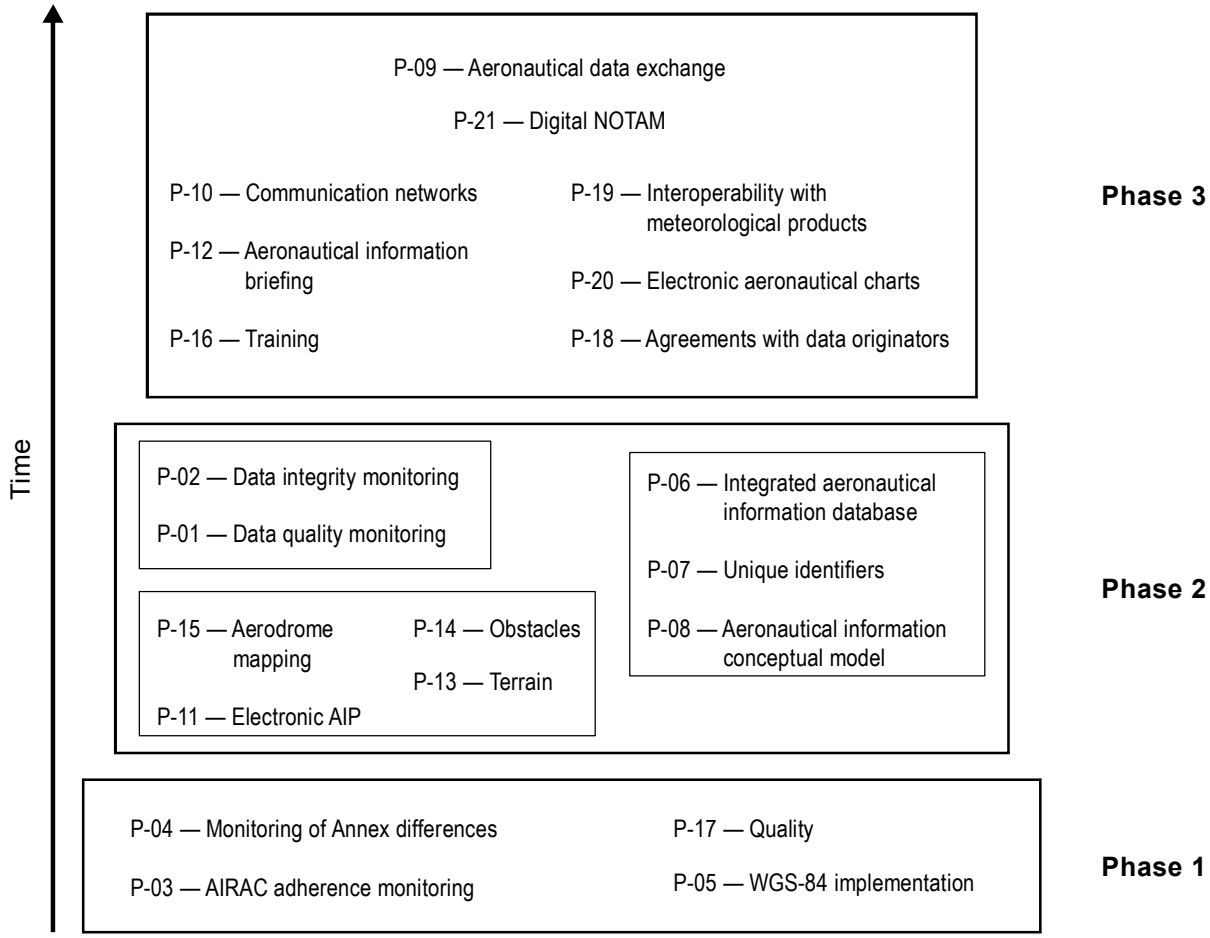


Figure 3. Positioning of the 21 steps of the roadmap in the three phases

P-01 — Data quality monitoring

An ongoing challenge for organizations producing information is to ensure that the quality of the information suits its intended uses and that data users are provided with the appropriate information about data quality.

P-02 — Data integrity monitoring

Data integrity requirements introduced by safety objectives must be measurable and adequate.

P-03 — AIRAC adherence monitoring

The standard regulation and control mechanisms for the distribution of aeronautical information is an essential element ensuring that each person involved makes decisions based on the same information.

P-04 — Monitoring of States' differences to Annex 4 and Annex 15

Adherence to Standards is an ongoing effort. The transition to AIM offers an opportunity to increase the focus on implementation and on reviewing differences in the application of the Standards by States.

P-05 — WGS-84 implementation

The target of expressing 100 per cent of coordinates in the WGS-84 reference system is achievable. This is one of the first steps to achieve in the transition to AIM.

P-06 — Integrated aeronautical information database

The establishment and maintenance of a database where digital aeronautical data from a State are integrated and used to produce current and future AIM products and services is the main step in Phase 2 of the transition to AIM.

A database may be operated by States or by regional initiatives under delegation from States. The design of such a database will not be identical in all States or regions because local technical or functional requirements must be considered. However, the material that will be provided under Step P-08 will provide guidance that may be used to validate the design for facilitating the future data exchange.

P-07 — Unique identifiers

Improvements to the existing mechanisms for the unique identification of aeronautical features are required to increase the effectiveness of information exchange without the need for human intervention.

P-08 — Aeronautical information conceptual model

Defining the semantics of the aeronautical information to be managed in terms of digital data structures is essential for introducing interoperability.

The existing documentation developed by States and international organizations and considered mature enough for global applicability will be used to produce common guidance material. This may serve as a reference for the database design needed in P-06 for States that do not yet have a database.

New information requirements coming from the Global Air Traffic Management Operational Concept will be analysed and modelled if needed (e.g. airspace sectors, or information related to airspace and route traffic restrictions, or generic information related to aircraft performance, or information related to airline operators' call signs).

P-09 — Aeronautical data exchange

Defining the syntax of the aeronautical data to be exchanged in terms of field names and types is essential for introducing interoperability.

The exchange of data and the mechanisms to exchange or access the new digital products or services will be defined by an exchange model. The content of the model will be driven by the aeronautical information conceptual model (top-down) and by requirements coming from technological choices (bottom-up); the evolution of the model will be coordinated in order to balance the need for innovation with the need for protecting investments.

The use of the Internet as a communication media is, for example, one important bottom-up driver in the definition of the model. The use of well-established, geographic information standards also applied in non-aeronautical domains is another important technological choice.

P-10 — Communication networks

More data will be exchanged on ground networks and the current data will be exchanged in a form that will require more bandwidth. It is envisaged that a transition of the network to one based on Internet protocol (IP) will be required to cope with these future needs. For the transition to AIM to be effective, the needs of future AIM will have to be declared in terms useable for network specification. Which data network will be used to distribute the new data products and services; what information can be exchanged via the Internet; and what information requires a secured network reserved for aviation are open questions that will need to be answered for the transition to be effective.

P-11 — Electronic AIP (eAIP)

The integrated aeronautical information package will not be phased out. On the contrary, it will be adapted to include the new data products needed during the transition to AIM.

The electronic version of the AIP will be defined in two forms: a printable document and one that can be viewed by web browsers.

Guidance material will be required to help States implementing the web browser form of the electronic AIP in order to avoid the proliferation of different presentations of AIP information over the Internet.

P-12 — Aeronautical information briefing

Fine tuning of the current NOTAM format by introduction of new selection criteria is needed to improve the selectivity of the information presented to pilots in the pre-flight information bulletin. (This can be done in Phase 1.)

The combination of graphical and textual information in a digital net-centric environment will be used to better respond to the airspace users requirements for aeronautical information in all phases of flight when the new digital data products are specified and made available (in Phase 3).

P-13 — Terrain

The compilation and provision of terrain data sets is an integral part of the transition to AIM.

P-14 — Obstacles

The compilation and provision of obstacle data sets is an integral part of the transition to AIM.

P-15 — Aerodrome mapping

There is a new requirement emerging from industry for traditional aerodrome charts to be complemented by structured aerodrome mapping data that can be imported into electronic displays.

P-16 — Training

The training of personnel will be adapted to the new requirements on skill and competencies introduced by the transition to AIM.

A new training manual will be developed to reflect the new competencies required.

P-17 — Quality

Quality management measures will be re-enforced to ensure the required level of quality of the aeronautical information. In order to assist States in the implementation of an efficient quality management system, guidance material for the development of a quality manual will be developed.

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, neighbouring States, information service providers or others.

P-19 — Interoperability with meteorological products

The meteorological data products of the future will be combined with the AIM data products to form the future flight briefings and the new services provided to all ATM components.

This will require that meteorological data be made available in a similar format to the other aeronautical data that are clearly focussing on the use of open standards (such as XML and GML) for the implementation of table-driven data validation built into the data exchange mechanism, whereas current meteorological data products for aviation are based on simple alphanumeric codes.

Now that the bandwidth of telecommunication links and space for digital storage devices are no longer limiting factors, the move towards net-centric and system-wide information management is becoming feasible for the wider distribution of meteorological forecast data from the world area forecast centres in a format that will not require considerable effort for the learning and configuration of decoding software, thereby ensuring true interoperability.

Meteorological information is essential in the compilation of pilot briefings. The transition to AIM will include activities at both the standardization and the implementation level to find solutions for the interoperability of meteorological data products with the new AIM data products.

P-20 — Electronic aeronautical charts

New electronic aeronautical charts, based on digital databases and the use of geographic information systems, will be defined to complement some paper charts and to replace others that have become obsolete and need to be improved to satisfy user needs. The possibility of deploying these new products over the Internet will be explored.

P-21 — Digital NOTAM

One of the most innovative data products that will be based on the Standard for an aeronautical data exchange model will be a digital NOTAM that will provide dynamic aeronautical information to all stakeholders with an accurate and up-to-date common representation of the aeronautical environment in which flights are operated.

The digital NOTAM will be defined as a data set that contains information included in a NOTAM in a structured format that can be fully interpreted by a computer system for accurate and reliable updates of the aeronautical environment representation both for automated information equipment and for aviation personnel.

PART III

ROADMAP TIMELINE

This roadmap provides a general indication of what the air transport industry may be expecting from States in their implementation of the transition to AIM. The timeline below indicates to States the major milestones that ICAO envisages to support the transition to AIM and the Global Air Traffic Management Operational Concept initiatives related to the management of aeronautical information.

December 2008 **Phase 1 — Consolidation** began with the establishment of the AIS-AIM Study Group. More information on the work and planned actions of the Group may be found on the ICAO website at www.icao.int/anb/aim.

The consultation process for Amendment 36 to Annex 15 and Amendment 56 to Annex 4 was initiated in the first quarter of 2009.

The development of Amendment 2 to the AIS Manual (Doc 8126) and Amendment 30 to the PANS-ABC (Doc 8400) introduced guidance material on best practices already available.

November 2009 **Phase 2 — Going digital** will begin by the development of new, related guidance material (electronic AIP, aeronautical information conceptual model, training, quality) that will be developed with the support of the AIS-AIMSG which will hold its second meeting at the end of 2009.

November 2010 Amendment 36 to Annex 15 and Amendment 56 to Annex 4 will become applicable. The preparation of Amendment 37 to Annex 15 and Amendment 57 to Annex 4 and any consequential amendments required in other annexes will progress with the help of the AIS-AIMSG.

October 2011 **Phase 3 — Information management** will begin with the fourth meeting of the AIS-AIMSG which will finalize the proposals for Amendment 37 to Annex 15 and Amendment 57 to Annex 4. These amendments will set the scene for the future requirements for States to produce data sets. It is not envisaged that new data products will be required for mandatory provision by the future ATM systems by this date, but if States choose to provide the data identified in scope at that time, they will be able to base their development on recommendations, ensuring global harmonization.

The consultation process of Amendment 37 to Annex 15 and Amendment 57 to Annex 4 will be initiated in the first quarter of 2012.

November 2013 Amendment 37 to Annex 15 and Amendment 57 to Annex 4 will become applicable,

A divisional-type meeting may be held, should a substantial number of subjects of worldwide scope involving meteorological, aeronautical information and supporting communication network fields need to be agreed upon in order to finalize the transition to AIM. This could

include a substantial enlargement of the scope of aeronautical information required by ATM and an obligation to provide the information in the form of digital data.

November 2016 Amendment 38 to Annex 15 and Amendment 58 to Annex 4 will become applicable including the recommendations of the divisional meeting.

— END —

APPENDIX B

12. IMPLEMENTATION OF WGS-84 AND e-TOD

Benefits

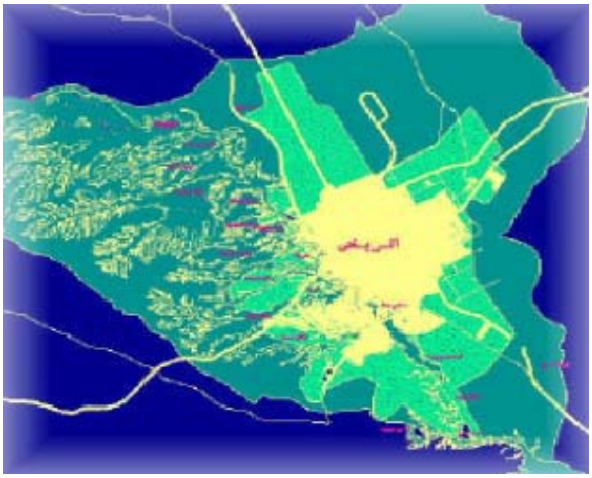
Efficiency	• implementation of WGS-84 is a requirement for the performance based navigation, benefits are described in the PBN performance objectives • support to the approach and departure procedures design • improve aircraft operating limitations analysis • support aeronautical chart production and on-board databases (FMS)
Safety	• improve situational awareness • improve electronic terrain and obstacle data in cockpit display • CFIT reduction • support technologies such as ground proximity and minimum safe altitude warning systems (GPWS) • observe the benefits described in the PBM performance objectives

Strategy
Short term (2010)
Medium term (2011-2015)

ATM Component	TASK DESCRIPTION	START-END	RESPON-SIBLE	STATUS
SDM-CM	***Electronic terrain and obstacle data (eTOD)*** a) Share experience and resources in the implementation of e-TOD through the establishment of an e-TOD regional project.	2011-2015	GREPECAS States	Valid
	b) Technical requirements	2010-2015	GREPECAS States	
	c) Report requirements and monitor implementation status of e-TOD using electronic media to ICAO Regional Offices.	2010-2011	States	
	d) Develop a high level policy for the management of a national eTOD programme.	2010-2011	States	
AUO	e) Establish WGS-84 implementation goals in coordination with the national PBN implementation.	2010-2012	GREPECAS States	Valid
	f) Define technical requirements.	2010-2011	GREPECAS States	
	g) Report requirements and monitor implementation status of WGS-84 using the AIS-5 Table of the FASID and take remedial action if required.	On going	GREPECAS States	
GPIs	GPI-5: Performance-based navigation; GPI-9: Situational awareness; GPI-11: RNP and RNAV SIDs and STARs; GPI-18: Aeronautical Information; GPI-20: WGS-84; GPI-21: Navigation systems			

APPENDIX C

Due to budgetary limitations, this Appendix is available in Spanish only.

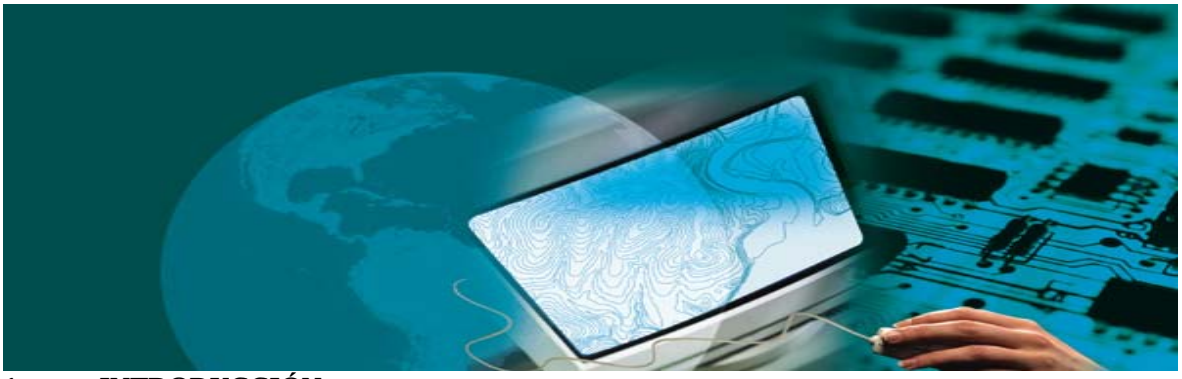


MANUAL GUÍA DE IMPLANTACIÓN GIS EN LA GESTIÓN DE LA INFORMACIÓN AERONÁUTICA (AIM)

Objetivo: La presente guía se orienta a la implantación de un Sistema de Información Geográfica (GIS), como un soporte a la Gestión de Información Aeronáutica (AIM), en la que se detallan una serie de pasos básicos para dicha implantación y que permita disponer de una poderosa herramienta tecnológica en soporte a la AIM.

Versión: 1.05

ÍNDICE **Página**



1. INTRODUCCIÓN

La Organización de Aviación Civil Internacional (OACI) establece en su Anexo 15 “Servicios de Información Aeronáutica”, que la finalidad del servicio de información aeronáutica es asegurar que se distribuya la información necesaria para la seguridad, regularidad y eficiencia de la navegación aérea internacional.

En la actualidad toda esa información se publica y distribuye desde los servicios de información aeronáutica de forma global como Paquete de Documentación Integrada de Información Aeronáutica (IAIP), compuesto principalmente por:

- AIP: Publicación de Información Aeronáutica.
- Suplementos y enmiendas al AIP.
- Circulares de Información Aeronáutica (AIC).
- NOTAM.

El AIP, los suplementos, enmiendas y circulares se publican y distribuyen en formato papel, mientras que los NOTAM se publican y distribuyen a través de la Red de Telecomunicaciones Fijas Aeronáuticas (AFTN) a través de mensajes de texto que siguen formatos y protocolos específicos para ese tipo de información aeronáutica.

Los actuales métodos de publicación y distribución de la información se basan en las tecnologías disponibles desde hace ya más de 50 años. Las tecnologías digitales de la información y las comunicaciones electrónicas existentes permiten la transformación en los procedimientos de producción, publicación y distribución de los servicios de información aeronáutica, en la transición desde el concepto AIS al AIM.

El fundamento de esta transformación son los Sistemas de Información Geográfica (GIS) aplicados a la información aeronáutica, la publicación de cartas aeronáuticas, la integración de información topográfica o Modelo Digital del Terreno (DTM), etc.

En el presente documento de guía se describe la secuencia de acciones y elementos a tener en cuenta para la implantación de un GIS en un servicio de información aeronáutica.

2. PROPÓSITO DE LA IMPLANTACIÓN

La implantación de un GIS en un AIS debe hacerse de forma que cubra dos objetivos principales:

- Mejorar los procesos de producción.
- Mejorar y controlar la calidad de los productos y servicios
- Permitir nuevos canales digitales de publicación y distribución electrónica de la información.
- Reducir significativamente el Factor Humano en los procesos de producción.

Un aspecto clave a considerar en la implantación de un GIS, es el requerimiento de los AIS de seguir prestando el servicio tradicional de publicación del IAIP y dar paso a las tecnologías digitales de la transición a la AIM de la OACI. Por tanto, para implantar un GIS se debe tener en cuenta que éste debe soportar los nuevos procesos de producción electrónica de textos y cartografía necesarios.

Para asegurar la producción a las demandas de los usuarios, el sistema GIS debe ser la plataforma tecnológica sobre la que se desarrollen dichos procesos de producción, sin tener que realizar exportaciones o interfaces con otros sistemas externos para desarrollar las tareas propias del GIS. Se requiere de una base de datos relacional espacial como elemento central del sistema de información geográfica, a la que se asocian diferentes sistemas para realizar las tareas de mantenimiento de datos, producción de dibujo CAD y publicación electrónica incluyendo la WEB. El sistema de mantenimiento de datos es uno de los elementos principales, el mantenimiento de una base de datos con información espacial georeferenciada y actualizada es uno de los requisitos principales para que el sistema de información geográfica cumpla con las exigencias dentro de la organización.

Los GIS se destacan por dar soporte al concepto de interoperabilidad, esto es, la integración de información con componente espacial georeferenciada desde diversas fuentes digitales de datos que facilita su incorporación a la base de datos AIS de diversa información proveniente de diversas fuentes validadas y oficiales: institutos geográficos, aeropuertos, etc.

El sistema de publicación digital (incluyendo los servicios por la Internet) posibilita la transición desde los convencionales servicios proporcionados por los AIS al concepto AIM. Empleando las nuevas tecnologías digitales y estándares en la distribución electrónica de la información, es necesario implementar el formato del modelo de intercambio de información aeronáutica (AIXM) y a la disposición de una base de datos espacial georeferenciada, se abre el camino a una transición desde el "IAIP" a los servicios electrónicos de información integrada aeronáutica.

La base de datos espacial georeferenciada es el elemento principal del sistema, un almacén centralizado de información aeronáutica con rasgos geográficos asociados que permiten su explotación a través de las tecnologías GIS. Existen dos conceptos importantes que deben tomarse en cuenta para definir la base de datos:

- **La temporalidad**: o como las diferentes entidades van sufriendo cambios a lo largo del tiempo.
- **Componente Geoespacial**: las diferentes entidades describen su componente Geoespacial a través de la representación de su geometría.

Estos conceptos y cómo un sistema GIS funciona, es fundamental para la implantación de una solución específica de la Gestión de Información Aeronáutica. Los sistemas de producción, se han mantenido separados para marcar una clara diferencia existente entre ambos en la forma en la que tratan la información. El sistema de producción cartográfica usa tecnología GIS para explotar de forma completa la base de datos relacional Geoespacial, tanto la información gráfica como la alfanumérica es tratada e integrada en los diferentes productos cartográficos.

Por su parte, el sistema de producción de textos, sólo trata la información alfanumérica, permitiendo la generación de informes, tablas, etc.

3. IMPLANTACIÓN

El proceso de implantación de un GIS en la gestión de información aeronáutica es complejo, primero por la especificidad y a la vez diversidad de la información con que se trabaja, y segundo por las propias necesidades funcionales que el conjunto de los usuarios esperan. Por tanto debe ser un proceso en al que se incorpore a toda la organización. Dentro del proceso se definen 4 fases principales:

1. Selección de la plataforma
2. Carga de datos
3. Formación a los usuarios
4. Evolución funcional

Durante los siguientes Ítems se revisan las diferentes fases en el proceso de implantación.

3.1 Plan de sistema de información

La fase inicial en la implantación de todo sistema de información, es la realización de un *plan de sistema de información*. La realización de un plan de sistemas de información debiera garantizar la implantación satisfactoria de un sistema de información geográfica, ya que es un elemento clave que definirá el objetivo perseguido, el método para conseguirlo, y los recursos necesarios para hacerlo exitosamente.

Un plan de sistemas es un desarrollo detallado y particularizado de implantación GIS a un entorno y organización concretos. Y debe incluir los siguientes puntos:

- *Funcionalidad* que se espera del sistema y casos de uso de éste. Necesidades que se van a cubrir. Información que se usará fundamentalmente en el proceso de selección de la plataforma y en las fases de configuración del sistema.
- *Entorno tecnológico* en el que se va a implantar, que influirá fundamentalmente en las necesidades hardware, software y requisitos específicos que puedan requerirse del GIS.
- *Datos* a ser integrados en las bases de datos GIS, lo que influirá decisivamente en las necesidades de almacenamiento y trabajos de integración de información debidamente validada de origen por un sistema de gestión de la calidad.
- *Previsión de formación*, identificación de la base de usuarios del sistema y planificación de una formación adecuada del personal a cargo.
- *Planificación de la implantación*, con fases, fechas, responsables, especificación de entregables, recursos humanos y materiales dedicados en cada fase.

3.2 Selección de la plataforma

Una vez tomada la decisión de implantar un GIS, la siguiente decisión fundamental es qué tecnología se va a implantar, para lo cual deben valorarse diversas opciones:

- Desarrollo a Medida.
- Tecnología GIS específica AIS.
- Tecnología GIS genérica y adaptación funcional propia.

Para implantar un sistema GIS habrá que considerar realizar un desarrollo completo de GIS analizando los costos y los riesgos, y definir la estrategia que más convenga a la organización.

Existe también la posibilidad de buscar un distribuidor específico, vaya evolucionando su plataforma y se puedan incorporar esos desarrollos a la implantación de la organización, o por el contrario optar por una plataforma general sobre la que diversas empresas puedan realizar implementaciones de tecnologías e ir implantando estas o desarrollando algunas propias según las necesidades:

Concepto de temporalidad

Por soporte de la temporalidad en información aeronáutica se entiende la habilidad del sistema de permitir el trabajo típico de un servicio de información aeronáutica basado en enmiendas. Esto implica que el sistema debe ser capaz de:

- Permitir el acceso a datos que representen el estado actual del sistema de navegación aérea. Información publicada y en vigor.
- Permitir el acceso a datos que representen el estado futuro del sistema, en un conjunto de fechas predeterminadas. Información publicada y no en vigor.
- Permitir el acceso a datos que representen el estado pasado del sistema, en un conjunto de fechas predeterminadas. Información publicada y obsoleta.
- El sistema debe permitir la edición de información de forma que esta no sea accesible a los usuarios finales hasta la aprobación de estas ediciones.
- Se debe permitir la edición simultanea de la información y mecanismos que permitan compartir estas ediciones, incluso antes de hacer pública la información.
- Una vez la información es aprobada, esta debe poder ser publicada como no en vigor (ver punto 2 de esta lista).
- El sistema debe soportar la posibilidad de publicar diferentes conjuntos de datos de forma simultánea.
- Una vez la información es aprobada, el sistema debe permitir retrasar y/o suprimir su publicación, pero de forma que se pueda seguir trabajando en la edición de futuros conjuntos de datos.

Este soporte de temporalidad debe estar integrado al núcleo del sistema, de forma que se tenga en cuenta en todo el resto de flujos de producción cartográfica.

Gestión de las geometrías

Tradicionalmente la geometría de las diferentes elementos aeronáuticos se han descrito de una forma básica de información aeronáutica, por ejemplo: los tramos de aerovías basadas en los nombres de los puntos de Origen y Destino de cada segmento que conforma la Ruta. Sin embargo para facilitar la descripción de las geometrías a una representación Geoespacial GIS que pueda almacenarse en la base de datos relacional, se dispone de herramientas que permiten *traducir* imágenes del Terreno desde formatos Raster a Vectoriales, proporcionando referencias georeferenciadas para la cartografía aeronáutica y otros productos requeridos por los usuarios.

Adaptación específica AIS

Los GIS se adaptan fácilmente a las necesidades propias de AIS, esto ahora es más eficiente con la implementación del modelo de intercambio de datos aeronáuticos (AIXM), con una amplia disponibilidad estructuras de información (Anexo 15 y Doc. 8126) y de simbología basadas en las Normas (Anexo 4 y Doc. 8697) de OACI, preparada para la producción de información/datos y cartas aeronáuticas tipo OACI, etc.

Producción cartográfica

Muy importante en la selección de la plataforma de hardware y software es que ésta disponga de herramientas de dibujo asistido por computadora (CAD) que permitan la producción cartográfica sobre el propio GIS, con programas que permitan la georeferenciación de elementos gráficos e imágenes, con una relación directa entre los mismos gráficos y los elementos tabulares de las bases de datos. Esto quiere decir que aunque existan varios tipos de cartas, y una entidad grafica tenga una representación diferente en cada una de ellas, si las entidades del GIS se ven modificadas en algún atributo, esta modificación se ve reflejada en los productos cartográficos derivados de ese GIS en particular.

Dada la importancia la producción cartográfica basada en GIS en el proceso de implantación de esta tecnología en la gestión de información aeronáutica, mas adelante en este documento se le dedica una sección.

Producción de textos

Otra Función del propio sistema GIS, u otros productos existentes en el mercado, es que se conecten a la base de datos relacional espacial del sistema de información geográfica y permitan la producción de informes, reportes, tablas, etc., de forma que pueda automatizarse total o parcialmente la producción del IAIP (eAIP, AIC, AMD, manuales VFR, etc.), siempre que haya necesidades técnicas particulares no cubiertas por el sistema, la existencia de mecanismos de extensión por medio de desarrollo o programación (Visual Basic, Visual C, etc.), de scripts que permitan la extensión funcional de la automatización de los productos derivados del GIS es un aspecto que debería observarse en el proceso de adquisición del sistema.

Es mejor la opción de interface directa a la misma base de datos del GIS exportando a una base de datos intermedia para la producción de textos. Si la estructura de base de datos GIS se basa en el AIXM, esto debería ser posible.

Costos

Es fundamental para la implantación de un GIS considerar los costos, que suponen de principio una limitación a tener en cuenta por las Administraciones. Por lo tanto es necesario hacer un estudio detallado de costos, que permita tener acotada e identificada la inversión necesaria y los retornos que el uso de esta tecnología tendrá en la organización; a través de mejoras en la productividad y la comercialización de nuevos productos. Los aspectos de gastos más importantes en la implantación de un GIS a considerar son:

- compra y mantenimiento de licencias de software;
- compra y/o actualización de hardware;
- adquisición y mantenimiento de datos; y
- programa de capacitación permanente al personal involucrado.

Características de hardware

Los sistemas de la tecnología GIS permiten:

- trabajar con una gran cantidad de datos georeferenciados
- realizar operaciones y cálculos sobre ellos
- aplicar simbologías y gráficos complejos
- manipular imágenes satelitales.

Los requisitos hardware dependen fundamentalmente de la plataforma básica GIS a implantar, por lo que habría que considerar el volumen de datos de trabajo esperados en relación de las unidades de almacenamiento masivo y su respectivo respaldo, la capacidad gráfica con los plotters, velocidad de procesos para imágenes con los aceleradores gráficos y el tipo de procesadores de las estaciones de trabajo, tipo de red y de la capacidad de comunicaciones requerida del sistema. Por tanto los recursos hardware necesarios para soportar los requerimientos del usuario experimentado debieran evaluarse y tenerse en cuenta para el rubro de los costos de implantación.

En las diferentes plataformas GIS disponibles existe una gran diversidad en cuanto a la interface de usuario, sin embargo, en común cada plataforma está orientada hacia el análisis de información, edición, visualización, etc. Por tanto para seleccionar la plataforma GIS adecuada se debe hacer un análisis de la funcionalidad requerida de este. En los servicios de información aeronáutica en principio es la producción del IAIP y los usos típicos a considerar serían:

- edición de la información
- producción cartográfica
- validación de información/datos
- auditación de la información
- desarrollo y producción de diversos productos de información aeronáutica impresos y digitales según los requerimientos de los usuarios.

Interoperabilidad

Los servicios de información aeronáutica reciben información de muy diversas fuentes que deben cotejar/ensamblar y que se debiera exigir a los originadores de los datos su envío en formatos de calidad muy estrictos para poder ser procesados por las áreas de información aeronáutica, así como tener acceso y disponer de fuentes extensas de datos relacionales. Esto

representa un aspecto fundamental, que debiera ser bien soportado por los sistemas de información geográfica, e integrar información tabular, texto, grafica y datos en diversos formatos, proyecciones cartográficas, etc. de forma que una vez validados puedan incorporarse a las bases de datos relacionales de información aeronáutica.

3.3 Sistemas

De acuerdo con la plataforma GIS a implantar, es importante realizar la adquisición de los elementos software y hardware que lo soportarán. Para ello se deben tener en cuenta los requisitos de los sistemas operativos dentro de la organización, disponibilidad de la infraestructura de redes de comunicaciones adecuadas, personal técnico de soporte, en general todo un entorno tecnológico en el que se va a realizar la implantación del GIS. Un sistema GIS adecuado a las necesidades de un servicio de información aeronáutica debería considerar tres elementos principales:

1. base de datos corporativa
2. servidor GIS
3. sistemas clientes GIS

Por tanto dentro del despliegue del sistema GIS se deben atender estos otros tres elementos:

- **Servidores de datos**

  - Se entiende por servidor de datos el conjunto de software y hardware que actúa como gestor de bases de datos GIS. Dado el carácter de servicio de información aeronáutica, la base de clientes potenciales y el uso, tanto interno como externo, de la información AIS, se debe seleccionar un sistema gestor de base de datos adecuado y dotarle de los recursos hardware necesarios para un funcionamiento fluido.

  - A priori es difícil identificar un sistema gestor de bases de datos concreto, así como especificar lo requisitos hardware, esta debe ser una labor que se realice una vez se haya identificado la plataforma GIS concreta a desplegar y el volumen de datos a manejar. Un punto mínimo de partida es un sistema gestor de bases de datos corporativo con soporte de almacenamiento de información espacial.

  - Una posibilidad a tener muy en cuenta es la opción de disponer de dos servidores de datos, uno de ellos estaría destinado a almacenar los datos reales de producción, y el otro se dedicaría a la realización de pruebas sobre el sistema, instalación previa de nuevas versiones, etc. de forma que se garantiza una estabilidad máxima del sistema de producción.

- **Servidor GIS**

  - Por servidor GIS se entiende el conjunto de hardware y software que permite centralizar determinada funcionalidad GIS, de forma que los usuarios finales de esta funcionalidad no requieran instalaciones específicas de software GIS. Un ejemplo típico son los servicios GIS a través de Internet, que permiten a los usuarios acceder a visualización de datos y análisis sin necesidad de disponer de un cliente GIS instalado.

- Se debe valorar si funcionalmente la disponibilidad de un servidor GIS será necesaria, y tenerlo en cuenta en el despliegue del sistema. Muchas veces los servidores GIS pueden utilizarse para abaratar un despliegue GIS, ya que se limita el número de licencias software de sistemas clientes necesarias. Un servidor GIS es fundamental de cara a la provisión de servicios digitales de información, claves en el camino de implantación del concepto AIM.

- **Sistemas clientes GIS**

  - Los sistemas clientes GIS son el conjunto de software y hardware que permiten acceder a los servidores de datos GIS para realizar tareas de análisis, producción cartográfica, actualización de datos, etc. Los sistemas clientes GIS deben estar correctamente dimensionados desde el punto de vista de los recursos hardware para que la experiencia de los usuarios con la tecnología GIS sea satisfactoria.

- **Comunicaciones**

  - Otro aspecto a tener muy en cuenta en el despliegue de un sistema GIS es el volumen de información que debe ser transferido entre los clientes y el servidor, que habitualmente es grande. Con las actuales tecnologías de comunicaciones este no debería ser un problema, pero si es importante tenerlo en cuenta en el despliegue y en los futuros planes de comunicaciones de la organización, fundamental también si se quiere dar servicios a usuarios externos a través de Internet.

3.4 Carga de datos

Ya completada la fase de definición del Plan, en la que se han dejado claros los datos a integrar en las bases de datos relacionales, se ha de pasar al proceso de carga de dichas bases de datos (proceso sumamente delicado, que requiere aplicación de los sistemas de control de la calidad). Se puede distinguir entre dos tipos de datos claramente diferenciados a tratar en los sistemas de información aeronáutica. Por un lado la base topográfica (WGS84 e e-TOD) de las cartas y por otro lado los datos propiamente aeronáuticos de cada componente del IAIP.

Datos Topográficos

Refiere a los datos proporcionados y validados por los servicios cartográficos nacionales y que conforman la base topográfica de las cartas aeronáuticas. El formato de entrega de estos datos por parte de los servicios cartográficos nacionales dictará la forma de carga de los mismos, siendo el GIS una herramienta adaptada a la carga de cualquier tipo de formato (tanto vectorial como raster). En cualquier caso se hará una selección por escalas de la base cartográfica, necesaria para cada tipo de carta, extrayendo en cada caso las entidades cartográficas a representar según indica la OACI en la documentación aplicable para el tema.

El GIS permite la importación de DTM (modelos digitales del terreno) pudiendo realizar estudios sobre ellos, así como realizar tratamientos a los mismos para la producción cartográfica generando procesos matemáticos, geodésicos y geométricos diversos así como degradados hipsométricos para la cartografía de que se trate en cada caso.

Datos Aeronáuticos

La base de datos aeronáutica debe contener toda la información necesaria para la producción. Desde este punto de vista el modelo de datos a seguir es el estándar AICM/AIXM. La carga de esta base de datos se ha de establecer en cada caso, de forma que se incorpore o modifique la información directamente mediante interfaces de usuario adaptadas o mediante la importación desde otros sistemas siguiendo los protocolos de seguridad en todos los casos.

3.5 Configuración GIS

Independientemente de la plataforma GIS seleccionada, son necesarias las Normas de la OACI a seguir en la configuración del sistema para la generación de cartas aeronáuticas y poder preparar el sistema de producción. En primer lugar se ha de definir la estructura de los tipos de cartas que se van a producir, de forma que se generen en el GIS las plantillas para cada uno de estos productos. De igual modo se definirá el sistema de coordenadas WGS84 que se va a utilizar, tanto en la producción como en la carga de los datos.

Dentro de cada producto se establece una jerarquización adecuada (por ejemplo por aeródromo) donde se han de definir los marcos de cada una de las cartas aplicables de acuerdo al Anexo 4. Estos marcos serán las vistas de cada carta. En cada tipo de carta se representa un tipo de información diferente, por lo que se definirán con el GIS las entidades que tienen que aparecer en cada una, es decir, se hace necesaria la definición de reglas de visualización por cada capa de información.

Otro punto importante es la selección de la simbolización de todas las entidades representadas por el GIS a partir de los documentos de la OACI que aplican. El sistema permite mediante las herramientas de representación gráfica realizar y editar símbolos y guardarlos en bibliotecas de forma que éstos puedan utilizarse en la producción cartográfica continua y diversificada.

Una vez creada la simbología para todas las entidades, el GIS permite también generar reglas de simbolización, de modo que facilita al usuario la aplicación de éstas de un modo automatizado. Otro aspecto es el correspondiente al etiquetado, en donde se definen las normas de representación de textos. Los GIS disponen de herramientas para ello que permiten generar las distintas formas de etiquetado de las entidades aeronáuticas.

3.6 Configuración del subsistema de producción cartográfica

Con las normas de configuración del GIS ya creadas, para cada carta será necesario realizar un flujo de trabajo para la producción cartográfica. Se establecerán unas capas de información organizada por temas o ciertas características definidas por el usuario, de modo que se mantenga esta jerarquía en todas las cartas (como mínimo se deberían establecer las capas de topografía, entidades aeronáuticas, de símbolos, de obstáculos y de etiquetas, entre otros mas) Sobre estas capas se aplicarán las normas de relación, simbolización y etiquetado configuradas, utilizando las herramientas que el GIS proporciona para la edición apropiada de la cartografía. Los GIS disponen de herramientas de etiquetado automático y reglas topológicas que permiten que la edición de las cartas se automatice en buen grado.

Sin embargo, una vez realizados todos estos pasos, es preciso un trabajo de edición final de las cartas por parte del usuario. Este proceso debe estar regulado por altos controles de calidad correspondientes, dentro de los cuales el GIS debe participar en gran medida ya que se puede configurar para gestionar el control de cambios de edición realizados sobre la carta.

Finalizada la edición de la carta y realizados los controles de calidad oportunos, el último paso de la producción son los procesos de postproducción. Los GIS disponen a servicio del usuario de diversos formatos de salida, tanto para procesos de separación de colores, formatos pdf, formatos de imagen, servicios web, etc. por lo que se definirá el modo adecuado al sistema de producción de cada producto.

3.7 Formación a los usuarios

Es fundamental a la hora de implantar un nuevo sistema de producción que los usuarios tengan una formación adecuada para el correcto funcionamiento del proyecto. La formación debe estar especificada para cada tipo de usuario que va a utilizar el sistema, por lo que deberán adecuarse a los distintos perfiles que se definan. Por un lado se precisa una formación administrativa y de gestión de la parte de bases de datos relacional y por otro lado el usuario del GIS en donde se sugiere una formación de **geógrafo** o **cartógrafo**.

Con la formación queda asegurado que los usuarios y responsables del GIS, disponen de los conocimientos suficientes para obtener el mayor rendimiento y las máximas prestaciones del sistema.

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4. PRODUCCIÓN CARTOGRÁFICA CON GIS

El objetivo principal es obtener un sistema que automatice al máximo la producción de cartas aeronáuticas. Esto hay que entenderlo desde la perspectiva de un proceso de producción cartográfico, por lo tanto el objetivo final es la producción de cartografía, la producción de mapas.

Un mapa tiene el objetivo de transmitir un determinado mensaje a determinados usuarios que se desenvuelven en un entorno geodésico-espacial. Por tanto, todos los elementos del mapa, la simbología (colores, tipos de línea, ...), las etiquetas (nombres de los elementos), las relaciones entre elementos, ... deben ser tenidos en cuenta, estudiados y definidos con el objetivo de transmitir este mensaje de la mejor forma posible basados en el Anexo 4 y el Doc. 8697 de la OACI .

A continuación se describen las fases y procesos que pasa la información para ser representada en un mapa:

Entorno geográfico: El mundo real el cual se quiere representar

Extracción y representación de la información: Se extrae la información del entorno geográfico, a través de mediciones y se representa como producto de información geográfica, en adelante denominado producto geográfico

Interpretación de la información: La información se interpreta para transmitir el mensaje, se eliminan determinados elementos, se resaltan o transforman otros.

Mapa: Este mapa debe ser publicado, ya sea en formato papel, electrónico, de todo este proceso Los Servicios de Información Aeronáutica participan parcialmente en el segundo y totalmente en los dos últimos. Parcialmente en el segundo por que recibe los productos geográficos generados por otras organizaciones, y tienen la misión de cotejarlos y ensamblarlos de forma que se obtenga un producto coherente y válido. Totalmente en el proceso de

interpretación de la información y producción de mapas pues es tarea exclusiva de los AIS, la producción y distribución de productos cartográficos derivados del producto geográfico.

TRANSICIÓN AIS A AIM MANUAL GUÍA DE IMPLANTACIÓN GIS PARA LOS SERVICIOS DE INFORMACIÓN AERONÁUTICA

Un *producto geográfico* representa la realidad de una forma fidedigna, es poco intuitivo y a menudo presenta demasiada información para ser interpretada por un humano, pero sin embargo es el producto perfecto para la realización de análisis y estudios.

Un *producto cartográfico* representa una interpretación de la realidad dada por un cartógrafo, por tanto, y de cara a mejorar la interpretación de la información, esta puede verse modificada parcialmente. Un ejemplo muy claro de este se produce en las cartas de radionavegación:

Cuando un punto de notificación no pertenece a una aerovía producto geográfico producto cartográfico

En los enlaces con radio-ayudas producto geográfico producto cartográfico Otro gran diferencia entre el producto geográfico y los productos cartográficos es que el primero es único, un elemento es como es y así se almacena y representa, en contraposición con los elementos cartográficos en los cuales un mismo elemento se puede representar de diferente forma en diferentes mapas, de acuerdo a los criterios cartográficos. Por ejemplo el ARP del aeródromo carta de radionavegación carta tipo ADC

4.1 Automatización

A continuación se describe la visión ideal de un sistema que automatizase todo el proceso de producción cartográfica, el objetivo es disponer de una guía que marque el objetivo final, aunque muy posiblemente no se pueda alcanzar en el corto/medio plazo. Dentro de esta visión se incorpora la interacción con sistemas y agentes externos al sistema de producción, fundamentales en un sistema de información moderno.

El primer aspecto fundamental es el de la coherencia y seguridad de la información, para ello debe existir un almacén central en el cual la información se almacene de forma única. Que cuando varias personas traten sobre una entidad, se refieran al mismo elemento almacenado. En el contexto de la producción cartográfica esto debe tener en cuenta tanto la producción de cartas, esto es, la representación de la entidad en las diferentes posibles cartas, como los ciclos de enmiendas y el trabajo en paralelo.

Todo esto quiere decir que aunque existan varias cartas, y una entidad tenga una representación diferente en cada una de ellas, si el producto geográfico se ve modificado en algún atributo de la entidad, esta modificación se ve reflejada en los productos cartográficos. Esto debe ser así para cada ciclo de enmienda, y del mismo modo se deben tener en cuenta las actuaciones sobre los ciclos de enmienda anteriores al de trabajo.

Es fundamental que todo este sistema que tiene en cuenta la naturaleza temporal (atributos de las entidades varían con el tiempo) y cartográfica (las entidades varían su representación en las cartas) de las entidades esté constituido de forma que para su correcto funcionamiento no se dependa de actuaciones externas por parte del usuario, y que tenga mecanismos de integridad para que se mantenga siempre coherente.

Otro aspecto fundamental en la coherencia de la información son las relaciones, el sistema debe ser capaz de gestionar relaciones entre entidades a nivel alfanumérico y gráfico, de forma que se puedan definir reglas de integridad (valores extremos de frecuencias, relación entre aerovías y puntos de notificación, relación entre espacios aéreos) A continuación se presenta un gráfico con la visión global del sistema:

En el almacén central debe existir y ser accesible el producto geográfico, los cambios que se producen en el entorno geográfico y que implican variaciones sobre la información, implican la actuación sobre este producto, con el alta, baja o modificación de sus entidades.

Este proceso de actualización sobre el producto geográfico se puede realizar por un operador, a través de las interfaces de usuario apropiadas, o de forma automática, a través de conexiones con otros sistemas, en este aspecto es fundamental el estándar AIXM. Este producto geográfico es en si mismo un producto publicable, ya que es óptimo de cara a la realización de análisis, simulaciones, etc. Esta publicación debe de hacerse a través de estándares electrónicos, de forma que las aplicaciones comerciales existentes puedan hacer uso de estos datos sin necesidad de desarrollos propios.
Estándares apropiados para la publicación de este producto geográfico son los propios promovidos por el Open Gis Consortium (OGC) como GML, WMS, WFS, etc.
Ya desde el aspecto de la producción cartográfica, el sistema debe soportar la producción, gestión y almacenamiento coherente de productos cartográficos, más específicamente, debe poseer:

Mecanismos que permitan derivar productos cartográficos desde el producto geográfico.

Mecanismos que permitan mantener la coherencia entre ambos productos; los cambios que se producen en el producto geográfico deben trasladarse a los productos cartográficos, de forma que la información que presentan sea coherente y única.

El sistema debe almacenar los productos cartográfico de forma centralizada, y disponer de mecanismos para su publicación, ya sea en formatos tradicionales (papel, etc.) o modernos (electrónicos, etc.)

El proceso fundamental que debe soportar el sistema es el de edición cartográfica, este proceso convierte los elementos del producto geográfico en elementos cartográficos. A través de este proceso se debe permitir generar nuevos productos cartográficos o actualizar los existentes.

El proceso de edición cartográfica incluye actuaciones del tipo:

Aplicación de simbología específica por tipo de carta (colores, tipos de letra, etc.)

Generación de anotaciones para los diferentes elementos.

Modificaciones geométricas de elementos dependientes del objetivo del producto cartográfico.

Generación de elementos auxiliares (escalas, tabla de simbología, etc.) De todas estas actuaciones, la más compleja es la de la modificación geométrica de las entidades, en este punto es donde reside el ‘arte’ cartográfico, y por tanto puede ser muy complejo de implementar en un sistema automático. El objetivo por tanto debe ser automatizarlo de forma razonable y disponer de las herramientas y soporte por parte del sistema para completar esta tarea de forma manual por un operador.

El resto de actuaciones son más sistemáticas, y por tanto susceptibles de ser automatizadas de forma satisfactoria. Finalmente dependerá de las capacidades gráficas del sistema la complejidad y riqueza visual que se obtenga en los productos cartográficos. Una vez que se produce un producto cartográfico, es fundamental que mantenga la coherencia con el producto geográfico, para ello el sistema debe soportar la propagación de las modificaciones sobre el producto geográfico a los productos cartográficos.

En una situación ideal, en la cual todo el proceso de edición cartográfica esta automatizado de forma completa, no debe existir diferencia entre la actualización de un producto cartográfico y su generación nueva, ya que es posible obtener el producto final de forma automática. Por contrario, si el proceso de edición cartográfico no está automatizado completamente (situación más realista), es muy importante que antes cambios en el producto geográfico estos se propaguen a los productos cartográficos de forma controlada, de forma que se minimice el esfuerzo manual necesario para obtener de nuevo el producto cartográfico final. Cuanta más automatizado está un sistema, y fundamentalmente uno que soporta un gran volumen de información como es el caso de un sistema de producción cartográfica, mayor es la sensación de 'no saber que pasa'. Por tanto es fundamental habilitar mecanismos que permitan en todo momento saber que está haciendo el sistema, que cambios está aplicando sobre las entidades, etc.

4.2 Tecnologías

Ante todo, un sistema de producción cartográfica es un sistema de información, para dar soporte de forma corporativa a los sistemas de información se usan los sistemas gestores de bases de datos (DBMS).

Por tanto el almacén de información debe estar implementado sobre un sistema gestor de bases de datos. Esto garantiza un acceso centralizado a la información y simplifica los procesos de distribución, seguridad y disponibilidad de esta. Por otro lado, un sistema de producción cartográfica es un sistema gráfico, almacena elementos que tienen geometría. Por lo tanto el sistema gestor de bases de datos debe soportar la gestión de este tipo de información, incluyendo las operaciones típicas sobre ellas: proyecciones, relaciones geométricas y topológicas, etc.

La tecnología GIS surgió inicialmente para cubrir la necesidad de hacer estudios complejos sobre información con un carácter geográfico, por tanto era fundamental mantener una relación fuerte entre los atributos geográficos y los alfanuméricos, así como se desarrollaron complejas técnicas de análisis y tratamiento de relaciones geométricas. Los sistemas GIS, dada su naturaleza de análisis, trabajan fundamentalmente sobre productos geográficos, en los cuales la precisión y fiel reflejo del entorno geográfico es fundamental.

Debido a este aspecto fundamental y a la baja automatización en los procesos de producción cartográfica tradicionales, la tecnología CAD ha sido históricamente la más utilizada. Sin embargo, ante grandes volúmenes de información y alto número de productos cartográficos, la tecnología GIS presenta interesantes ventajas. Por la garantía de coherencia de la información, por las capacidades de procesamiento de elementos geométricos, por las capacidades de interacción con otros sistemas. Actualmente las tecnología GIS esta sufriendo un fuerte empuje hacia el soporte de productos cartográficos, existiendo ya en el mercado sistemas comerciales con dicho soporte.

La publicación de productos de información/datos (texto-tabulares y cartográficos) obtenidos de un sistema GIS, y ante el aumento en la demanda de información de carácter

gráfico y geográfico, es importante implementar tecnologías que permitan la mayor difusión y funcionalidad posible, y por tanto soporten tanto la publicación tradicional en papel como diversos modos de publicación electrónica.

APPENDIX D
(*available only in Spanish)*

PROCESO DE ADQUISICIÓN E IMPLANTACIÓN DE UN SISTEMA DE INFORMACIÓN GEOGRÁFICA (GIS)

1. Introducción

1.1 Durante la 1ª Reunión del Grupo de Tarea de Cartas Aeronáuticas Electrónicas en la Gestión de la Información Aeronáutica (AIM/e-MAP/TF/1), se presentó la necesidad de contar con un Sistema de Información Geográfico (GIS) para la gestión de la información aeronáutica y generación de productos derivados tomando como base las recomendaciones del Proyecto de Estrategia para la Transición a la Gestión de la Información Aeronáutica (AIM) en la Región CAR/SAM.

1.2 En relación a dichas necesidades se presenta en este documento un conjunto de orientaciones que podrían ser útiles para los Estados que vayan a encarar este problema o se encuentren en un proceso de migración de sus actuales sistemas hacia un GIS.

2. Discusión

2.1 Las tecnologías de la información y las comunicaciones actuales permiten abordar la transición desde el concepto AIS a AIM de forma exitosa, es decir desde la generación y distribución de productos, a la gestión de la información y prestación de servicios.

2.2 Un pilar fundamental de esta transformación son los sistemas de información geográfica (GIS). Esto se debe principalmente al tipo de información manejada, que incluye la publicación de cartas, la integración de información topográfica, y la información en formato texto, las cuales pueden manejarse como una unidad a través de los GIS.

2.3 Por tanto, la implantación de un GIS en un AIS resultará muy ventajoso, en la medida en que lo que antiguamente podía manejarse de forma separada (generalmente los mapas del resto de la información aeronáutica), hoy se puede administrar como una sola cosa a través del GIS. Aún así, al momento de la implantación de los mismos, deben tenerse en cuenta dos objetivos principales:

- *Mejorar los procesos de producción.* Durante bastante tiempo aún, será necesaria la publicación de productos ‘tradicionales’, por lo que es fundamental que el sistema GIS soporte estos procesos de producción eficientemente.

- *Permitir nuevos canales de publicación y distribución de la información.* Según se vayan implementando nuevas mejores prácticas, el sistema GIS debe permitir la transición fluida y controlada a nuevos paradigmas de distribución AIS (muy posiblemente basados en tecnologías de Internet principalmente)

2.4 El GIS puede ser, entonces, la plataforma tecnológica sobre la que se desarrollen los procesos de producción, publicación e intercambio de los AIS, y un aspecto importante a considerarse es la capacidad que éste debe tener para manejar todas las fases de los procesos antes mencionados, sin necesidad de disponer de otros productos externos, lo cual lo convertiría en algo poco ágil.

2.5 Para la elección de un GIS, se tuvieron en cuenta aspectos relevantes que detallaremos a continuación a modo de ejemplo, lo cual no implica que puedan existir otros que también deban considerarse, de acuerdo a las características de cada Estado.

2.5.1 Estudios previos

2.5.1.1 *Análisis de costo/beneficio*. Este ítem permitió acotar la inversión necesaria y los retornos que el uso de esta nueva tecnología tendría en la Organización, a través de la mejora y comercialización de nuevos productos. Se consideró también la compra de licencias software, mantenimiento de las mismas, hardware, capacitación y todo aquello necesario para que el nuevo sistema funcione correctamente. Además, se tuvo en cuenta la posibilidad de que el producto a adquirir estuviese desarrollado en módulos separados, de forma tal de que se pudieran ir adquiriendo para ampliar las capacidades del GIS.

2.5.1.2 *Análisis de funcionalidades del GIS*. Sobre este aspecto, se consideró que el sistema se adaptara a las necesidades propias del AIS en cuanto a las recomendaciones y normativas OACI vigentes, es decir, el manejo de un modelo de datos aeronáuticos basado en el estándar AIXM, la disponibilidad de librerías de simbología basadas en los estándares de OACI y la existencia de plantillas preparadas para cartas tipo OACI, a fin de lograr productos compatibles con los estándares.

2.5.1.3 *Análisis de ofertas existentes en el mercado*. Principalmente este análisis se basó en el mercado local y en la evaluación se tuvieron en cuenta varios aspectos, los que fueron determinantes al concretar cual sería la plataforma que mejor se adaptaría a nuestra Organización:

- *Funcionalidades esperadas del nuevo sistema*. Detalle de cada una de las funciones que dispone el sistema y qué necesidades cubre.

- *Entorno tecnológico en el que se va a implantar*. Indica las necesidades tanto de hardware así como de software (incluidos los sistemas operativos) que requiere el GIS.

- *Datos a ser integrados en las bases de datos GIS*. Define los tipos de almacenamiento que se necesitan y su vinculación con otras bases de datos que el GIS necesitará como datos básicos para su funcionamiento.

- *Identificación de los usuarios del sistema*. Resulta sumamente necesario para contrastar la calificación de los recursos humanos existentes y a partir de allí definir la capacitación que se requiera para el uso y administración del GIS.

- *Interoperabilidad*. Específicamente se estudiará cómo se vincula el GIS con los sistemas ATM actuales y futuros para que no existan incompatibilidades insalvables así como la capacidad de este para importar o exportar datos a otras aplicaciones.

- *Modularidad del sistema*. El GIS debe ser capaz de incrementar su funcionalidad en cuanto a la posibilidad de incluir nuevos módulos a los ya existentes sin que esto implique adquirir un sistema totalmente nuevo.

2.5.1.4 *Vínculo con el Sistema de Gestión de la Calidad*. Desde este punto, se tuvo en cuenta que el GIS tuviese la capacidad de integrarse con los sistemas de gestión de la calidad o que permitiera realizar las tareas descritas en él, de forma tal que cumpliera con los aspectos incluidos en la Norma ISO 9000.

2.5.1.5 *Consideraciones para la adquisición*. En cuanto a la compra propiamente dicha, se tuvo en cuenta la posibilidad de adquirir un producto base, que permitiera una funcionalidad tal, que cubriera los aspectos actuales de la demanda de información aeronáutica del AIS. No obstante, dada la modularidad que se buscó en el producto que se deseaba adquirir, se consideraron los futuros módulos a adquirir, los cuales interactuarán con la información ya cargada en las bases de datos y que permitirán no realizar una erogación completa en la primera etapa.

2.5.2 Cronograma de implantación

2.5.2.1 Toda transición a una nueva tecnología conlleva un esfuerzo considerable para toda la organización. Esta consideración se aplica directamente a la implantación de un GIS, que requiere esfuerzos de gestión, financieros, y de los equipos de sistemas y técnicos AIS.

2.5.2.2 Una vez realizadas las evaluaciones, se confeccionó un cronograma de implantación a fin de definir cómo se realizaría el trabajo del AIS durante el tiempo de la transición de los sistemas actuales al del nuevo GIS, el cual incluye también, la formación del personal responsable de las tareas.

2.5.2.3 Por estos motivos, y facilitado por la propia modularidad del sistema seleccionado, se plantea la implantación en una serie de fases:

2.5.2.3.1 *1ª Fase*: Instalación y manejo de módulos básicos del producto por parte de la Empresa Vendedora. A lo largo de esta fase, los diferentes grupos técnicos (sistemas, AIS, etc.) se familiarizan con los aspectos básicos de la nueva tecnología GIS, y adquieren los conocimientos necesarios para abordar el resto de fases de implantación de forma satisfactoria.

2.5.2.3.2 *2ª Fase*: Instalación y manejo de módulos específicos AIS. Estos módulos específicos son los que permiten la elaboración de aplicaciones Cartográficas tales como mapas topográficos, cartas de navegación aeronáuticas entre otras, así como el mantenimiento, gestión y consulta de la base de datos aeronáutica. Para minimizar los riesgos y plazos de implantación, Uruguay contará con la experiencia adquirida por el AIS España en la implantación de su GIS, de forma que técnicos de AENA apoyarán en la migración.

2.5.2.3.3 *3ª Fase*: Instalación del sistema operativo y de las aplicaciones. Verificación del funcionamiento contra un conjunto de datos de prueba. Tras la carga de una serie de datos de prueba, se recorrerán diferentes escenarios de prueba, de forma que se complete la formación en un escenario operativo y se verifique el correcto funcionamiento de todos los componentes dentro de los flujos de trabajo.

2.5.2.3.4 *4ª Fase*: Carga de datos existentes. Se trata de la fase previa a la entrada en producción del sistema, e implica la carga de los datos aeronáuticos desde las fuentes que existan previamente. La existencia previa de bases de datos digitales facilitará y minimizará el tiempo necesario para cumplir esta fase. Una vez cargada este conjunto de datos de partida, el sistema GIS queda preparado para producción, debiendo prestarse el máximo cuidado en mantener la base de datos GIS actualizada.

2.5.2.3.5 *5ª Fase*: Trabajo en paralelo de ambos sistemas. Para minimizar los riesgos de migración, se prevé un plazo de tiempo en el cual los sistemas de producción anteriores a la implantación del GIS y este mismo, convivan, trabajen en paralelo. Paulatinamente, según se vaya

ganando confianza en el nuevo sistema, y según este vaya cubriendo todas las funcionalidades prestadas por el procedimiento previo, se irá potenciando el sistema GIS hasta que se convierta en el único sistema de producción.

2.5.2.4 Ciclos de evolución del sistema. La funcionalidad que se puede esperar de un sistema GIS como apoyo a los servicios AIS y dentro de las prácticas recomendadas por la OACI, es muy amplia desde producción de las cartas del AIP, producción de series especiales VFR, generación de productos digitales (AMDB, eTOD), etc. Por tanto, para obtener los mejores resultados y realizar una implantación exitosa, se debe plantear un proceso de ciclos, cada uno de ellos compuesto por las fases descritas anteriormente. En cada uno de los ciclos sólo se abordará la carga de un subconjunto de los elementos aeronáuticos y de los productos que se desean implantar.

2.5.2.4.1 Un ejemplo de planificación de estos ciclos puede ser:

Ciclo 1: Navegación en ruta.
Ciclo 2: Datos y cartas visuales (VFR 1:500.000 y VAC)
Ciclo 3: eTOD
Ciclo 4: Aeródromo (ADC, PDC, GMC)
Ciclo 5: Procedimientos y cartas SID, STAR
Ciclo 6: Procedimientos de aproximación (cartas IAC)
El contenido concreto de cada ciclo, así como el tiempo de duración de cada uno de ellos, debe ajustarse a las necesidades y posibilidades de cada organización.

3. Resultados

3.1.1 Con la implantación de un GIS en el AIS Uruguay, se esperan solucionar problemas de homogeneidad de la información, estandarización de los productos obtenidos, capacidad de responder a los requisitos planteados por el nuevo ATM y sobre todo generar productos que sean de satisfacción plena para los clientes, lo cual incluirá también productos específicos para aquellos que así lo requieran.

4. Conclusión

4.1.1 Existen ventajas claramente definidas al adoptar un GIS, no obstante, una vez implantado, el AIS deberá pasar por el proceso de desarrollo, a fin de poder percibir los beneficios, considerando las capacidades que los Sistemas de Información Geográfica poseen para la gestión de la información en ambientes digitales.

4.1.2 Por último y dado el esfuerzo que significó por parte de Uruguay el proceso de selección de productos y la formación y de acuerdo a lo acordado en la 1ª Reunión del Grupo de Tareas de Cartas Aeronáuticas Electrónicas AIM/e-MAP/TF/01, se estima conveniente que a través de las Oficinas Regionales de la OACI se promuevan Programas de Adiestramiento en Sistemas de Información Geográfica, Bases de Datos y DTM en función a la producción y empleo de la Cartografía Aeronáutica como actividad regional de la Región CAR/SAM.

Agenda Item 4: Review of the AIM Implementation Process

4.1 Review of compliance by Spanish speaking States on the requirement of publication for the Integrated Aeronautical Information Package (IAIP) in English.

4.1.1 Under this agenda item, the meeting referred to Annex 15, Chapter 3, paragraph 3.6.1 which indicates that *"Each element of the Integrated Aeronautical Information Package for international distribution shall include English text for those parts expressed in plain language"* and recalled that the AIM/SG/11 Meeting agreed that an English version of the IAIP should be included for its publication, initiating as soon as possible the action plans aimed at its compliance by those States which do not comply with this ICAO Standard.

4.1.2 Further to the discussions on this topic and using the information available, the meeting prepared the following status of application of de above-mentioned ICAO Standard for the CAR/SAM Regions. The following **Table 1** presents a list of the States and Territories whose language is French, Portuguese and Spanish which have complied with the Standard.

4.1.3 The information presented in **Table 2** shows that Spanish Speaking States should continue making efforts through actions aimed at the availability of the production of the IAIP for international distribution with special attention to the NOTAM Information. Particularly, shows the list of the CAR and SAM States which have not reached yet compliance of Standard in Annex 15:

TABLE 1

IN COMPLIANCE WITH STANDARD 3.6.1 OF ANNEX 15			
STATE/TERRITORY/INTERNATIONAL ORGANIZATION		REGION	MOTHER TONGUE
1	Brazil	SAM	Portuguese
2	Cuba	CAR	Spanish
3	Costa Rica	CAR	Spanish
4	Dominican Republic	CAR	Spanish
5	France – French Guyana	SAM	French
6	France –Guadaloupe Island	CAR	French
7	France – Martinique	CAR	French
8	Haiti	CAR	French
9	Panama	SAM	Spanish
10	Venezuela	SAM	Spanish

TABLE 2

DO NOT COMPLY WITH STANDARD 3.6.1 OF ANNEX 15				
STATE/TERRITORY/ INTERNATIONAL ORGANIZATION		REGION	MOTHER TONGUE	IS THERE A PROJECT OR A PLAN TO PUBLISH THE ENGLISH VERSION AND DID STATES SENT THE INFORMATION TO THE ICAO REGIONAL OFFICES?
1	Argentina	SAM	Spanish	To be comply in 2010
2	Bolivia	SAM	Spanish	There is an action plan for second semester 2010
3	Colombia	SAM	Spanish	Estimated by the second semester of 2010
4	Chile	SAM	Spanish	Estimated to be complied by 2010
5	Ecuador	SAM	Spanish	Estimated to be complied by January 2010
6	El Salvador	CAR	Spanish	There is an action plan for 2010
7	Guatemala	CAR	Spanish	Will initiate action plan in 2010
8	Honduras	CAR	Spanish	N/A
9	Mexico	CAR	Spanish	N/A
10	Nicaragua	CAR	Spanish	N/A
11	Paraguay	SAM	Spanish	Will initiate action plan in 2010
12	Peru	SAM	Spanish	Will initiate action plan in 2010
13	Uruguay	SAM	Spanish	Estimated by the first semester of 2010
14	COCESNA	CAR	Spanish	Estimated 70% completed and the rest will be completed during second semester 2010

4.1.4 From the above information, up to date, the majority of the Spanish Speaking States have not made the publications of the IAIP in English.

4.1.5 With regard to this topic, **Appendix A** to this part of the report shows the current situation presented by Chile to the Meeting.

4.2 Update of the reclassification of the "U" deficiencies using SMS methodology as a means for risk assessment in its last version and incorporation of information sources validated by IATA and IFALPA to the GREPECAS GANDD.

4.2.1 The meeting reviewed the documentation prepared by GREPECAS regarding the procedures for classifying and treating "U" deficiencies. In this respect, the participants and the Secretariat agreed that these risk assessment procedures contributed to the implementation of the uniform methodology for the identification, assessment, and reporting of deficiencies approved by the ICAO Council, which contained criteria for identifying "U" deficiencies. Therefore, the Meeting considered important to use the SMS methodology for the classification of new deficiencies and reclassification of the existing deficiencies.

4.2.2 Also the meeting took as a reference the results of the ASB/9 and GREPECAS/15 meetings to carry out the risk assessment and provide the information to the GANDD.

4.2.3 In this respect, GREPECAS/15 through Conclusion 15/47 – *Further Action for the Implementation of Conclusion ASB/8/2* urges the States that have not done so yet to conduct, as soon as possible, a risk assessment of "U" deficiencies, and to present the results obtained to the accredited Regional Office.

4.2.4 On this matter, GREPECAS/15 also reviewed the implementation of Decision ASB/8/1. In this regard, it noted that GREPECAS had developed criteria for the classification of "U" deficiencies based on the existing SMS risk analysis model, and that, through the aforementioned decision, the Secretariat had been requested to conduct an analysis to extend the use of these criteria to the classification of "A" and "B" deficiencies.

4.2.5 Taking into consideration that:

a) the ICAO SMS Risk Analysis Model only applies to those cases related to matters affecting air navigation safety;

b) an "A" deficiency is defined as a deficiency with high-priority requirements in terms of safety; and

c) a "B" deficiency is defined as a deficiency with intermediate requirements in terms of air navigation regularity and efficiency.

4.2.6 The analysis by the GREPECAS Secretariat concluded that, in addition to the elements of the SMS risk analysis model considered for the classification of "U" deficiencies (elements 5A, 5B, 5C, 4A, 4B, and 3A), the remaining elements could be used to classify "A" deficiencies. Therefore, when analysing a deficiency that affects safety using the SMS model, it is noted that a deficiency unrelated to risk indices associated with type "U" deficiencies could be classified as an "A" deficiency, and matters affecting the regularity and efficiency of air operations could be classified as a "B" deficiency.

4.2.7 Furthermore, taking into account the criteria of the uniform methodology approved by the Council, based on the premise that the deficiency exists and detected by a user or by an ICAO mission or through any other mean, and thus should be subsequently classified for its treating and/or action plans . Accordingly, GREPECAS/15 considered that the SMS model should be subsequently used as a tool to classify the deficiencies directly affecting safety, that is, "U" or "A", according to the uniform methodology approved by the Council. The Meeting also recognised that classification criteria could be improved, but considered that it for the moment it is more important to put into practice the aforementioned criteria and gain experience with their implementation.

4.2.8 GREPECAS/15 approved the use of the ICAO SMS risk assessment model for classification of "U", "A" and "B" deficiencies shown in **Appendix B** to this part of the report.

4.2.9 The meeting took note that GREPECAS/15 emphasised that consideration should be given to the fact that the existing deficiencies affect the provision of air navigation services in the ICAO Regions, and the urgent need for the States/Territories to establish programmes for their elimination, were matters of ongoing concern and high priority for the ICAO Council.

4.2.10 Also, in view of the above, the meeting took note of Conclusion 14/59 – *National Coordinator Responsible for Updating the GREPECAS Air Navigation Deficiency Database,* and in order to facilitate the administrative coordination of the GREPECAS database (GANDD) with those responsible for the various areas of the air navigation services of the States/Territories, and that, to this respect, GREPECAS Secretariat prepared a list of National Coordinators responsible for updating the GANDD (see **Appendix C** to this part of the report).

Application of the ICAO SMS Risk Evaluation Model

4.2.11 On the other hand, under the coordination of the Secretariat, the Meeting had the opportunity to carry out series of practices on the application of the Risk Evaluation Model by using the information contained in the GREPECAS valid deficiencies, which made more efficient the exercise by working on the actual data of each participant State.

4.2.12 In consideration to the above mentioned, the Meeting carried out the mentioned exercise of classification of deficiencies under the new methodology with the purpose that each State develops in an uniform manner this classification informing the results to their respective ICAO regional offices in a period no longer than 2010. During the exercise the participants expressed their concern regarding the complexity that this evaluation could be performed without having all the necessary knowledge and data on the analysis of risk of the SMS, to this end, the Secretariat recalled the expressed in paragraph 4.2.7 under this Agenda Item, in which it is mentioned that this is only a tool that could be improved, but it was necessary to put in practice these elements with the required data and thus to be acquiring greater experience.

4.2.13 Finally, the Meeting took note of the need that each aeronautical administration will apply the necessary resources in order that through the National Coordinator the responsible of the air navigation services maintain the information of the GANDD updated.

4.3 Guidance for the Implementation of the NOTAM Contingency Plan During the analysis of guides for the implementation of NOTAM Contingency Plan, the GREPECAS/12 meeting agreed on the need for the States/Territories/International Organisations to develop "NOTAM Contingency Plans" to support Air Traffic Service Contingency Plans, thus ensuring the efficient exchange of NOTAM information at both national and international level.

4.3.2 Consequently, GREPECAS adopted Conclusion 12/99 - *Agreement on NOTAM Contingency Plans for the CAR/SAM Regions*, whereby CAR/SAM States/Territories/International Organisations were requested to develop their NOTAM contingency plans for flight information regions (FIRs), and, insofar as possible, to enter into bilateral and/or multilateral arrangements with those States/Territories and International Organisations responsible for neighbouring airspaces.

4.3.3 As a result, the GREPECAS/13 formulated Conclusion 13/52 - *Guidance Material for NOTAM Contingency Plans* whereby, in addition to urging States to comply with Conclusion 12/99, they were requested to consider the adoption of the NOTAM Contingency Plan of the Havana FIR, together with the experience of Cuba and COCESNA in the establishment of operational agreements on this subject matter, as guidance material.

4.3.4 In view of the above, and based on the Contingency Plan of Cuba, the meeting revised a text presented to the meeting to serve as general guidance to States/Territories/International Organisations in the drafting of their respective Contingency Plans (**Appendix D** to this part of the report.).

4.3.5 Consideration was also given to the requirements for the implementation of PBN and computer-based navigation systems which introduced the need for new AIS requirements to ensure the quality and timely distribution of information.

4.3.6 In order to provide information and meet these new requirements, the traditional function of aeronautical information services will become an information management service with obligations and responsibilities guided to new technologies.

4.3.7 In order to facilitate coordination, improve efficiency and safety, and ensure that the various members of the ATM community have the same information for collaborative decision-making, (CDM) it is essential to have real-time quality electronic information (aeronautical information on terrain and obstacles).

4.3.8 The electronic information will improve the en-route, terminal, and aerodrome situational awareness of pilots through the use of on-board equipment with geographical reference data containing information for the en-route, terminal, and aerodrome phases. The same information can be provided at different ATC positions and pre-flight planning units, and can be available to airline flight planning departments or users from general or private aviation.

4.3.9 Electronic information can be adapted and its format modified to meet the requirements of ATM users and their applications. Standard data formats will be used to create databases fed with data sets of assured quality.

4.3.10 The above clearly shows the need for CAR/SAM Regions to have the Contingency Plans of all the States/Territories/International Organisations and their respective bilateral or multilateral agreements to ensure the regular flow of NOTAM information contained in the various databases.

NOTAM Contingency Plan between Guayaquil NOF and Santiago NOF

4.3.11 The delegations of Chile and Ecuador presented the **NOTAM Contingency Plan developed between the Guayaquil NOF and the Santiago NOF**. This plan had been prepared pursuant to GREPECAS Conclusion 12/99 "Agreement on NOTAM Contingency Plans for the CAR/SAM Regions".

4.3.12 In this regard, the two delegations stated that they had deemed necessary to hold a work meeting to analyse and establish a NOTAM Contingency Plan, to which end the coordination meeting was held on 4-6 November 2009, in Santiago, Chile. As a result of its discussions, the meeting considered that the Guides for the development of the NOTAM Contingency Plan had to be revised and updated, since they considered that the PIB and the FPL are currently not part of the plan, and it should also include the communications to the REDDIG, as an alternate means for oral transmission of information.

4.3.13 For this reason, and after analysing the aforementioned proposal, the Meeting considered that the Guides for the development of the NOTAM Contingency Plan were only intended as a general guidance for those responsible for AIS services, and thus the text proposed in these guides could be modified and adapted, in keeping with the requirements and specific characteristics of each Administration.

4.4 Follow-up on e-TOD (electronic terrain and obstacle data) implementation. Results of the discussions of the Aeronautical Information Service – Aeronautical Information Management Study Group (AIS-AIM/SG 2).

4.4.1 In order to address this agenda item, the Secretariat presented the Summary of Discussions of the second meeting of the AIS-AIM/SG of ICAO Headquarters. Copy of this summary is shown in **Appendix E** to this part of the report.

4.4.2 In turn, the delegation of Chile reminded the Meeting that the implementation of electronic terrain and obstacle data (e-TOD) regulated in ICAO Annex 15, contemplated four areas: Area 1, which covers the whole national territory; area 2, for terminal areas (TMA) with a radius of 45 km with respect to the aerodrome ARP; area 3, related to the aerodrome surface movement area; and area 4, defined by a rectangular area on the runways operating ILS Cat. II y Cat. III.

4.4.3 The Secretariat also recalled that the GREPECAS/15 meeting held in Rio, Brazil, had noted that the difficulties in e-TOD implementation were derived from insufficient resources, lack of explanatory notes to accompany the SARPs, and the availability of guidance material only in the English language (Doc 9881). The Meeting also noted that the work to be carried out by some States to collect terrain and obstacle data for Area 1 was significant, even with the use of satellite technology.

4.4.4 Regarding the collection of obstacle data for Areas 2 and 3, GREPECAS/15 agreed to request ICAO to consider extending the deadline for this e-TOD-related provision, since many airports in the CAR/SAM Regions apply IFR, reason why the task would take a long time and financial, technological and human resources and represented a significant challenge.

4.4.5 The meeting was informed by the Secretary of the AIS/AIMSG intention to significantly reduce the implementation difficulties associated with eTOD as contained in State letter AN 2/2.2/09/13. Consequently, the GREPECAS/15 meeting formulated the following conclusion:

CONCLUSION 15/2 EXTENSION OF E-TOD IMPLEMENTATION DATES

That ICAO consider extending the implementation dates for meeting e-TOD requirements, as follows: a) Areas 1 and 4, 2010; and b) Areas 2 and 3, 2013.

4.4.6 Based on the foregoing with respect to the proposed amendment to Annex 15 and the resulting amendments to Annexes 4, 11, and 14, Volumes I an II, the Administration of Chile agreed with e-TOD implementation, and had prepared the following action plan:

a) Chile foresees the implementation of areas 3 and 4 at international airports starting in 2012; and

b) the implementation of areas 1 and 2 at international airports starting in 2014.

4.4.7 Furthermore, Chile indicated that, for Area 1, a general scale 1:1.000.000 and a more detailed scale 1:250.000 should be considered. Regarding Area 2, Chile was analysing filing a difference to the above, since it considered that the 45 km of the TMA, converging at the aerodrome datum, constituted too big an area and thus, of high cost. Consequently, only an area of 15 km, converging at the airport/aerodrome ARP and adjusted to the requirements of Chile, would be covered, thus reducing the investment in equipment, training, software, and hardware, in order to comply with the cited implementation. However, the implementation of requirements established at previous ICAO meetings that is, the remaining 30 km., or measures to be adopted in the future in this regard, would not be discarded.

APPENDIX A

E/CAR/DCA/22 — WP/25
International Civil Aviation Organization 11/11/09
North American, Central American and Caribbean Office (NACC)
Twenty Second Meeting of Directors of Civil Aviation of the Eastern Caribbean (E/CAR/DCA/22)
Port of Spain, Trinidad and Tobago, 8 to 11 December 2009

Agenda Item 4 **Review of AIM Implementation Processes**
4.1 Review of compliance by Spanish Speaking States with IAIP in English language requirement.

IAIP IN ENGLISH LANGUAGE

(Presented by the Delegate of Chile)

SUMMARY

Present status of the Integrated Aeronautical Information Package (IAIP) produced by the Aeronautical Information Service, regarding its production and publication in the English language.

References:
- AIMS/SG/11 Report Bogotá, Colombia, 16 to 20 June 2008. Agenda Item 4, paragraph 4.1.
- Doc. 9835/AN/453 2 "Manual on the Implementation of ICAO Language Proficiency Requirement"

ICAO Strategic Objectives	*This Working Paper is related to Objective D.*

1. Introduction

1.1 Aeronautical Information Service functions are at present performed by Flight Service Tecnicians (TSV) who are trained at the Escuela Técnica Aeronáutica (ETA). As a form of upgrading technicians to ICAO proficiencies and requirements, a plan was started in 2009 to upgrade them according to requirements of ICAO course AIS 021 through the e-learning system. Out of a universe of 218 technicians, 61 have already passed said course and the process is expected to end in 2010. Future formation courses consider incorporation of course AIS 021 requirements.

1.2 On the other hand, improving the English level is of the utmost priority for technicians, but it is necessary to note that the AIS responsibility rests with the form of publishing aeronautical information, whereas the contents of data /information is the responsibility of the operational areas that generate the information and must send it in English language.

1.3 With regard to the production of the Integrated Aeronautical Information Package (IAIP) in English language, a process of upgrading of technicians has been initiated according to the rating scale required by ICAO.

1.4 Evaluation of technicians' English level is made through an agreement between our organization and a specialized company, certified for issuing ICAO level certificates. Said company must issue an evaluation report on the evaluee´s English proficiency level. According to the results of the report, steps with regard to those technicians who do not meet ICAO requirements are taken.

1.5 114 out of 218 TSVs have already been evaluated. Three technicians are in level 5, eighteen in level 4 and ninety in level three. The rest will be evaluated according to financial resources available, since many of them are at the ARO offices through the country. Those below that level will undergo a reinforcement plan so that they can attain the ICAO requirement within a period of three years.

1.6 ICAO Language Profiency Rating Scale

LEVEL	
6	Expert
5	Extended
4	Operational
3	Pre-operational
2	Elementary
1	Pre-elementary

2. Actions

2.1 At present some parts of the Aeronautical Information Publication are in Spanish and English. In 2008 an English version was initiated which was available in the web site www.dgac.cl. However, due to administrative reasons it was not possible to keep it updated, and its updating has been postponed until a date that will be informed in due time. A hard copy Spanish language version of the AIP and an English version in digital format are being prepared, the latter is available only in the DGAC web site.

2.2 For the SUP AIP and AIC, internal coordination will be made so that information to be published is in both languages.

2.3 With regard to international dissemination NOTAMs, they are being published in standard abbreviated phraseology and plain English. National NOTAMs are published in standard abbreviated phraseology and plain Spanish.

3. Suggested Action

3.1 The meeting is invited to:

a) take note of the information contained in this WP; and,

b) take note of the actions taken with regard to the English language in the Integrated Aeronautical Information Package (IAIP).

- END -

APPENDIX B

METHODOLOGY TO DETERMINE THE THREE LEVELS OF PRIORITY OF AIR NAVIGATION DEFICIENCIES (U/A/B) BASED ON THE RISK INDEX

Risk Probability		Risk Severity				
		Catastrophic A	Hazardous B	Higher C	Lower D	Insignificant E
Frequent	5	5	5	5	5	5
Occasional	4	4	4	4	4	4
Remote	3	3	3	3	3	3
Unlikely	2	2	2	2	2	2
Extremely unlikely	1	1	1	1	1	1

(Available only in Spanish)

Modelo para la confección del Plan de Contingencia NOTAM

APPENDIX C / APÉNDICE C

GANDD NATIONAL COORDINATORS / COORDINADORES NACIONALES GANDD

CAR REGION / REGION CAR

Estado / State	Coordinador / Coordinator	Dirección e-mail / E-mail address
Anguilla (U. K.)	----------	----------
Antigua & Barbuda	Rosemond James	oecs.dca@candw.ag
Antillas Francesas / French Antilles	Roger Gabriel Prudent	roger-gabriel.prudent@aviation-civile.gouv.fr
Antillas Neerlandesas / Netherlands Antilles	Vilmo Pieter	vilmo.pieter@gov.an
Aruba	Louis Reed	louis.reed@aruba.gov.aw
Bahamas	Wendy Major	wendymajor@bahamas.gov.bs
Barbados	David Brones	civilav@sunbeach.net
Belice / Belize	J.A. Contreras	dcabelize@btl.net
Bermuda	Rosemond James	oecs.dca@candw.ag
Costa Rica	Luis Gustavo González Trigo	ggonzalez@dgac.go.cr
Cuba	Iraida Alfonso	iraida.alfonso@iacc.avianet.cu
Dominica	Rosemond James	oecs.dca@candw.ag
El Salvador	Mauricio E. Rivas Rodas	navegacion-aerea@acc.gob.sv
Estados Unidos / United States	Mayte Ashby	mayte.ashby@faa.gov
Granada / Grenada	Rosemond James	oecs.dca@candw.ag
Guatemala	Carlos Urizar	carouriz@yahoo.com
Haiti	Jacques Boursiquot	jboursiquot@ofnac.org
Honduras	Geovany Sauceda	gsauceda@yahoo.com
Islas Caimanes / Cayman Islands	Richard Smith	richard.smith@caacayman.com
Islas Turcas y Caicos / Turks and Caicos Is.	Thomas Swann	tswann@gov.tc
Islas Vírgenes Br / Virgin Islands Br	Margaret Wilson	margaret.wilson@caribairsafety.aero
Jamaica	Patrick Stern	dans@jcca.gov.jm
Mexico	José Javier Roch Soto	jjrochso@sct.gob.mx
Montserrat	Margaret Wilson	margaret.wilson@caribairsafety.aero

Nicaragua	Carlos Salazar	dg@inac.gob.ni
República Dominicana / Dominican Republic	Santiago Rosa	subdireccion_sna@idac.gov.do
St Kitts & Nevis	Rosemond James	oecs.dca@candw.ag
St. Vincent and The Grenadines	Alastair Alexander	ETJoshua@caribsurf.com
Santa Lucía / St. Lucia	Rosemond James	oecs.dca@candw.ag
Trinidad y Tabago / Trinidad and Tobago	Randy Gomez	rgomez@caa.gov.tt

REGION SAM / SAM REGION

Estado / State	**Coordinador / Coordinator**	**Dirección e-mail / E-mail address**
Argentina	Eduardo Rodino	buecrucga@faa.mil.ar
Bolivia	Daniel Navajas Orellana Jefe de la Unidad de Infraestructura Aeroportuaria	dnavajas@dgac.gov.bo
Brasil / Brazil	Paulo Jorge de Medeiros Vieira Asesor de la CERNAI	asscernai1@decea.gov.br
Chile	Jesús Sánchez Cvitanic Jefe Sección Navegación Aérea del Departamento Planificación	jsanchez@dgac.cl
Colombia	Grupo de Proyectos Internacionales	sparis@aerocivil.gov.co nsanchez@aerocivil.gov.co
Ecuador	Bolívar Dávalos Cárdenas	bolivar_davalos@dgac.gov.ec bolodavalos@hotmail.com
Guyana Francesa / French Guiana	Catherine Arnaud	catherine.arnaud@aviation-civile.gouv.fr
Guyana / Guiana	Director Air Navigation Services	dans@gcaa-gy.org
Panamá	----------	----------
Paraguay	Hernán Jhonny Colman Gerente de Navegación Aérea	gna@dinac.gob.py
Perú	Raymundo Hurtado Paredes Inspector de Navegación Aérea	rhurtado@mtc.gob.pe
Surinam	----------	----------
Uruguay	Carlos Acosta Director de Circulación Aérea	insvuelo@adinet.com.uy
Venezuela	Pablo Cecilio Rattia Rodríguez Gerencia de Servicios a la Navegación Aérea	p.rattia@inac.gov.ve

- END -

Introducción

Este Plan de Contingencia NOTAM ha sido elaborado en cumplimiento de la **CONCLUSION 12/99** "Acuerdo sobre Planes de Contingencia NOTAM para las Regiones CAR/SAM" del GREPECAS y para ser aplicado en la FIR ……

El objetivo de este Plan de Contingencia NOTAM es precisar los arreglos y coordinaciones necesarias para establecer medidas técnicas y administrativas para los procedimientos de coordinación y operación que garanticen la prestación del servicio NOTAM y su distribución en caso de interrupción del servicio AIS y de los servicios de apoyo conexos.

El Plan tiene en consideración todas las vías posibles de respaldo incluyendo acuerdos con la Oficina Central de Información Aeronáutica de …….. y en cada caso se especifica los pasos a seguir, aplicando las fichas de actuación implementadas con el presente Plan.

Plan de Contingencia - NOTAM

Procedimientos de respaldo para situaciones de Contingencia

1. Principios Generales.

1.1 Este documento se establece con el objetivo de definir procedimientos y medidas de respaldo a tomar en caso que se genere una situación de Contingencia en la Oficina NOTAM Internacional (NOF) …… que impida el cumplimiento de algunas o todas sus funciones.

2. Definiciones.

2.1 Se considera "*Eventualidad*" aquella que provocada por una situación imprevista o planificada, traiga como consecuencia una situación de contingencia en la NOF ……

2.2 Se considera una "*Situación de Contingencia en la NOF …..…*", aquella que imposibilite cumplir con alguna o todas las funciones para lo cual fue creada y por tanto sea necesario aplicar los procedimientos descritos en el presente Plan de Contingencia para garantizar la publicación, recepción y mantenimiento de la información NOTAM en la FIR ….. en soporte de las actividades ATM.

3. Clasificación de eventualidades y contingencias.

3.1 Entre las eventualidades contempladas en este Plan de Contingencia, así como las posibles consecuencias que pueden generar diferentes tipos de contingencias en la Oficina Central AIS….. se encuentran:

Eventualidad	Situación creada	Contingencia
1- Falla menor en Hardware o software del BD NOTAM.	1- Imposibilidad de trabajo del BD NOTAM, pero el sistema de mensajería AFTN operativa.	Tipo A
2- Falla de comunicaciones en toda la red o falla del Servidor de mensajería AFTN.	2- El BD NOTAM puede estar operable o no, pero se imposibilita la transmisión y recepción por AFTN.	Tipo B
3- Falla de la Red de Comunicaciones Regional (MEVA – REDDIG, etc.)	3- Imposible transmisión y recepción por AFTN.	Tipo B

3.2 Las situaciones de contingencia en la Oficina Central ……. se clasifican en:

Tipo A: El BD NOTAM está inoperativo, pero las funciones que el mismo realiza serán asumidas *manualmente* por los propios técnicos NOTAM y retransmitidas por el sistema de mensajería AFTN.

Tipo B: El BD de NOTAM puede estar operando o no, pero el sistema de mensajería se encuentra inoperativo por lo que la Oficina NOTAM ….. se ve imposibilitada de divulgar y recibir nacional e internacionalmente información NOTAM lo que obliga a utilizar otra Oficina Central de respaldo en el área para mantener el servicio de información NOTAM. En esta clasificación se incluye también las situaciones de desastres naturales o de otra índole.

3.3 Plan de Aviso.

3.3.1 Cuando la Oficina NOTAM detecta alguna falla que pudiera generar un estado de contingencia por el acontecimiento de una eventualidad descrita en 3.1, que clasifica como Tipo A o B, informa de inmediato al ….(*Departamento técnico responsable*)…. De confirmarse la situación de contingencia NOTAM el ….(*Departamento técnico responsable*)…. proporcionará información sobre la misma, como:

- Tipo de contingencia según tabla del punto 3.1 del presente Plan de Contingencia.
- Tiempo estimado de duración de la contingencia.

3.3.2 El técnico NOTAM informará de inmediato al Jefe de la Oficina NOTAM, quien decretará oficialmente el estado de contingencia NOTAM, para lo cual activará en el orden de prioridad asignado el Plan de Aviso siguiente informando en todos los casos el tipo de contingencia que se está decretando:

Plan de Aviso:

1. …….
2. …….
3. …….
4. ……

3.4 Infraestructura de Contingencia.

3.4.1 En la Oficina NOTAM Central deberán estar creadas o se crearán de inmediato las condiciones mínimas indispensables para que se realicen todas las funciones que normalmente y de forma automatizada realiza el BD NOTAM, indispensables para garantizar la seguridad y regularidad de la navegación aérea en la FIR …… y estas condiciones serán:

a) Acceso a Internet en la Oficina NOTAM Central y una cuenta de correo electrónico con salida internacional.

b) Se habilitará/n …(P.ejemplo 2)… PC además de las ya existentes para garantizar el trabajo continuo de …. técnicos elaborando y distribuyendo la información NOTAM y PIB, las cuales deberán estar previamente definidas.

c) Se instalará un telefax con línea directa que garantice la comunicación permanente y rápida, nacional e internacionalmente, que deberá estar previamente definido.

d) Se designarán … técnicos AIS de la dependencia ……. que reforzarán el trabajo de confección de los PIB en la Oficina NOTAM, mientras dure la contingencia.

e) Se definirán oportunamente los usuarios nacionales que deberán contar con cuentas de correo electrónico, a fines de estar informados mientras dure la contingencia NOTAM.

3.5 Vías de comunicación.

3.5.1 La comunicación durante la contingencia se realizará, según se especifica en cada caso, mediante vía telefónica, e-mail o AFTN.

3.5.2 Los datos para la comunicación estarán previamente contenidos y actualizados en adjunto a la Carta de Acuerdo Operacional entre las Oficinas NOTAM internacionales …… y …….... En esta carta se incluirán los datos de ambas NOF, así como las direcciones AFTN de todos los usuarios internacionales de los NOTAM de la FIR ……...

3.5.3 Adjunto a este Plan se recogerán y mantendrán actualizados los datos de teléfonos, e-mail y AFTN de todas las Dependencias nacionales involucradas en la contingencia.

3.6 Organización de la contingencia.

3.6.1 El Jefe de la Oficina NOTAM Central asume la dirección de la contingencia NOTAM en ……, dando todas las indicaciones pertinentes para asumir la contingencia de cualquier tipo, tales como:

a) Duplicar o triplicar al personal en turno para asumir la contingencia, elaborando “horario de trabajo de contingencia” hasta una semana como mínimo después del estimado de fin de la contingencia.

b) Mantener contacto estrecho con ….(*Autoridad Aeronáutica que corresponda y el Departamento de Control Operacional que corresponda*), adoptando siempre que sea posible las decisiones que han sido coordinadas con los mismos.

c) Mantener contacto estrecho con el Departamento/organismo…..*(responsable de las comunicaciones y area técnica)*.. , manteniéndose debidamente informado sobre el estado técnico, durante la contingencia.

3.7 Solicitudes de publicación de NOTAM.

3.7.1 Las Dependencias AIS de Aerodromo conjuntamente con …*(responsable de los servicios de navegación aerea, Dependencias ATC involucradas..),* la Oficina de Publicaciones AIS, así como otros usuarios aeronáuticos autorizados a solicitar la publicación de un NOTAM, enviarán a la Oficina NOTAM las solicitudes de los NOTAM a publicar cumpliendo con todos los requerimientos descritos en… *(normativa establecida)* , vía AFTN (Contingencia Tipo A) o vía e-mail o telefónica (Contingencia Tipo B).

3.8 Solicitudes de elaboración de PIB.

3.8.1 Una vez decretada cualquier tipo de contingencia NOTAM, las Dependencias AIS de Aerodromo se verán imposibilitadas de elaborar sus propios PIB como se realiza habitualmente, por lo que deberán solicitar su confección a la Oficina NOTAM:

- En Contingencia Tipo A: enviando los FPL vía AFTN tan pronto como se reciban en la Dependencia AIS de Aerodromo.
- En Contingencia Tipo B: enviando los FPL tan pronto como se reciban en la Dependencia vía e-mail o vía telefónica/fax o cualquier otro medio disponible y aceptado por la autoridad aeronáutica, en cuyo caso deberán incluirse todos los datos contenidos en el FPL.

4. Procedimientos aplicables en caso de Contingencia Tipo A.

4.1 Publicación de NOTAM de advertencia.

4.1.1 Una vez decretada la Contingencia Tipo A, el Jefe de la Oficina NOTAM Central indicará al funcionario AIS cuando y como debe publicar el primer NOTAM que anuncia el estado de contingencia a los usuarios NOTAM de la FIR ……., como se indica en el siguiente ejemplo:

(AXXXX/YY* NOTAMN
Q)MUFH/QXXCA/IV/NBO/AE/000/999
A)MUFH B)*fecha/hora inicio contingencia* C)*fecha/hora EST fin contingencia.*
E)NOTAM CONTINGENCY ACT DUE TECHNICAL REASONS. THE INFORMATION NOTAM OF HAVANA BY THE INTERROGATION SERVICE WILL BE INTERRUPTED)

** (XXXX numeración consecutiva correspondiente, YY año)*

4.2 Publicación de NOTAM.

4.2.1 La Oficina NOTAM recibirá las solicitudes de publicación de NOTAM por cualquiera de las vías especificadas en la documentación técnica y de calidad establecidas, aplicando en todos los casos de forma habitual la Regulación Nacional AIS aplicable y procediendo posteriormente a verificar y elaborar de forma manual los NOTAM solicitados y finalmente transmitirlos por AFTN a todos los usuarios NOTAM correspondientes, nacionales e internacionales.

4.3 Elaboración de PIB.

4.3.1 La Oficina NOTAM elaborará los PIB solicitados desde las dependencias AIS de Aeródromo mientras dure la contingencia y los reenviará por e-mail con un tiempo no menor de 2 horas antes del estimado de salida de cada vuelo.

5. Procedimientos aplicables en caso de Contingencia Tipo B.

5.1 De las coordinaciones entre Oficinas Centrales AIS …… y ……*(se citan las oficinas centrales que establecen el acuerdo de contingencias).*

5.1.1 El Jefe de la Oficina NOTAM una vez decretada la Contingencia Tipo B contactará de inmediato con el especialista designado Jefe de la Contingencia NOTAM por ….*(.autoridad aeronáutica correspondiente).*…

5.1.2 El …..*(Autoridad aeronáutica)* de ….*(Estado)*.. solicitará por escrito a …*(Autoridad Aeronáutica con que suscribe el Acuerdo de Contingencias)* de…*(Estado)* activar los procedimientos descritos en Carta de Acuerdo firmada por ambas entidades y pasará copia de esta comunicación a la Oficina NOTAM. Una vez recibida la copia de la carta, el Jefe de la Oficina NOTAM se comunicará telefónicamente con la Oficina NOTAM Internacional de *(Estado)* y coordinarán todos los temas necesarios para llevar a cabo los procedimientos de respaldo a la Oficina Central …… mediante la Oficina NOTAM Internacional ..*(Estado)..*, según Carta de Acuerdo operacional.

5.2 Publicación de NOTAM.

5.2.1 En estado de Contingencia Tipo B todos los NOTAM que se necesiten publicar en la FIR …. serán emitidos y distribuidos desde la Oficina NOTAM Internacional …*(según Carta de acuerdo).*

5.2.2 Todos los NOTAM que se soliciten publicar serán elaborados completamente en la Oficina NOTAM Internacional de … …*(según Carta de acuerdo)…*, de inicio a cierre de la contingencia, manteniendo el numero de secuencia de los NOTAM de la dependencia AIS en contingencia y se enviarán por fax o e-mail a la Oficina NOTAM Internacional …*(según Carta de acuerdo)…*, dejando constancia escrita de lo solicitado.

5.2.3 Después que el NOTAM en cuestión es publicado se verificará si coincide exactamente con lo que se solicitó y en caso contrario se solicitará reemplazo o cancelación, según proceda.

5.2.4 Antes de comenzar a publicar algún NOTAM, se enviará un primer fax o e-mail a la Oficina NOTAM Internacional …*(según Carta de acuerdo)*.. con el listado actualizado de direcciones AFTN internacionales, a quienes deberán ser enviados todos los NOTAM que la NOF …*(según Carta de acuerdo)*.. solicite publicar. El listado de direcciones AFTN de usuarios internacionales de la información NOTAM de la FIR ….. estará contenido en adjunto a la Carta de Acuerdo Operacional entre ambas NOF.

5.2.5 El Jefe de la Oficina NOTAM indicará al funcionario AIS cuando y como debe publicar el primer NOTAM que anuncia el estado de contingencia Tipo B a los usuarios, como se muestra en el siguiente ejemplo:

(AXXXX/YY* NOTAMN
Q)MUFH/QXXCA/IV/NBO/AE/000/999
A)MUFH B)*fecha/hora inicio contingencia* C)*fecha/hora EST fin contingencia.*
E)NOTAM CONTINGENCY ACT. THE INFORMATION NOTAM OF HAVANA AIS OFFICE BY THE INTERROGATION SERVICE WILL BE INTERRUPTED. INFO NOTAM OF HAVANA FIR WILL BE PROVIDED BY COCESNA AIS OFFICE).

* *(XXXX numeración consecutiva correspondiente, YY año)*

5.3 Distribución de NOTAM a usuarios nacionales.

5.3.1 Los NOTAM de la FIR …. publicados por la Oficina NOTAM Internacional …*(según Carta de acuerdo)*, serán distribuidos a usuarios internacionales desde dicha NOF. El Oficial NOTAM se encargará de distribuir a los usuarios nacionales posibles vía e-mail, los NOTAM de la FIR …. después de ser recepcionados por la Oficina NOTAM Internacional …*(según Carta de acuerdo)* y debidamente revisados.

5.4 Elaboración de PIB.

5.4.1 La Oficina NOTAM elaborará los PIB solicitados desde las dependencias AIS de Aerodromo, mientras dure la contingencia y los reenviará por e-mail o Fax con un tiempo no menor de 2 horas antes del estimado de salida de cada vuelo.

6. Cese de la Contingencia y restablecimiento de funciones.

6.1 Cese de la Contingencia.

6.1.1 Una vez confirmado el cese de la contingencia, el responsable de la Contingencia de la Oficina NOTAM afectada procederá a realizar una verificación minuciosa de todas y cada unas de las funciones que realiza el Banco de Datos NOTAM a fin de comprobar el perfecto estado de funcionamiento, así como el sistema de mensajería AFTN, solo entonces se procede a decretar el cese oficial de la Contingencia NOTAM.

6.1.2 El Jefe de la Oficina NOTAM será el encargado de emitir las indicaciones para publicar un NOTAM de cese del estado de Contingencia NOTAM y con ello decretar el final de la misma.

6.1.3 En Contingencia Tipo A:

6.1.3.1 Cuando el Jefe de la Oficina NOTAM lo indique, se publicará desde la Oficina Central AIS …. el NOTAM de cierre de la misma como se muestra en el siguiente ejemplo:

(AXXXX/YY* NOTAMC AXXXX/YY*
Q)MUFH/QXXAK//////
A)MUFH B)*fecha/hora cese contingencia*
E) END NOTAM CONTINGENCY HAVANA AIS OFFICE OPR NML)

* *(XXXX numeración consecutiva correspondiente, YY año)*

6.1.4 En Contingencia Tipo B:

6.1.4.1 El Jefe de Oficina NOTAM comunicará de inmediato a ….*(Autoridad Aeronáutica correspondiente)*…el cese del estado de contingencia NOTAM y este gestionará a la mayor brevedad posible se envíe la comunicación pertinente a la Autoridad Aeronáutica de …*(Estado con que se ha establecido la Carta de acuerdo)* informando sobre el cese de la Contingencia. El mensaje debe especificar que el cierre oficial de la Contingencia será en fecha y hora del NOTAM de cancelación que se emitirá para estos efectos.

6.1.4.2 ..*(Autoridad Aeronáutica correspondiente)*.. informará por cualquier vía posible al Jefe de NOTAM de la comunicación cursada a la Autoridad Aeronáutica …*Estado con que se ha firmado la Carta de acuerdo)* sobre el cierre de la contingencia, y solo entonces el Jefe de NOTAM dará las indicaciones pertinentes para que sea publicado por la Oficina Central AIS …. el NOTAM de cancelación como se muestra en el siguiente ejemplo:

(AXXXX/YY* NOTAMC AXXXX/YY*
Q)MUFH/QXXXX//////
A)MUFH B)*fecha/hora cese contingencia*
E) END NOTAM CONTINGENCY HAVANA AIS OFFICE OPR NML)

6.2 Restablecimiento de funciones.

6.2.1 Una vez emitido este NOTAM el Jefe de la Oficina NOTAM se encargará de:

a) tomar todas las medidas pertinentes para restablecer las condiciones y régimen de trabajo normal en la oficina
b) actualizar la BD NOTAM y revisar que se ha mantenido la continuidad de los números de serie; y
c) establecer el regreso del personal de refuerzo a sus puestos de trabajo de forma gradual.

6.2.2 …*(Departamento Técnico)*…se encargará de restablecer el equipamiento y medios que habitualmente se encuentran en la Oficina, retirando de forma gradual y convenida con el Jefe de la Oficina NOTAM las PC de refuerzo, mientras que el telefax se mantendrá de forma permanente.

-0-0-0-0-0-0-0-

AIS-AIMSG/2-SoD
13/11//09

AERONAUTICAL INFORMATION SERVICES-AERONAUTICAL INFORMATION MANAGEMENT STUDY GROUP (AIS-AIMSG)

SECOND MEETING

Montréal, 10 to 13 November 2009

SUMMARY OF DISCUSSIONS

1. HISTORICAL

1.1 The second meeting of the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG) was held at the International Civil Aviation Organization (ICAO) Headquarters in Montréal, Canada, from 10 to 13 November 2009.

1.2 The meeting was opened by David Lewtas, Chief, Aeronautical Information Unit (C/AINF), MET/AIM, of the Air Navigation Bureau (ANB) and Dr. Olli M. Turpeinen, Chief, Meteorology and Aeronautical Information Management Section (MET/AIM) who briefed the group on forthcoming milestones, in particular a possible MET/AIM Divisional meeting in 2014 of which the Air Navigation Commission would be informed in the Spring of 2010. He thanked the group, on behalf of the Director of the Air Navigation Bureau of ICAO, for their valuable work and continued support.

1.3 The names and addresses of the participants are listed in Appendix A. Mr. Paul Bosman, was nominated to be Chairman of the meeting. The meeting was served by the Secretary of the AIS-AIMSG, David Lewtas, Chief, Aeronautical Information Unit (C/AINF), MET/AIM, of the Air Navigation Bureau (ANB) who was assisted by Jean-Michel Galais and Michael Hohm, Technical Officers, AINF.

1.4 The meeting considered the following agenda items:

Agenda Item 1: Opening of the meeting

Agenda Item 2: Election of Chairman

Agenda Item 3: Adoption of working arrangements

Agenda Item 4: Adoption of the agenda

Agenda Item 5: Global strategy/roadmap

Agenda Item 6:	**Aeronautical information models**
6.1	Guidance material on digital data exchange
6.2	Including AIM in Annex 15
Agenda Item 7:	**Electronic AIP (eAIP)**
Agenda Item 8:	**NOTAM and related messages**
8.1	Amendment No. 2 to the *Aeronautical Information Services Manual* (Doc 8126)
8.2	AIS-MET data link services
Agenda Item 9:	**Electronic charts and GIS**
9.1	Amendments to Annexes 4, 14 and 15 related to aerodrome mapping
9.2	Guidance material for aerodrome mapping
9.3	*World Geodetic System — 1984 (WGS-84) Manual* (Doc 9674)
9.4	*Aeronautical Chart Manual* (Doc 8697)
Agenda Item 10:	**AIM quality management system**
Agenda Item 11:	**Electronic terrain and obstacle data (eTOD)**
Agenda Item 12:	**AIM staff training guidance**
Agenda Item 13:	**Legal and institutional issues related to AIM**
Agenda Item 14:	**AIM in the future ATM System**
14.1	Information on NextGen and SESAR
14.2	Consideration of the MET component
Agenda Item 15:	**Future work programme of the group**
Agenda Item 16:	**Any other business**

1.5 The group also agreed to discuss the Flight and Flow Information for a Collaborative Environment (FF-ICE) Concept under a new Agenda Item 14.3.

1.6 A list of study notes and information papers issued for the meeting is given at Appendix B and are available on the AIM website at www2.icao.int/en/ais-aimsg.

1.7 Appropriate working hours were adopted by the group.

AGENDA ITEMS 1 TO 4: OPENING OF THE MEETING ELECTION OF CHAIRMAN; ADOPTION OF WORKING ARRANGEMENTS; ADOPTION OF THE AGENDA

1.8 These items are covered under Section 1: Historical.

2. AGENDA ITEM 5: GLOBAL STRATEGY/ROADMAP

2.1 The Secretariat provided a summary of the amendments made to the *Roadmap for the Transition from AIS to AIM* since AIS-AIMSG/1 based on the consultative process undertaken with members, States and ICAO Regional Offices. It was noted that the Roadmap had been published on the ICAO website as a first edition and would be further amended as necessary.

2.2 The group was made aware that during this consultative process, three issues had emerged:

1) the definition of AIM;
2) the need to include in Annex 15 terms used in the Roadmap; and
3) the need to include in Annex 15 a chapter/section on legal and institutional issues.

2.3 On the issue of the definition of AIM, the group agreed that definitions should be included both in Annex 15 and in the Roadmap which better define the differences between AIS and AIM and to clearly define information management and system wide information management (SWIM) and their relationship to AIM. Furthermore, it was agreed that the terms "data", "information", "product", and "service" needed to be further clarified in Annex 15.

2.4 Considering that there was already a subgroup of the AIS-AIMSG working on including AIM in Annex 15, the group agreed to the following action:

Action agreed 2/1 — Inclusion in Annex 15 of new definitions related to AIM

That the ad-hoc group consisting of **Greg (Rapporteur), Amy, Augustin, Charity, Paul, Stefan, Stéphane, Tony** and **Valerie,** be tasked with reviewing, for suitability for inclusion in Annex 15, the terms and definitions in the *Roadmap for the Transition from AIS to AIM*, and present a draft list of definitions to AIS-AIMSG/3, with the objective of including them in Amendment 37.

2.5 The group recognized that there was a need to consider strengthening Annex 15 provisions related to legal and institutional issues and to add guidance to Doc 8126 — *Aeronautical Information Services Manual* to provide a framework on which decisions on legal and institutional issues could be based. It was also suggested that an overview of what States may need to consider when addressing legal and institutional issues be included in the Roadmap.

2.6 It was agreed that any actions on legal and institutional issues as they relate to material to be included in Annex 15 and related guidance material should be deferred to the discussion of Agenda Item 13.

2.7 It was noted that in the Roadmap, the data quality step referred to how States verified data quality (monitoring), while the data integrity step required a stronger focus to address States' difficulties encountered when measuring the integrity requirements stated in the SARPs. These requirements needed to be clarified and supported by guidance material. It was pointed out that copyright may be an effective tool for ensuring integrity within a State. It was noted that resources must be placed on verifying the SARPs relating to data integrity in Annex 15. Therefore, the group formulated the following action:

Action agreed 2/2 — Review of the data integrity requirements in Annex 15

That the ad-hoc group consisting of **Greg (Rapporteur), Amy, Augustin, Charity, Paul, Stéphane, Stefan, Tony** and **Valerie** be tasked with reviewing the data integrity requirements in Annex 15 with a view to clarifying them or developing additional requirements as necessary and submit proposals to the AIS-AIMSG/3 meeting for possible inclusion in Amendment 37 to Annex 15.

2.8 Concerning the CANSO AIM Working Group activities, the group agreed that the development of a Glossary which would aim to achieve a common terminology and definitions with respect to AIM should re-use existing material including the result of the international Aeronautical Information Harmonization Working Group (AIHWG). It was agreed that a careful consideration should be undertaken of definitions, both broad and highly technical, being developed by the various groups. Further it was agreed that an incremental approach to the implementation of AIS to AIM should be taken and any Annex 15 amendments should start with preserving initially the integrated aeronautical information package and adding AIM services.

3. AGENDA ITEM 6.1: GUIDANCE MATERIAL ON DIGITAL DATA EXCHANGE

3.1 The group recalled that AIS-AIMSG/1 had proposed text for inclusion Amendment 36 to Annex 15 to introduce a requirement to enable data exchange (Action agreed 1/6 refers). The proposed text modified an existing Recommended Practice in Annex 15 related to the use of automation and added a note indicating that guidance material on an aeronautical conceptual and data exchange model for the development of databases and the establishment of data exchange services was to be found in Doc 8126. The group was reminded that the aeronautical information exchange model (AIXM) was a means of compliance for aeronautical data exchange. It was agreed that a new chapter describing AIXM version 5 (hereafter referred to as AIXM 5), along with a CD-ROM containing complete AIXM 5 documentation, be included in the next amendment to Doc 8126.

3.2 The group noted that many States had expended significant resources to develop their aeronautical data exchange systems using AIXM version 4.5 (hereafter referred to AIXM 4.5) and may not be in a position to quickly transition to AIXM 5. It was noted that there were no operational systems that were fully using AIXM 5.

3.3 It was generally accepted that States which had not yet begun to develop aeronautical data exchange systems would benefit most from adopting AIXM 5 as a data model, since it incorporated functionality and improvements not available in AIXM 4.5. It was considered that the industry had a preference for developing AIXM 5 systems.

3.4 While it was considered that States would benefit from stability in the application of an AIXM model, the group was of the opinion that it was not expected that implementation of a single version of the data exchange model could be synchronized across the entire industry. It was recognized that the target for implementation should be AIXM 5 but that some States would continue to use AIXM 4.5.

3.5 It was noted that AIXM 5 was fundamentally different from AIXM 4.5, with AIXM 5 introducing provisions for metadata, UML, GML, a temporality model and latest ICAO and industry requirements for obstacles, terminal procedures and aerodrome mapping. The group considered that while the implementation of data exchange based on AIXM 5 was preferable, it should be possible to

implement data exchange based on AIXM 4.5 with appropriate local extensions and supported by tools that would automatically convert the data into an AIXM 5 format.

3.6 It was agreed that guidance material on AIXM would be included in Doc 8126, but that it would not refer to any particular version of AIXM and that the AIXM 5 would be described as general "performance" requirements. AIXM 5 would then be mentioned as a possible means of compliance and presented on a CD-ROM.

3.7 The group discussed that further development of the AIXM model would require international participation and focus and that governance of the state of the model would be a particular issue. It was observed that the AIS-AIMSG may not offer the required international exposure to provide adequate governance of the model. It was agreed that the group would take the recommendations from Federal Aviation Administration (FAA) and EUROCONTROL as to an appropriate body to govern the further development of the AIXM/AICM model. Such a body would need to represent all appropriate international stakeholders.

Action agreed 2/3 — AIXM governance

That **Paul** and **Gregory** develop a proposal for the establishment of an appropriate body with technical and broad-based representation to support the governance of the evolution of the AIXM model by for review by AIS-AIMSG/3.

Action agreed 2/4 — Inclusion of guidance material on AIXM in Doc 8126

That the Secretary include guidance material on AIXM in Amendment No. 3 to Doc 8126.

4. AGENDA ITEM 6.2: INCLUDING AIM IN ANNEX 15

4.1 It was noted that an incremental approach to the transition to AIM was inevitable. The group realized that in the future data-driven environment, users would have the option to specify the data items needed and download them to their applications. This option would also be available for deriving paper products as long as these were required.

4.2 The Secretary informed the group that the objective of the MET/AIM Divisional Meeting planned for 2014 would be to present a restructured Annex 15. The restructuring of an Annex was considered to have significant implications on all Contracting States that an international consensus should be sought. It could not be included in a routine amendment. Amendment 37, scheduled for applicability in 2013, would need also to include AIM elements. Some key elements may be included as Recommended Practices which may be upgraded to Standards in a subsequent amendment after consideration by the divisional meeting. It was further considered that the need to include elements of AIM in Annex 15 would form a parallel activity to the actual restructuring of the Annex.

4.3 The group noted that the ad-hoc group on including AIM in Annex 15 had looked into ways and means to restructure the Annex to fully reflect the move to AIM. In an effort to provide assistance with this task, the group considered which elements and features a future restructured Annex 15 should contain. The elements submitted were examined for the ones deemed most significant and were combined into three areas of further development as follows:

1) definition of AIM services and the scope of AIM within the context of SWIM;

2) provision of data — legal and copyright effects on data ownership; and

3) data handling processes including the means of compliance with integrity Standards to be established in Annex 15.

4.4 The group examined all three areas with a view that it would provide additional input to the ad-hoc group. The results of this work are found in Appendix C.

Action agreed 2/5 — Including AIM in Annex 15 and relevant guidance material

That the ad-hoc group consisting of **Greg (Rapporteur), Amy, Augustin, Charity, Gregory, Paul, Stefan, Stéphane, Steven, Tony** and **Valerie**:

a) continue to consider the restructuring of Annex 15 to introduce the notion of services and to separate data from publication;

b) develop digital AIM services guidance material;

c) take into account additional input outlined in Appendix C; and

d) submit draft proposals to the AIS-AIMSG/3 meeting.

5. AGENDA ITEM 7: ELECTRONIC AIP (eAIP)

5.1 During review of draft guidance material on the eAIP, the group noted that the Secretariat would undertake, during the editorial review, the aligning of terms of necessity (e.g. should, may, shall, must), with the related Standards and Recommended Practices in Annex 15 and with the technical demands of the guidance material. It was considered that whatever editorial criteria used should be consistent and made clearly evident to the reader. The group agreed to a proposed schedule for development of the material which included the following action:

Action agreed 2/6 — Review of the draft guidance material on the eAIP

That

a) the group provide further comments on the draft guidance material on the eAIP to the Secretary by 31 January 2010;

b) **Paul** provide the Sample eAIP to the Secretary for review by 30 April 2010;

c) the Secretary finalize the edited eAIP guidance material and consequential changes to Doc 8126 by 30 June 2010;

d) **Paul** provide the Sample eAIP (as revised by the Secretary) and Toolbox CD-ROM by 31 July 2010; and

e) the Secretary include the material in Amendment No. 3 to Doc 8126.

6. AGENDA ITEM 8.1: AMENDMENT NO. 2 TO THE *AERONAUTICAL INFORMATION SERVICES MANUAL* (DOC 8126)

6.1 The group noted the progress report on Amendment No. 2 to Doc 8126 and that the amendment would be distributed within the coming month. The group noted that the title "ATC surveillance Minimum Altitude Chart" that replaces the previous denomination of "Radar Minimum Altitude Chart" was consistent with current Annex 4 nomenclature. The group also noted that one of the current difficulties of the NOTAM format was that it allowed for flight level (FL) to be used in item Q) and another unit of measurement to be used in Items F) and G). It was noted that the Secretary would verify that the text in Amendment No. 2 was correctly entered as "one aerodrome per NOTAM" rather than "one NOTAM per aerodrome" as stated in AIS-AIMSG/2-SN/8. The group noted that the current practice for representing the "@" sign of an e-mail address was not harmonized and that the recommended use of "(A)" in Amendment No. 2 of Doc 8126 would require system changes in those systems using a different convention. The group also noted the consequential changes to Doc 8126 resulting from amendments to Annex 15, and questioned the relevance and clarity of changing from channel to frequency for navaid information in the AIP. Also, the addition of information on low visibility procedure in the section AD 2.22 was questioned as the same information was published on a chart. However, it was agreed that Doc 8126 should align with the provisions in Annex 15. It was agreed that the Secretary would take these comments into account when finalizing Amendment No. 2 to Doc 8126.

Action agreed 2/7 — Changes to Amendment No. 2 to Doc 8126

That the Secretary take into account comments provided during AIS-AIMSG/2 in relation to Amendment No. 2 to Doc 8126.

7. AGENDA ITEM 8.2: AIS-MET DATA LINK SERVICES

7.1 The group reviewed a draft note for inclusion in Amendment 37 to Annex 15 related to supplying aeronautical data directly to flight crews via data link. Discussion centred on aligning such a note with specifications for AIRAC. The group considered that the wording of the note should in no way contradict existing AIRAC specifications and it should be clear that information supplied by data link would be supplemental, from an operational perspective, to that provided through AIRAC, as the issue of baseline synchronization presented several challenges that had not yet been resolved. It was suggested that text supporting the use of data link be included in Chapter 6 of Annex 15 which dealt with the AIRAC system.

7.2 It was suggested that it would be too soon to introduce a Standard for data link into Annex 15, considering the capacity of some States to collect the required data, equipage of current fleets, available bandwidth and so on. However, the group considered a note in Annex 15 would serve to create awareness about it in the AIM community.

7.3 It was noted that provision of aeronautical data via data link was also being considered by groups concerned with the provision of MET information. It was agreed that the note required refining, and that a provision may also need to be drafted for inclusion in Annex 3, resulting in the following:

Action agreed 2/8 — Proposed note in Annex 15 related to provision of aeronautical data using data link

That the group provide **Stéphane** further comments on the draft note for inclusion in Annex 15 (AIS-AIMSG/2-SN/6, paragraph 3.1 refers) by 31 January 2010 and that the amended version of the note be presented in a Study Note at AIS-AIMSG/3.

Action agreed 2/9 — Coordination the Secretary OPLINK Panel on provisions related to data link

That the Secretary assess, by 31 January 2010 in coordination with the Secretary of the OPLINK Panel, whether inclusion of a note in Annex 15 related to data link would initiate a similar amendment to Annex 3.

8. AGENDA ITEM 9.1: AMENDMENTS TO ANNEXES 4, 14 AND 15 RELATED TO AERODROME MAPPING

8.1 The group acknowledged that there was a need to include provisions in Annex 15 related to aerodrome mapping data because existing and emerging situational awareness applications requiring such data had a significant potential to enhance safety. Stéphane, acting as liaison between EUROCAE/RTCA Committee WG44/SC217 (Action agreed 1/13 refers), presented a proposal by that group and reported that consensus within the group and with stakeholders had been achieved on the proposal except for the data quality classification. Unresolved concerns related to the stringency of the data quality requirements whereby the stringent requirements that would serve all applications needed at some aerodromes would be too costly to implement or unnecessary to serve other aerodromes.

8.2 The group discussed various ways to address these concerns, including providing two levels of accuracy, the less stringent of which would be required (Standard) and the more stringent of which would be recommended (Recommended Practice).

8.3 It was noted that the terminology to be used to describe aerodrome mapping should be aligned with terminology used in Annex 15 and in guidance material (i.e. introduce terms such as data dictionary and dataset) and that explanatory text may need to be included in Annex 15 to explain why a data product specification had been included in the provisions.

8.4 It was concluded that the provisions needed to be aligned with related provisions in Annex 14 and that the group must develop the provisions working closely with the aerodrome community of ICAO, the regions and with other groups.

Action agreed 2/10 — Annex provisions related to aerodrome mapping data

That the group provide, to the ad-hoc group on aerodrome mapping data bases which consists of **Stéphane (Rapporteur), Bill, Roy** and **Stefan**, further comments on the proposed provisions (AIS-AIMSG/2-SN/2, Appendix refers) related to aerodrome mapping data, as well as comments regarding the inclusion of two levels of accuracy by 31 January 2010.

Action agreed 2/11 — Coordination with Aerodrome Panel

That, with a view to ensuring coordination, the Secretary present a working paper related to aerodrome mapping data bases the second meeting of the Aerodrome Panel meeting scheduled for October 2010.

9. AGENDA ITEM 9.2: GUIDANCE MATERIAL FOR AERODROME MAPPING

9.1 The group recalled that the *Draft Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information* (Doc 9881) already contained guidance on aerodrome mapping data except for guidance on generation of the data. The group reviewed the draft aerodrome mapping data base (AMDB) guidance material and agreed that copyright permission related to use of RTCA material by ICAO needed to be verified.

Action agreed 2/12 — Follow-up on copyright permission from RTCA

That the Secretary review the recent Memorandum of Understanding between ICAO and RTCA to ascertain whether copyright of RTCA material for AMDB has been waived for ICAO use.

Action agreed 2/13 — AMDB guidance material

That the group provide further comments on the AMDB guidance material to **Stéphane** as Rapporteur of the ad-hoc group consisting of **Bill, Roy** and **Stefan**, by 31 January 2010.

10. AGENDA ITEM 9.3: *WORLD GEODETIC SYSTEM — 1984 (WGS-84) MANUAL* (DOC 9674)

10.1 The group reviewed a proposed amendment to the *World Geodetic System — 1984 (WGS-84) Manual* (Doc 9674). It was noted that the proposed new wording which recommended that once WGS-84 coordinates had been obtained the use of transformation be avoided needed to be amended, since it was considered that coordinates would continued to be transformed for survey purposes. It was agreed that the Secretary would study this matter further and provide new text.

10.2 While the group acknowledged that transforming 1/10 min into degree, minutes and seconds may cause difficulties, it considered that the proposed new text prohibiting a resolution of 1/10 min by all applications was too restrictive and did not reflect some operational uses. The suggested new wording would state instead that “The charting and data publication resolution ranges from the highest resolution requirement of 1/100 sec to the lowest resolution requirement of 1 min (i.e. 1/100 sec,

1/10 sec, sec and min). Applications or messages processing or transmitting coordinates may have different resolution requirements (e.g. flight plan, coordinate entry in FMS by the pilot)".

10.3 While the group acknowledged that the addition of guidance on resolution for the conversion of coordinates from degree, minutes and seconds to the decimal degrees representation was valuable, it considered that the proposed text did not address problems raised by rounding of calculated values. The suggested new wording would state instead that "For applications processing coordinates in decimal degrees, the resolution is expressed in terms of the number of significant digits of decimal degrees as specified in Table 2-8. For example, a coordinate published in degrees, minutes and seconds when converted into decimal degrees will have a resolution value of 4 (e.g. a latitude of 355418N is converted into a decimal of 35.9050). Note that when calculations are done on decimal values and depending on the rounding process (single final application or intermediate applications), end results may differ slightly."

10.4 It was also noted that additional guidance material on height reference systems was required in the Doc 9764 to respond to the note to paragraph 3.7.2.2 in Annex 15. It was agreed that such material, recently discussed at the EUROCONTROL eTOD Working Group, should be provided to the Secretary for inclusion in Doc 9674 once mature.

Action agreed 2/14 — Guidance material on height reference systems

That an ad-hoc group consisting of **Paul (Rapporteur), Roy, Stefan and Stéphane** provide guidance material on height reference systems for inclusion in Doc 9674.

Action agreed 2/15 — Guidance on the use of coordinates transformation

That the Secretary review the proposed text related to the use of coordinates transformation for inclusion in Amendment No. 1 to Doc 9674.

11. AGENDA ITEM 9.4: *AERONAUTICAL CHART MANUAL* (DOC 8697)

11.1 The group reviewed an outline of work needed to be undertaken to revise Doc 8697 — *Aeronautical Chart Manual*. It was noted that coordination with the Instrument Flight Procedure Panel (IFPP) Integration Working Group would be necessary and that work would continue to be progressed with the help of the ad-hoc group, to which John Moore and Stefan offered his support.

Action agreed 2/16 — New guidance material for inclusion in Doc 8697

That the group provide **David** as the Rapporteur of the ad-hoc group consisting of **Augustin, Bill, Charity, John Moore, Paul, Raul** and **Stefan,** further comments on the draft plan for amendment of Doc 8697 by 31 January 2010 and notify the Secretary of any resources available in their administration to assist in the production of material for Doc 8697.

12. AGENDA ITEM 10: AIM QUALITY MANAGEMENT SYSTEM

12.1 The group concurred that the Rapporteur and ad-hoc group tasked with developing a draft quality manual had produced a mature document. Consequently, there were few outstanding issues to be addressed. It was suggested that guidance to States be included on how to manage the quality of data

originating with a provider outside the State AIS. In response, the Secretary pointed out that States' comments on Amendment 36 to Annex 15 had already raised this concern. The Air Navigation working paper containing the final review of the amendment included two proposed notes under paragraph 3.2.2 indicating that quality management may be provided by serial quality systems and that letters of agreement may be used to manage aeronautical information data chain (i.e. service agreements with the information provider). It was also pointed out that Appendix 6 of the draft quality manual included information on service agreements. It was suggested that the Secretariat replace the word "distributor" in the proposed Note 2 with "AIS provider".

12.2 It was pointed out that the text in the quality manual on using the CRC algorithm to provide security against malicious or deliberate changes to data during transmission must be corrected to reflect the fact that CRC may be used only to protect against unintentional changes to the data during transmission.

12.3 It was explained that guidance material for measuring integrity was foreseen for Chapter 8. There was also a suggestion about including a reference to safety management systems in and text describing how quality management systems (QMS) operate within SMS or vice-versa. The group noted that under Agenda Item 12 — AIM staff training guidance, it had been agreed to proceed with development of an AIS training manual that would be amended to include AIM elements at a later stage. The group agreed to take a parallel approach to the AIM quality manual, suggested. The group agreed to take the following actions:

Action agreed 2/17 — Inclusion of SMS in the AIS quality manual

That a reference to Doc 9859 — *Safety Management Manual (SMM)* be included in the AIS quality manual.

Action agreed 2/18 — Inclusion of QMS/SMS models in the AIS quality manual

That members with knowledge of State QMS that incorporate SMS (or vice-versa) provide information on these models to the Rapporteur of the ad-hoc group on the AIS quality manual **(Susumu)** for examination by the group at AIS-AIMSG/3 and subsequent inclusion in the manual.

Action agreed 2/19 — Inclusion of reference to AIS quality manual in Annex 15

That the Secretary include a note in Amendment 36 to Annex 15 to refer to guidance on QMS available in the AIS quality manual.

12.4 It was noted that the section on data integrity, including the incorporation of CHAIN solutions (Action agreed 1/21 refers) was still under development.

Action agreed 2/20 — Inclusion of means for measuring integrity in the AIS quality manual

That the ad-hoc group consisting of **Susumu (Rapporteur), Amy, Augustin, Charity, Paul** (replacing Manfred), **Tony** and **Valerie** develop guidance material on the means for measuring integrity for examination by the group at AIS-AIMSG/3 and subsequent inclusion in the AIS quality manual.

12.5 It was also noted that while the quality manual would be based on ISO 9000:2008, State QMS used as examples may be based on ISO 9000:2000. The group determined that this was acceptable

for the first edition of the quality manual, since there were few differences between ISO 9000:2000 and ISO 9000:2008.

Action agreed 2/21 — Final comments on draft AIS quality manual

That the group provide final comments on the draft quality manual to the ad-hoc group, consisting of **Susumu (Rapporteur), Amy, Augustin, Charity, Paul** (replacing Manfred), **Tony** and **Valerie,** by 31 January 2010.

Action agreed 2/22 — Final draft of the AIS quality manual

That the final draft of the AIS quality manual be submitted to the Secretary by 30 May 2010.

13. AGENDA ITEM 11: ELECTRONIC TERRAIN AND OBSTACLE DATA (ETOD)

13.1 The group reviewed the progress made on proposals for amendment of Chapter 10 of Annex 15 since their original presented at AIS-AIMSG/1. The group was briefed by the Secretary on the results of parallel consultations with carried out by ICAO and EUROCONTROL and informed that the results of the ICAO consultation with States and international organizations would be considered by the Air Navigation Commission in mid-November 2009.

13.2 The group was informed that EUROCONTROL was developing eTOD guidance material which would be made available to ICAO in the second half of 2010. The guidance material was expected to include advice on implementation planning, data quality, metadata, assessment of obstacle representation, determination of areas for specific aerodromes, and data collection techniques.

Action agreed 2/23 — eTOD guidance material

That **Paul** provide the eTOD guidance material to the group for comment as soon as the first version is available (expected in the first quarter of 2010).

14. AGENDA ITEM 12: AIM STAFF TRAINING GUIDANCE

14.1 The group noted the progress underway to develop AIM staff training guidance and that an ad-hoc group under the CANSO AIM Working Group had been formed to address this task. It was considered that the best way to proceed would be to first address existing AIS training issues. Therefore, the group agreed to develop an AIS training manual that would be amended to include AIM elements at a later stage. The group noted that the guidance material was to apply the competency framework of the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) to EUROCONTROL's Common AIS Staff Profiling (CASP) and AIS Training Development Guidelines.

14.2 Training material from NAV Portugal was identified as source material to be taken into account in the development. It was also noted that the CAR/SAM Regional Planning and Implementation Group (GREPECAS) had developed training material which could be useful. It was noted that there was only a Rapporteur and two members for the ad-hoc group tasked with developing an AIS training manual and that they would require the assistance of others.

Action agreed 2/24 — Guidance material on AIS training

That members consider participation in the ad-hoc group tasked with developing the AIS training manual and inform the Secretary of their willingness to participate by 1 February 2010.

Action agreed 2/25 — Guidance material on AIS training

That an ad-hoc group, consisting of **Augustin (Rapporteur), Paul, Valerie** and others to be named:

a) develop an AIS training manual, taking into account available material on AIS training and aligning with the principles in the PANS-TRG;

b) ensure, during development of the AIS training manual, coordination with Secretariat members responsible for the PANS-TRG; and

c) present a draft of the AIS training manual to the AIS-AIMSG/3 meeting.

Action agreed 2/26 — Guidance material on AIS training

That the Secretary provide the Rapporteur with training material developed by the CAR/SAM Regional Planning and Implementation Group (GREPECAS) by15 December 2009.

15. AGENDA ITEM 13: LEGAL AND INSTITUTIONAL ISSUES RELATED TO AIM

15.1 The group noted that the Secretary continued to coordinate the group's activities on legal and institutional issues with the Airport Economics Panel (AEP) and Air Navigation Services Economics Panel (ANSEP).

15.2 The group then reviewed a number of legal and institutional issues to be considered in the context of AIM that had been identified by the ad-hoc group, and the comments thereon provided by the Secretariat. The issues were grouped under three main areas concern, namely, cost recovery, liability and copyright/ownership.

15.3 It was noted that with respect to cost recovery the cost base and additional charges need to be explicitly defined especially for commercial third-party data providers acting as the agents for airspace users and that double charging should be avoided.

15.4 It was noted that the State's responsibility for the provision of aeronautical information was already included in Annex 15. The group was informed by the Secretariat that the resolution of liability issues rested with States and it was not within ICAO's purview to address liability through Annex material.

15.5 The group noted the explanation from the Secretariat that copyright issues and applications differed considerably from State to State and between civil law and common law jurisdictions.

15.6 It was noted that there were concerns that copyright may be extended in some jurisdictions to limit access to information in a manner detrimental to flight safety and the need to provide airspace users with timely and complete information.

15.7 It was noted that although legal and institutional aspects would require further and continuous investigation, no showstoppers had been identified so far which would block the transition from AIS to AIM.

15.8 The group agreed that the issues identified by the ad-hoc group should be developed into guidance material, in coordination with the CANSO AIM Working Group, for inclusion in the *Roadmap for the Transition from AIS to AIM*. It was further agreed that examples of State policies on legal and institutional issues would assist the ad-hoc group in carrying out this task.

Action agreed 2/27 — Examples of State policies on legal and institutional issues

That members endeavour to acquire information on their respective State's policy on legal and institutional issues and provide this to Eugene by 31 January 2010.

Action agreed 2/28 — Coordination with AEP-ANSEP

That the ad-hoc group consider the outcome of the AEP-ANSEP/3 meeting and develop a plan for coordination between the AIS-AIMSG and the AEP-ANSEP by 1 March 2010.

Action agreed 2/29 — Guidance material on legal and institutional issues

That the ad-hoc group consisting of **Eugene (Rapporteur), Bill, Stéphane, Steven** and **Paul,** prepare an amendment to the Roadmap *for the Transition from AIS to AIM* to incorporate guidance, in coordination with the CANSO AIM Working Group, on legal and institutional issues by 31 July 2010.

16. AGENDA ITEM 14.1: INFORMATION ON NEXTGEN AND SESAR

16.1 The meeting took note of SESAR information management. In view of the numerous data domains to be modelled and possible spill over into AIXM, concern was expressed that AIXM should not be allowed to expand to an unmanageable extent. There was also discussion on the total cost of SESAR and associated cost savings including those that may be brought about by enterprise architecture methodology. The meeting recognized that it should monitor developments concerning NextGen and SESAR and that members should endeavour to share information in this regard with the group at the next meeting. Accordingly the meeting agreed to the following actions.

Action agreed 2/30 — Information on SESAR

That **Paul** provide an information paper to AIS-AIMSG/3 concerning developments in SESAR on aeronautical information in the context of information management and SWIM.

Action agreed 2/31 — Information on NextGen

That **Greg** provide an information paper to AIS-AIMSG/3 concerning developments in NextGen on aeronautical information in the context of information management and SWIM.

17. AGENDA ITEM 14.2: CONSIDERATION OF THE MET COMPONENT

17.1 Information was presented to the group on data link initiatives in the MET field. The group recalled the discussions under Agenda Item 8.2 on AIS-MET data link services which recognized the need to synchronize the development of SARPs for Annex 15 with potential parallel SARPs for Annex 3.

17.2 The group was informed that there were already specifications related to meteorological information for aircraft in flight in Annex 3. In addition, draft Amendment 75 to Annex 3, applicable in November 2010, would introduce an enabling clause for the provision of any other meteorological information in alpha-numeric or graphical form as agreed between the meteorological authority and the operator concerned. The group noted that draft guidance material in support of this provision had been developed by the former Meteorological Information Data Link Study Group (METLINKSG) and was awaiting publication pending adoption of Amendment 75 in February 2010. The group was invited to review this guidance material, which had been placed on the AIS-AIMSG secure website, and provide comments to the Secretary.

Action agreed 2/32 — Review of draft guidance material on the display of graphical (meteorological) information in the cockpit

That the group review the draft guidance material on the display of graphical (meteorological) information in the cockpit and provide comments to the Secretary by 31 December 2009.

17.3 It was emphasized that developments continue to be communicated to members' MET counterparts in their administrations on initiatives related to MET issues or general information management principles stemming from the work of the group. In this regard, it was noted that the membership lists for the all MET study groups and working groups are accessible from the MET/AIM website of which the AIS-AIMSG website is a part. In addition, the current membership list of the Aerodrome Meteorological Observation and Forecast Study Group (AMOFSG) is included at Appendix D.

17.4 It was agreed that the Secretary should continue to coordinate closely with the Secretary of the AMOFSG on all matters of common interest. In addition, the following action was agreed:

Action agreed 2/33 — Study Note on AIS-AIMSG developments related to the MET component

That the Secretary prepare a study note for the next meeting of the AMOFSG in February 2010 on recent AIS-AIMSG developments with MET components.

18. AGENDA ITEM 14.3: FLIGHT AND FLOW INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE)

18.1 The group was briefed on the FF-ICE concept developed by the Air Traffic Management Requirements and Performance Panel (ATMRPP) as a follow-up to their work on developing the conceptual framework for the future ATM system. The group was further informed that the ATMRPP was interested in receiving feedback from other panels and study groups on whether:

a) these groups were aware of the current work of the ATMRPP;

b) the work of these groups was affected by the FF-ICE concept;

c) the FF-ICE concept was consistent with the work being undertaken by these groups and, if not, whether it was possible to make it consistent;

d) issues and elements relevant to the concept existed that had not be included; and

e) the FF-ICE concept document was clear.

18.2 The group noted that aircraft performance information would be a very large issue involving both reference information and dynamic data elements. It was further noted that operators' fleets may include aircraft types in multiple configurations which would further complicate the process of providing and using performance information.

18.3 The group noted that considerable work had been accomplished in Europe in connection with flight object as an extension to the flight plan. Further, the concept of a business/mission trajectory was being worked out in which the airspace users and ANSPs define together, through a collaborative process, the optimal flight path.

18.4 The group concluded that there was little overlap between the FF-ICE concept and the work of the AIS-AIMSG at the current level of conceptual development expressed in the draft FF-ICE concept document. However, once FF-ICE would be progressed beyond concept and into systems development there could be a considerable impact, and that the systems envisioned by FF-ICE would need to be aware and interoperable with AIM systems and information management principles. In this regard, the group was interested in knowing how the work on the concept was intended to be further progressed. It was agreed that that members should contact their counterparts on the ATMRPP. The current membership list for that group is in Appendix G.

Action agreed 2/34 — Review of FF-ICE concept document

That the group provide further comments on the draft FF-ICE concept document to the Secretary by 30 November 2009 for onward transmission to the ATMRPP.

19. AGENDA ITEM 15: FUTURE WORK PROGRAMME OF THE GROUP

19.1 The group reviewed the follow-up table of action items from AIS-AIMSG/1. It was noted that the vast majority of action items had been completed or had been overtaken by action items developed by the current meeting. The two action items remaining were also addressed (see below). This completed all the actions agreed in the follow-up table from AIS-AIMSG/1, which is included in

Appendix D with appropriate references to action taken. The follow-up table for the current meeting is found at Appendix E.

19.2 It was agreed that Action agreed 1/30, to identify data process and procedures that would be required for the provision of new datasets, would be completed by 31 July 2010 by Paul.

Action agreed 2/35 — Identify data process and procedures that would be required for the provision of new datasets

That Paul identify, for review by AIS-AIMSG/3 the new data process and procedure requirements related to the future provision of new datasets, in addition to the current paper or text products

19.3 The group agreed that Action agreed 1/23 on integrated briefing would be completed by 31 December 2009 for review by the group at the next meeting.

Action agreed 2/36 — Integrated briefing

That **John Synnott** develop draft guidance material on the provision of integrated briefing by 31 December 2009.

Action agreed 2/37 — Review of draft guidance material on integrated briefing

That the Secretary prepare a Study Note for the AIS-AIMSG/3 meeting based on the draft guidance material on the provision of integrated briefing.

19.4 The group discussed mapping the activities of the group to established deliverables.

Action agreed 2/38 — Mapping of group activities to deliverables

That the Secretary prepare a table which maps the activities of the group to:

a) the original expected outputs outlined in the Air Navigation Commission working paper (AN-WP/8309) that established the AIS-AIMSG;

b) the terms of reference included in AIS-AIMSG-Memo/1; and

c) the steps (projects) in the *Roadmap for the Transition from AIS to AIM*.

19.5 The group considered that the next meeting should be convened in Montreal from 9 to 12 November 2010. It was agreed that 8 November 2010 could be used by the ad-hoc groups for informal meetings.

19.6 Members were advised to periodically check the meetings page of the ICAO website at: http://www.icao.int/cao/en/conf/ should they wish to attend other ICAO meetings scheduled immediately before or after the AIS-AIMSG meeting. Furthermore, it was agreed that the Secretary would maintain a list of major global AIM events on the AIS-AIMSG website. Members are encouraged to inform the Secretary of events worth noting.

20. AGENDA ITEM 16: ANY OTHER BUSINESS

20.1 The group was informed that the next Global AIM Congress would take place in Beijing from 22 to 24 June 2010, preceded by a workshop on 21 June. It was indicated that group members attending the Congress who would wish to take the opportunity to convene ad-hoc group meetings should contact Amy so that she may reserve meeting rooms. Information on the Congress in available at http://www.eurocontrol.int/aim/public/standard_page/global_congress.html.

20.2 A demonstration of the AIS-AIMSG website was given by Rebecca Vann of the MET/AIM Section and members provided comments for possible improvements to the site which were noted. The meeting agreed that access to the AIS-AIMSG secure website would be restricted to members and their designated advisors. Ad-hoc groups were encouraged to use the collaborative functionality of the website for their activities.

20.3 The group agreed that Paul Bosman would become the group's permanent chairman.

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APPENDIX A

LIST OF PARTICIPANTS

Nominated by	*Name*	*Postal address*	*Telephone/Fax/E-mail*
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The meeting was assisted by the following members of the ICAO Secretariat:

- Dr. Olli Turpeinen, Chief, MET/AIM Section, Air Navigation Bureau
- Mr. David Lewtas, Chief, Aeronautical Information Unit, MET/AIM Section
- Mr. Michael Hohm, Technical Officer, MET/AIM Section
- Mr. Jean-Michel Galais, Technical Officer, MET/AIM Section
- Mr. Neil Halsey, Technical Officer, MET/AIM Section
- Mr. Arie Jakob, Legal Officer, Legal Affairs and External Relations Bureau
- Mr. Benoit Verhaegen, Legal Officer, Legal Affairs and External Relations Bureau
- Mr. Julian de la Camara, Economist, Economic Policy and Infrastructure Management Section, Air Transport Bureau.
- Ms. Donna Lane, Editorial Assistant, MET/AIM Section
- Mrs. Rebecca Vann, Secretary, MET/AIM Section

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APPENDIX B

LIST OF DOCUMENTATION

STUDY NOTES

SN No.	Presented by	Title	Agenda Item
1	Secretary	Provisional Agenda	4
2	Stephane Dubet	Provisions for Aerodrome Mapping Data in ICAO Annexes	9.1
3	Rapporteur	Legal and Institutional Issues related to the Transition from AIS to AIM	13
4	Stephane Dubet	Aerodrome Mapping — Draft Guidance Material	9.2
5	Japan	AIM Quality Manual	10
6	Stephane Dubet	Provisions for AIS Data-Link in ICAO Annex 15	6.1
7	Ad-hoc group members	Report of the Ad-hoc Group Including AIM in Annex 15 SARPs	6.2
8	Secretary	Amendment No. 2 to the Aeronautical Information Services Manual (Doc 8126)	8.1
9	Stephane Dubet	AMDB Generation Guidelines — Draft Document	9.2
10	Secretary	Timetable for Annex 3 Amendment Proposals	14.2
11	Paul Bosman	Guidance Material for the Provision of Electronic AIP (eAIP)	7
12	Paul Bosman Steven Pray	Guidance Material for the Aeronautical Information Conceptual Model	6.1
13	Secretary	Introduction of FF ICE Draft Document to the AIS-AIM	14.3
14	Augustin Lamprecht	CANSO AIMWG Activities	5
15	Secretary	Review of eAIP Guidance Material	7
16	Secretary	Amendment No. 1 to Doc 9674	9.3
17	Secretary	Task regarding Legal and Institutional Issues related to the Transition from AIS to AIM	13
18	Secretary	Follow-up of Action Items	15
19	Secretary	Development of the Training Manual	12
20	Secretary	Task regarding the Aeronautical Chart Manual (Doc 8697)	13

INFORMATION PAPERS

IP No.	Presented by	Title	Agenda Item
1	Secretary	Arrangements for the Meeting	3
2	Paul Bosman	EUROCONTROL Meteorological Information Management Activities	14.2
3	Paul Bosman	SESAR Information Management	14.1

FLIMSIES

Flimsy No.	Presented by	Title	Agenda Item
1	Secretary	WGS-84	9.3

PART II — LIST OF STUDY NOTES AND INFORMATION PAPERS IN ORDER OF AGENDA ITEM

Agenda Item	WP No.
1	—
2	—
3	IP/1
4	SN/1
5	SN/14
6	—
6.1	SN/12
6.2	SN/7
7	SN/11, SN/15
8	—
8.1	SN/8
8.2	SN/6
9	—
9.1	SN/2
9.2	SN/4, SN/9
9.3	SN/16, Flimsy No. 1
9.4	—
10	SN/5
11	—
12	SN/19
13	SN/3, SN/17, SN/20
14	—
14.1	IP/3
14.2	SN/10, IP/2
14.3	SN/13
15	SN/15
16	—

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APPENDIX C

**ELEMENTS TO CONSIDER
WITH RESPECT TO INCLUDING AIM IN ANNEX 15**

Item	*Issue*	*Tags*	*Urgent*
	I. HUMAN FACTORS		
18.	Human factors	10	
	II. AIRAC		
19.	Update AIRAC		
22.	Near real time data provision (AIRAC)	1	
23.	Timeliness aspect of data distribution strengthening	5	1
	III. DATA CHAIN		
1.	Clarify integrity requirements to cover data chain		
7.	Monitoring of data completeness	2	
14.	Data traceability + responsibility		
	IV. SCOPE		
2.	Define AIM services	13	8
9.	IM principles on all data items used in aviation	2	
16.	Detail requirements on data provision		
21.	Clarify information/data	4	1
26.	Scope of AIM in context of SWIM	5	1
31.	AIM in the overall ATM operational concept	2	1
32.	Define applicability of AMDB & eTOD %AD		
34.	Integrate Annex 4 and 15		
	V. SMS		
3.	Introduce SMS provisions	2	
5.	Address QMS in context of SMS	3	1
	VI. CNS		
4.	Expand telecommunications requirements to support data exchange	4	
13.	Internet expand – new electronic (web) services	4	
	VII. LEGAL		
8.	Clarify State's obligation on provision data e.g. copyright	13	1

11.	Clarify States responsibility — products and services	3	
25.	Clarify responsibility regulators service providers		
33.	Clarify data ownership across data chain	11	1
VIII. DATA EXCHANGE			
10.	Specification related to exchange model = performance requirements	3	
27.	Data resolution requirements in one appendix only		
29.	Link AIM with MET (same format)		
30.	Expand metadata	3	
IX. PRODUCTS			
6.	User-friendly AIS product definition	1	1
15.	Expand on the PIB requirements	1	
20.	Standardize data users application		
24.	Future NOTAM	1	
28.	Std. display of data		
X. SECURITY			
12.	Data handling (sources, traceability, integrity) in data chain(authentication)	13	5
17.	Security	3	

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APPENDIX D

FOLLOW-UP OF ACTION ITEMS FROM AIS-AIMSG/1

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/1 — Draft Roadmap for the Transition from AIS to AIM	That the draft *Roadmap for the Transition from AIS to AIM*, together with the amendments agreed during the meeting, be endorsed by the group.	N/A		N/A	√
1/2 — Finalization of the Roadmap for the transition from AIS to AIM	That: a) further comments on the revised roadmap be provided by 19 December 2008 through correspondence; and; b) these comments be incorporated by the Secretariat for final review by the group before submission to the Air Navigation Commission in February 2009.	All AIS/AIMSG and Secretariat	a) 19 December 2008 b) 15 January 2009	AIS-AIMSG/1-SN/3	√
1/3 — Consideration of the ATM operational concept	That the group endorse the concept of a systematic assessment of the global ATM operational concept to ensure all AIM requirements are included in the future amendments to Annex 15.	N/A		N/A	√
1/4 — Aerodrome mapping databases	That Stéphane Dubet (Rapporteur): a) act as a liaison with the joint EUROCAE/RTCA Committee WG44/SC217 to develop a draft proposal to integrate aerodrome mapping databases into Annexes 4, 14 and 15 provisions while maintaining compatibility with the AIXM; and b) submit the draft proposed for consideration by the group at the AIS-AIMSG/2 meeting.	Stephane Dubet	27 July 2009	AIS-AIMSG/2-SN/2	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/5 — Draft Amendment 36 to Annex 15: Electronic terrain and obstacle data	That: a) members comment, by 5 January 2009, on the proposal to amend Chapter 10 of Annex 15 related to Areas 1, 3 and 4; and b) an ad hoc group comprised of David (Rapporteur), Benoit, Gregory, John, Manfred, Stéphane, Steve and Takashi develop a draft proposal for inclusion in Amendment 36 to Annex 15 by 15 January 2009.	David Lewtas, Benoit Tardif, Gregory Pray, John Synnott, Manfred Unterreiner, Stephane Dubet, Takashi Hatta	a) 5 January 2009 b) 15 January 2009	AIS-AIMSG/1-SN/21	√
1/6 — Draft Amendment 36 to Annex 15: Automation enabling digital data exchange	That the following text [SoD, page 7, refers] be included in Amendment 36 to Annex 15.	Secretariat	ANC Preliminary Review February 2009		√
1/7 — Draft Amendment 36 to Annex 15: Electronic AIP (eAIP)	That the following text [SoD, page 8, refers] be included in Amendment 36 to Annex 15.	Secretariat	ANC Preliminary Review February 2009		√
1/8 — Draft Amendment 36 to Annex 15: Quality	That the proposed amendments in Appendix C [of the SoD] be included in Amendment 36 to Annex 15.	Secretariat	ANC Preliminary Review February 2009		√
1/9 — Draft Amendment 37 to Annex 15: Reference to guidance material related to Chain solutions	That a note referring to guidance material on data supply chain management be included in Amendment 37 to Annex 15.	Secretariat	December 2011	Action Agreed 2/16	√
1/10 — Draft Amendment 36 to Annex 15: NOTAM date and time	That Amendment 36 to Annex 15 include the following change [SoD, page 9, refers] to Appendix 6.	Secretariat	ANC Preliminary Review February 2009		√
1/11 — Draft Amendment 36 to Annex 15: Reference to guidance material on NOTAM	That Amendment 36 to Annex 15 include the following changes [SoD, page 10, refers].	Secretariat	ANC Preliminary Review February 2009		√
1/12 — Draft Amendment 36 to Annex 15: AIRAC late postponement	That Amendment 36 to Annex 15 include the following changes [SoD, page 11, refers] to Chapter 6.	Secretariat	ANC Preliminary Review February 2009		√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/13 — AIS-MET data link services	That Stéphane (Rapporteur) act as a liaison with the joint EUROCAE WG76/RTCA SC 206 Committee regarding the possible inclusion in ICAO Annexes of high-level SARPs related to AIS-MET datalink services and report back to the group on developments at the AIS-AIMSG/2 meeting.	Stephane Dubet	27 July 2009	AIS-AIMSG/2-SN/6	√
1/14 — Guidance material for aerodrome mapping data bases	That Stephane (Rapporteur) and Paul provide draft guidance material on aerodrome mapping data bases (AMDBs) for consideration by the AIS-AIMSG/2 meeting.	Stephane Dubet and Paul Bosman	27 July 2009	Doc 9881 AIS-AIMSG/2-SNs/4 & 9	√
1/15 — Guidance material on AIXM	That Paul (Rapporteur) and Gregory provide draft guidance material on digital data exchange based on AIXM for review by the AIS-AIMSG/2 meeting.	Paul Bosman and Gregory Pray	22 July 2009	AIS-AIMSG/2-SN/12	√
1/16 — Ad-hoc group on including AIM in Annex 15 SARPs	That an ad-hoc group consisting of Gregory (Rapporteur), Steven, Charity, Gregory, Paul, Stéphane and Tony be tasked to: a) consider the restructuring of Annex 15 to introduce the notion of services and separate data from publication; b) develop a digital AIM services manual; and c) submit draft proposals to the AIS-AIMSG/2 meeting.	Steven Hill, Charity Muthoni, Gregory Pray, Paul Bosman, Stephane Dubet and Tony Williams	22 July 2009	AIS-AIMSG/2-SN/7	√
1/17 — Future evolution of the data exchange model	That the group act as the primary body for reviewing and endorsing the evolution of the model at the global level based on mature proposals emanating from regional and multi-national agreements.			N/A	√
1/18 — Guidance material on electronic AIP (eAIP)	That Manfred prepare draft guidance material on the provision of electronic AIP, aligned with the existing guidance on AIP in Doc 8126, for comment by the study group at the AIS-AIMSG/2 meeting.	Manfred Unterreiner	27 July 2009	AIS-AIMSG/2-SNs/11 & 15	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/19 — Guidance material on AIS training	That an ad-hoc group, consisting of David (Rapporteur), Manfred, Benoit* and Augustin, be formed which would: a) create a plan, by 1 February 2009, for the development of an AIS training manual, taking into account available material on AIS training and aligning with the principles in the PANS-TRG; b) ensure, during development of the AIS training manual, coordination with Secretariat members responsible for the PANS-TRG; and c) present a draft of the AIS training manual to the AIS-AIMSG/2 meeting. * Indicates participation in the group is to be confirmed.	David Lewtas, Augustin Lamprecht, Benoit Tardif and Manfred Unterreiner	a) 1 February 2009 b) 27 July 2009	Doc 9868, CASP, ATDG AIS-AIMSG/2-SN/	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/20 — AIS quality manual	That: a) group members provide, to the Rapporteur of the group in b) below, examples of AIS quality manuals in use in States; b) an ad hoc group, consisting of Susumu (Rapporteur), Greg, Manfred, Charity, Augustin and Tony develop a plan, to be completed by 1 March 2009, for the production of a new AIS quality manual to be based on the fundamental structure of the Manual on the Quality Management System for the Provision of Meteorological Service to International Air Navigation (Doc 9873); c) the ad hoc group provide a draft AIS quality manual for review by the AIS-AIMSG/2 meeting; and d) the ad-hoc group develop guidance material on the means for measuring integrity to be included in the AIS quality manual. * Indicates participation in the group is to be confirmed.	a) All members b,c,d) Susumu Miguchi, Augustin Lamprecht, Charity Muthoni, Gregory Pray, Manfred Unterreiner and Tony Williams	a) 15 January 2009 b) 1 March 2009 c) 27 July 2009 d) 27 July 2009	Doc 9674, Doc 9873, Doc 9906, ADP and SDP, CHAIN AIS-AIMSG/2-SN/5 Action Agreed 2/17	√
1/21 — Guidance material on CHAIN solutions	That Manfred supply guidance material on data supply CHAIN management to be integrated in the AIS quality manual for review by the ad-hoc group referred to in Action agreed 1/20 on the AIS quality manual.	Manfred Unterreiner	15 January 2009		√
1/22 — Guidance material on NOTAM	That guidance material on NOTAM in Doc 8126 be harmonized with OPADD 3.0 by the Secretariat as part of Amendment No. 2 to Doc 8126.	Secretariat	30 June 2009	OPADD 3.0	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/23 — Integrated briefing	That: a) an ad-hoc group, consisting of John (Rapporteur) and Manfred develop guidance material on the provision of integrated briefing by 1 June 2009; and b) the Secretariat prepare a Study Note for the AIS-AIMSG/2 meeting based on the guidance material provided.	John Synnott and Manfred Unterreiner	a) 1 June 2009 b) 10 August 2009	Action Agreed 2/33 Action Agreed 2/34	√
1/24 — Frequently asked questions (FAQ) on AIRAC adherence	That: a) the Secretariat post frequently asked questions (FAQ) on AIRAC adherence on the AIM website; and b) members enable wider use of the FAQ by creating links from other websites.	Secretariat, All AIS-AIMSG	1 March 2009		√
1/25 — Evaluation of pTracker Tool	That the Secretary evaluate the "pTracker tool" and determine how to disseminate it for use by States and users.	Secretariat	1 March 2009	pTracker Tool	√
1/26 — Guidance material on AIRAC adherence	That the Secretary evaluate the use of AIRAC related paragraphs in aeronautical industry standards ED 77/DO 201A and the Manual on Required Navigation Performance (RNP) (Doc 9613) in Doc 8126.	Secretariat	30 June 2008	ED 77/DO 201A, Doc 9613	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/27 — Update of NOTAM Selection Criteria	That the Secretary: a) update the NOTAM Selection Criteria (NSC) in Doc 8126 to reflect new NOTAM Codes introduced in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400) and; b) analyze the reports submitted by the EANPG (EANPG Conc. 47/42 refers) to progress the changes needed to clarify and improve the use of NSC for NOTAM in Annex 15, Doc 8400 and Doc 8126.	Secretariat	a) 30 June 2009 b) 26 February	AIS-AIMSG/2-SN/5	√
1/28 — Progress report on Amendment No. 2 to Doc 8126	That the Secretary provide a progress report on Amendment No. 2 to Doc 8126 at the AIS-AIMSG/2 meeting.	Secretariat	10 August 2009	AIS-AIMSG/2-SN/8	√
1/29 — Data process and procedures in the AIS quality manual	That the ad-hoc group created to address the AIS quality manual in Action agreed 1/20 use the EUROCONTROL AIS Data Process and Static Data Procedures documentation provided by Paul as examples to be included in the manual.	Paul Bosman	1 March 2009	ADP and SDP	√
1/30 — Identify data process and procedures that would be required for the provision of new datasets	That Manfred identify, for review by the AIS-AIMSG/2 meeting, the new data process and procedure requirements, related to the future provision of new datasets, in addition to the current paper or text products.	Manfred Unterreiner	27 July 2009	Action Agreed 2/32	√
1/31 — Aeronautical Chart Manual (Doc 8697)	That an ad hoc group, consisting of David (rapporteur), Charity, Bill, Raul, Greg*, Paul* and Augustin* develop a plan, to be completed by 1 May 2009, for the development of a new edition of the Aeronautical Chart Manual (Doc 8697). * Indicates participation in the group is to be confirmed.	David Lewtas, Augustin Lamprecht, Bill Kellogg, Charity Muthoni, Gregory Pray, Paul Bosman and Raul Octaviano de Sant'Anna	1 May 2009	AIS-AIMSG/2-SN/20	√

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
1/32 — Legal and institutional issues	That an ad hoc group, consisting of Eugene (Rapporteur), Bill, Stéphane, Steven and Paul, be tasked with: a) consolidating all available information related to cost recovery, copyright and liabilities for AIS; and b) developing a list of current and future institutional and legal issues to be considered in the context of current AIS and future AIM.	Eugene Hoven, William Kellogg, Paul Bosman, Stephane Dubet and Steven Hill	27 July 2008	Doc 9082, Doc 9161, Presentation by J. de la Camara AIS-AIMSG/2-SNs/3 & 17	√
1/33 — Expertise on the inclusion of meteorological information in the data-centric environment	With a view to coordinating synergies, preventing duplicated/conflicting requirements, and discovering other areas, besides data modelling, for cooperation which may benefit from a joint MET-AIM approach, that: a) the Secretary invite the WMO to nominate a member to the group; b) the Secretary coordinate with the Secretaries of ICAO MET study groups and operations groups; and c) members ensure that expertise be made available on the inclusion of meteorological information in the data-centric environment for future meetings of the group and for the work of the group, as necessary.	Secretariat and all AIS-AIMSG	1 March 2009	AIS-AIMSG/2-SN/10	√

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APPENDIX E

FOLLOW-UP OF ACTION ITEMS FROM AIS-AIMSG/2

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/1 — Inclusion in Annex 15 of new definitions related to AIM	That the ad-hoc group consisting of Greg (Rapporteur), Amy, Augustin, Charity, Paul, Stefan, Stéphane, Tony and Valerie be tasked with reviewing, for suitability for inclusion in Annex 15, the terms and definitions in the *Roadmap for the Transition from AIS to AIM*, and present a draft list of definitions to AIS-AIMSG/3, with the objective of including them in Amendment 37.	Greg (Rapporteur), Amy, Augustin, Charity, Paul, Stefan, Stéphane, Tony and Valerie	AIS-AIMSG/3	AIS-AIMSG/2-SN/14	
2/2 — Review of the data integrity requirements in Annex 15	That the ad-hoc group consisting of Greg (Rapporteur), Amy, Charity, Gregory, Paul, Stéphane, Stefan and Tony, be tasked with reviewing the data integrity requirements in Annex 15 with a view to clarifying them or developing additional requirements as necessary and submit proposals to the AIS-AIMSG/3 meeting for possible inclusion in Amendment 37 to Annex 15.	Greg (Rapporteur), Amy. Charity, Gregory, Paul, Stéphane, Stefan and Tony	AIS-AIMSG/3		
2/3 — AIXM governance	That Paul and Gregory develop a proposal for the establishment of an appropriate body with technical and broad-based representation to support the governance of the evolution of the AIXM model for review by AIS-AIMSG/3.	Paul and Gregory	AIS-AIMSG/3		
2/4 — Inclusion of guidance material on AIXM in Doc 8126	That the Secretary include guidance material on AIXM in Amendment No. 3 to Doc 8126.	Secretary	31 July 2010	AIS-AIMSG/2-SN/12	

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/5 — Including AIM in Annex 15 and relevant guidance material	That the ad-hoc group consisting of **Greg (Rapporteur), Amy, Augustin, Charity, Gregory, Paul, Stefan, Stéphane, Steven, Tony** and **Valerie**: a) continue to consider the restructuring of Annex 15 to introduce the notion of services and to separate data from publication; b) develop digital AIM services guidance material; c) take into account additional input outlined in Appendix C; and d) submit draft proposals to the AIS-AIMSG/3 meeting.	Greg (Rapporteur), Amy, Augustin, Charity, Gregory, Paul, Stefan, Stéphane, Steven, Tony and Valerie	AIS-AIMSG/3	AIS-AIMSG/2-SN/7 AIS-AIMSG/2-SoD, Appendix C	
2/6 — Review of the draft guidance material on the eAIP	That: a) the group provide further comments on the draft guidance material to the Secretary by 31 January 2010; b) Paul provide the Sample eAIP to the Secretary for review by 30 April 2010; c) the Secretary finalize the edited eAIP guidance material and consequential changes to Doc 8126 by 30 June 2010; d) Paul provide the Sample eAIP (as revised by the Secretary) and Toolbox CD-ROM by 31 July 2010; and e) the Secretary include the material in Amendment No. 3 to Doc 8126.	All Paul Secretary	a) 31 January 2010 b) 30 April 2010 c) 30 June 2010 d) 31 July 2010	AIS-AIMSG/2-SNs 11 & 15	
2/7 — Changes to Amendment No. 2 to Doc 8126	That the Secretary take into account comments provided during AIS-AIMSG/2 in relation to Amendment No. 2 to Doc 8126.	Secretary	31 July 2010	AIS-AIMSG/2-SN/8	

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/8 — Proposed note in Annex 15 related to provision of aeronautical data using data link	That the group provide Stéphane further comments on the draft note for inclusion in Annex 15 (AIS-AIMSG/2-SN/6, paragraph 3.1 refers) by 31 January 2010 and that the amended version of the note be presented in a Study Note at AIS-AIMSG/3	All Stephane	31 January 2010	AIS-AIMSG/2-SN/6	
2/9 — Coordination the Secretary OPLINK Panel on provisions related to data link	That the Secretary assess, by 31 January 2010 in coordination with the Secretary of the OPLINK Panel, whether inclusion of a note in Annex 15 related to data link would initiate a similar amendment to Annex 3.	Secretary	31 January 2010		
2/10 — Annex provisions related to aerodrome mapping data	That the group provide, to the ad-hoc group on aerodrome mapping data bases which consists of Stéphane (Rapporteur), Bill, Roy and Stefan, further comments on the proposed provisions (AIS-AIMSG/2-SN/2, Appendix refers) related to aerodrome mapping data, as well as comments regarding the inclusion of two levels of accuracy by 31 January 2010.	All Stéphane (Rapporteur), Bill, Roy and Stefan	31 January 2010	AIS-AIMSG/2-SN/2	
2/11 — Coordination with Aerodrome Panel	That, with a view to ensuring coordination, the Secretary present a working paper related to aerodrome mapping data bases the second meeting of the Aerodrome Panel meeting scheduled for October 2010.	Secretary	October 2010		
2/12 — Follow-up on copyright permission from RTCA	That the Secretary review the recent Memorandum of Understanding between ICAO and RTCA to ascertain whether copyright of RTCA material has been waived for ICAO use.	Secretary	15 January 2010		
2/13 — AMDB guidance material	That the group provide comments on the AMDB guidance material to Stéphane as Rapporteur of the ad hoc group consisting of Bill, Roy and Stefan, by 31 January 2010.	Stéphane (Rapporteur), Bill, Roy and Stefan	31 January 2010	AIS-AIMSG/2-SNs 4 and 9	
2/14 — Guidance material on height reference systems	That Paul provide guidance material on height reference systems for inclusion in Doc 9674.	Paul	31 July 2010		

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/15 — Guidance on the use of coordinates transformation	That the Secretary review the proposed text related to the use of coordinates transformation for inclusion in Amendment No. 2 to Doc 9674.	Secretary	31 January 2010	AIS-AIMSG/2-SN/16 AIS-AIMSG/2-Flimsy No. 1	
2/16 — New guidance material for inclusion in Doc 8697	That the group provide David as the Rapporteur of the ad hoc group consisting of Augustin, Bill, Charity, Greg, Paul, Raul and Stefan, further comments on the draft plan for amendment of Doc 8697 by 31 January 2009 and notify the Secretary of any resources available in their administration to assist in the production of material for Doc 8697.	All David (Rapporteur), Augustin, Bill, Charity, Greg, Paul, Raul and Stefan	31 January 2009		
2/17 — Inclusion of SMS in the AIM quality manual	That a reference to Doc 9859 — *Safety Management Manual (SMM)* be included in the AIS quality manual.	Susumu (Rapporteur), Amy, Augustin, Charity, Greg, Paul, Tony and Valerie	31 January 2010		
2/18 — Inclusion of QMS/SMS models in the AIM quality manual	That members with knowledge of State QMS that incorporate SMS (or vice-versa) provide information on these models to the Rapporteur of the ad-hoc group on the AIS quality manual (Susumu) for examination by the group at AIS-AIMSG/3 and subsequent inclusion in the manual.	All Susumu (Rapporteur), Amy, Augustin, Charity, Greg, Paul, Tony and Valerie	AIS-AIMSG/3		
2/19 — Inclusion of reference to AIM quality manual in Annex 15	That a note be included in Amendment 36 to Annex 15 to refer to guidance on QMS available in the AIS quality manual.	Secretary	31 January 2010		
2/20 — Inclusion of means for measuring integrity in the AIM quality manual	That the ad hoc group consisting of Susumu (Rapporteur), Amy, Augustin, Charity, Paul (replacing Manfred), Tony and Valerie develop guidance material on the means for measuring integrity for examination by the group at AIS-AIMSG/3 and subsequent inclusion in the AIS quality manual.	Susumu (Rapporteur), Amy, Augustin, Charity, Greg, Paul, Tony and Valerie	AIS-AIMSG/3		

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/21 — Final comments on draft AIM quality manual	That the group provide final comments on the draft quality manual to the ad-hoc group, consisting of Susumu (Rapporteur), Amy, Augustin, Charity, Paul (replacing Manfred), Tony and Valerie, by 31 January 2010.	All Susumu (Rapporteur), Amy, Augustin, Charity, Greg, Paul, Tony and Valerie	31 January 2010	AIS-AIMSG/2-SN/5	
2/22 — Final draft of the AIM quality manual	That the final draft of the AIM quality manual be submitted to the Secretary by 30 May 2010.	Susumu (Rapporteur), Amy, Augustin, Charity, Greg, Paul, Tony and Valerie	30 May 2010		
2/23 — eTOD guidance material	That Paul provide the eTOD guidance material to the group for comment as soon as the first version is available expected in the first quarter of 2010.	Paul	First quarter of 2010		
2/24 — Guidance material on AIS training	That members consider participation in the ad-hoc group tasked with developing the AIS training manual and inform the Secretary of their willingness to participate by 1 February 2010.	All Augustin (Rapporteur), Paul	1 February 2010	AIS-AIMSG/2-SN/5	
2/25 — Guidance material on AIS training	That an ad-hoc group, consisting of Augustin (Rapporteur), Paul, and others be named: a) develop an AIS training manual, taking into account available material on AIS training and aligning with the principles in the PANS-TRG; b) ensure, during development of the AIS training manual, coordination with Secretariat members responsible for the PANS-TRG; and c) present a draft of the AIS training manual to the AIS-AIMSG/3 meeting.	Augustin (Rapporteur), Paul	AIS-AIMSG/3	AIS-AIMSG/2-SN/5	
2/26 — Guidance material on AIS training	That the Secretary provide the Rapporteur with training material developed by the CAR/SAM Regional Planning and Implementation Group (GREPECAS) by 15 December 2009.	Secretary	15 December 2009		

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/27 — Examples of State policies on legal and institutional issues	That members endeavour to acquire information on their respective State's policy on legal and institutional issues and provide this to Eugene by 31 January 2010.	All Eugene (Rapporteur), Bill, Paul, Stéphane and Steven	31 January 2010		
2/28 — Coordination with AEP-ANSEP	That the ad hoc group consider the outcome of the AEP-ANSEP/3 meeting and develop a plan for coordination between the AIS-AIMSG and the AEP-ANSEP by 1 March 2010.	Eugene (Rapporteur), Bill, Paul, Stéphane and Steven	1 March 2010		
2/29 — Guidance material on legal and institutional issues	That the ad hoc group consisting of Eugene (Rapporteur), Bill, Paul, Stéphane and Steven, prepare an amendment to the Roadmap *for the Transition from AIS to AIM* to incorporate guidance on legal and institutional issues by 31 July 2010.	Eugene (Rapporteur), Bill, Paul, Stéphane and Steven	31 July 2010		
2/30 — Information on SESAR	That in a Paul provide an information paper to AIS-AIMSG/3 concerning developments in SESAR on aeronautical information in the context of information management and SWIM.	Paul	AIS-AIMSG/3		
2/31 — Information on NextGen	That Greg provide an information paper to AIS-AIMSG/3 concerning developments in NextGen on aeronautical information in the context of information management and SWIM.	Greg	AIS-AIMSG/3		
2/32 — Review of draft guidance material on the display of graphical (meteorological) information in the cockpit	That the group review the draft guidance material on the display of graphical (meteorological) information in the cockpit and provide comments to the Secretary by 31 December 2009.	All	31 December 2009	Draft Guidance Material on the Display of Graphical (Meteorological) Information in the Cockpit on AIS-AIMSG Website	
2/33 — Study Note on AIS-AIMSG developments related to the MET component	That the Secretary prepare a study note for the next meeting of the AMOFSG in February 2010 on recent AIS-AIMSG developments with MET components.	Secretary	February 2010		

Item No and Title	*Description*	*Assigned to*	*Deadline*	*Notes and References*	*Completed*
2/34 — Review of FF-ICE concept document	That the group provide comments on the draft FF-ICE concept document to the Secretary by 30 November 2009 for onward transmission to the ATMRPP.	All Secretary	30 November 2009	AIS-AIMSG/2-SN/13	
2/35 — Identify data process and procedures that would be required	That Paul identify, for review by AIS-AIMSG/3 the new data process and procedure requirements related to the future provision of new datasets, in addition to the current paper or text products.	Paul	AIS-AIMSG/3		
2/36 — Integrated briefing	That John Synnott develop draft guidance material on the provision of integrated briefing by 31 December 2009.	John Synnott	31 December 2009		
2/37 — Review of draft guidance material on integrated briefing	That the Secretary prepare a Study Note for the AIS-AIMSG/3 meeting based on the draft guidance material on the provision of integrated briefing.	Secretary	AIS-AIMSG/3		
2/38 — Mapping of group activities to deliverables	That the Secretary prepare a table which maps the activities of the group to: a) the original expected outputs outlined in the Air Navigation Commission working paper (AN-WP/8309) that established the AIS-AIMSG; b) the terms of reference included in AIS-AIMSG-Memo/1; and c) the steps (projects) in the Roadmap for the Transition from AIS to AIM.	Secretary	31 December 2010		

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APPENDIX F

COORDINATES OF THE MEMBERS OF THE AERODROME METEOROLOGICAL OBSERVATION AND FORECAST STUDY GROUP (AMOFSG)

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APPENDIX G

COORDINATES OF THE MEMBERS OF THE AIR TRAFFIC MANAGEMENT REQUIREMENTS AND PERFORMANCE PANEL (ATMRPP)

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Agenda Item 5: Review of Administrative Aspects of the AIM Subgroup

5.1 Review of the Terms of Reference and Work Programme of the AIM Subgroup and its task forces, based on the performance approach adopted by GREPECAS.

Global and regional air navigation plans - Performance Based Approach (PBA) for the Terms of Reference (TORs) and work programme of the AIM/SG

5.1.1 Regarding this agenda item, the Meeting agreed that one of the key aspects of the air navigation planning approach based on the performance is the development of performance objectives with related measurable indicators and its metrics of application. Consequently, the Meeting considered that in the revision of the terms of reference and the work programme of the AIM/SG, it should be considered an initial set of key performance areas and associated metrics to be used as the basis for performance measurement of the regional air navigation work programme.

5.1.2 The Secretariat explained to the Meeting that the ICAO planning objective is to achieve a performance based global air traffic management (ATM) system through the implementation of air navigation systems and procedures in a progressive, cost-effective and cooperative manner. The regional planning and implementation process is the principal engine of ICAO's planning framework.

5.1.3 The Meeting recognized that, within the context of GREPECAS/15 Conclusion 15/1 related to the development of the regional performance objectives and the performance framework forms (PFFs) to be completed by all air navigation areas, particularly applies in the AIM case due to its in-depth transformation and relevant role in the ATM Operational Concept.

5.1.4 With reference to the above paragraph, the Meeting was informed that the interpretation of the above conclusion is a performance reference framework and should include the identification of national objectives performance considering the users expectation and the finalization of the national performance framework forms for each air navigation services as shown in **Appendix A** to this part of the Report.

5.1.5 In this regard, as a follow-up to Conclusion GREPECAS 15/1, the ICAO Secretary General in January 2009, authorized a SIP which allowed the conduction of two PBA workshops, one for the SAM Region States and the other one for the NAM/CAR Regions, in order to provide training for the requirement on the development of an air navigation national reference framework. The workshops were carried out from 13 to 17 April 2009 in Lima, Peru and 6 to 10 July 2009 in Mexico City, Mexico, aimed at familiarized and trained participants to develop its own performance objectives in their respective areas. Unfortunately, the AIS personnel did not participate in any of the two regional workshops.

5.1.6 The Meeting commented and took note on the notion of a performance based air navigation system emanated from good industry practices that have emerged over many years. As the aviation industry evolved into a less regulated and more corporatized environment with greater accountabilities, the advantages of transitioning from systems based to performance-based planning are apparent.

5.1.7 In this connection, the performance-based approach (PBA) was presented, which adheres to the following principles:

- strong focus on results through adoption of performance objectives and targets;
- collaborative decision making driven by the results; and
- reliance on facts and data for decision making.
- In PBA methodology the assessment of achievements is periodically checked through a performance review, which in turn requires adequate measurement and data collection capabilities.

5.1.8 The Meeting was informed of the advantages of PBA methodology that include: Result oriented, transparent and promotes accountability; specifying desired performance; employs quantitative and qualitative methods; supports decision makers and to set priorities, makes the most appropriate trade-offs, and basically allows optimum resource allocation.

5.1.9 The Meeting focused the discussion on the importance of data collection, processing, storage and reporting are fundamental to the performance-based approach and form part of performance monitoring and management. In the end, data will be condensed into a few indicators which represent the high level knowledge about the performance of the system.

5.1.10 Another relevant aspect that the Meeting noted was the need to use harmonized terminology in applying performance based approach to planning and implementation of air navigation systems. For performance measurement three basic terms were presented:

a) *Performance Indicator:* Current/past performance, expected future performance as well as actual progress in achieving performance objectives is quantitatively expressed by means of performance indicators (sometimes called Key Performance Indicators, or **KPIs**). To be relevant, indicators need to correctly express the intention of the associated performance objective. Since indicators support objectives, they should not be defined without having a specific performance objective in mind. These performance indicators are not often directly measured. They are calculated from supporting metrics according to clearly defined formulas, e.g. cost-per-flight-indicator= Sum(cost)/Sum(flights);

b) *Performance target*: Performance targets are closely associated with performance indicators: they represent the values of performance indicators that need to be reached or exceeded to consider a performance objective as being fully achieved; and

c) *Metrics:* Performance measurement is done through the collection of data for the supporting metrics (e.g. this leads to a requirement for cost data collection and flight data collection). Supporting metrics fulfil three functions. They form a

basis for assessing and monitoring the provision of ATM services, they define what ATM services user value and they can provide common criteria for cost benefit analysis for air navigation systems development. These metrics are used to calculate the values of performance indicators. In other words, metrics are quantitative measure of system performance functioning.

5.1.11 Further, the Secretariat focused on performance monitoring and measurement of ATM systems calls for metrics in area that envelopes access, capacity, cost effectiveness, efficiency, environment, flexibility, predictability and safety. On the basis of the Global ATM Operational Concept and the Manual on Performance of the Global Air Navigation System.

5.1.12 The Meeting received a recommendation from the Secretariat in relation to the need of counting with a clearly defined strategy for the implementation of the ATM systems, as well as the need to align the work programmes of States, regions and ICAO Headquarters, CAR/SAM States should adopt a national performance framework on the basis of ICAO guidance material, and guarantee its alignment with regional performance objectives, the regional air navigation plan, and the global ATM operational concept.

5.1.13 Considering the above, the Meeting proceeded to revise the AIM regional work programme through a practical exercise conducted by the Secretariat, based on the ICAO Global Air Navigation Plan and in the performance objectives, taking into account the forms referred to performance framework, which are included in **Appendix B** to this part of the report. To this end the Meeting established the metrics related to the Subgroup tasks, contemplating efficiency and safety.

5.1.14 It finally agreed to encourage CAR/SAM States to adequate their respective work programmes based on ICAO guidance material, ensuring its alignment with performance regional objectives, air navigation regional plan and ATM Global Operational concept.

Terms of reference and work programme of the AIM Subgroup

5.1.15 Under this agenda item, the Meeting kept in mind that the seventh meeting of the Administration Coordination Group (ACG/7), held on 3-4 March 2008 en Lima, Peru, at the ICAO Regional Office, reviewed the results of the work of the GREPECAS contributory bodies, their respective Terms of Reference, the GREPECAS Terms of Reference, the *GREPECAS Procedural Handbook*, the schedule of meetings for the 2008-2009 period and the respective contribution(s) by the State(s) for the aforementioned meetings and the provisional agenda for the GREPECAS/15 meeting.

5.1.16 On that occasion, the ACG/7 meeting considered that most of the ongoing tasks contained in the work programmes of the various contributory bodies should be eliminated, with few exceptions. In general, the Regional Offices should handle the tasks identified as ongoing.

5.1.17 In addition to the above, the Meeting took as work reference that GREPECAS/15 formulated the following decision on this respect:

DECISION 15/49 ASPECTS TO BE CONSIDERED IN DEVELOPING THE WORK PROGRAMMES OF GREPECAS CONTRIBUTORY BODIES

That, in developing the work programmes of the GREPECAS contributory bodies, the following aspects be considered:

a) the related strategic objective;

b) the contribution made to achieve that strategic objective;

c) other relevant tasks in the overall programme of GREPECAS contributory bodies;

d) the relationship to the Regional Air Navigation Plan and/or SARPs implementation;

Note: Until the new Regional Air Navigation Plan is developed, GREPECAS Contributory Bodies should refer tasks to Global Plan Initiatives (GPIs).

e) detail specific deliverables into the work programme in order to clarify understanding of the expected results; and

f) identify the completion date of the task.

5.1.18 The Meeting also noted that GREPECAS/15 approved the Terms of Reference, Work Programmes and composition of its contributory bodies and the related to the AIM Subgroup was updated by the Meeting as indicated under **Appendix C** to this part of the report.

5.1.19 It also recalled that GREPECAS/15 had recognised that its activities had to be carried out within the scope of the Business Plan and the Strategic Objectives, and that the Work Programme of the GREPECAS contributory bodies should include deliverables.

5.1.20 Based on the above, GREPECAS/15 formulated **Decision 15/53 -** *New format for the work programme of GREPECAS contributory bodies*, whereby these bodies were required to use the format included as **Appendix D** to this part of the report to submit their respective work programme to GREPECAS.

5.1.21 Decision 15/53 also defined the format to be used by these contributory bodies to submit their next review by the ACG **(Appendix E** to this part of the report**)**.

5.1.22 The Group was presented with an example of AIM performance objectives concerning the implementation of WGS-84 and e-TOD, generated by the Special AFI/RAN meeting in its WP/13. The Group then proceeded to analyse its tasks in detail, adjusting them to the requirements of the new format. The result of this task is reflected in the new AIM SG work programme shown in **Appendix F** to this part of the report.

5.2 Consideration of restructuring of the AIM Subgroup. Substitution of the AUTO/TF by the AIM-IT/TF (AIM-Information Technology Task Force)

5.2.1 The Meeting was apprised of the intention to create the AIM IT Task Force. However, it was also informed that, during the coordination meeting held prior to the AIM SG/12, on 22 November, with the participation of the President, the Rapporteurs of the QM TF and the TRAIN TF, Chief, Aeronautical Information Unit of ICAO Headquarters, the co-Secretary, and the Secretary, it was deemed advisable to wait for more information to be available from the AIS-AIM Study Group at ICAO Headquarters, since it was preparing guidance material that would be useful for the AIM IT TF. Therefore, the Meeting decided to postpone the creation of the aforementioned task force so as not to interfere with the work being carried out at Headquarters and/or duplicate efforts in similar or equal tasks.

5.2.2 Furthermore, on this same topic, the Meeting accepted to change the name of the AIM eMAP task force for AIM GIS task force, in order to give greater coverage to the work of the Subgroup in topics related to geographical information systems, including, *inter alia,* the task of providing advice and guides on electronic aeronautical charting. The Meeting proposed Mr. Juan José González, from Uruguay, as Rapporteur, and Mrs. María Inés Villalba, from Argentina, as alternate Rapporteur. The task to be assigned to this task force remained to be defined, and would be submitted to the AIM SG/13 meeting.

5.2.3 The Meeting noted that the AIS-AIMSG was developing guidance on the implementation of GIS and that the Secretariat would coordinate with the AIM GIS Task Force. Also, the Meeting noted that the AIS-AIMSG was developing guidance on the SIG application and that the Secretariat would coordinate with the AIM SIG Task Force (AIM SIG/TF).

5.2.4 The AIM QM task force maintained its composition, with Mr. Enrique Echarri, from Cuba, as Rapporteur. Only in the case of the AIM TRAIN task force, its Rapporteur, Mrs. Mery Frontanilla, from Bolivia, said she would not be able to continue as Rapporteur, but would continue to be part of the group. In this sense, the Meeting designated Mrs. Gladis Mercedes Roa de la Cruz, from Colombia, as Rapporteur of this working group, and Mrs. Graciela Monzillo, from Uruguay, as alternate Rapporteur. Also, El Salvador joined the group as new member.

APPENDIX A

PERFORMANCE FRAMEWORK FORM - EXPLANATORY NOTES

1. **Performance framework form:** This form is an output and management form which is applicable to both regional and national planning and includes references to the Global Plan. Other formats may be appropriate but should contain as a minimum the elements described below.

2. **Performance objective:** Regional /national performance objectives should be developed using a performance based approach that best reflects the necessary activities needed to support regional/national ATM systems. During their life cycle, performance objectives may change depending on the ATM system's evolution; therefore, throughout the implementation process, these should be coordinated with and be available to all interested parties within the ATM Community. The establishment of collaborative decision making processes ensures that all stakeholders are involved in and concur with the requirements, tasks and timelines.

3. **Regional performance objective:** Regional performance objectives are the improvements required to the air navigation system in support of the global performance objectives, and are related to the operating environments and priorities applicable at the regional level.

4**.** **National performance objective:** National performance objectives are the improvements required to the air navigation system in support of the regional performance objectives, and are related to the operating environments and priorities applicable at the State level.

5**.** **Benefits:** The regional/national performance objectives should meet the expectations of the ATM community as described in the operational concept and should lead to benefits for stakeholders and be achieved through operational and technical activities aligned with each performance objective.

6. **Strategy:** ATM evolution requires a clearly defined progressive strategy including tasks and activities which best represent the national and regional planning processes in accordance with the global planning framework. The goal is to achieve a harmonized implementation process evolving toward a seamless global ATM system. For this reason, it is necessary to develop short (1 to 5 years) and medium term (6 to 10 years) work programmes, focusing on improvements to the system indicating a clear work commitment for the parties involved.

7. **ATM operational concept components;** Each strategy or set of tasks should be linked with associated components of the ATM operational concept. The designators for ATM components are as follows:

- AOM – Airspace organization and management
- DCB – Demand and capacity management
- AO – Aerodrome operations
- TS – Traffic synchronization
- CM – Conflict management
- AUO – Airspace user operations
- ATM SDM – ATM service delivery management

8. **Tasks:** The regional/ national work programmes, using these PFF templates, should define tasks in order to achieve the said performance objective and at the same time maintain a direct relation with ATM system components. The following principles should be considered when developing work programme:

- The work should be organized using project management techniques and performance-based objectives in alignment with the strategic objectives of ICAO.

- All tasks involved in meeting the performance objectives should be developed using strategies, concepts, action plans and roadmaps which can be shared among parties with the fundamental objective of achieving seamlessness through interoperability and harmonization.

- The planning of tasks should include optimizing human resources as well as encouraging dynamic use of electronic communication between parties such as the Internet, videoconferences, teleconferences, e-mail, telephone and facsimile. Additionally, resources should be efficiently used, avoiding any duplication or unnecessary work.
- The work process and methods should ensure that performance objectives can be measured against timelines and the national and regional progress achieved can be easily reported to PIRGs and ICAO Headquarters respectively.

9. **Timeframe:** Indicates start and end time period of that particular task(s).

10. **Responsibility:** Indicates the organization/entity/person accountable for the execution or management of the related tasks.

11**.** **Status:** The status is mainly focused on monitoring the progress of the implementation of that task(s) as it progresses toward the completion date.

12**.** **Linkage to global plan initiatives (GPIs)*:*** The 23 GPIs, as described in the Global Plan, provide a global strategic framework for planning for air navigation systems and are designed to contribute to achieving the regional/national performance objectives. Each performance objective should be mapped to the corresponding GPIs. The goal is to ensure that the evolutionary work process at the State and regional levels will be integrated into the global planning framework.

AIM safety and efficiency	
Benefits	
Safety Efficiency	• Enhance safety in the States/Territories and International Organisations.
Environment	• Uniform implementation of ICAO SARPS in the CAR/SAM States/Territories and International Organizations. • Reduction in fuel consumption (example)
Metrics (examples)	i) Increased capacity, ii) Efficiency and use of digital and communications resources, iii) Reduction in of errors in the aeronautical information/data, iv) Reduction in CFIT number of cases related to the information, v) Maintain the e-TOD data integrity, vi) Reduced incident/accident factors related to the information, vii) Reduced number of deficiencies,

Strategy
Short Term (2011) (to be defined)
Medium Term (2011 - 2014) (to be defined)

ATM COMPONENT	**PROJECT / TASK DESCRIPTION**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AO				
(Include all components)				
GPIs	GPI/6 Air traffic flow management; GPI/9 Situational Awareness; GPI/18 Aeronautical information (consider all applicable GPIs)			

2009-2011

FOLLOW-UP AND IMPLEMENTATION ACTION PLAN AERONAUTICAL INFORMATION MANAGEMENT (AIM)

No.	Performance Objective Task	Action Description	Responsible	Begin date	End date	Deliverables	Observations
1	2	3	4	5	6	7	8
1	a)						
	b)						
	c)						
2	b)						
3	b)						
4	d)						
5	d)						
6	e)						

APPENDIX B

WORK PROGRAMME OF THE AERONAUTICAL INFORMATION MANAGEMENT SUBGROUP (AIM)

GREPECAS Outstanding Conclusions/ Decisions/ Strategic Objective	Task No.	Task	Follow-up action	To be initiated by	State	Deliverable	Target date
1	2	3	4	5	6	7	8
A, D	AIM/1	Coordinate the implementation of quality management systems in AIS services, in the CAR/SAM States.	Letter to the States that have not yet implemented the QMS.	AIM/SG Secretariat States	Valid	Quality system implemented.	Dec. 2010
A, D	AIM/2	Uniform application of the AIM training programme guides in the CAR/SAM Regions.	Monitor the training programme guides presented by the TRAIN/TF (send to CATCs).	AIM/SG Secretariat States	Valid	Training programme guides.	Dec. 2010
C15/32 A, D	AIM/3	Develop an action plan for the implementation of conceptual and aeronautical information/data exchange models in the CAR/SAM Regions.	Monitor the development of the Action Plan.	AIM/SG Secretariat	Valid	Action plan available to CAR/SAM States.	Dec. 2011
C14/40 A, D	AIM/4	Develop an action plan for the implementation of practical guides to assist States in the provision of electronic terrain and obstacle data, the production of electronic aeronautical charts, and the production of electronic aerodrome obstacle charts, as necessary.	Monitor the development of the Action Plan.	AIM/SG Secretariat	Valid	Action plan available to CAR/SAM States.	Dec. 2011
C14/39 A, D	AIM/5	Implement the correspondent guidelines for the use of geographical information systems (GIS) in the CAR/SAM States.	Assess and submit to GREPECAS the technical guides prepared.	AIM/SG Secretariat States	Valid	Application of GIS.	2010

APPENDIX C

TERMS OF REFERENCE AND WORK PROGRAMME OF THE AERONAUTICAL INFORMATION MANAGEMENT SUBGROUP (AIM/SG)

1. Terms of Reference

1.1 To encourage and ensure the transition of CAR/SAM Aeronautical Information ~~Services~~ Management ~~from~~ in a ~~manual~~ environment to one in which high-quality and high-integrity digital aeronautical information is electronically processed and exchanged to support the implementation in a global concept of ~~CNS/ATM systems, GNSS,~~ the operational ATM, and a state-of-the-art FMS.

1.2 Aeronautical Information Management (AIM) provides, on a global and inter-operational basis, aeronautical information and data covering the needs of the current and future ATM system and all flight phases, for use by pilots, air traffic controllers, and other data users.

2. Work Programme

TASK NO.	TASK DESCRIPTION	PRIORITY	DATE	
			START	END
~~**AIM/1**~~	~~To develop strategies and policies for the establishment of basic requirements and planning criteria for the evolution of AIS services within an effective Aeronautical Information Management (AIM) environment, in keeping with the components of the Global Inter-operational Concept.~~	~~A~~	~~2007~~	~~2010~~
AIM/~~2~~1	To coordinate the ~~application~~ implementation of quality systems in ~~AIM~~ AIS ~~services, in keeping with the relevant ISO standards; to propose action plans so that~~in the CAR/SAM States can implement these types of systems; and to assess the problems facing AIM services for the implementation of the aforementioned systems.	A	2007	~~2008~~2010
AIM/~~3~~2	~~To define the requirements that will ensure due process when assessing personnel, within the framework of effective aeronautical information management, together with the u~~Uniform implementation of AIM training programmes in the CAR/SAM Regions~~, also taking into account the need for basic criteria that will ensure the development of an English language training programme related to the effective management of aeronautical information~~.	B	2007	2010
AIM/~~4~~3	~~To coordinate the development of basic operational requirements and the strategies required~~ Develop an action plan for the implementation ~~for the adoption~~ of ICAO conceptual models and aeronautical information exchange (AICM/AIXM) in the CAR/SAM Regions~~, in order to facilitate the electronic exchange of aeronautical information/data between operational systems, as well as their inter-functionalities, both within the CAR/SAM Regions and between these and other ICAO Regions~~.	B	2008	~~2010~~2011

TASK NO.	TASK DESCRIPTION	PRIORITY	DATE	
			START	END
AIM/~~5~~4	To develop an action plan for the implementation of ~~To implement~~ practical guides to assist States with the provision of electronic terrain and obstacle data ~~(Doc 9881)~~, the production of electronic ~~display of~~ aeronautical charts~~,~~ and ~~the production of~~ electronic aerodrome obstacle charts, as necessary.	A	2007	~~2010~~2011
AIM/~~6~~5	~~To conduct the~~To implement relevant ~~studies~~guidance required for the use of geographical information systems (GIS) in the AIM~~; also, to prepare technical guides so that the States can produce VFR aeronautical charts (scales between 1:500,000 and 1:1,000, 000) in digital format~~ in the CAR/SAM States..	A	2007	2010
~~**AIM/7**~~	~~To periodically update the CAR/SAM Regional Air Navigation Plan (Part VIII, AIS) in order to ensure its effective evolution with respect to the Global CNS/ATM Plan, in keeping with the SARPs contained in ICAO Annexes 4 and 15.~~	~~A~~	~~2008~~	~~2010~~
~~**AIM/8**~~	~~To promote and follow up on the effective implementation of AIM requirements, in keeping with the established procedures, in order to take the necessary corrective action to resolve the deficiencies that affect air operations.~~	~~A~~	~~2007~~	~~2008~~
~~**AIM/9**~~	~~To coordinate continuously with all GREPECAS contributory bodies in order to ensure the appropriate integration of all the areas that contribute to the implementation of CNS/ATM systems.~~	~~A~~	~~2007~~	~~2010~~

3. **Priority**

A High-priority tasks that must be expedited.
B Medium-priority tasks that should be started as soon as possible, but without detriment to **A**-priority tasks.
C Low-priority tasks that should be started when time and resources allow, without detriment to **A** and **B** priority tasks.

4. **Composition**

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Spain, United States, France, Paraguay, Peru, Dominican Republic, Trinidad and Tobago, Venezuela, COCESNA, IATA, and PAIGH.

5. **Presidents**

President: Mrs. Noemí Carta (Cuba)
Vice-president: Mr. Rafael Torres (Venezuela)

APPENDIX D

MODEL TABLE PROPOSED FOR GREPECAS CONTRIBUTORY BODIES WORK PROGRAMME

Valid GREPECAS Conclusions/ Decisions/ Strategic Objective	Task Number	Task	Follow-up Action	To be initiated by	Status	Deliverable	Deadline
1	2	3	4	5	6	7	8

EXPLANATION OF THE MODEL TABLE PROPOSED FOR GREPECAS CONTRIBUTORY BODIES WORK PROGRAMME

Number / Column Title	Contents Description
1 / No.	Indicates the relation of the task with ICAO strategic objective/objectives and/or GREPECAS valid conclusions or decisions
2/ Task number	Indicates the number of the task assigned by the Subgroup or Committee of GREPECAS.
3/ Task	Description of the Task to be carried out
4/ Follow-up Action	Indicates the mechanism for follow up of the tasks execution (ICAO Regional Offices Activities, Coordination Meeting, Meetings of the Subgroup Task Forces or informal meetings, etc.)
5/ To be initiated by	Indicates Responsible person or group for the execution of the task
6/ Status	Indicates the advance status of task implementation
7/ Deliverable	Indicates the expected product
8/ Deadline	Indicates the deadline for the delivery of the product describes in column 5

WORK PROGRAMME OF GREPECAS CONTRIBUTORY BODIES

FOR REVISION BY THE ACG

Task No.	Strategic objective	Task	Activities	Responsible party	Implementation (%)	Result (%)	Period	
							Start	End
1	2	3	4	5	6	7	8	9

AIM PERFORMANCE OBJECTIVE

IMPLEMENTATION OF WGS-84 AND e-TOD

Benefits

Efficiency

- WGS-84 is a prerequisite for performance-based navigation, benefits described in performance objectives for PBN.
- support approach and departure procedure design and implementation
- improve aircraft operating limitations analysis
- support aeronautical chart production and on-board databases

Safety

- improve situational awareness
- improve electronic terrain and obstacle data in display cockpit
- CFIT reduction
- support technologies such as ground proximity and minimum safe altitude warning systems (GPWS)
- see benefits described in performance objectives for PBN

Strategy
Short term (2010)
Medium term (2011 - 2015)

ATM OC COMPONENTS	TASKS	TIME FRAME START - END	RESPOSA-BILITY	STATUS
1. ATM Conflict Management (CM)	***Electronic terrain and obstacle data (eTOD)***			
	a. share experience and resources in the implementation of e-TOD through the establishment of an e-TOD Regional working group.	2011-2015	GREPECAS States	
	b. Technical requirements.	2010-2014	GREPECAS States	
	c. report requirements and monitor implementation status of e-TOD using electronic media to ICAO NACC Regional Office	2010-2015	States	
	d. develop a high level policy for the management of a national eTOD programme.	2010-2011	States	
2. ATM Airspace Users Operations (AUO)	***WGS-84***			
	a. Establish WGS-84 implementation goals in coordination with the national PBN implementation	2010-2012	GREPECAS States	
	b. Technical requirements.		GREPECAS States	
	a. Report requirements and monitor implementation status of WGS-84 using the AIS-5 Table of the FASID and take remedial action if required.	Ongoing	GREPECAS States	
Link to GPIs	GPI-5: Performance-based navigation; GPI-9: Situational awareness; GPI-11: RNP and RNAV SIDs and STARs; GPI-18: Aeronautical Information; GPI-20: WGS-84; GPI-21: Navigation systems			

Agenda Item 6: Other issues according to the AIM/SG Terms of Reference

6.1 New improved version of the AIP Audit tool (AZ version 2.5) and its application in the quality processes.

6.1.1 The Meeting noted that the QM/TF/3 Meeting, held in Antigua, Guatemala, had discussed the AIP Audit Programme of EUROCONTROL, called AAA, a basic tool in MS-Excel for conducting AIP audits. Now, in substitution to the previous one a new version 2.5.1 *Audit Zone* has been released, a more evolved tool that supports a *MySQL* database.

6.1.2 The AIP Audit Programme, *Audit Zone*, is a valuable tool for the application of Quality systems for reviewing the contents of the AIP and identifying any errors or omissions therein, which should be corrected through an AIP Amendment, applying the standards and recommendations described in Annex 15 - Aeronautical Information Services, ICAO Doc 8126 - *Aeronautical Information Service Manual*, and complying with a quality system.

6.1.3 The Meeting noted that access to the AIP Audit programme could be obtained through the webpage http://**www.oztech**, following the steps listed below:

a) Select the product tab, where you will find:

- Download software
  Complete version
- Download documents
  Installation guide
  Administration guide
  Quick AIP Audit guide
  User guide

6.2 Next AIM/SG/13 Meeting

6.2.1 The Meeting was informed that since no proposals to host the next AIM/SG/13 Meeting were received from any of the participant States, the Secretariat proposed to consider the ICAO CAR or SAM Regional Offices to hold the next meeting. To this respect, it was also mentioned that letters will be sent to CAR/SAM States/International Organizations, in order to request support to host the AIM/SG meeting.

6.2.2 The Meeting agreed to consider scheduling the next AIM/SG/13 meeting, following the GREPECAS/16 meeting which is planned to be carried out in October 2010.