INTERNATIONAL CIVIL AVIATION ORGANIZATION

South American Regional Office

Fifth Workshop/Meeting of the SAM Implementation Group
Regional Project RLA/06/901

(SAM/IG/5)

PRELIMINARY REPORT

(Lima, Perú, 10 to 14 May 2010)

SAM/IG/5

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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Fifth Workshop/Meeting of the SAM Implementation Group
Regional Project RLA/06/901

(SAM/IG/5)

FINAL REPORT

Lima, Peru, 10 to 14 May 2010

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HISTORY OF THE MEETING

ii-1 PLACE AND DURATION OF THE MEETING

The Fifth Workshop/Meeting of the SAM Implementation Group (SAM/IG/5) was held at the premises of the ICAO South American Regional Office in Lima, Peru, from 10 to 14 May 2010, under the auspices of Regional Project RLA/06/901.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mr. Franklin Hoyer, Regional Director of the ICAO South American Office, greeted the participants and expressed his gratitude to DGCA Peru, for the continuous support provided to activities developed at regional scale by the South American Office, as well as to the civil aviation authorities and national and private organizations of the ICAO South American Region, as well as the FAA for the continuous support to the activities of the SAM Implementation Group. He highlighted the importance of Regional Project RLA/06/901, which hosts the realisation of these events, as well as the synergy reached with Regional Project RLA/99/901, which has oriented its activities towards meeting the implementation requirements of the South American Region. Finally, he pointed out the importance of issues to be dealt with in the agenda of the Fourth Workshop/Meeting, which will allow the review of the matters dealt with during the Fourth Workshop/Meeting SAM/IG/4, and emphasized that the teamwork shown by the Implementation Group is essential to execute the projects that have been adopted by the Region.

Mr. Alan Trigoso Pissani Director of Aviation Safety, on behalf of the General Director of Civil Aviation, welcomed the participants, highlighting the importance of the issues to be examined at regional level, opening the meeting.

ii-3 SCHEDULE, ORGANIZATION, WORKING METHODS, OFFICERS AND SECRETARIAT

The Meeting agreed to hold its sessions from 09:00 to 15:00 hours, with appropriate breaks. The work was done with the Meeting as a Single Committee, Working Groups and Ad-hoc Groups.

Mr. Hernán Johnny Colman Quintana, Civil Aviation Director of Paraguay, acted as Chairman of the Meeting and Mr. Paulo César Vila Millones, delegate from Peru, as Vice President.

Mr. Jorge Fernández, RO/ATM/SAR of ICAO Regional Office, Lima, acted as Secretary, assisted by Messrs. Onofrio Smarrelli, RO/CNS, Alberto Orero, RO/ATM/SAR/AIM, from the Lima Office, and the Project RLA/99/901 experts. Likewise, the Secretariat had the support of Mr. Doug Marek, ICAO HQ Technical Officer and of the PBN, OPS/AIR, ATFM, ATSRO, CNS and AUTO Implementation Groups Rapporteurs and the Implementation Groups Coordinator, to analyse de different agenda items.

ii-4 WORKING LANGUAGES

The working language of the Meeting was Spanish, with simultaneous interpretation in English, and its relevant documentation was presented in Spanish and English.

ii-5 **AGENDA**

The following agenda was adopted:

Agenda Item 1:	Monitoring to Conclusions and Decisions adopted by SAM/IG Meetings
Agenda Item 2:	Optimisation of the ATS routes structure
Agenda Item 3:	Implementation of performance-based navigation (PBN) in the SAM Region
Agenda Item 4:	Standards and procedures for performance-based navigation operations approval
Agenda Item 5:	Implementation of air traffic flow management (ATFM) in the SAM Region
Agenda Item 6:	Assessment of operational requirements in order to determine the implementation of communications and surveillance (CNS) capabilities improvement for en-route and terminal area operations
Agenda Item 7:	Operational implementation of new ATM automated systems and integration of the existing systems
Agenda Item 8:	Other business

ii-6 **ATTENDANCE**

The meeting was attended by 54 participants from 10 States of the SAM Region Argentina, Bolivia, Brazil, Chile, Colombia, Panamá, Paraguay, Perú, Uruguay and Venezuela, 1 State of NAM Region, United States, and 4 International Organizations, ARINC, IATA, (including LAN and TAM), IFALPA and Washington Consulting Group. The list of participants is shown in pages iii-1 to iii-10.

LIST OF CONCLUSIONS

SAM/IG/5

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Agenda Item 1: Follow up to Conclusions and Decisions adopted by SAM/IG

Review of the status of compliance of conclusions formulated by SAM/IG meetings and pending activities

1.1 The Workshops/Meetings of the SAM Implementation Group (SAM/IG/1, 2, 3 and 4), have timely produced a series of agreements translated into conclusions, that indicate the actions to be carried out by the Implementation Group and/or States, as well as activities assumed by the Working Groups.

1.2 During the first four SAM/IG Meetings carried out so far, some conclusions were formulated and a series of activities were adopted, oriented towards the implementation of different functions that will enable the Region to evolve towards the application of the global ATM operational concept.

1.3 The implementation programmes foreseen for the application of the global ATM Operational Concept in the SAM Region have been initially focused in the following:

a) SAM ATS routes network optimization.
b) Performance Based Navigation (PBN) both for en-route, terminal area and approach areas.
c) Air Traffic Flow Management (ATFM).
d) CNS systems improvements; and
e) Automation.

1.4 In view of the above, and with the information provided by the Secretariat and States on the works carried out with regard to conclusions and actions adopted, the status of compliance was updated, as shown in **Appendices A, B, C, D** and **E** to this part of the report.

Activities of the RCC/3 Meeting

1.5 The Third Coordination Committee Meeting (RCC/3) was carried out at the ICAO SAM Regional Office, Lima, Peru, from 22 to 23 April 2010. The Committee analysed the tentative activities programme, proposed for the period May-December 2010, in order to continue with the achievement of expected results of Immediate Objectives 1, 2, and 3 of Regional Project RLA/06/901.

1.6 It was also recalled that through State Letter LN 3/24.1-SA5420 dated 23 December 2009, States participating in the project were informed that, within the activities required by the Implementation Group (SAM/IG), it was necessary to carry out the following training events during the first months of 2010, and agreement was requested to hold them:

a) ATS Routes Optimisation Workshop (Lima, Peru, 1-5 March 2010),
b) ATFM Course (Rio de Janeiro, Brazil, 22-26 March 2010),
c) RNAV Approval Course (Lima, Peru, 22-26 March 2010)
d) CDM Workshop, (Rio de Janeiro, Brazil, 29-30 March 2010), and
e) BARO-VNAV Course (Lima, Peru, 6-16 April 2010)

1.7 The activities programme for 2010 is based on the results of the works carried out during the SAM/IG meetings, related to the programmes described in paragraph 1.3 above.

1.8 In reviewing the list of the tasks proposed, the Committee felt that they responded to the requirements of regional implementation programmes and approved the activities for the period May-December 2010 included as **Appendix F** to this part of the report. Also, **Appendix G** shows the activities already carried out from January to April 2010, that are related to the implementation programmes.

APPENDIX A

STATUS OF APPLICATION OF CONCLUSIONS AND/OR TASKS ORIGINATED IN SAM/IG MEETINGS

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
1. ATS Route Implementation							
1-1 Prev. 1-4	That States examine: a) The impact of RNAV route implementation on the airspace b) The aircraft fleet c) Air traffic services, and d) Coordinate as necessary to enable an integrated, harmonious and timely implementation of more direct RNAV routes.	Analyse airspace Evaluate national and international fleet Evaluate ATS Coordinate with authorities involved Coordinate with adjacent States, as necessary	Adequate information will be available to execute PBN action plan. A new ATS RNAV route network will be available, with the necessary PBN values so as to respond to current requirements of airspace users	SAM/IG/7	States	RO/ATM RO/AIM	**Valid**
1-2 Prev 2-1	CRR VOR/FNO VOR RNAV route (UM 661)	Coordinate the implementation. Issue AIC. Train personnel. Amend CAR/SAM ANP	Route implemented	TBD Information from Brazil is pending	States Secretariat	RO/ATM RO/AIM	**Completed**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
1-3 Prev 2-1	UM 662 Guayaquil – Madrid	Coordinate implementation. Issue AIC. Train personnel. Amend CAR/SAM ANP	Route implemented	Agreement with FAV in Venezuela is pending	States Secretariat	RO/ATM RO/AIM	**Valid** (see Agenda Item 2)
1-4 Prev 2-1	UM 527 Lima – Madrid	Coordinate implementation. Issue AIC. Train personnel. Amend CAR/SAM ANP	Route implemented	Implementation agreement - 24 September 2009	States Secretariat	RO/ATM RO/AIM	**Completed** 24/09/09
1-5 Prev 2-1	Santiago-Miami	Coordinate implementation. Issue AIC. Train personnel. Amend CAR/SAM ANP	Route implemented	Finalise coordination with States involved and IATA	States IATA Secretariat	RO/ATM RO/AIM	**Completed** Appendix A to Agenda Item 2 was modified. If no agreement is reached on the first quarter of 2010, the analysis will continue within the SAM ATS route network optimisation programme.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
2. Optimisation of ATS routes in the SAM Region							
2-1	**Conclusion SAM/IG/3-1 Optimisation of the ATS Route Network in the South American Region** That ICAO SAM States take relevant action to follow the guidelines and meet the target dates established in the SAM ATS Route Network Optimisation Programme that appears in Appendix B to this part of the report. (Action adopted in SAM/IG/2) Optimise the airspace structure, reorganising the network or implementing new routes based on the strategic objectives of the airspace concept, taking into account "airspace modelling", ATC simulations (accelerated time and/or real time), live tests, etc.	See action plan of the ATS route network optimisation programme (Appendix B, Attachment 1 to Item 2 of the SAM/IG/3 meeting)	Optimised ATS route network	As per action plan	States RLA/06/901 IATA Regional Office	RO/ATM RO/AIM	**Completed** The conclusion and the action adopted in SAM/IG/2 are oriented towards achieving the same results. The Action Plan was updated (see Appendix B to Item 2, SAM/IG/4.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
2-2	Prepare the preliminary airspace safety assessment	Collect the necessary data. Carry out safety assessment applying the methodology adopted.	PBN will be implemented, showing that the agreed safety levels will be maintained or improved	SAM/IG/6	CARSAMMA	RO/ATM	**Valid** SAM/IG/3 agreed that safety assessment should be based in a qualitative analysis using the SMS
2-3 Prev 2-15	Flexibility in special use airspace.	ANSPs will establish a mechanism for coordination with the military authorities Discuss matters such as location, altitudes, and validity periods of special use airspaces.	Achieve an efficient use of airspace under terms coordinated and agreed between civil and military authorities, taking into account the interests of all users	SAM/IG/4	States	N/A	**Valid** Global civil/military coordination forum (October 2009) A civil/military seminar/ workshop will be required in 2001 in the SAM Region

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
2-4 Prev 2-16	Manage the environmental problems of air transport	Capture of objective data on the benefits to be derived in terms of reduced emission of noxious gas into the atmosphere.	Known data Availability of information required for monitoring environmental protection.	SAM/IG/6	States	N/A	**Valid.** Check template on fuel savings estimates. Permanent task.
2-5	Prepare a plan for measuring performance, including gas emissions safety, efficiency, etc.	Check available tools to carry out this task Prepare a measuring plan	A measuring plan will be available in order to have a clear idea of current and future performance regarding gas emissions, safety and efficiency	SAM/IG/6	RLA/06/901	RO/ATM	**Valid.** This task was included in the action plan of the optimisation programme.
2-6	**Conclusion SAM/IG/3-2 Data Collection** That SAM States: a) collect data on all flights carried out in the upper airspace (FL 245 or above) of the SAM Region, on national and international routes, during the period **1-31 July 2009** and send them to the SAM Regional Office before **30 September 2009.** b) use a sample consistent with the **form and the instructions for completing the form**, contained in **Attachment 2 to Appendix B** to this part of the report, using the EXCEL format.	The Secretariat will send a State letter. States will collect information as agreed. States will send information to the Regional Office. Information received will be assessed.	A database containing – - traffic in ATS routes, by FIR - traffic between city pairs - peak hours - traffic in TMA - most frequently used FLs - air operators and type of aircraft used	SAM/IG/5	Regional Office States RLA/06/901	RO/ATM RO/AIM CARSAMMA	**Completed** Letter LT 2/3A.13-LN 3/24.6.1-SA364 was sent on 8 June, 2009 Except for French Guyana and Suriname, all States replied to this survey.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
2-7	Determine entry/exit points of main TMAs in the SAM Region	States will determine the entry/exit points of main TMAs States will submit information to SAM/IG/4	Adequate information will be available to prepare Version 1 of the ATS route network	SAM/IG/4	States	RO/ATM	**Completed** States informed that they would not make changes in their TMAs. Except for Brazil and Guyana, which shall reply in March 2010.
2-8	Determine and obtain the necessary tools for the development of Version 1 of the route network (aeronautical charts, specific software)	Evaluate the necessary tools	Basic elements will be available for the development of Version 1 of ATS route network	SAM/IG/6	SAM PBN RLA/06/901	RO/ATM	**Valid** Flight Star available.
2-9	Interphase between ATS routes network of the CAR and SAM Regions	Assess interface options for the ATS route network in the CAR and SAM Regions	Develop Version 1 of ATS routes network to respond to users requirements	SAM/IG/5	SAM PBN TF Regional Office	RO/ATM	**Completed** Harmonise lower limit of CAR and SAM routes.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
2-10	Carry out a detailed study of the SAM ATS route network, with a view to preparing Version 1 of the route network (ref 2.2.2 of the Action Plan of the SAM ATS route optimisation programme.	Carry out a workshop with SAM experts to review and validate the study of item 2.2.5 of the Action Plan of the SAM ATS route optimisation programme.	Initial draft of Version 1 of the route network ready	March 2010	RLA/06/901 Regional Office IATA	RO/ATM	**Completed.**
2-11	Carry out the required safety assessment applying a qualitative methodology using the SMS (Ref 2.2.3 of the Action Plan – SAM ATS Route Network Optimisation Programme)	Carry out safety assessment	Version 1 of the ATS route network will be implemented, showing that the agreed safety levels will be maintained or improved.	October 2010	RLA/06/901	RO/ATM CARSAMMA	**Valid**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3. Implementation of Performance Based Navigation (PBN) in the SAM Region							
3-1 Prev. 1-1	**SAM/IG/1-1 CAR/SAM PBN Roadmap** That ICAO SAM States, when implementing RNAV/RNP, take relevant actions to follow the guidelines contained in the CAR/SAM PBN Roadmap shown in Appendix C to this part of the report.	Will facilitate regional implementation Each State must comply with the actions agreed in the PBN Roadmap	States will have a National en-route, TMA and APP PBN implementation Plan.	SAM/IG/3	States	N/A	**Completed.** States adopted the PBN roadmap.
3-2 Prev. 2-3	**Conclusion SAM/IG/2-1 PBN implementation Programme for en-route operations** That ICAO SAM States take appropriate action to follow the guidelines and meet the deadlines established in the Project for the implementation of PBN for en-route operations, which appears in **Appendix B** to this part of the Report.	Execution of the action plan	RNAV 5 implemented in the SAM Region	SAM/IG/6	PBN focal points of the States.	RO/ATM	**Valid**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-3 Prev. 2-14	**Conclusion SAM/IG/2-4 PBN Implementation Model for TMA and Approach** That States/Territories and International Organisations use the PBN Implementation Model for TMA and Approach in the preparation of their PBN implementation programme for TMA and Approach, as shown in **Appendix E** to the SAM/IG/2 report.	Prepare action plans for PBN implementation in TMA and approach	Action plans accompanying regional implementation	SAM/IG/4	PBN focal points of the States	RO/ATM	**Valid**
3-4	Assess the regulations for the use of GNSS, and if applicable, proceed to their publication	Review information available.	All SAM States with regulations for the use of GNSS in place	SAM/IG/3	Secretariat	RO/CNS	**Completed**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-5 Prev. 1-1	**Conclusion SAM/IG/3-3 National PBN Implementation Plans** That SAM States submit their PBN Implementation National Plan to SAM/IG/4, using the PBN Implementation Plan Model shown in **Appendix B** of this part of the report, and also using the action plan models and information contained in the Project for the Implementation of PBN for TMA and Approach Operations in the short term in the SAM Region, approved by the SAM/IG/2 meeting.	Prepare national PBN plans	All SAM States will have a PBN implementation plan aligned with the regional PBN plan	SAM/IG/6	States	RO/ATM	**Valid** 10 SAM States submitted a draft national PBN plan for harmonisation. Following the analysis, it was agreed that all PBN national plans would be sent to the ICAO SAM Regional Office by 31 December 2009.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-6 Prev. 2-12	**Conclusion SAM/IG/2-3 Survey on Fleet Navigation Capacity** That States conduct a survey on the fleet navigation capacity, using, to that end, the form contained in **Appendix D** to this part of the Report, and send the information collected to the ICAO South American Regional Office, on the following dates: a) Aircraft operating commercial flights with an MTOW above 5 700 kg. – 15 February, 2009 b) Aircraft operating commercial flights with an MTOW above 5 700 kg. – 15 May, 2009; c) Other aircraft registered in the Region – 15 August, 2009.	The States will carry out this survey. The Secretariat will post on the web the form shown in Appendix D of the SAM/IG/2 meeting.	Navigation capacity of thefleet flying in the SAM Region known	The date of delivery of items a), b) and c) was re-scheduled and unified to 31 July, 2009	Focal points designated by States RO	JF/OQ/ MU/VCH	**Completed** for item a) Valid for items b) and c)
3-7	Analyse aircraft fleet navigation capacity	Prepare database	Aircraft fleet capacity analysed	SAM/IG/4	RLA/99/901	RO/ATM Regional Project RLA/99/901 RO/FLS	**Completed** for item a) Pending for items b) and c).

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-8 Prev. 2-13	Collect air traffic data to understand air traffic flows in a specific airspace.	States will collect air traffic flow data	States will have a clear idea of the type of traffic operating in a given airspace	SAM/IG/4	PBN focal points of the States	RO/ATM RO/AIM	**Completed**
3-9	Analyse the means of communication, navigation (VOR, DME) and surveillance on ground to meet navigation specifications and the navigation reversal mode.	Prepare CNS database	Navigation specification and the navigation reversal mode defined.	SAM/IG/6	RLA/06/901	RO/CNS	**Valid.** CNS Task A partial report was submitted to SAM/IG/4 and SAM/IG/5 FL250 coverage will be completed
3-10	Training on RNP AR approach procedure design	Prepare SIP in order to have FAA instructors	State experts duly qualified on RNP AR APCH matters	SAM/IG/4	Regional Office SIP 06/901	Brazil/Chile RO/ATM	**Completed.** Two courses were given: RNAV/RNP and RNP AR APCH. Brazil and Chile provided the instructors. Support was obtained from a SIP and from Regional Project RLA/06/901 for the participation of the students.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-11 Prev. 2-10	**Conclusion SAM/IG/2-2 Initial AIC** That SAM States, using as a model the AIC shown in Appendix C to this part of the Report: a) publish an Aeronautical Information Circular (AIC) on AIRAC date 9 April 2009, informing the aeronautical community of their intention to implement RNAV-5 on 18 November 2010; b) reflect in this AIC the specific circumstances in the airspace under their jurisdiction.	Prepare AIC Publish AIC	Aeronautical community duly informed of the plans of the States regarding RNAV-5 implementation.	SAM/IG/6	States	RO/ATM RO/AIS	Partially implemented: French Guyana, Panama and Suriname had not implemented by 23 October 2009.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
4. Standards and procedures for performance based navigation operations approval							
4-1	Analyse aircraft and operators (pilots, dispatchers, and maintenance personnel) approval requirements, as established in the PBN manual, and develop the necessary documentation. Note: See SAM/IG/2 Agenda Item 3, and SAM/IG/3 Agenda Item 4.	Develop LAR concerning PBN approval	Guidelines available to the States	SAM/IG/3 SAM/IG/4	Project RLA/99/901	RO/ATM Regional Project RLA/99/901 RO/FLS	**Completed** Under development by RLA/99/901. ACs on RNAV-10, RNAV-5, RNAV-1 and 2, Basic RNP-1, RNP APCH, RNP AR APCH and APV Baro VNAV were completed. A new work plan has been established for the development of ACs on RNP-4, RNP-2 and advanced RNP-1.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
4-2	**Conclusion SAM/IG/3-4 Advisory Circulars 91-008, 91-009 and 91-010** That SAM States: a) use Advisory Circulars 91-008, 91-009 and 91-010, shown in **Appendices B, C and D,** respectively, to this part of the report for the development of their acceptable means of compliance for the approval of aircraft and operator for RNP APCH, RNP AR APCH and APV/baro-VNAV operations; and b) publish the respective national regulations and ACs by **5 October 2009**.	Develop the procedures for the approval of aircraft and operators for RNP, APCH, RNP AR APCH and APV/Baro-VNAV operations	National regulations for the approval of aircraft and operators ready	SAM/IG/4	States Project RLA/06/901	RO/ATM Regional Project RLA/99/901 RO/FLS	Superseded by Conclusion SAM/IG/4-2

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-1 Prev 4-2	**Conclusion SAM/IG/2-6 ATFM Roadmap** That: a) the ATFM Roadmap shown in **Appendix B** to this part of the Report be adopted in order to provide guidance to the ATFM community with regard to ATFM applications to be implemented in the short and medium term in the SAM Region; and b) the ICAO Secretariat send the ATFM Roadmap to the GREPECAS ATFM Task force for analysis and relevant action.	States must adopt the ATFM Roadmap and advise the national aeronautical community of their intentions.	Aeronautical community aware of regional and national ATFM activities The Roadmap will be presented at the ATFM/4 meeting	SAM/IG/3	ATFM focal points of the States ATFM Rapporteur	ATFM Rapporteur/ JF/AO	**Completed**
5-2	Carry out the tasks to be developed by Regional Project RLA/06/901. See SAM/IG/3 report	Hire experts through RLA/06/901	Tasks identified by the meeting for implementation by Project RLA/06/901 already implemented.	SAM/IG/4	RLA/06/901 consultants	RO/ATM RO/FLS	**Completed**
5-3 Prev 4-5	Publish initial ATFM AIC using the model prepared by SAMIG	States publish AIC	Community informed of ATFM plans of the States		States	RO/ATM	**Completed**. Except for Suriname.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-4	ATFM Manual – First Part	Continue developing the ATFM manual	States will have a manual available for harmonised use in the SAM Region	SAM/IG/4	RLA/06/901 consultant	RO/ATM RO/AIM	**Completed** (ref. SAM/IG/4-WP/10)
5-5	**Conclusion SAM/IG/3-5 Runway and associated ATC sector capacity at an international airport** SAM States are urged to carry out at least an exercise to determine the runway and associated ATC sector capacity at an international airport or at another one selected by each State, and submit the results to the SAM/IG/4 meeting, providing the following information: a) Number of trained personnel for the exercise b) Methodology applied c) Results of the exercise, indicating the capacity declared for each runway and selected ATC sector. d) Problems identified in the methodology used.	Calculate the capacity of an airport and its associated ATC sector	States will put into practice what they learned at the course dictated on this matter and will obtain the necessary experience to assess capacity at national level.	SAM/IG/4	States	RO/ATM	**Valid** Bolivia, Brazil, Colombia, Paraguay, Peru and Venezuela presented their preliminary exercise.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-6	Guidance document for the application of a common methodology for estimating airport and ATC sector capacity for the SAM Region	Prepare a guidance document for the application of a common methodology for estimating airport and ATC sector capacity for the SAM Region	States will have a guide for the application of a common methodology for estimating airport and ATC sector capacity in the SAM Region	SAM/IG/4	RLA/06/901 consultant	RO/ATM RO/AIM	**Completed** (ref. SAM/IG/4-WP/5)
5-7	**Conclusion SAM/IG/4-1 SAM Route Network Point of Contact**: That SAM States designate a point of contact to support task 2.2.5 of the Action Plan for the Optimisation of the SAM Route Network, and send the corresponding information (e-mail and phone number) by 31 January 2010.	Complete database	A list of contacts will be available for coordinating the optimisation of the ATS route network	SAM/IG/5	States	RO/ATM	**Completed**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-8	**Conclusion SAM/IG/4-2 Advisory Circulars on the approval of aircraft and operators for RNP-10, RNAV-5, RNAV-1 and 2, basic RNP-1, RNP APCH, RNP AR APCH, and APV/baro-VNAV operations**: That SAM States, in keeping with their PBN implementation plan: a) use the Advisory Circulars shown in **Appendices A-1, A-2, B-1, B-2, C-1, C-2, D-1, D-2, E-1, E-2, F-1, F-2, G-1, and G-2**, to this part of the report for the development of their acceptable means of compliance for the approval of aircraft and operators for RNP-10, RNAV-5, RNAV-1 and 2, basic RNP-1, RNP APCH, RNP AR APCH and APV/baro-VNAV operations; and b) the work aids of the aforementioned circulars be included in the Operations and Airworthiness Inspector manuals.	Publish the Advisory Circulars for the approval of aircraft and operators	Advisory Circulars and Work Aids used for aircraft approval	SAM/IG/5	States	N/A	**Completed**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-9	**Conclusion SAM/IG/4-3 Continued collection of data on PBN capacity of the fleet in the SAM Region** – The Meeting considered that a) efforts should continue so that each State, through its PBN focal point, may send its information on PBN capacity of its fleet as soon as possible to the ICAO Regional Office. The information collected by the States, to the extent possible, should be sent to the Regional Office in Excel; b) each State is responsible for the data it provides and for making subsequent updates and clarifications to the data sent; c) in order to facilitate data updates, the file containing the survey of each State should be posted on the SAM Office website, so that each State, by means of a code, may access and update the information on its fleet and send it by e-mail to the Regional Office.	Complete the collection of data on PBN capacity of the fleet in the SAM Region	Database available	SAM/IG/6	States	N/A	**Valid**

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-10	**Conclusion SAM/IG/4-5 Guidance for the use of a common methodology for estimating airport and ATC sector capacity** – The guidance for the use of a common methodology for estimating airport and ATC sector capacity, shown in Appendix C to this part of the report is approved, which recommends SAM States to use the methodology for estimating airport and ATC sector capacity applied in Brazil.	Use of the guidance for the use of a common methodology for estimating airport and ATC sector capacity	Airport and ATC sector capacity estimated	SAM/IG/6	States	ATFM/WG	**Valid**

APPENDIX B

FOLLOW-UP OF CONCLUSIONS AND PENDING TASKS OF THE SAM/IG MEETING

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
1-1 **SAM/IG/1-1** **CAR/SAM PBN Roadmap** That ICAO SAM States, in implementing RNAV/RNP, take the pertinent actions to follow guidelines contained in the CAR/SAM PBN Roadmap as shown in **Appendix C** to this part of the report.	**YES**	**YES**	**YES**	**YES**	**YES**	**O/G**	**--**	**YES**	**O/G**	**YES**	**YES**	**YES**	**YES**	**YES**	
1-1 That States examine: a) Impact of RNAV routes implementation in the airspace b) Aircraft fleet, Air traffic services, and establish pertinent coordination so as to enable integrated, harmonious and timely implementation of more direct RNAV routes.	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**--**	**O/G**	**O/G**	**O/G**	**YES**	**O/G**	**YES**	**O/G**	**ECU**: Local coordination with corresponding area.
2-3 Flexibility in the airspace of Special Use	**O/G**	**O/G**	**O/G**	**YES**	**O/G**	**O/G**	**--**	**O/G**	**N/A**	**O/G**	**YES**	**O/G**	**YES**	**O/G**	**CHI:** There Is a coordination committee for this purpose. **PAN:** N/A **PER:** Implemented since 2002.**VEN:** Not determined.
2-4 Management of environmental problems of air transport	**O/G**	**NO**	**O/G**	**YES**	**NO**	**NO**	**--**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**YES**	**NO**	**ECU:** i.e. Chile SAM/IG/5 **PER:** SAM/IG/5 **BOL**: SAM/IG/6

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
3-2 **Conclusion SAM/IG/2-1 PBN implementation Programme for en-route operations** That the ICAO SAM States take appropriate actions to follow the guidelines and comply with the targets established in the PBN implementation for en-route operations, which is shown in **Appendix B** to this part of the Report.	**YES**	**YES**	**YES**	**YES**	**YES**		**--**	**YES**	**YES**	**YES**	**O/G**	**YES**	**YES**	**YES**	
3-3 **Conclusion SAM/IG/2-4 PBN Implementation Model for TMA and ach That States/Territories and** International Organizations use the PBN Implementation Model for TMA and Approach in the preparation of their PBN implementation programmes for TMA and Approach, shown in **Appendix E** of SAM/IG/2	**YES**	**O/G**	**O/G**	**YES**	**YES**	**O/G**	**--**	**YES**	**O/G**	**YES**	**YES**	**O/G**	**YES**	**O/G**	**ECU:** Developing. **VEN:** MAR 2010 **SUR:** 15 NOV 09

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
3-5 **Conclusion SAM/IG-3-3 National Plans for PBN Implementation** That States of ICAO South American Region, present their PBN Implementation National Plans to SAM/IG/4 Meeting, using PBN Implementation Plan Model, shown in Appendix B of this part of the Report, as well as using the action plan models and information contained PBN Implementation Project TMA Operations and Short Term Approximations of SAM Region, approved by SAM/IG/2 Meeting.	**YES**	**YES**	**YES**	**YES**	**YES**			**YES**		**YES**	**YES**		**YES**	**YES**	**VEN:** Ready to be sent
3-6 **Conclusion SAM/IG/2-3 Survey on the Fleet Navigation Capacity** That States conduct a survey on the fleet navigation capacity, using, to that end, the form contained in **Appendix D** to this part of the Report, and send the information collected to the ICAO South American Regional Office, on the following dates: a) Aircraft operating commercial flights, which have more than 5 700 kg. of MTOW – 15 February 2009; b) Aircraft operating commercial flights, which have less than 5 700 kg. of MTOW – 15 May 2009; c) Other aircraft registered in the Region – 15 August 2009.	**YES**	**YES**	**O/G**	**YES**	**YES**	**YES**	**--**	**YES**	**YES**	**NO**	**YES**	**O/G**	**YES**	**YES**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
3-11 **Conclusion SAM/IG/2-2 Initial AIC** That States of ICAO SAM Region using as model the AIC presented in Appendix C to this part of the Report: **Initial AIC** a) publish in the AIRAC date of 9 April 2009 an Aeronautical Information Circular b) reflect in this AIC the specific situations within the airspace under their jurisdiction.	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**--**	**YES**	**YES**	**YES**	**YES**	**O/G**	**YES**	**YES**	SUR: Will inform 15 NOV 09
4-5 **Initial AIC ATFM Model**	**YES**	**YES**	**N/A**	**O/G**	**YES**	**YES**	**--**	**YES**	**YES**	**YES**	**YES**	**O/G**	**YES**	**O/G**	**GUY**: 22 OCT 09 **VEN:** MAR 10
Conclusion SAM/IG/3-1 Route Network Optimising in the South American Region That the CAO SAM States take relevant action to follow the guidelines and meet the target dates established in the ATS Route Network Optimising Programme in the South American Region that appears in **Appendix B** to this part of the report.				**YES**	**O/G**						**YES**		**YES**	**OG**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
5-5 **Conclusion SAM/IG/3-5 Runway capacity of an international airport and ATC associated sector** SAM States are encouraged to carry out at least an exercise to determine the runway capacity of an international airport and ATC sector, associated or another one selected for each State, to present the results to the SAM/IG/4 Meeting, providing the following information: a) Amount of personnel trained for the exercise b) Methodology applied c) Result of the exercise, providing the declared capacity for each runway and ATC selected sector. d) Identification of problems found in the methodology applied.	**OG**			**OG**	**YES**					**YES**	**YES**			**OG**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
5-7 **Conclusion SAM/IG/4-1** **SAM routes network point of contact** That SAM States designate a point of contact to support the development of task 2.2.5 of the Action Plan for optimisation of the SAM Routes Network, and send the corresponding data (email and telephone) until 31 January 2010.	**YES**			**YES**	**YES**					**YES**	**YES**		**YES**		

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
5-**8** **Conclusion SAM/IG/4-2 Advisory Circulars for Aircraft approval and operators for RNP 10 operations, RNAV 5, RNAV 1 and 2, Basic RNP 1, RNP APCH, RNP AR APCH and APV/baro-VNAV** That States of ICAO South American Region, according to the PBN implementation plans: a) use the Advisory Circulars (AC), in developing their acceptable means of compliance of approval of aircraft and operators for RNP 10 operations, RNAV 5, RNAV 1 and 2, Basic RNP 1, RNP APCH, RNP AR APCH and APV/baro-VNAV, that are shown in Appendices A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1 and G2 of this part of the report; and b) that job aids of aforesaid circulars be incorporated into Inspector's manuals of Operations and airworthiness.	**RNAV5** YES OTHERS OG			**O/G**		**O/G**				**O/G**	**YES**		**YES**	**NO**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
5-9 **Conclusion SAM/IG/4-3 Continued data collection about PBN Fleet Capacity in the South American Region** The Meeting considered that: a) efforts should be continued in order that each State, through its PBN Focal Points, conduct such actions to send, as soon as possible, information, about its PBN fleet capacity to ICAO Regional Office. The information collected by States should, as far as possible, be sent to the Regional Office in a file with Excel format. b)that each State is responsible for providing data and, as time passes, updates or further details on the submitted data should be made; c) to facilitate the updating of data, the file of the survey of each state be posted on the website of the SAM Office, in order that each State, through a code, can have access to information on its fleet , and thus can perform the update of the data entered , and send it, via e-mail, to the Regional Office									**YES**	**YES**			**YES**		

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
5-10 **Conclusion SAM/IG/4-5 Guidance for the application of a common methodology for calculating airport and ATC sector capacity** The Guidance for the application of a common methodology for calculating airport and ATC sector capacity, shown in Appendix C to this part of the report, which recommends that SAM States apply the Brazilian methodology for calculating airport and ATC sector capacity, is approved.										**YES**			**YES**		

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- En ejecución: colocar **O/G** (on going) e indicar en "observaciones" la fecha prevista de término./ In execution: place **O/G** (on going) and indicate under "remarks" the estimated deadline
- No cumplida: colocar **NO** en el casillero correspondiente y, de ser el caso, hacer comentarios en columna de observaciones/ Not complied: place **NO** in the corresponding box and if such were the case, make comments in the remarks column

APPENDIX C

FOLLOW-UP TO CONCLUSIONS ON CNS IMPROVEMENTS

Conc/Dec Strategic Objective	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Status	Deliverable	Target date
SAM/IG 1-5 D	Adoption of Action Plan Models for the improvement of communications and surveillance systems for en-route and terminal area operations	When carrying out activities for the improvement of communications and surveillance systems for en-route and terminal area operations, the action plan models are to be taken into account for the improvement of ground-air, ground-ground communications and surveillance systems being presented as **Appendices D, F and I** to the report of this agenda item.	Implementation of action plan for improvement of ground-air communications. Implementation plan for improvement of ground-ground communications systems. Implementation plan for improvement of surveillance systems.	SAM States/ Territories and ICAO SAM Regional Office	Valid Valid Valid	Improvement of the communications, navigation and surveillance systems	Mar 2011 Dec 2012 Dec 2015
SAM/IG/4-7	Drafting of pending Action Plans for the Improvement of CNS Systems to meet Short- and Medium-Term Operational Requirements for En Route and Terminal Area Operations	That the aeronautical administrations of Colombia, French Guiana and Panama draft their respective action plans for the improvement of CNS systems, following the model action plan presented at the SAM/IG/3 meeting (Appendix A to agenda item 6) and send them to the ICAO SAM Regional Office no later than **30 November 2009**.	From the three States which have pending the preparation of the action plans for CNS improvements, only Colombia sent it to the ICAO South American Office. The delegate of Panama informed the Meeting that it would be sending the Action Plan on CNS Improvements by June 2010.	SAM States/ Territories	Valid	National Action plan for CNS improvements	30 June 2010

Conc/Dec Strategic Objective	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Status	Deliverable	Target date
			All SAM action plans on CNS improvements, with the exception of French Guiana and Panama, are found in the ICAO SAM Office website www.lima.icao.int, electronic documents, CNS				
SAM/IG/4-8	Updating of the Action Plans for the improvement of CNS Systems to meet Short- and Medium-Term Operational Requirements for En Route and Terminal Area Operations	That SAM States, with the aim of keeping updated the Action Plans for the improvement of CNS Systems to meet Short- and Medium-Term Operational Requirements for En Route and Terminal Area Operations, present their updated versions twice a year, if any, in the dates corresponding to the holding of SAM/IG meetings.	States have taken note of the need to update action plans. It is expected that during the SAM/IG/6 Meeting, the corresponding updating is presented.	SAM States/Territories ICAO SAM Regional Office	Valid	Action plans for SAM CNS national improvements updated	Continuous
SAM/IG/4-9	Review of the guide for the interconnection of AMHS	That SAM States review the guide for the interconnection of AMHS in Appendix A to this part of the Report and, once reviewed, send their comments to the ICAO SAM Regional Office no later than **15 December 2009.**	Some States of the Region made comments on the guidance document. The guidance document for AMHS systems interconnection is considered approved	SAM States/Territories ICAO SAM Regional Office	Completed	Guidance material for AMHS systems interconnection	15 December 2009

Conc/Dec Strategic Objective	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Status	Deliverable	Target date
SAM/IG/ 4-10	AMHS interconnection between Argentina-Chile, Argentina-Peru, Brazil-Colombia, Brazil-Peru, Chile-Peru and Colombia-Peru	The respective administrations are urged to operationally interconnect AMHS between Argentina-Chile, Argentina-Peru, Brazil-Colombia, Brazil-Peru, Chile-Peru and Colombia-Peru, and that, to that end, they: a) Use the model Memorandum of Understanding (MoU) shown in Appendix B to this part of the report; b) Complete the information in the MoU, taking into account the action plan for AMHS interconnection in Appendix C to this part of the Report; c) Present the MoU to the ICAO SAM Regional Office by 15 December 2009; and d) Sign the model MoU at the SAM/IG/5 meeting.	SAM States involved have taken note of the preparation of the MoU for AMHS systems interconnection. During SAM/IG/6 meeting, MoUs for the interconnection of AMHS systems between Argentina-Peru and Brazil-Peru were drafted.	SAM States/Territories ICAO SAM Regional Office	Valid	MoU for the implementation of AMHS systems between Argentina-Chile, Argentina-Peru, Brazil-Colombia, Brazil-Peru, and Colombia-Peru	30 September 2010

APPENDIX D

FOLLOW-UP TO CONCLUSIONS ON AUTOMATED SYSTEMS

Conc/Dec Strategic Objective	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Status	Deliverable	Target date
SAM/IG 3-8 D	Preparation of specific implementation plans for the interconnection of automated systems	That States of the SAM Region start the development of specific plans for the implementation of automated systems interconnection, considering the implementation dates indicated in Regional Interconnection Plan for Automated Systems in adjacent ACCs, specified in **Appendix B** of this part of the Report, and information contained in the following documentation: a) Memorandum of Understanding for the implementation of automated systems interconnection between two States having adjacent ACCs, Interface Control Document (ICD) for data communication between ATS dependencies in Caribbean and South American Regions (CAR/SAM ICD); b) Interface control document (ICD) for data communications between ATS units in the Caribbean and South American Regions (CAR/SAM ICD);	To date, as follow-up to the action plan for the implementation of automated systems between SAM pairs of States, Argentina-Uruguay, Argentina-Brazil and Brazil-Uruguay have drafted and signed MoUs for the interconnection of their automated systems.	SAM States	Valid	Memorandum of Understanding (MoU) between SAM pairs of States for the interconnection of automated systems	2012

Conc/Dec Strategic Objective	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Status	Deliverable	Target date
		c) System Interface Control Document (SICD); and d) Regional interconnection initial plan for ACC automated systems. e) Preliminary reference system/ subsystem specification for the air traffic control automation system (SSS).					
SAM/IG 4-11	Action plan for the implementation of Amendment 1 to Doc. 4444	That SAM States, taking into account the actions indicated in the strategy document for the implementation of Amendment 1 to ICAO PANS ATM, 15th Edition (Doc. 4444), contained in Appendix D to this part of the Report, draft their respective action plans for the implementation of the amendment, and send them to the ICAO SAM Regional Office by 30 March 2010, for their presentation at SAM/IG/5 Meeting.	States of the Region have been reported with regard to the action plans for the implementation of the amendment Action plans prepared by Panama, Paraguay and Uruguay were presented during SAM/IG/5 meeting The action plans target date for delivery has been extended to 30 August 2010.	SAM States	Valid	National Action plans for implementation of Amendment 1 to the 15th Edition of the PANS ATM (Doc 4444).	30 March 2010

APPENDIX E

FOLLOW-UP OF PENDING TASKS OF THE SAM/IG MEETING ON CNS IMPROVEMENTS

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Drafting of pending Action Plans for the Improvement of CNS Systems to meet Short- and Medium-Term Operational Requirements for En Route and Terminal Area Operations *(Conclusion SAM/IG/4-7)*	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	YES	YES	YES	YES	Panama informed it will send the action plan in June 2010
Updating of the Action Plans for the improvement of CNS Systems to meet Short- and Medium-Term Operational Requirements for En Route and Terminal Area Operations *(Conclusion SAM/IG/4-8)*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	O/G	NO	The action plans on CNS improvements are published in the ICAO SAM Office Web site: www.lima.icao.int States should proceed with its updating every time it is required
AMHS interconnection between Argentina-Chile, Argentina-Peru, Brazil-Colombia, Brazil-Peru, Chile-Peru and Colombia-Peru *(Conclusion SAM/IG/4-10)* The requirement for the establishment of the MoUs has been extended until 30 June 2010. The MoU between Colombia and Panama has been included The MoUs for the States unmarked in the table will be drafted once AMHS systems are implemented	O/G		O/G	O/G	O/G				O/G	**NO**	O/G				Drafted the MoU; pending signature are: **Argentina-Perú**: SAM/IG/6 **Brazil-Perú**: August 2010 (ATM Multilateral) Have started drafting MoU; finishing and signature pending for: **Argentina-Chile:** August 2010 (ATM Multilateral) **Chile Perú:** August 2010 (ATM Multilateral) **Brazil–Colombia:** SAM/IG/6 **Colombia-Perú:** SAM/IG/6 **Colombia-Panamá:** SAMIG/6

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Preparation of specific implementation plans for the interconnection of automated systems, in accordance with the action plans drafted in this respect *(Conclusion SAM/IG/3-8)*	O/G		O/G	O/G	O/G				O/G		O/G		O/G	O/G	MoU for ATM automation drafted for: Argentina-Uruguay Argentina-Brazil Brazil-Uruguay Of these MoU, implementation tasks have only started between Argentina and Uruguay, pending the transport of the radar from Durazno to Ezeiza. Pending MoU for the interconnectin of ATM automated systems: **Argentina-Chile:** (August 2010 ATM multilaterall meeting) **Colombia-Panamá**: SAM/IG/6 **Brazil-Venezuela:** (July 2010)
Action plan for the implementation of Amendment 1 to Doc. 4444 *(Conclusion SAM/IG/4-11)*	No	No	O/G	No	No	No	No	No	YES	YES	No	No	YES	No	Target date has been extended up to end of August 2010, with the aim that SAM States action plans can be presented at the Meeting / Seminar / Workshop on the Implementation of the New Flight Plan Format Lima, 13-15 de September 2010.

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APPENDIX F

Regional Project RLA/06/901 Draft ATM and CNS activities programme for May-December 2010

1. ***EN-ROUTE PBN IMPLEMENTATION PROGRAMME (RNAV 5)***

Task	Result	Site and execution dates	Resources required	Observations
Safety assessment required for RNAV 5 implementation and implementation of Version 01 of ATS Routes Network applying qualitative methodology using SMS.	PBN and new optimised ATS routes network implemented.	Lima, August	Three weeks mission of one expert plus a fellowship for each participating State. One week event.	
Seminar/Workshop on implementation of the new flight plan format (Amendment 1 to the 15th edition of ICAO Doc 4444).	Guidance material to support States in the implementation of the new flight plan format and 15 experts of the Region trained.	Lima, 13 to 15 September	Two fellowships for each Participating State, 5 fellowships for non-participating States, simultaneous interpretation, translation of material.	
Second ATS Routes Optimisation workshop.	Version 01 of SAM ATS routes network and proposal for amendment to CAR/SAM ANP developed.	Lima, 23 to 27 August	Two fellowships for each Participating State, 5 fellowships for non-participating States, simultaneous interpretation, translation of material.	

2. ***IMPLEMENTATION PROGRAMME OF LA PBN IN TMA AND APPROACH***

Task	Result	Site and execution dates	Resources required	Observations
RNP approval course	20 experts trained on aircraft and users approvals for RNP operations.	Lima, 17 to 21 May	2 fellowships for each participating State	

3. ***IMPLEMENTATION PROGRAMME OF AIR TRAFFIC FLOW MANAGEMENT***

Task	Result	Site and execution dates	Resources required	Observations
Second Course on Air Traffic Flow Management (ATFM) and Collaboration in Decision Making (CDM)	15 experts of the Region trained in Air Traffic Flow Management and CDM concept.	TBD, November	One fellowship per participating State, 3 fellowships for non-participating, States simultaneous interpretation, translation of material	
Second Part of the ATFM Manual	Segunda parte del manual ATFM desarrollada	Lima, September	Mission of one ATM expert for 2 weeks	
CDM Basic Manual focused on ATFM	CDM Manual focused on ATFM prepared	Lima, September	Mission of one ATM expert for 2 weeks	

4. ***IMPLEMENTATION PROGRAMME OF COMMUNICATIONS, NAVIGATION AND SURVEILLANCE IMPROVEMENT CAPABILITIES***

Task	Result	Site and execution dates	Resources required	Observations
Study of an ATN SAM network	Study for the implementation of an ATN SAM network including REDDIG and a possible regional ground network developed.	Lima, Peru 16 to 27 August	Mission of one CNS expert for 15 days	
Seminar surveillance and automation	15 experts of the Region trained in surveillance and automation systems, such as el ADS-B and multilateration	San Carlos Bariloche, Argentina, 6 to 8 December	One fellowship for each participating State, expenses for the assistance of 2 CNS Officers (Lima and Montreal), simultaneous interpretation expenses for three days	

5. ***OPERATIONAL IMPLEMENTATION PROGRAMME OF NEW AUTOMATED SYSTEMSA AND INTEGRATION OF EXISTING SYSTEMS***

Task	Result	Site and execution dates	Resources required	Observations
Asterix, AIDC and OLDI courses	15 experts of the Region trained on Asterix and AIDC and OLDI	Lima, 5 to 17 July	One fellowship for each Participating State	

6. ***IMPLEMENTATION PROGRAMME OF OPERATIONAL IMPROVEMENTS IN THE PROVISION OF AERONAUTICAL INFORMATION SERVICES***

Task	Result	Site and execution dates	Resources required	Observations
Supplement AIC Model for PBN implementation containing applicable standards and procedures, including corresponding contingency flights.	Supplement AIC Model developed	Lima, July-August	Mission of one ATM expert ATM for 2 weeks	
Amendment to regional documentation, particularly to Doc 7030	Amendment to Doc 7030 in PBN and ATFM matters prepared	Lima, July-August	Integrated to the above activity	
AIC supplement model for ATFM implementation	AIC ATFM supplement model developed	Lima, July-August	Integrated to the above activity	

7 ***OTHER ACTIVITIES***

Task	Result	Site and execution dates	Resources required	Observations
SAM Region Performance-Based Air Navigation Regional Implementation Plan	Draft performance-based implementation including all air navigation areas and metrics that enable the performance objectives achievement	Lima, September	Mission of 5 experts for 2 weeks each one, ATM, CNS, AGA, AIS and MET.	
Fifth SAM Implementation Workshop/Meeting (SAM/IG/5)	Assessment of material developed by Regional Project RLA/06/901 and follow-up of the work programme	Lima, 10 to 14 May	2 fellowships per participating State, 5 fellowships for non-participating States, simultaneous interpretation, translation of material	
Sixth SAM Implementation Workshop/Meeting (SAM/IG/6)	Assessment of material developed by Regional Project RLA/06/901 and follow-up of the work programme	Lima, 18 to 22 October	2 fellowships per Participating State, 5 fellowships for non-participating States, simultaneous interpretation, translation of material	

APPENDIX G

REGIONAL PROJECT RLA/06/901 ACTIVITIES PROGRAMME FOR TH EPERIOD JANUARY-MAY 2010

1. ***IMPLEMENTATION PROGRAMME OF EN-ROUTE PBN (RNAV 5)***

2. ***IMPLEMENTATION PROGRAMME OF TMA AND APPROACH PBN***

Task	Result	Site and implementation dates	Required resources	Observations
RNAV Approvals course	Provide information on aircraft and users approval for RNAV operations and train 20 experts of the South American Region.	Lima, 22-26 March 2010	2 fellowships per each participating State	Finalised
APV-BARO/VNAV procedures design Course	One expert for each participating State in the project(9 in total) trained in APV Baro/VNAV procedures approach	Lima, Perú, 6 to 16 April 2010	1 fellowship per each participating State	Finalised
First Workshop on SAM ATS Routes Optimisation (SAM ATS/RO/1)	Draft Version 01 of the SAM ATS Routes Network	Lima, Perú, from 1 to 5 March 2010.	2 fellowships per each participating State.	Finalised

3. ***IMPLEMENTATION PROGRAMME OF AIR TRAFFIC FLOW MANAGEMENT***

Task	Result	Site and implementation dates	Required resources	Observations
Air Traffic Flow Management Course (ATFM)	Provide knowledge on Air Traffic Flow Management Course and train 15 experts of the SAM Region	Río de Janeiro, Brazil, 22 -26 March 2010	2 fellowships per each participating State.	Finalised
First Workshop on Collaboration in Decision Making (CDM)	Provide knowledge on decision making process (CDM) and train 15 experts of the Region on this new concept. CDM Workshop carried out.	Río de Janeiro, Brazil, 29-30 March 2010.	2 fellowships per each participating State. Mission of a CDM expert for 3 days.	Finalised

Agenda Item 2: Optimisation of the ATS routes

Analysis of Version 01 of the SAM ATS routes network

2.1 The meeting noted the status of implementation of RNAV routes as approved by the First SAM Workshop on ATS Routes Network Optimisation (SAM ATSRO/1), as well as other routes that were reviewed and agreed to implement during bilateral or multilateral meetings.

2.2 **Appendix A** to this part of the report shows the updated list of routes in process that integrate Version 01 of the SAM ATS routes network, and comments, when required. It was agreed that the deadline to present the result of coordination of routes that are part of Version 01 of the SAM ATS routes network is the Second SAM Workshop on ATS Routes Network Optimisation (SAM ATSRO/2), scheduled to be held from 23 to 27 August 2010.

2.3 In this respect, the Meeting was of the opinion that as of SAM/IG/4 Meeting, RNAV routes should not be implemented independently, taking into consideration that the SAM Region ATS routes network optimization programme has as main objective to achieve an inter-functional air traffic management, available to all users during all flight phases, which complies with the agreed safety levels and provide economically optimum operations, be sustainable with regard to the environment, and meets national aviation safety requirements. In view of the above, States and users were requested to analyse new routes within the framework of such optimisation programme.

2.4 Also, the Meeting recalled that the SAM ATS routes network Optimization Programme should be applied in phases, in order to achieve the operational benefits as early as possible. The use of routes network versions shall enable to revise it in an integrated and periodical manner, so as to always ensure the best possible airspace structure.

2.5 Therefore, such programme shall be carried out in three different phases: Phase 1 – RNAV-5 Implementation; Phase 2 – Implementation of Version 01 of the ATS SAM Routes Network; and Phase 3 – Implementation of Version 02 of the ATS SAM Routes Network. As of phase 2, the concept of routes network versions would be incorporated, keeping in mind that the airspace structure is changing, as a function of air traffic movement growth, of the air traffic demand movement of a region or one airport to the other, of the available technology, among other aspects.

Implementation of the SAM ATS Routes Network that are part of Version 01

2.6 The revision and updating of Version 01 has the aim to initiate the implementation process and preparation of the corresponding proposal for amendment to CAR/SAM (Basic) Air Navigation Plan, ATS Table, made it evident that there is a need to establish dates as reference during the corresponding coordination and also to enable the harmonised preparation of aeronautical information publication considering the AIRAC Cycle. When it has so been established, these dates are shown in the Column “Remarks”.

2.7 Also, the meeting agreed that the routes that have not been included in Version 01, will be part of Version 01, to be dealt with during the Second SAM Workshop on ATS Routes Network Optimisation (SAM ATSRO/2).

2.8 The meeting agreed that the following routes be implemented in advance, since these routes have been coordinated for several years. In this connection, it was agreed that:

- UM661: Brazil should distribute publication on 03/06/10 and implement on 29/07/10.

- UM532 Segment Brasilia/Cuara: Brazil should distribute publication on 26/08/10 and implement on 21/10/10.

- UM403: Brazil/Paraguay distribute publication on 26/08/10 and implement on 23/09/10.

- Lima/Miami: be published on 23/09/10 and implemented on 18/11/10.

- UM 662 Guayaquil/Madrid: be published on 23/09/10 and implemented on 18/11/10.

- VOR Córdoba/Bitak/VOR Aldeia (UM400): be published on 23/09/10 and implemented on 18/11/10.

2.9 Also, and in order to initiate the amendment process to the Basic CAR/SAM ANP, States involved committed to complete the information related with significant points and geographical coordinates for 26 May 2010.

Methodology to follow for coordination purposes

2.10 Taking into consideration that coordination will be made as bilateral or multilateral among all administrations involved the use of e-mails to exchange information or other communication tools such as skype, or similar are recommended among focal points, listed as **Appendix B** to this part of the report.

2.11 **Appendix C** shows a model for proposal for amendment to the Air Navigation Plan to serve as guidance in the exchange of information during coordination.

2.12 The meeting also recommended to keep into account that the process to assign an ICAO five-letter name Code from the SAM 5LNC data bank, should be made once the definitive geographical coordinate from the significant or reporting point has been established. The Secretariat will provide the required support.

2.13 Also, it was considered appropriate to recall that every change to routes network produces the need to review, and if appropriate, update ATS operational agreements and ATS contingency plans.

ATS routes structure optimisation programme

2.14 The meeting reviewed the action plan associated to the SAM ATS routes network optimisation, which contemplates tasks in charge of defined responsible persons with dates of compliance established. **Appendix D** to this part of the report shows the revised version.

APPENDIX A

Analysis of the routes with air traffic movement below 30 monthly flights

ATS Route	States involved	Action	Remarks
UB554	Bolivia/Brazil/ Paraguay	Eliminate	Only segment FOZ-Cuiaba
UA308	Argentina/Brazil / Uruguay	Eliminate	Coincident with UN857
UA310	Brazil / Uruguay	Eliminate	Eliminate segment between VOR CRR and VOR SCB. Realign UM792 from VOR CGO/Melo to VOR SCB/Melo
UA314	Argentina/Brazil / Uruguay	Eliminate	Coincident with UN741 between Ezeiza and Bage and UN857. Contingency plan will be reviewed.
UA316	Brazil/Bolivia	Eliminate	Coincident with UL322. It is not necessary to maintain UA316. Addition of movements of two Routes (UA316 and UL322) was 31 flights
UB561	Argentina-Chile	Under analysis	Evalutate Contingency plan. Chile will confirm action to be taken.
UB652	Brazil/Bolivia	Eliminate	Segment Viru-Viru / Cuiaba is eliminated.
UB680	Brazil/Suriname	Under analysis	Maintain in Rochambeau FIR and re-align in Amazónica/Brasilia FIR. Requested to IATA, will evaluate the need for viability of realignment
UB695	Brazil/Paraguay	Eliminate	Replaced by Route SGAS /SBBR (UM403)
UG680/ UB449	Argentina/ Brazil/Uruguay	Eliminate	Route UG680 (VOR GUA/VOR BGE); Route UB 449 (VOR GUA/VOR MLO) will be eliminated when *Porto Alegre/Rosario is implemented (See Appendix B)*
UL309	Brazil	Eliminate	Brazil will eliminate the segment from SGC to ZORRO.
UM778	Venezuela	Eliminate	Low movement
UR558	Brazil	Eliminate	Coincident with UL309
UR563	Argentina/Brazil	Eliminate	Extend UL216 up to Porto Alegre

ATS Route	States involved	Action	Remarks
UT101	Argentina	Eliminate	Only one operator uses this route, there is a shorter route, used by Other Airlines.
UT102	Argentina	Eliminate	Low movement
UT653	Argentina	Eliminate	VOR segment Rosario-Marco Juarez VOR-PAMAL.
UT656	Argentina	Eliminate	Low movement
UT657	Argentina	Eliminate	Low movement
UW12	Brazil	Eliminate	Coincident with UZ24
UW16	Brazil	Eliminate	Low movement
UW17	Argentina	Eliminate	Low movement
UW22	Brazil	Eliminate	
UW36	Argentina	Eliminate	Low movement
UW42	Brazil	Eliminate	Direct Route UZ17 exists.
UW5	Brazil	Eliminate	Eliminate segment BHZ up to CAX. Coincident with UZ03
UW51	Brazil	Eliminate	In function of the arrival flow in TMA SP
UW52	Brazil	Eliminate	Coincident with UZ22
UW65	Argentina	Eliminate	Coincident with UL793
UW68	Argentina	Eliminate	Eliminate segment VOR SRA / VOR GPI
UW7	Venezuela	Eliminate	Low movement
UZ23	Brazil	Eliminate	Flight attended by Route UL304
UZ28	Brazil	Eliminate	New RNAV international route, from PCX to TIM.
UR560	Argentina	Eliminate	Low movement
UT651	Argentina	Eliminate	Low movement
UW19	Argentina	Eliminate	Low movement
UA568	Bolivia	Replace	JoinsTrinidad and La Paz: will be changed to national route
UW21G	Ecuador	Is maintained. Change to RNAV	Only Route Quito – Galápagos - Oceanic Route

ATS Route	States involved	Action	Remarks
UW2	Ecuador	Is maintained Change to RNAV	Route Guayaquil- Salinas- Galápagos - Oceanic Route
UG426	Panamá, Perú, Ecuador, Colombia	Change to RNAV; Realign; request to CAR Region	Not enough NAVAID coverage.
UR505	Panamá	Eliminate	Must be consulted previously with CAR Region.
UG434, UB510, UG426 and UA319	Panamá, Ecuador, Colombia	Change to RNAV Consult with CAR Region	There is no sufficient NAVAID coverage. Panama made a consultation with the CAR Region, reply is pending.
UV11, UV16, UV18 and UV20	Panamá	Eliminate	Will be only from the lower airspace
UG431.	Perú and Colombia	Segment Puerto Leguizamo VOR/ Girardot VOR is maintained.	Route UL305 too close.
UB677	Perú and Bolivia	Change to RNAV route segment LIM-EQU-La Paz	There is no sufficient NAVAID coverage
UT222	Perú	Eliminate segment EQU-KOMPA	
UG437	Perú, Ecuador, Colombia, Panamá	Eliminate segment LIM to TABOGA	Panama must establish SID/STAR with UL 780.
UG436	Ecuador/Perú	Realign and Change to RNAV	Route mostly oceanic
UA566	Perú and Ecuador	Change to RNAV	There is no sufficient NAVAID coverage
UA565	Perú, Colombia and Ecuador	Change to RNAV	There is no sufficient NAVAID coverage
UL474:	Panamá-Colombia	Eliminate	IATA will consult with operators.
UT652	Argentina	Realign	Segment ESITO/SOLER. A meeting will be carried out among aeronautical authorities and operators.

Version 01 of the SAM Routes Network

ATS Routes to Implement/Realign

Version 01 – Implementation/Realignment		
ATS Route	**States involved**	**Remarks**
Porto Alegre (SBPA) /Córdoba (SACO)	Argentina/Brazil/Uruguay	Route UA432 (VOR Córdoba and VOR Porto Alegre) is eliminated. Publication: 13/01/11. Implementation: 10/03/11.
Porto Alegre (SBPA) /Rosario (SAAR)	Argentina /Brazil/Uruguay	Routes UG680 (VOR GUA/VOR BGE) is eliminated and Route UB 449 (VOR GUA/VOR MLO) Publication: 13/01/11. Implementation: 10/03/11.
TMASP-TMASV	Brazil	Pending on the agreement to enter restricted airspaces
UM 784	Argentina/ Bolivia/ Brazil/ Colombia/ Panamá/ Perú	-Panamá/Iquitos/Reporting point LIMPO (Amazonica FIR) up to KILEB -KILEB/APARE (Bolivia) VOR SIS implemented Publication: 26/08/10. (Brazil) Implementation: 21/10/10 (Brazil).
Lima-Miami	Colombia, Ecuador, Panamá and Peru	Former proposal of IATA for the RNAV route SCEL – KMIA could not be implemented due to different difficulties: forbidden airspaces, insufficient communications and surveillance coverage. In order to optimise current alternatives, the following RNAV route is proposed: - LIM VOR, - BOKAN INT (FIR Guayaquil / FIR Bogotá boundary) - PML VOR (La Palma, FIR Panama) - UCA VOR (Ciego de Avila, FIR La Habana) - URSUS INT Publication: (23/09/10)2 AIRAC cycles. Implementation: 18/11/10.
UM530	Brazil	Implementation of route VOR RBC (FIR Amazónica / VOR BRS (FIR Brasilia) – proposal from Brazil. Route already implemented in La Paz FIR Publication: 13/01/11. Implementation: 10/03/11.

Version 01 – Implementation/Realignment		
ATS Route	**States involved**	**Remarks**
UM662	Colombia, Ecuador and Venezuela	Implementation of Route Guayaquil / Madrid Publication: 21/10/10. Implementation: 18/11/10.
UM661	Brazil	Route published in Montevideo FIR, pending from publication by Brazil. Publication: 03/06/10. Implementation: 29/07/10.
UM532	Brazil	Segment Brasilia/Cuara
UM402	Argentina, Paraguay and Uruguay	Extend route UM402 from VOR VAS up to VOR CRR. Due to operational problems FIR SIS: Publication: 13/01/11. Implementation: 10/03/11.
UM403	Brazil/Paraguay	Implementation route Asuncion/Brasilia Publication: 26/08/10. Implementation: 10/03/11.
VOR Córdoba/ BITAK/ NDB Aldeia VOR	Argentina, Brazil	Bidirectional route between VOR Córdoba and Resistencia and Curitiba FIR boundaries. Unidirectional route between Resistencia/Curitiba FIR boundaries and VOR Aldeia. Realignment of UL310 from CGO to Resistencia/Curitiba boundary. Publication: 21/10/10 Implementation: 18/11/10.
Segment VOR MCS/LUCIA	Argentina	Once safety is ensured: Publication: 20/10/11. Implementation: 17/11/11 Will be included in Version 02.
Segment KAMUV and VOR SNT	Argentina	Once safety is ensured: Publication: 20/10/11. Implementation: 17/11/11 Will be included in Version 02.
Segment TBG VOR / VOR TMC/ WPT a 80 NM al NNW de VOR SLS sobre the Route UV1/ SLS VOR	Colombia, Ecuador, Panamá and Peru	Publication: 13/01/11. Implementation: 10/03/11

Version 01 – Implementation/Realignment		
ATS Route	**States involved**	**Remarks**
UM654	Argentina/Brazil/Uruguay	Change direction from NDB BRU to VOR EZE. Once safety is ensured: Publication: 20/10/11. Implementation: 17/11/11 Will be included in Version 02
PORT OF SPAIN/BOA VISTA	Brazil/French Guyana/ Suriname/Venezuela	Publication: 13/01/11. Implementation: 10/03/11 (extension UM402)
KMIA/SBRF	Brazil/French Guyana/ Suriname/Trinidad & Tobago	Publication: 13/01/11. Implementation: 10/03/11
KMIA/SBSV	Brazil/French Guyana/ Suriname/Trinidad & Tobago	Publication: 13/01/11. Implementation: 10/03/11

APÉNDICE B / APPENDIX B

PUNTOS FOCALES PARA LA COORDINACIÓN DE OPTIMIZACIÓN DE RUTAS ATS					
Estado/State Organization	**Autoridad / Authority**		**Dirección / Address**	**E-mail**	**T / F**
	Area	**Nombre y título / Name and Title**			
Argentina	ATM|	**Walter Daniel Silva**	Administración Nacional de Aeronáutica Civil (ANAC) Departamento ATM	silvawd@yahoo.com	TF: +54114 4317 6502
Bolivia		César Varela Carvajal	DGAC Bolivia Dirección de Navegación Aérea	cvarela@dgac.gov.bo	T: +5912 2114465
Brasil		José Tristão Mariano	Departamento de Control de Tránsito Aéreo	pln1.5@decea.gov.br tristaocta@globo.com	
Chile	ATM	**Mariela Valdés Piña** Controlador de Tránsito Aéreo Especialista en Diseño de Procedimientos	Departamento de Aeródromos y Servicios Aeronáuticos, Subdepartamento de Tránsito Aéreo San Pablo 8381, Pudahuel Santiago, Chile	mvaldes@dgac.cl	T: +562 290 4714
Colombia		Rafael Rocha Rocha	Diseñador de Procedimientos de Vuelo Controlador de Tránsito Aéreo Dirección de los Servicios a la Navegación Aérea-Grupo Procedimientos ATM	rafael.rocha1@hotmail.com rrocha@aerocivil.gov.co	+571 266 2545 +571 266 2398
Ecuador		N/A			
Guyana		N/A			
Panamá	ATM	Lic. Flor Silvera	Jefa de Tránsito Aéreo	fsilvera@aeronautica.gob.pa	T: +507 501 9898 F: +507 501 9879
Paraguay		Tomás Alfredo Yentzch Irala Jefe Interino Depto de Gestión de Tránsito Aéreo		atm_gna@dinac.gov.py tayi68@gmail.com	TF: +595 21205365

PUNTOS FOCALES PARA LA COORDINACIÓN DE OPTIMIZACIÓN DE RUTAS ATS					
Estado/State Organization	**Autoridad / Authority**		**Dirección / Address**	**E-mail**	**T / F**
	Area	**Nombre y título / Name and Title**			
		Silvia Carolina Maciel Oviedo Gerente Interina de Normas de Navegación Aérea		gnnacm@dinac.gov.py scmoatm@gmail.com	TF: +595 21205365
Perú		Raymundo Hurtado Inspector de Navegación Aérea	Dirección General de Aeronáutica Civil Ministerio de Transportes y Comunicaciones Jr. Zorritos 1203 Lima 1, Perú	rhurtado@mtc.gob.pe	Tel: +511 615-7800, Anexo 1576 Fax: +511 615 7881
Suriname					
Uruguay	ATM	Roberto Arca	Centro de Control de Montevideo Aeropuerto de Carrasco, 1402 Montevideo, Uruguay	rlarca@adinet.com.uy	T: +5982 260 40251 Ext. 5109
Venezuela		N/A			
IATA		N/A			
ICAO		N/A			
ICAO		N/A			

APENDIX C

Example of the format to present a proposal for amendment to the CAR/SAM ANP (Basic)

Proposal for amendment to the CAR/SAM ANP - Volume I - Basic
Serial N° SAM XX - ATM

a) **Plan**: CAR/SAM Air Navigation Plan – Volume I - Basic
(Document 8733)

b) **Proposal for amendment:**

1. **Add,** as described below, the following routes: **UXxxx; UXxxx…**
(Cf – Doc. 8733, Volume I, Basic, Part V - Appendix A – Table ATS-1).

ESPACIO AÉREO SUPERIOR / UPPER AIRSPACE ***UX xxx***		
Punto Significativo Significant Point	**Latitud Latitude**	***LONGITUD*** **Longitude**
XXXXX	xx° xx' xx''S	0xx° xx' xx'' W
XXXXX	xx° xx' xx'' S	0xx° xxx' xx'' W
XXXXX	xx° xx' xx'' S	0xx° xx' xx'' W

2. **Realign,** as described, the following routes: **UXxxx, UXxxx, …**
(Cf – Doc. 8733, Volume I, Basic, Part V – Appendix A - Table ATS-1)

ESPACIO AÉREO SUPERIOR / UPPER AIRSPACE UX xxx		
Punto Significativo Significant Point	**Latitud Latitude**	**Longitud Longitude**
~~**XXXXX**~~	~~xx° xx' xx''S~~	~~0xx° xx' xx'' W~~
~~**XXXXX**~~	~~xx° xx' xx'' S~~	~~0xx° xxx' xx'' W~~
XXXXX	xx° xx' xx''S	0xx° xx' xx'' W
XXXXX	xx° xx' xx'' S	0xx° xxx' xx'' W
~~**XXXXX**~~	~~xx° xx' xx''S~~	~~0xx° xx' xx'' W~~

3. **Delete,** as described below, the requirement of routes **UXxxx** in all its extension.

(Cf – Doc. 8733, Volume I, Basic, Part V – Appendix A - Table ATS-1)

ESPACIO AÉREO SUPERIOR / UPPER AIRSPACE UX xxx		
Punto Significativo Significant Point	**Latitud Latitude**	**Longitud Longitude**
~~xxxxx~~	~~xx° xx' xx''S~~	~~0xx° xx' xx'' W~~
~~XXXXX~~	~~xx° xx' xx'' S~~	~~0xx° xxx' xx'' W~~
~~XXXXX~~	~~xx° xx' xx''S~~	~~0xx° xx' xx'' W~~
~~XXXXX~~	~~xx° xx' xx'' S~~	~~0xx° xxx' xx'' W~~
~~XXXXX~~	~~xx° xx' xx''S~~	~~0xx° xx' xx'' W~~

c) **Originated by**: (States, Territories, International Organizations).

d) **Originators' reasons for the amendment:**

1) Within the framework of ATM evolution, as approved by the Third Regional Air Navigation Meeting (CAR/SAM/3 RAN) for CAR/SAM Regions, States and International Organizations originating this proposal, according to users, have considered that these routes shall improve air navigation in the SAM Regions.

2) During the..(*SAM/IG meeting*).., the implementation of routes **UXxxx; UXxxx; …**was agreed to. Realign routes **UXxxx, UXxxx,….** Eliminate the requirement of route **UXxxx** ... in all its extension.

3) All of them are part of the CAR/SAM ANP ATS routes network, Volume I, Basic. The implementation of the new routes and changes made to the aforementioned trajectories, shall enable a reduction of distance and flight time, with the consequent fuel saving and operational costs.

e) **Proposed date for implementation**

At least three AIRAC cycles after the proposal has been approved by ICAO Council, in accordance with specific implementation programmes established to this effect in coordination with the States/Territories/International Organizations.

f) **Proposal circulated to the following States/Territories and Organizations**:

Anguilla (UK)
Antigua and Barbuda
Argentina*****
Aruba (Netherlands)
Bahamas
Barbados
Belize
Bermuda (UK)
Bolivia*****
Brazil*****
British Virgin Islands (UK)
Canada
Cayman Islands (UK)
Chile*
Colombia*****
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador*
El Salvador
France
French Antilles (France)
French Guiana (France)
Germany
Grenada
Guatemala
Guyana*
Haiti
Honduras
Italy
Jamaica
Mexico
Montserrat
Netherlands Antilles (Netherlands)
Netherlands
Nicaragua
Panama
Paraguay*
Peru*
Puerto Rico (USA)
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Spain
Suriname*
Trinidad and Tobago
Turks and Caicos Islands (UK)
United Kingdom
United States
Uruguay*
Venezuela*
Virgin Islands (USA)

International Organizations
COCESNA
IATA*
IFALPA

g) **Secretariat's comments**:

1) The Third Meeting of the South American Region Implementation Group (SAM/IG/3) carried out in Lima, from 20 to 24 April 2009 under the auspices of Regional Project RLA/06/901, taking into the result of the 36th General Assembly of ICAO and the ALLPIRG / 5 Meeting through Conclusion SAM/IG/3-1, it was approved that ICAO SAM States take the pertinent actions to follow-up guidelines and comply with established deadlines in the ATS Routes Network Optimization Programme for the South American Region which will enable a wider use of such routes, thus larger number of airspace users of the mentioned airspace.

2) The trajectories have been configured keeping in mind the need for fuel saving and the economy of operations. The main goal of this optimization programme is to maximize the efficient use of the airspace, in order to achieve an inter-functional air traffic management system, at disposal of all users during all flight phases, complying with safety levels agreed, providing economically optimum operations, being sustainable with regard to the environment and meeting national aviation security requirements.

3) This amendment has been carried out attending the Strategic Objectives: C-Environment Protection and D-Efficiency.

APPENDIX D

PROGRAMME FOR OPTIMISING THE ATS ROUTE NETWORK IN THE SOUTH AMERICAN REGION (GPIs 1, 5, 7, 8, 10, 11)

Activity	Start	End	Responsible party	Observations
1. **Phase One – RNAV-5 Implementation**				
1.1. RNAV-5 implementation in the SAM Region	**Apr 2008**	**Nov 2010**	**Regional Project RLA/06/901**	The implementation will be carried out according to the Implementation Programme approved at the SAM/IG/2 meeting
2. **Phase Two – Implementation of Version 01 of the SAM ATS Route Network**				
Activity	**Start**	**End**	**Responsible party**	**Observations**
2.1. Conduct a Feasibility Study for Optimising the SAM Route Network	March 2009	Apr 2009	Regional Project RLA/06/901	**Completed**
2.2. Airspace Concept				
2.2.1 Collect traffic data to understand air traffic flows	June 2008	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901) States	**Completed** Task 1.2 o RNAV5 implementation project. The Secretariat will send a request to States for data collection using Attachment 2 of Appendix A in Excel format.
2.2.2 Analyse the fleet navigation capacity	June 2008	SAM/IG/4	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States-IATA	**Completed** Task 1.3 of RNAV-5 Implementation Project
2.2.3 Determine the gateways of the main TMAs in the SAM Region	SAM/IG/3	SAM/IG/4	States	**Completed**

Activity	Start	End	Responsible party	Observations
2.2.4 Determine and obtain the necessary tools to make the studies related with the ATS routes network (aeronautical charts, specific software)	SAM/IG/3	SAM/IG/5	SAM/PBN/IG (Project RLA/06/901)	Flight Star.(Verify if the acquisition of another software is necessary)
2.2.5 Make a detailed study of the SAM ATS route network, with a view to preparing version 1 of the route network, including the following: • Indicate the domestic and international ATS routes that should be eliminated, in accordance with their use; • Indicate the "conventional" RNAV routes that should be eliminated or replaced by RNAV routes in the exclusionary RNAV-5 airspace. • Indicate the RNAV routes that should be realigned, in accordance with the gateways of the main SAM TMAs (see 2.2.3). • Describe in detail the proposed new SAM route network, based on the analysis of the aforementioned items.	SAM/IG/4	March 2010 Completed Completed Completed Version 1 Completed Version 1	SAM/PBN/IG (Project RLA/06/901)	This task requires the hiring of three experts to develop the study. This requirement will be presented to RCC Meeting of RLA/06/901. 3 persons for a period of three weeks. IATA and operators would be invited to select one person to assist in the development of this task.
2.2.6 Detail the interphase between the SAM routes network and the CAR routes network		Completed		
2.2.7 Propose initial draft proposal for amendment to the CAR/SAM ANP		Valid		
2.2.8 Prepare safety assessment required, applying a qualitative methodology through the use of SMS	April 2010	October 2010	Project RLA/06/901	**Valid** 1 person for 3 weeks. One 5-day meeting in August 2010.

Activity	Start	End	Responsible party	Observations
2.2.9 Hold the Workshop of Experts from the SAM States to review and validate the study made under item 2.2.5 and 2.2.6.	SAM/IG/5	June 2010	SAM/PBN/IG (Project RLA/06/901) States	**Completed** The First Workshop was carried out from 1 to 5 March 2010, in Lima, Peru.
2.2.10 Carry out the second workshop of SAM States experts, in order to review and validate the study of item 2.2.5 and 2.2.6	SAM/IG/5	August 2010	Regional Project RLA/06/901	**Valid** The Second Workshop will be carried out from 23 to 27 August 2010, in Lima, Peru.
2.2.11 Update LOAs among involved ACCs	SAM/IG/5	November 2010		**Valid**
2.3 Implementation of Version 1 of the SAM ATS Route Network				
2.3.1 Process the proposal of amendment to the CAR/SAM Air Navigation Plan	September 2010		SAM Regional Office	**Valid** Shall depend on the decisions to be adopted by the second routes workshop
2.3.2 Present proposal for amendment				
2.3.3 Publish version 1 of the SAM ATS Route Network	November 2010		States ICAO ANP	**Valid** Shall depend on the decisions adopted in the Second ATS routes workshop
2.3.4 Entry into effect of version 1 of the SAM ATS Route Network	The dates will be defined during the second ATSRO Workshop		States	**Valid**

Activity	Start	End	Responsible party	Observations
3. **Phase Three – Implementation of Version 2 of the SAM ATS Route Network**				
Activity	**Start**	**End**	**Responsible party**	**Observations**
3.1. **Flexible Use of Airspace**				
3.1.1. Develop guidance material for the application of the Flexible Use of Airspace concept, including: • Model for using non-permanent routes similar to that applied in EUROCONTROL (Conditional Routes – CDR). • Criterion for defining scenarios in which non-permanent routes are applied • Criterion for categorising non-permanent routes • Harmonised publication of non-permanent routes • Representation of non-permanent routes in aeronautical charts	SAM/IG/5	SAM/IG/6	SAM/PBN/IG (Project RLA/06/901)	
3.1.2. Establish the Civil-Military Coordination Committee to evaluate application of the Flexible Use of Airspace concept mentioned in 3.1.1.	SAM/IG/6	SAM/IG/7	States	The Civil/Military Committees should be implemented in those States which have not done so. Plan Civil/Military Meeting/Workshop in 2011.
3.1.3. Develop proposals for route implementation and/or realignment, in keeping with the utilisation of FUA	SAM/IG/6	SAM/IG/7	States	See 3.1.2
3.2. **Airspace Concept**				
3.2.1. Collect traffic data to understand air traffic flows	SAM/IG/6	SAM/IG/7	SAM/PBN/IG (Project RLA/06/901) States	

Activity	Start	End	Responsible party	Observations
3.2.2. Analyse the fleet navigation capacity	SAM/IG/6	SAM/IG/7	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States IATA	
3.2.3. Determine the gateways of the main TMAs in the SAM Region	SAM/IG/6	SAM/IG/7	States	
3.2.4. Determine the necessary tools for making the study mentioned in item 3.2.5 (aeronautical charts, specific software)	SAM/IG/6	SAM/IG/7	SAM/PBN/IG (Project RLA/06/901)	
3.2.5. Make a detailed study of the SAM ATS route network with a view to developing version 2 of the route network, including: • Definition of scenarios for the SAM airspace structure, including ATS routes, control sectors, TMA interface, for assessment using airspace modelling and fast-time ATC simulation tools. • Indicate the ATS routes that should be eliminated in accordance with their utilisation; • Propose, if necessary, the extent of exclusionary airspace volume for RNAV-5 application • Indicate, as necessary, the “conventional” ATS routes that should be eliminated or replaced by RNAV routes in accordance with the possible extension of the exclusive RNAV-5 airspace volume. • Indicate the RNAV routes that should be realigned in keeping with possible modifications to the gateways of the main TMAs in the SAM Region. • Detail possible scenarios for version 2 of the SAM route network and of control sectors,	SAM/IG/7	June 2011	SAM/PBN/IG (Project RLA/06/901)	

Activity	Start	End	Responsible party	Observations
based on the analysis of the previous items • Detail the interface between the SAM route network and the CAR route network • Propose the initial draft Proposal of Amendment to the CAR/SAM ANP.				
3.2.6. Prepare a safety assessment and routes spacing	SAM/IG/7	July 2011	CARSAMMA	Quantitative assessment in order to determine spacing between routes to be applied in item 3.2.5
3.2.7. Make Airspace Modelling and Fast-Time Simulation studies to assess the scenarios developed in 3.2.5	August 2011	SAM/IG/9		
3.2.8. Hold the Workshop of Experts from the SAM States to review and validate the studies made in items 3.2.5, 3.2.6, and 3.2.7.	SAM/IG/9	June 2012	Project RLA/06/901 States	
3.3. **Implementation of Version 2 of the SAM ATS Route Network**				
3.3.1. Process the proposal of amendment to the CAR/SAM Air Navigation Plan	TBD		SAM Regional Office	
3.3.2. Publish version 1 of the SAM ATS Route Network	TBD		States	
3.3.3. Entry into effect of version 2 of the SAM ATS Route Network	TBD			

Agenda Item 3: Implementation of performance-based navigation (PBN) in the SAM Region

En-Route PBN Action Plan (RNAV5)

3.1 The SAM/IG meetings reviewed in due course the SAM short-term en-route PBN Implementation Project and the associated regional en-route PBN Action Plan, introducing the changes that the meeting deemed advisable, establishing the responsible parties and start/end dates for the different activities were established, and the action plan was adopted as guidance for the States.

3.2 As a follow-up on the status of compliance of the tasks assigned to each one of the responsible parties designated by the Implementation Group, the Meeting reassessed the PBN Action Plan, and, as a result, made the following comments on pending tasks:

Task 1.3 Analyse the navigation capability of the aircraft fleet

3.3 According to the information obtained during the SAMIG/4, 95% of the fleet of the SAM Region is susceptible of being approved for RNAV 5 operations. According to Conclusion SAMIG/4-3, the States must continue making efforts to complete the corresponding database.

Task 1.4 Analyse the means of communication, navigation (VOR, DME) and surveillance on the ground to meet the navigation specifications and the navigation reversal mode

3.4 The Meeting was presented with the results of the work on the coverage of VOR/DME radio aids at FL 250 in the SAM Region. The Meeting considered that the work must be supplemented in order to determine whether radio aid coverage and geometry are adequate for RNAV-5 operation, identifying those airspaces that lacked the appropriate coverage or geometry for this type of operation. The Secretariat was requested to take relevant measures so that Regional Project RLA/06/901 could carry out this task by 31 July 2010. Any restrictions caused by the lack of coverage could be reflected in the AIP Supplement, aeronautical charts and/or Doc. 7030. The Meeting also requested the Secretariat that the results of these activities be approved through the fast-track procedure used by GREPECAS.

Task 2.1 Conduct the safety assessment applying a qualitative methodology using the SMS

3.5 Project RLA/06/901 will carry out the safety assessment process through a meeting/workshop and the mission of a risk assessment expert.

Task 5.2 Publish the national regulations for the implementation of the RNAV-5 navigation specification.

3.6 The Meeting noted that 5 States of the Region already published the regulations, 3 States informed that this task was in execution and there is no information available from 6 States..

Task 5.3 Start the approval of aircraft and operators

3.7 The Meeting expressed its concern for the few operators that had applied for approval. The Meeting also considered that operators should be encouraged to start this process. One State expressed that its concern was mainly oriented to commercial operators up to 19 passengers (135). As per information received, 2 States have initiated the process for approval, 2 States have not done so yet, and 4 States are in execution process. There is no information available from 6 States.

Task 5.4 Establish and keep up to date a record of approved aircraft and operators

3.8 The OPS/AIR Group analysed a form to be used by the States to send information to the regional monitoring agency. In this respect, it was recalled that, according to Conclusion GREPECAS 11/22, CARSAMMA would be responsible for creating a database with this information. The Secretariat was requested to check with CARSAMMA if the regional agency could prepare a SAM database in the first instance. Likewise, the Meeting asked that the aforementioned form be reviewed by CARSAMMA to determine if the information contained therein is appropriate for creating the database.

3.9 The Meeting discussed the objectives sought with the database of approved aircraft and operators. It agreed that the first objective would be to take note of the percentage of operations approved for RNAV-5 operations so that SAM/IG/6 could make the decision to continue or not with the implementation of RNAV-5, and the second one would be to ensure that aircraft operating in PBN airspace are really approved. It also considered that, if the idea was to extend this database it in order to obtain information on aircraft approvals in other regions, it could generate a significant workload. Accordingly, the Secretariat was requested to assess and coordinate this matter with ICAO Headquarters.

Task 6.5 Develop an AIP Supplement model containing applicable standards and procedures, including the corresponding flight contingencies

3.10 Project RLA/06/901 will carry out this task through the mission of an expert on this matter. Consideration should be given to the harmonisation of procedures with a view to ensuring that aircraft not approved for RNAV 5 use only the conventional routes that will be maintained in the regional ATS route network. The resulting AIP Supplement Model will be sent to States for knowledge, through the GREPECAS Fast Track Mechanism.

Task 6.6 Publish an AIP Supplement containing applicable standards and procedures, including the corresponding flight contingencies

Task 6.9 Amend the regional documentation if necessary

3.11 Project RLA/06/901 will carry out this task through the mission of an expert on this matter

Task 7.2 Develop a training and documentation programme for air traffic controllers and AIS operators

3.12 The Meeting recalled that Document 9613, *Manual on Performance-Based Navigation* states that the introduction of PBN may entail a considerable investment in terms of training, education and material for pilots and air traffic controllers. Some States have effectively used computer-based training packages. ICAO has also provided training and conducted seminars on PBN. Likewise, Doc. 9613, in each navigation specification, lists the most relevant aspects that must be provided to pilots and controllers.

3.13 The meeting analysed the proposal presented by the Secretariat and considered that it required some changes, since the material presented exceeded the training that should be provided to ATCOs and AIS personnel. In this connection, after a fruitful exchange of opinions, the meeting approved the material shown in **Appendix A** to this part of the report, which would contemplate what is required for aforementioned personnel training, which would permit a safe implementation of performance-based navigation. In this connection, the Meeting approved the following conclusion:

Conclusion SAM/IG/5-1 Training programme and documentation for air traffic controllers and AIS operators

That SAM States use the material shown in **Appendix A** to this part of the report as guidance material for air traffic controllers and AIS operators.

Task 7.5 Conduct seminars for operators, indicating plans and the expected operational and economic benefits

3.14 Taking into account the few operators that had applied for RNAV-5 approval and the need to encourage them to start this process, aeronautical authorities were urged again to carry out events in which the operators were informed about the approval processes. Accordingly, the Meeting formulated the following conclusion:

Conclusion SAMIG/5-2 PBN/RNAV5 seminars for operators

That SAM States, in view of the few operators that have requested the approval, and the need to encourage them to start this process, conduct PBN seminars in which operators are informed about the corresponding approval procedures.

8.2 Assess the percentage of operations approved for RNAV-5 (non-exclusionary airspace)

3.15 In order to complete this task at the SAM/IG/6 meeting, it will be necessary to compare the database of approvals with a new traffic data collection between 1 and 15 July 2010. This information shall be sent to the ICAO Regional Office before 13 August 2010. This sample would also serve to analyse aspects related to the optimisation of the ATS route network and to make a safety assessment in RVSM airspace. In this regard, the Meeting approved the following conclusion:

Conclusion SAMIG/5-3 Data Collection

That:

a) SAM States collect data on flights conducted on domestic and international routes in the upper airspace (FL 245 or above) of the SAM Region during the period 1 to 15 July 2010, and send them to the SAM Regional Office before 13 August 2010; and

b) That the sample be consistent with the form and the guidelines for completing the form described in **Appendix B** to this part of the Report, using the Excel format.

Task 9.1 Develop a post-implementation monitoring programme for en-route operations

3.16 Regional Project RLA/06/901 will carry out this task through the mission of an expert on this matter.

3.17 The updated En-route PBN Action Plan (RNAV5) is shown as **Appendix C** to this part of the report.

Continuous Descent Operations (CDO) Manual (Doc 9931)

3.18 The meeting was informed through a presentation by ICAO Secretariat that Continuous Descent Operations (CDO) manual that provides guidance on the development and implementation on the airspace design, instrument flight procedures, ATC facilitation and flight techniques necessary to enable Continuous Descent (CD) profiles. It therefore provides background and implementation guidance for:

a) Airspace and procedure designers;

b) Air traffic managers and controllers;

c) Service providers (Airports and Air Navigation Service Providers (ANSP)); and

d) Pilots.

3.19 Key objectives of the manual are to improve the:

a) Overall management of traffic and airspace in order to enable uninterrupted continuous descents, without disrupting departures;
b) Understanding of continuous descent procedures and profiles;
c) Harmonization and standardization of associated terminology.

3.20 The meeting noted that continuous descent is one of several tools available to aircraft operators and ANSPs to increase safety, flight predictability, and airspace capacity, while reducing noise, ATC/Pilot communications, fuel burn and the emission of greenhouse gases. Over the years, different route models have been developed to facilitate CDs and several attempts have been made to strike a balance between the ideal of environmentally friendly procedures and the requirements of a specific airport or airspace.

3.21 Likewise, IATA supported the implementation of these procedures, emphasising the benefits to be derived by the operators. The information presented by IATA appears in **Appendix D** to this part of the Report.

3.22 The meeting was of the opinion that for ease of reference, part of the material presented should be incorporated, as expected with CDO implementation, the relationship between airspace design and procedures with this type of operations, as well as the document content, as **Appendix E** to this part of the report. Also, the document may be accessed through the ICAO website in the intranet site.

3.23 The meeting was also of the opinion that, in light of the completion of the ICAO CDO manual which will standardize and harmonize the development and implementation of CD operations, States are encouraged to consult the CDO Manual during their STAR implementations. Recognizing the efficiency, environmental and other benefits of Continuous Descent operations, and the need to harmonize these operations in the interest of safety, the meeting is invited to adopt the following conclusion:

Conclusion SAM/IG/5-4 Implementation of Continuous Descent Operations

That, recognizing the efficiency and environmental benefits of Continuous Descent operations, and the need to harmonize these operations in the interest of safety, States are encouraged to include the implementation of Continuous Descent operations (CDO) as part of their PBN implementation plans and to implement CDO in accordance with the ICAO CDO Manual.

Proposal to review Documents 8168 and 9613 as regards DME limitation

3.24 The meeting analysed a study presented by a State of the Region proposing a revision to ICAO Documents 8168 and 9613 as regards DME limitation in elevation angle above 40° and in inclusion angle below 30° and above 150°.

3.25 The meeting thanked the proposal presented, but in view of the specific nature of the matter proposed, it was deemed pertinent that the Secretariat sends such documents to the experts groups and ICAO panels to analyse this proposal within this environment. The proposal is included as **Appendix F** to this part of the Report.

Progress made in the National Performance-Based Navigation (PBN) Plan in the Asunción FIR

3.26 Paraguay informed on the progress made in the short- and mid-term planning and implementation, as established in the National PBN Plan for the Asuncion FIR. This planning includes aspects such as training, infrastructure, regulations, and the implementation *per se*.

3.27 Jeppesen presented detailed information about the viewpoint of the industry regarding the need for e-TOD information. The Meeting acknowledged the information presented and agreed that it would be advisable to include it as **Appendix G**[1] to this part of the Report.

[1] Appendix G corresponds to IP/10 presented by Jeppesen

APPENDIX A

Basic Performance-Based Navigation (PBN) Training Programme for Air Traffic Controllers

Introduction

Document 9613, Manual on Performance-Based Navigation, states that PBN introduction can entail a significant investment in terms of training, education, and material for pilots and air traffic controllers. Some States have effectively used computer-based training packages. ICAO has also provided training and conducted seminars on PBN. Likewise, Doc. 9613, in each navigation specification, lists the most relevant aspects that must be provided to pilots and controllers.

Objective of the course

The objective of the PBN course is to provide air traffic controllers with sufficient knowledge on the PBN concept to permit a safe implementation of performance-based navigation.

Tentative programme

Initially, the training programme for air traffic controllers (ATCOs) must not be to too extensive, preferably focusing on the application of PBN knowledge, and should not last more than one or two days, depending on the requirements of each State. The ATSP and the States concerned shall define the modules to be presented to the ATCOs.

The basic PBN course for ATCOs could contain the following:

Contents of the basic performance-based performance (PBN) course		
Topics	**Reference**	**Comments**
Performance-based navigation (PBN) concepts	Doc 9613 Vol. I, Part A, Ch 1, Ch 2	Basic concepts of performance-based navigation and its main components (RNAV and RNP).
Benefits derived from the use of PBN	Doc. 9613, Part A, Ch 3	
Safety considerations	Doc. 9613, Vol. II, Part A, Ch 3	
GPS receivers and RAIM integrity concept, RAIM alerts, FDE		Explain basic functions. See advisory circulars for the approval of aircraft and operators and the respective courses in the SAM Regions
Precision, integrity, availability, and continuity	Doc. 9613	
Basic concept on requirements for airworthiness and RNAV/RNP approval	SAM/IG/4 report	Courses on approval conducted in the SAM Region

Contents of the basic performance-based performance (PBN) course		
Topics	**Reference**	**Comments**
Flight plan requirements	Amendment 1 Doc. 4444 FPL	Particularly as regards PBN. Boxes 10 and 18 of the flight plan. SAMIG/4 and CNS/ATM/SG/1 regional strategy
ATC procedures, including contingency procedures	Doc 4444	Particularly actions to be adopted in case of loss of surveillance signals, DME, etc.
Route spacing , and Separation minima	Annex 11	Emphasize that RNAV5 implementation in this instance does not modify airspace structure.
Exclusionary Mixed airspaces environment (exemptions for State aviation)	PBN Roadmap	
STAR and SID RNAV procedures in terminal area	Doc 8168	Explanation of procedure leg types, like, for instance, entry to holding patterns for basic RNAV1 and 2 procedures.
Interpretation of aeronautical charts	AIPs	
Behaviour of aircraft in applying fly over fly as well as path terminators, ARINC 424	ARINC 424	SAM procedure design course
Phraseology	Doc 4444	

States should evaluate if ATCOs require practices in a simulator containing exercises for en-route, terminal, and approach operations using RNAV/RNP, including emergency management and contingency procedures, depending on the complexity of the change made.

APPENDIX B

DATA COLLECTION OF FLIGHTS CARRIED OUT IN THE SAM REGION UPPER AIRSPACE (FL 245 - UNL)

MANDATORY FIELDS													CONDITIONAL FIELDS						
FIR IDENTIFICATION:													PROGRESSING IN UPPERAIRSPACE						
DATE	AICRAFT CALL SIGN	REGISTRATION NUMBER	AIRCRAFT TYPE	ORIGIN AERODROME	DESTINATION AERODROME	ENTRY FIX INTO UPPER AIRSPACE	TIME AT ENTRY FIX	FL AT ENTRY FIX	AIRWAY AT ENTRY FIX	EXIT FIX FROM UPPER AIRSPACE	TIME AT EXIT FIX	FL AT EXIT FIX	FIX 1	TIME AT FIX 1	FL AT FIX 1	FIX 2	TIME AT FIX 2	FL AT FIX 2	CONTINUE TO DESCRIBE EVERY CHANGE OCCURRED

INSTRUCTIONS FOR FULFILLMENT OF TEMPLATE

1 - Introduction

This guidance is to standardize the fulfillment of data collection template, aiming to obtain an air traffic movement on upper airspace (from FL245 to UNL)
"EXCEL" electronic form should be used and all events (air traffic movements) of every day of whole requested period should be shown in chronological sequence in only one form without any interposed blank line or heading.
The fulfillment of all fields is mandatory, except the fields contained in the entitled interval "Optional Fields" that should only be filled out if there is any change of flight level and/or airway.
Examples:

MANDATORY FIELDS												OPTIONAL FIELDS							
FIR IDENTIFICATION:												PROGRESSING IN UPPERAIRSPACE							
DATE	AIRCRAFT CALL SIGN	AIRCRAFT TYPE	ORIGIN AERODROME	DESTINATION AERODROME	ENTRY FIX INTO UPPER AIRSPACE	TIME AT ENTRY FIX	FL AT ENTRY FIX	AIRWAY AT ENTRY FIX	EXIT FIX FROM UPPER AIRSPACE	TIME AT EXIT FIX	FL AT EXIT FIX	FIX 1	TIME AT FIX 1	FL AT FIX 1	FIX 2	TIME AT FIX 2	FL AT FIX 2	CONTINUE IF NECESSARY	
01/09/03	PTLPN	C550	SBBH	SBBR	VURKI	12:20	250	UW12	IMEDI	12:29	310								annex: example 1
01/09/03	GLO1713	B737	SBRF	SBGL	NUQ	19:30	390	UW60	PONGA	20:12	390								annex: example 2
01/09/03	ARG1303	B747	KMIA	SAEZ	ELAKA	9:45	370	UT410/UA30	ISOPO	10:47	370	CERES	10:40	370					annex: example 4
02/09/03	TAM8097	A332	LFPG	SBGR	KAKUD	7:29	390	UG741	MENDS	8:33	390	MCL	7:35	390					
...	...	...	...	...	...	...	...	...	...	...	...								
...	....	...	...	...	...	...	...	...	...	...	...								
18/09/03	IBE6824	A340	SBGR	LEMD	BGC	20:06	290	UW13	RIGEL	21:10	370	COTON	20:40	330	CNF	20:54	370		annex: example 4
...	...	...	...	...	...	...	...	...	...	...	...								
...	...	...	...	...	...	...	...	...	...	...	...								
30/09/03	PTSAC	E135	SBCG	SBEG	TOSAR	10:57	350	UW28	RAPAT	11:41	390								annex: example 3

Data Sample should describe daily air traffic movement between FL245 and UNL in the period requested, by FIR and in all FIR routes

2 - Mandatory Fields

• Line 18: FIR Identification

It shall be filled out according to ICAO designators contained in Doc. 7910.
Examples: SBBS, SLLF, SAEU.

- **Column A: Date**

  It shall be filled just with numeric characters in the following way : dd/mm/yy
  Examples: February 01, 2003 enter 01/02/03.

- **Column B: Aircraft Call Sign**

  It shall be filled with seven alphanumeric characters at most, with no blank space or hyphen.
  Examples: AAL906, PTLCN, VRG8764.

- **Column C: Aircraft Type**

  It shall be filled out according to ICAO designators contained in Doc. 8643.
  Examples: for Airbus A320-211 enter A320;
  for Boeing B747-438 enter B744.

- **Column D: Origin Aerodrome**

  It shall be filled out according to ICAO designators contained in Doc. 7910.
  Examples: SBGR, SCEL, SAEZ.

- **Column E: Destination Aerodrome**

  It shall be filled out according to ICAO designators contained in Doc. 7910.
  Examples: SKBO, MPTO, SEQU.

- **Column F: Entry Fix into Upper Airspace**

  It shall be filled with five alphabetical characters at most, according to the name of the fix of entrance in corresponding airspace.
  Examples: UGADI, ILURI, BAQ
  RMK: For flights climbing into the upper airspace, without crossing FIR boundary, the entry fix will be the fix before the first fix that the aircraft pass leveled.

- **Column G: Time at Entry Fix**

  It shall be filled with numeric characters in the following way: hh:mm
  Examples: for 01 hour and 09 minutes enter 01:09;
  for 12 hours and 23 minutes enter 12:23.

- **Column H: Flight Level at Entry Fix**

  It shall be filled with three numeric characters corresponding to the flight level at entry fix of upper airspace.
  Examples: for FL250 enter 250; for FL310 enter 310.

• Column I: Airway at Entry Fix

It shall be filled with five alphanumeric characters at most, without space or hyphen.
Examples: UA301; UB689; UW20; UW7.
RMK: When aircraft change airway during the flight in upper airspace, the new airway must be reported after the first one separated by the character "/ ".
Example: UL302/UW650.

• Column J: Exit Fix from upper Airspace

It shall be filled with five alphabetic characters at most, according to the name of the fix of exit from corresponding airspace.
RMK: This fix will normally be the FIR limit, or the last one crossed by aircraft while in leveled flight.
Examples: INTOL, NIKON, CARPA

• Column K: Time at Exit Fix

It shall be filled with numeric characters in the following way: hh:mm
Examples: for 08 hours and 07 minutes enter 08:07;
for 00 hour and 48 minutes enter 00:48.

• Column L: Flight Level at Exit Fix

It shall be filled with three numeric characters, corresponding to the flight level at exit fix of upper airspace.
Examples: for FL330 enter 330; for FL350 enter 350.

3 – Optional Fields (“Progressing of the flight in Airspace”)

• Column M: Fix 1

It shall be filled with five alphabetical characters at most, according to the name of fix where flight level and/or airways changes have been made.
Note: This fix will be the last one the aircraft has crossed in leveled flight.
Examples: BAQ, KUBEK

• Column N: Time at Fix 1

It shall be filled with numeric characters in the following way: hh:mm.
Examples: for 10 hours and 05 minutes enter 10:05;
for 12 hours and 23 minutes enter 12:23.

• **Column P: Flight Level at Fix 1**

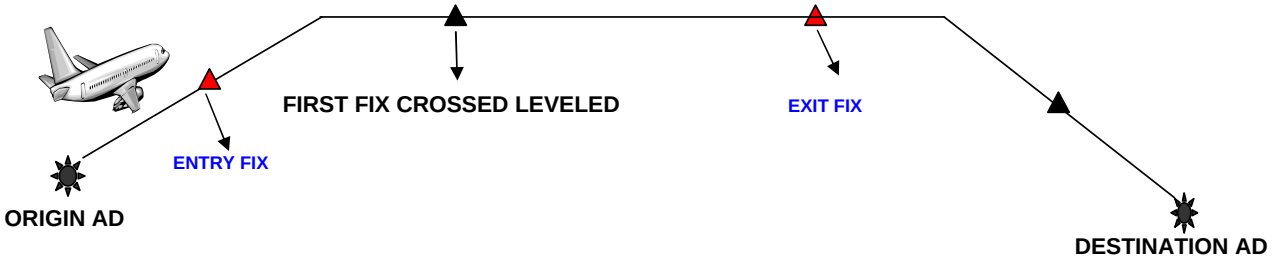
It shall be filled with three numeric characters corresponding to the flight level in the fix 1.

Examples: for FL370 enter 370;
for FL410 enter 410.

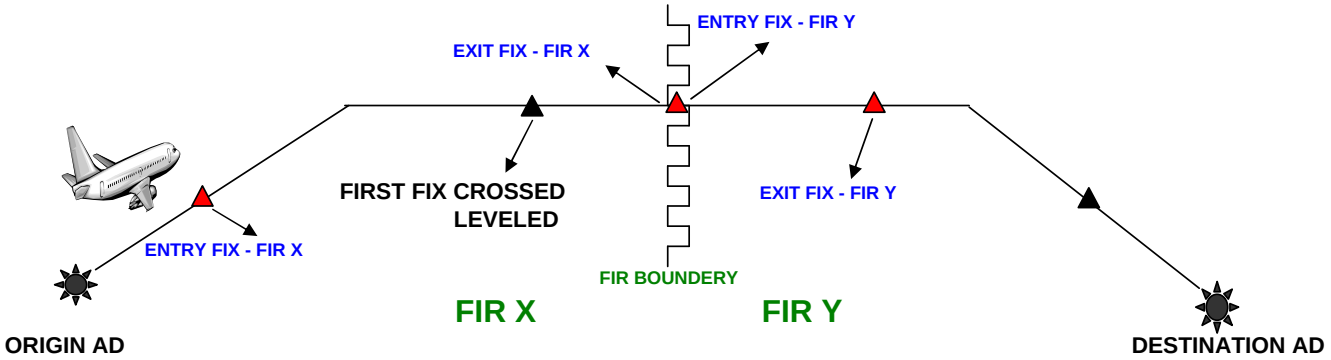
Note: Fill out "Fix/Time/Flight-Level" fields as many as they are required to describe every change occurred.

ANNEX

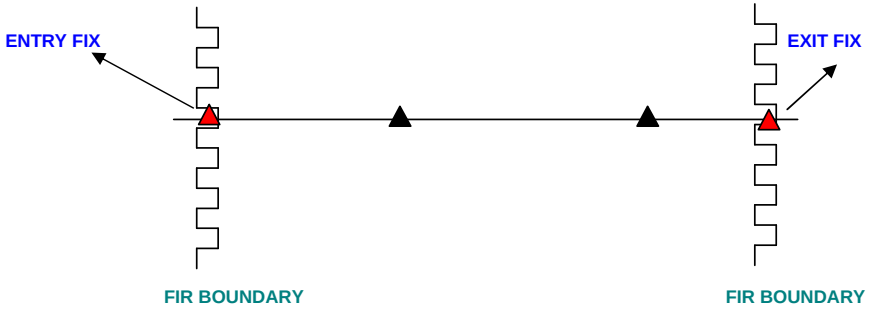
Example 1: Flight with origin and destination in the same FIR.



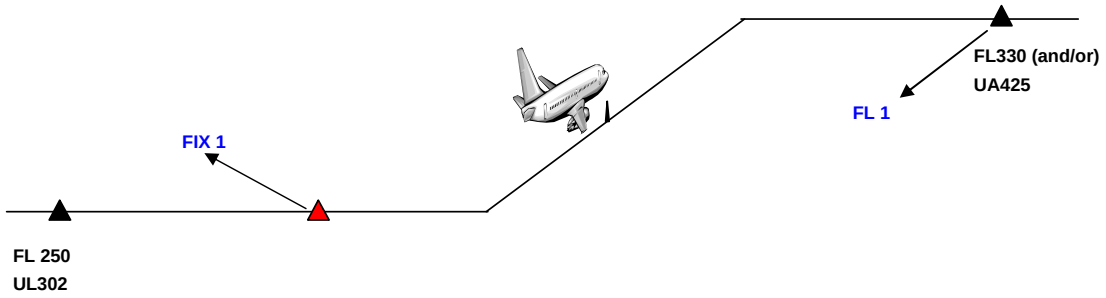
Example 2: Flight with origin and destination in different FIR



Example 3: Flight crossing FIR boundaries.



Example 4: Flight with change of FL and/or AWY (OPTIONAL FIELDS)



APPENDIX C

SHORT-TERM EN-ROUTE PBN ACTION PLAN (RNAV-5)
(GPIs 1, 4, 5, 7, 8, 10, 11, 12, 16, 21, 23)

1.	**Airspace concept**	**Start**	**End**	**Responsible party**	**Remarks**
1.1	Establish and prioritize strategic objectives (safety, capacity, environment, etc.)	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901)	Completed
1.2	Collect traffic data in order to understand traffic flows in a given airspace	June/2008	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901)	Completed
1.3	Analyze the navigation capacity of the aircraft fleet	June/2008	SAM/IG/4	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States IATA	Valid 95% of the fleet in the SAM Region is candidate for RNAV5 approval. States should continue their efforts to complete the data base (Conclusion SAM/IG/4-3)
1.4	Analyze ground-based means of communication, navigation (VOR, DME) and surveillance to meet navigation specifications and the navigation reversal mode	June/2008	SAM/IG/6	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States	Valid The work will be completed in order to prove that the coverage and geometry corresponds to RNAV5
1.5	Optimize airspace structure, reorganizing the network or implementing new routes based on the strategic objectives of the airspace concept, taking into account airspace modelling, ATC simulations (fast time and/or real time), live tests, etc.	SAM/IG/2	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901) States IATA	Transferred. The meeting reviewed this task and decided that it was more appropriate to incorporate to the SAM Region ATS routes network optimization action plan (2.2.5 SAM Region ATS routes network optimization action plan)

2	Safety assessment	Start	End	Responsible party	Remarks
2.1	Prepare safety assessment execution using a qualitative methodology through the application of SMS	SAM/IG/2	SAM/IG/6	CARSAMMA Project RLA/06/901 Regional Office	Transferred. Transferred to the SAM Region ATS routes network optimization action plan (2.2.6 of the SAM Region ATS routes network optimization action plan). Regional Project RLA/06/901 will carry out the evaluation process of safety through a Meeting/Workshop and mission of a risk analysis expert.

3	**Establish a collaborative decision-making process (CDM)**	**Start**	**End**	**Responsible party**	**Remarks**
3.1	Coordinate planning and implementation requirements with air navigation service providers, regulators, users, aircraft operators and military authorities	SAM/IG/2	SAM/IG/6	SAM/PBN/IG States	**Valid** Some States have published an initial AIC. Other States have not done so yet.
3.2	Establish the implementation date	SAM/IG/1	SAM/IG/4	SAM/PBN/IG States	**Completed.** 18 November 2009 was established as tentative date. States must analyse the feasibility of the tentative date in coordination with domestic operators and military authorities
3.3	Establish the documentation format in the SAM PBN website	SAM/IG/1	SAM/IG/2	SAM Regional Office	**Completed**
3.4	Report planning and implementation progress to the corresponding Regional Office. Conclusion to present national plans at SAM/IG/4	SAM/IG/2	SAM/IG/4	SAM/PBN/IG States	**Completed.** Eight SAM States presented a draft of their national PBN implementation plans and it was agreed that for 31 December 2009, States shall present the final version of the plan. The Secretariat was requested to as States that have not done so yet, submit their respective plans.

4	**ATC automated systems**	**Start**	**End**	**Responsible party**	**Remarks**
4.1	Assess PBN implementation in ATC automated systems, taking into account amendment 1 to the PANS/ATM (FPLSG). Note: It is not a requirement for RNAV5 implementation	June/2008	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901)	**Completed** According to the programme presented in ICAO guidelines (WP/09), it is not a requirement for the RNAV5 implementation. CNS/ATM sub-group will revise this issue.
4.2	Implement necessary changes in automated ATC systems	SAM/IG/2	TBD	States	**Completed**

5 Aircraft and operator approval	Start	End	Responsible party	Remarks
5.1 Analyze aircraft and operator approval requirements (pilots, dispatchers and maintenance personnel) in keeping with the PBN manual, and develop the necessary documentation.	June/2008	SAM/IG/2	Regional Project RLA/99/901- Regional Safety Oversight Cooperation System	**Completed**
5.2 Publish national regulations for the implementation of the RNAV-5 navigation specification	SAM/IG/2	SAM/IG/6	States	**Valid** There are some States in development process of their regulations, and for this reason, this task is pending. Five States of the Region have published the regulations and 3 States informed that this task is in execution. No information is available from 6 States.
5.3 Begin the approval of aircraft and operators	SAM/IG/3	SAM/IG/6	States	**Valid** This is a continuous task that States have initiated and shall continue to carry out upon requirement of operators. Operators should be encouraged to initiate this process.
5.4 Establish and keep up to date a registry of approved aircraft and operators	SAM/IG/3	Permanent	CARSAMMA States Regional Office	**Valid** This is an activity being developed permanently by each one of the States.
5.5 Verify the operation of the continuous monitoring programme (aircraft and procedures)	Nov/2010	Permanent	States	**Completed** This is an activity being developed permanently by each on of the States and is considered in the surveillance plans.

6	Standards and procedures	Start	End	Responsible party	Remarks
6.1	Assess and, if applicable, publish the regulations on the use of GNSS.	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901) States	**Completed**
6.2	Finalize WGS-84 implementation	TBD	TBD	States	**Completed** States which have not done so, should provide the information
6.3	Develop an AIC model to report PBN implementation plans	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901)	**Completed**
6.4	Publish the AIC reporting PBN implementation plans	SAM/IG/2	SAM/IG/4	States	**Completed** States should publish on 9 April 2009
6.5	Develop an AIP Supplement model containing applicable standards and procedures, including the corresponding in-flight contingencies	SAM/IG/4	June 2010	SAM/PBN/IG (Project RLA/06/901)	**Valid** RLA/06/901 will carry out this task through the mission of an expert on this matter.
6.6	Publish the AIP Supplement containing applicable standards and procedures, including the corresponding in-flight contingencies	SAM/IG/5	SAM/IG/6	States	**Valid**
6.7	Review the Procedural Handbook of the ATS units involved	SAM/IG/5	SAM/IG/6	States	**Valid**
6.8	Update the letters of agreement between ATS units	SAM/IG/5	SAM/IG/6	States	**Valid**
6.9	Develop an amendment to regional documentation, if necessary	SAM/IG/3	June 2010	SAM/PBN/IG (Project RLA/06/901)	**Valid** RLA/06/901 will carry out this task through the mission of an expert on this matter.
6.10	Submit a proposal of amendment to Doc. 7030, if necessary	SAM/IG/5	SAM/IG/6	SAM Regional Office	**Valid**

7. Training	Start	End	Responsible party	Remarks
7.1 Develop a training and documentation programme for operators (pilots, dispatchers and maintenance personnel)	SAM/IG/4	SAM/IG/5	Regional Project RLA/99/901	**Completed** The matters to be incorporated into each one of the training programmes of operators have been included in the corresponding advisory circulars
7.2 Develop a training and documentation programme for air traffic controllers and AIS operators	SAM/IG/4	SAM/IG/5	SAM/PBN/IG (Project RLA/06/901)	**Completed**
7.3 Develop a training programme for regulators (aviation safety inspectors)	SAM/IG/4	SAM/IG/5	RLA/99/901 States	**Completed** The SRVSOP technical committee has proposed a training programme oriented to the authorities
7.4 Conduct training programmes	SAM/IG/5	SAM/IG/6	States	**Valid** Only some States have initiated this process.
7.5 Conduct seminars for operators, explaining plans and expected operational and economic benefits	SAM/IG/1	SAM/IG/6	States	**Valid** There is information that only some States have initiated the guidance process to users, and therefore all States are encouraged to implement the dissemination programme among such users.

8.	**Implementation decision**	**Start**	**End**	**Responsible party**	**Remarks**
8.1	Assess the available operational documentation (ATS, OPS/AIR)	SAM/IG/5	N/A	States	**Valid**
8.2	Assess the percentage of aircraft and operators (non-exclusionary airspace)	SAM/IG/5	N/A	States	**Valid** It was decided to carry out a new air traffic data collection comprised within the period 1-15 July 2010
8.3	Analyze the results of the safety assessment	SAM/IG/5	N/A	States	**Valid**
8.4	Publish trigger NOTAM	Nov/2010	N/A	States	**Valid**

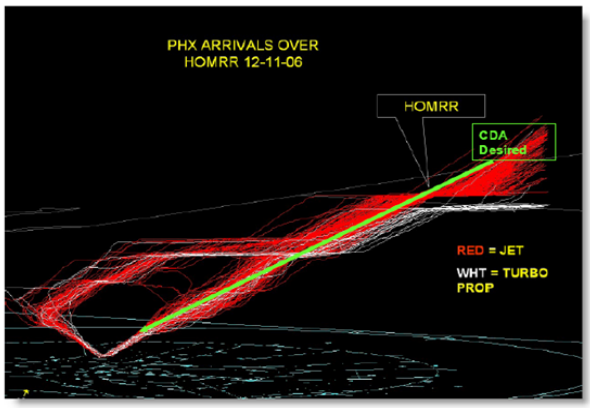
9. Performance monitoring system	**Start**	**End**	**Responsible party**	**Remarks**
9.1 Develop a post-implementation en-route operations monitoring programme	SAM/IG/4	SAM/IG/5	SAM/PBN/IG (Project RLA/06/901)	This task will be developed together with an AIP Supplement, Amendment 7030
9.2 Implement a post-implementation en-route operations monitoring programme	Nov/2010	Nov/2011	States	
Pre-operational implementation date	18 November 2010	N/A		**Valid** SAM/IG/4 defined the tentative implementation date 18 November 2010.
Definitive implementation date	Nov/2011	N/A		

APPENDIX D

1 Background

1.1 Aircraft should burn the least amount of fuel during the descent phase of flight. This is due to the smooth and unimpeded descent profile that the aircraft is capable of flying with engines running at an idle or near-idle speed. The ideal descent also starts at the highest possible altitude (top-of-descent) where the less dense and colder air helps with fuel efficiency.

Reduced engine and airframe drag through Continuous Descent Arrival (CDA) also reduces the noise footprint anywhere from 4-6 decibels from a conventional approach. An MIT study found that "a three-decibel difference is appreciably noticeable to the human ear while a 10-decibel reduction equates to 50 percent less noise".

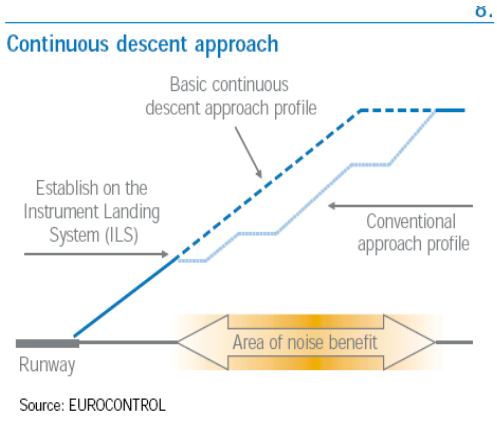


CDA's also reduce nitrogen oxides (NOx) pollutants by 30% at 3000 feet and below.

In today's arrival procedures, it is not unusual for a pilot to receive anywhere between 4 - 10 step-down altitude assignments by air traffic control (ATC). In busy airspace, these step down clearances allow controllers to manually sequence and space flights at relatively low altitudes and slower speeds. Each time the aircraft levels off at its altitude assignment, there is the noisy "spooling up" of engines to maintain level flight – resulting in additional fuel burn.

2 Benefits

2.1 CDA's save 50-200 kg fuel per flight - for a Boeing B767 around 165 kg fuel or 525 kilos CO_2 per arrival. The noise footprint is reduced anywhere by 3 to 6 decibels and the pilot workload decreases significantly.



For safety reasons, the NTSB actively recommends that all airlines incorporate a constant-rate-of-descent technique in flying non-precision approaches (NPA's).

As an example a study was done at Chicago's O'Hare International Airport (ORD) using Analysis of FOQA Data from arrival aircraft.

<u>Analysis has shown significant savings by reducing 1 minute of level flight</u>

- ↗ ORD arrivals average 9.7 minutes of level flights
- ↗ <u>Per one minute reduction</u> / lbs of fuel saved by aircraft type
  - Airbus – 31 lbs (67% of level flights in ORD occur with the Airbus)
  - B747 – 112 lbs
  - B767 – 55 lbs
  - B777 – 82 lbs

↗ Annualized savings would equate to 53 million lbs of CO2 savings / 17 million lbs of fuel

3 Suggested action

3.1 There is an easy way to implement CDA's today – it's a simple clearance by ATC instructing individual flights to at "pilot's discretion descend and maintain [assigned altitude]" in a way that does not force the aircraft to level off at an interim altitude assignment. This will allow the pilot to start descent at the profile that is optimum for fuel savings.

CDA's as a standard instrument arrival procedure for all aircraft is somewhat more complicated to develop. However, IATA recommends that ANSP's start developing CDA procedures where they can be relatively easy to accomplish – at low-density airports or after hours at the more busy airports. The communities below would be most grateful - as implementing CDA's over their homes will significantly reduce aircraft noise.

APPENDIX E

1. Future developments in this field are expected to allow different means of realising the performance potential of CD without compromising the optimal Airport Arrival Rate (AAR). The core CD definition and the concept at the heart of the manual will also apply to these increasingly sophisticated methods of facilitating CD operations.

2. Continuous Descent Operations are enabled by airspace design, procedure design and ATC facilitation, in which an arriving aircraft descends continuously, to the greatest possible extent, by employing minimum engine thrust, ideally in a low drag configuration, prior to the Final Approach Fix (FAF)/Final Approach Point (FAP). An optimum CD starts from the Top of Descent and uses descent profiles that reduce ATC/Pilot communication, segments of level flight, noise, fuel burn and emissions, while increasing predictability to ATC/Pilots and flight stability.

3. Maintenance of safety during all phases of flight is paramount - nothing in the guidance shall take precedence over the requirement for a safe operation and control of aircraft at all times. For the avoidance of doubt, all recommendations are to be read as "subject to the requirements of safety". Before any CD trials or operations commence, the proposed implementation should be the subject of a local safety assessment.

4. **Standardization and Harmonization.** Terminology and procedural standardization are important for flight safety. From the pilots' and air traffic controllers' perspective, flight procedures and pilot communications should be unambiguous. For the procedure designer, it is important to understand the flight characteristics, limitations and capabilities of aircraft expected to perform CDs, as well as the characteristics of the airspace and routes where it will be used. For airport operators and environmental entities, it is important to understand, the extent and limitations of environmental benefits, aircraft performance, and airspace limitations when proposing to introduce CD operations. Considering the high cost of fuel and growing concerns about the environment and climate change, collaborating to facilitate CDs is an operational imperative where all stakeholders benefit.

5. To standardize and harmonize the development and implementation of CD operations, the airspace and instrument flight procedure design and ATC techniques should all be employed in a cohesive manner. This will then facilitate the ability of flight crews to use in-flight techniques to reduce the overall environmental footprint and increase the efficiency of commercial aviation. The implementation guidance in the Manual is intended to support collaboration among the different stakeholders involved in implementing these Continuous Descents:

a) Airspace and procedure designers,
b) Air traffic managers and controllers,
c) Service providers (Airports and Air Navigation Service Providers (ANSP)); and
d) Pilots.

6. **CDO Manual contents.** Some of the content found in the manual follows:

Facilitating CD Operations
    Benefits
Concepts of Operation
Continuous Descent Operations
    Less noise at intermediate distances (10-30 NM) from the runway

- Lower emissions
- Reduced fuel burn
- Maximum Benefit

Design Options

- Closed Path Designs
- Open Path Designs
- Sequencing Methods
- Basic Design Examples
- Closed path CDO layout
- Developing a CD concept of operations

Specific Stakeholder Issues

- Procedure Design
- Airspace Collaboration and Standardization
- Speed Restrictions
- Transition Level
- Database Coding
- Charting issues

Flight operation

- Cockpit Workload
- Pilot Training
- ATC Techniques
- Transition Level
- CD, Optimal AAR and ATFM considerations
- ATC Training
- ATC workload
- Different CD options
- Sequencing Techniques in Relation to CD and Optimal AAR

CD Implementation Overview and Pre-Requisites

- The Importance of Effective Collaboration
- Community Relations and Consultation
- Policy Context
- Implementation Steps

Prepare an Outline CD Case

Establish Collaborative CD Implementation Group

- Planning

Joint Preliminary Assessment

Consider Options and Jointly Agree on Preferred Implementation Options

Design Preferred CD Facilitations Option(s)

Strategic Planning

- Implementation

Simulate and validate

Decision Point (go-no-go)

Make CD Operational and implement Iterative improvements

Assessment

Training, Marketing and Awareness Material

APPENDIX F

Proposal to review ICAO documents 8168 and 9613 as regards DME limitation

1.1 In several documents issued by ICAO and specifically in the two mentioned above, there is a restriction in the use of DME for elevation angles above 40° and in the case of DME/DME navigation the use is limited to inclusion angles smaller than 30° and bigger than 150°. This is a paragraph extracted from the ICAO Document 9613:

"3.2.1.4 The navaid infrastructure should be validated by modelling, and the anticipated performance should be adequately assessed and verified by flight inspection. The assessments should consider the aircraft capability described in this chapter. For example, a DME signal can only be used if the aircraft is between 3 NM and 160 NM from the facility, below 40 degrees above the horizon (as viewed from the facility) and if the DME/DME include angle is between 30 degrees and 150 degrees. The DME infrastructure assessment is simplified when using a screening tool which accurately matches ground infrastructure and aircraft performance, as well as an accurate representation of the terrain. Guidance material concerning this assessment can be found in PANS-OPS (Doc 8168), Volume II and the Manual on Testing of Radio Navigation Aids (Doc 8071)."

2 Discussion

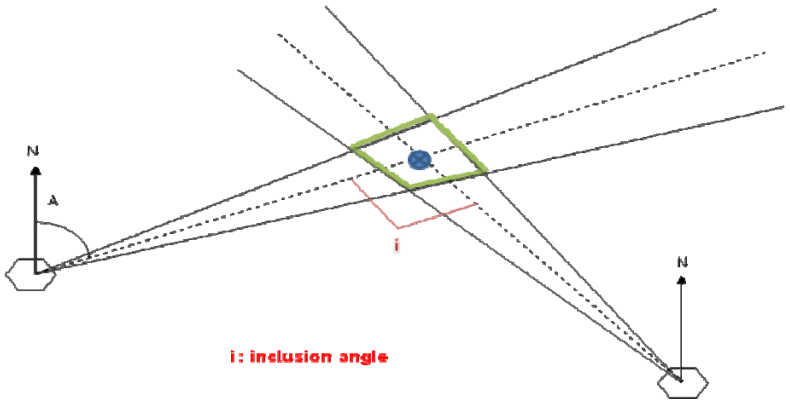
2.1 Elevation angle restriction for DME above 40° makes sense to diminish the error caused by the aircraft altitude, because RNAV computer (usually Flight Management System) executes the triangulation assuming the lineal distance when in fact DME calculate the slant distance. However this error could significantly increase when triangulation is executed using two DME stations with different altitude levels. For example in the Andes Mountains there are DME stations installed at sea level and DME stations 10.000 feet above sea level.

2.2 Regarding inclusion angle limitation for DME/DME Navigation, assuming two DME stations at the same altitude level, doing the calculations and flight checks the reason to restrict DME to inclusion angles smaller than 30° and bigger than 150° is not understood. This restriction is valid for VOR/VOR navigation because the VOR error is angular and in fact for inclusion angles smaller than 30° and bigger than 150° the calculation error is so that it may not be tolerable even for the navigation specification RNAV 5. Furthermore for inclusion angles near to 0° and 180° there is not solution to calculate the position. However this is not the case for DME/DME navigation because the error does not depend upon the angle and it is almost independent from the distance for the latest versions of DME equipment.

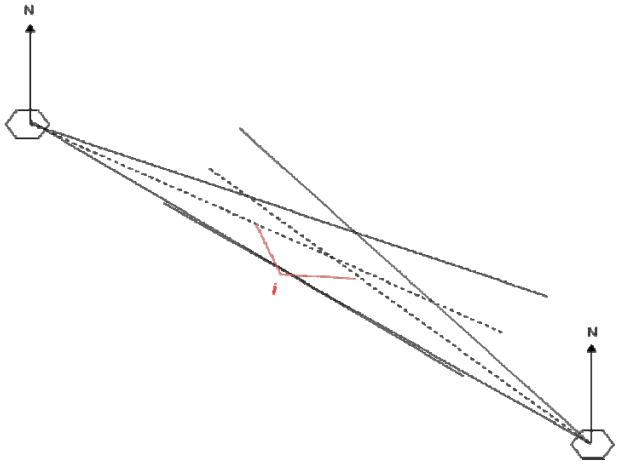
2.3 Even though DME operation principle is completely different to GPS, the triangulation method of these systems is similar, since both are based on distance measuring and position calculation by intersection of circumferences. GPS calculates distance by synchronization method, that is transmitter clock (satellite) should be synchronized with receiver clock and the distance is calculated by measuring the time that signal takes from the transmitter to the receiver; at least 4 satellites are required to compute position in the space 3D (latitude, longitude and altitude). DME calculates distance by interrogation-reply method, that is, a transponder A (aircraft) interrogates another transponder B (station), which replies to the interrogation. The distance is function of the time from the interrogation to the reception of the reply; at least 3 DME stations are required to compute position in the plane 2D (latitude and longitude), although FMS use only 2 stations because the ambiguity of the circumferences intersection can be eliminated with other sensors.

2.4 Taking into account the above mentioned, if the limitation of the inclusion angles smaller than 30° and bigger than 150° using DME/DME navigation is reasonable, should be reasonable also to limit the use of GPS satellites to a mask angle of 30°.?

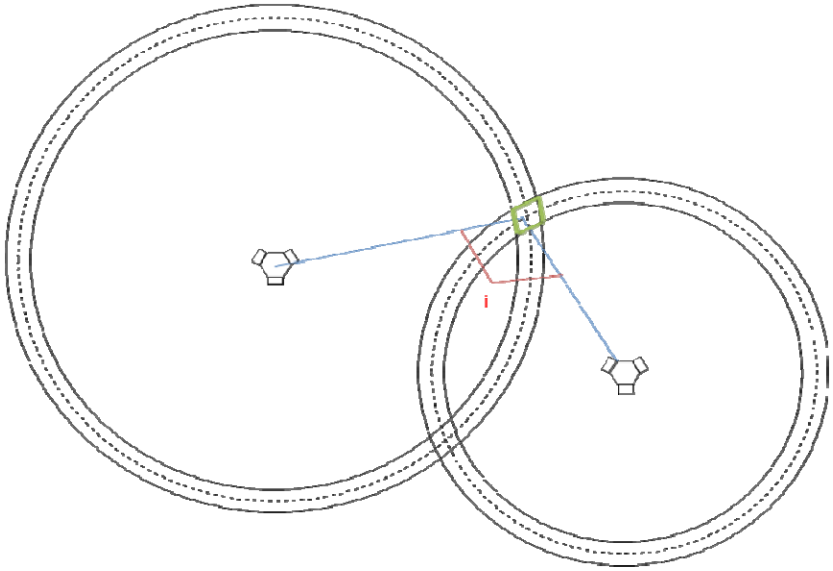
2.5 It could be mathematically demonstrated, nevertheless a graphic method has been used to explain why the inclusion angle limitation is applicable to VOR/VOR navigation, but it is not so significant to DME/DME Navigation. The next picture shows the error area around the intersection of the two VOR radials with an inclusion angle of 90°. The dotted lines are the measured radials and the continue lines delimitates the error (approximately ± 2°). It is clear that error linearly increases with the distance to the station.



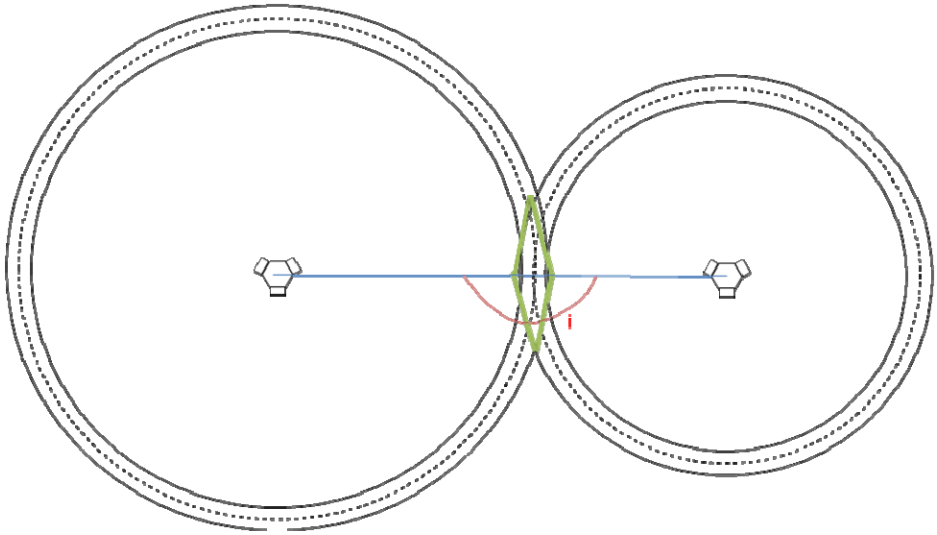
If the inclusion angle increases, the error area also increases and when it is near to 180° the position cannot be calculated as can be seen in the next picture.



For DME the error is not angular but radial that is, the error does not depend upon the distance. This error is bordered by a circumference slightly bigger and another circumference slightly smaller. There is ambiguity because two circumferences intersect in two points. In the next picture is shown the error area around the intersection of the two circumferences with an inclusion angle near to 100°.



In the next picture is shown the worst case with an inclusion angle near to 180°, where there is no ambiguity because the circumferences are tangent and the error increases but not significantly.



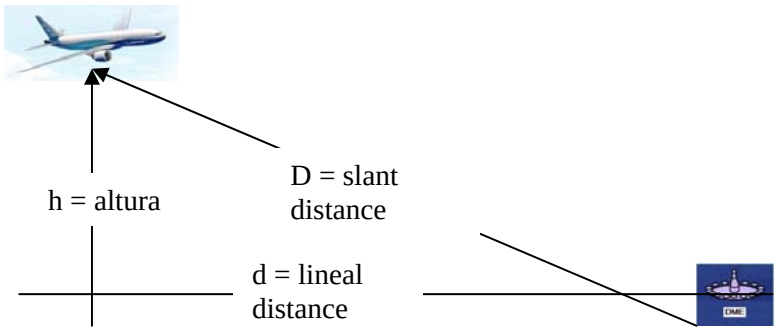
In all above pictures, the error is magnified in order to clearly show the error area, but in fact this error is much smaller, especially in the DME/DME navigation.

3 Suggested Action

3.1 It is suggested to reduce the inclusion angle limitation from 30° and 150° to inclusion angles smaller than 10° and bigger than 170°. This limitation could be reduced taking into account that DME error is not angular but radial and this angle has almost not influence in the error area as demonstrated above.

3.2 It is recommended to include aircraft altitude in the DME/DME method to reduce the error induced because the FMS computer assumes the lineal distance d, but in fact DME calculates the

slant distance D (see next figure). In this way the FMS computer can easily calculate the real distance at terrain level simply by $d = \sqrt{D^2 - h^2}$



3.3 Furthermore, the elevation angle limitation (40°) and the minimum distance limitation (3 NM) could also be suppressed because even when the aircraft is exactly on the DME station distance D is equivalent to altitude h and the FMS computer calculate d as 0.

3.4 Complementing the recommendation in 3.2, it is suggested to include in the Navigation data bases the altitude of the NAVAIDs stations to use it in the calculation based on DME/DME navigation. In this way the error could be reduced due to the difference in altitudes of DME stations, which in some cases can reach 10.000 feet.

3.5 The DME/DME Navigation is without a doubt the most accurate after GNSS Navigation. With the suggested changes, the use of this navigation could be spread out (reducing the current limitations) and improving the accuracy. This navigation is an excellent back up for the GNSS with the additional advantage that each state controls its own NAVAIDs, which is not the case of the GNSS systems.

SAM/IG/5
IP/10
10/05/10

International Civil Aviation Organization
South American Regional Office

FIFTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP (SAM/IG/5)
REGIONAL PROJECT RLA/06/901

Lima, Peru, 10 to 14 May 2010

Agenda Item 3: Implementation of performance-based navigation (PBN) in the SAM Region

The need for eTOD information from an industry perspective

(Presented by Jeppesen)

SUMMARY

Amendment 33 to ICAO Annex 15 introduced requirements for States to ensure that electronic sets of Terrain and Obstacle data (eTOD) are made available. The purpose of eTOD provisions is justified as supporting data for various air navigation applications which can bring significant safety benefits for the international civil aviation.

This information paper summarizes the cockpit-based, ground-based and aerodrome mapping applications using sets of eTOD collected/recorded in accordance with all four coverage areas and it continues with description and benefits of specific navigation applications based on eTOD Area 1 & 4.

Finally, the information paper presents Jeppesen role as data integrator: on one side, its evolving eTOD-based applications fully support the end state of the ICAO Global ATM concept and, on the other side, recognizing the challenge for States of eTOD implementation, the set-up of eTOD Area 1 program for States CAA.

1. ELECTRONIC TERRAIN AND OBSTACLE DATA

1.1 BACKGROUND

Amendment 33 to ICAO Annex 15 introduced requirements for States to ensure that electronic sets of Terrain and Obstacle data (eTOD) are made available. The data shall be made accessible for four distinct coverage areas, ranging from the entire territory of the State (Area 1) through to the precision approach areas at an aerodrome (Area 4) with each area having differing data collection requirements.

The new provisions in Annex 15 on the subject of electronic terrain and obstacle data are based on work done by ICAO with RTCA SC 193 and EUROCAE WG 44 industry groups as well as on comments received from States during the amendment process.

These new provisions deal with the electronic terrain and obstacle data function, coverage, obstacle numerical requirements, content and structure of terrain and obstacle databases (defined as two separate databases), data product specifications for terrain and obstacle data and their availability.

1.2 DEFINITION OF COVERAGE AREA 1, 2, 3 and 4

In order to satisfy identified user requirements for electronic terrain and obstacle data, while taking into account cost-effectiveness, acquisition methods and data availability, the data are to be provided according to the following four coverage areas definition:

1.2.1 AREA 1

a) Terrain:
- State territory excluding the geographical footprint of Area 3 & 4 and some portions of Area 2;
- Between 10km from ARP extending to the TMA boundary or 45km radius whichever is smaller, terrain not penetrating the horizontal plane of 120m above lowest THR elevation;
- Those portions of Area 2 where flight operations are prohibited;

b) Obstacles:
- Entire State territory all obstacles having minimum height of 100m AGL;
- Those portions of Area 2 where flight operations are prohibited;

1.2.2 AREA 2

a) Terrain:
- Within 10km from ARP;
- Between 10km from ARP extending to the TMA boundary or 45km radius whichever is smaller, terrain penetrating the horizontal plane of 120m above lowest THR elevation;

b) Obstacles:
- Conical surface whose origin is at the edges of the 180m wide rectangular area and at nearest runway elevation measured along the runway centreline, extending at 1.2% until reaches 120m above lowest runway elevation of all operational runways at the airport;
- Between 10km from ARP extending to the TMA boundary or 45km radius whichever is smaller, the horizontal plane of 120m above lowest THR elevation;

1.2.3 AREA 3

a) Terrain:
- Area adjacent to the movement area and extending from the edges of the runways up to 90m from runway centreline and for the rest of the movement area 50m from its edges;

b) Obstacles:
- Within same horizontal limits as above, all obstacles and terrain that raise higher than 0.5m above the horizontal plane passing through the nearest point of the movement area;

1.2.4 AREA 4

a) Terrain:

- Rectangular area of 60m each side of the extended runway centreline with the length of 900m extending from the runway threshold. This area is restricted to CAT II/III precision approach runways.

b) Obstacle:

- *Not required*;

2. TERRAIN AND OBSTACLE DATA APPLICATIONS

2.1 BACKGROUND

There is an emerging need for the development of digital aviation databases which are required to support the implementation of communications, navigation and surveillance/air traffic management (CNS/ATM) systems. During the past several years, there has been an increasing awareness within the aviation community that digital, computer-based avionics can be used to provide flight crew with additional information to support better, more balanced decisions.

Situational awareness is the term that best describes the ability of pilots to know what is going on in relationship to their aircraft and the external environment. The underlying philosophy is to make additional but relevant information available to pilots in order to assist them in their decision-making process. At the heart of a cockpit-centred situational awareness architecture is an advanced data management computer system. Beside the functions provided by existing avionics systems to fly the aircraft and to select optimized flight tracks as prescribed by procedure designers, the advanced CNS on-board system can support thru digital aviation databases a variety of new cockpit-based operational applications.

The “core” aviation databases include navigation, terrain, obstacles, aerodrome maps, airspace, and noise abatement procedures. Additional supportive aviation databases may also need to be developed and standardized in the future.

2.2 NAVIGATION APPLICATIONS USING TERRAIN & OBSTACLE DATA

Significant safety benefits for international civil aviation will be provided by in-flight and ground based applications that rely on quality electronic terrain and obstacle data. Terrain and obstacle databases can sustain two-dimensional (2-D), three-dimensional (3-D) and four-dimensional (4-D) predictive Controlled Flight into Terrain (CFIT) prevention systems as well as Approach and Landing Accident Reduction (ALAR) systems.
Sets of electronic terrain and obstacle data used in combination with relevant aeronautical data shall support the following air navigation applications:

2.2.1 COCKPIT-BASED APPLICATIONS

- Ground Proximity Warning System (GPWS) with forward looking terrain avoidance function;
- En-route “drift-down” procedures;
- En-route emergency landing location selection and,
- Synthetic vision;

2.2.2 GROUND-BASED OR GROUND-USED APPLICATIONS

- Minimum Safe Altitude Warning (MSAW) system;
- Instrument procedure design (including curved i.e. RF leg based approach procedures);
- Contingency procedure analysis (one-engine inoperative departure climb profile, etc);
- Flight simulator and,
- Aeronautical chart production.

2.2.3 AERODROME MAPPING DATA APPLICATIONS

Based on the availability of a standardized aerodrome mapping data set, a wide variety of applications can be envisioned. Note that several of the applications listed below can be used by multiple user classes e.g. pilots, Air Traffic Controllers, airline, Cargo, Business/General aviation, vehicle operators, etc:

- Map display information;
- Taxi guidance display information;
- Surveillance and conflict/runway incursion detection/alerting;
- Route/Hold-short portrayal and deviation detection/alerting;
- Advanced Surface Movement Guidance and Control System (A-SMGCS);
- Portrayal of D-ATIS information;
- D-NOTAMs with aeronautical data overlays;

3. FUNCTIONS OF eTOD AREA 1 AND 4

From the diversity of cockpit and ground-based set of applications where terrain and obstacle data play a significant role and which are listed in paragraph 2 above, this information paper will now continue to emphasize the respective functions supported by eTOD datasets collected and recorded in databases in accordance with coverage Area 1 and 4. According to ICAO Annex 15, paragraph 10.6 ‘*Availability*’ member States looking for compliance with Chapter 10, Annex 15 requirements shall ensure that terrain Area 4 and terrain & obstacle Area 1 data are made available already as of 20 November 2008.

3.1 eTOD AREA 1 APPLICATIONS

3.1.1 TERRAIN AWARENESS AND WARNING SYSTEM (TAWS)

Ground Proximity Warning System (GPWS) technology with forward-looking capabilities provides flight crew with information of impending dangerous terrain and obstacles. This will result in earlier alerts and

more time to take appropriate corrective action. New multifunction displays are merging terrain and obstacle databases, aircraft GNSS and Flight Management System sensor data.

Many qualified terrain warning systems use digitized terrain data intended for advisory use only since these data sets are not certified for navigation use as they lack stringent quality requirements (integrity). Consequently, there is a significant safety benefit made possible by developing a comprehensive terrain and obstacle database.

3.1.2 MINIMUM SAFE ALTITUDE WARNING (MSAW) SYSTEM

MSAW systems use ground-based radar to monitor the flight paths of aircraft equipped with encoding transponders to ensure adequate terrain and obstacle separation. The alerting function is accomplished by comparing the flight paths with a three-dimensional grid map stored in the ground-based radar system. If a potentially unsafe condition is detected, the controller will alert the pilot by radio. This operational application is a flight critical safety application as air traffic relies on this data to provide flight crews with guidance pertaining to safe terrain and obstacle avoidance. Consequently, comprehensive terrain and obstacles data sets of higher accuracy in the aerodrome vicinity may provide increased protection against approach and landing accidents and CFIT.

3.1.3 EN-ROUTE 'DRIFT-DOWN' PROCEDURES

As aviation moves forward to use Area Navigation (RNAV), with point-to-point direct routings predicated on navigation systems, more aircraft will likely fly off-airways. Many of these routes will overfly mountainous terrain (for example, over the Alps), or areas such as the Greenland Ice Cap.

Occasional re-routings take commercial aircraft on routes where a one-engine inoperative "drift-down" may require the aircraft to descend over mountainous terrain. In some situations, the one-engine inoperative cruise flight may be performance limited such that the aircraft is unable to sustain flight above Minimum Obstacle Clearance Altitude (MOCA). Consequently, without any outside help, pilots need to quickly and accurately calculate their best "escape" route to avoid high terrain and/or to maintain the necessary terrain and obstacle clearance. Therefore, this operational application has both a safety as well as an operational component.

Note: Although the requirements related to these procedures are provided in ICAO Annex 6 '*Operations of Aircraft'* - Part I, there is no association with the name "drift-down" as indicated in the Annex 15, Chapter 10, paragraph 10.1.

3.1.4 EN-ROUTE EMERGENCY LANDING LOCATION SELECTION

During an in-flight emergency, especially in general aviation operations, selection of an acceptable emergency landing site can often mean the difference between an aircraft sustaining only minor or no damage, versus suffering catastrophic damage. The risks are great when an aircraft must land immediately for any reason when flying at night or over unfamiliar territory. Under such circumstances, a high resolution, digital image, containing vegetation and cultural features, overlaid onto a terrain and obstacle database could assist pilots in identifying the safest location for a forced, emergency landing.

3.1.5 AERONAUTICAL CHART PRODUCTION

For pilots, a graphical portrayal of all aeronautical, cultural and topographic information generally specified for all type of charts by Annex 4 '*Aeronautical Charts*', is essential to safe and efficient navigation. Currently, this graphical portrayal is mostly provided to flight crews by way of paper charts. Alternatively, chart images can be portrayed on electronic displays of a flight deck. Electronic chart displays or electronic data-driven charts distributed via digital media or world-wide web connectivity respectively are the most appropriate solutions to enable flight crews to execute, in a convenient and timely manner, route planning, route monitoring and navigation.

Consequently, the usage of terrain and obstacle dataset satisfying Area 1 numerical requirements for generating the topographic layer (including possible contour generation capability) will significantly enhance the chart display for following ICAO Annex 4 type of charts: En-route Chart, Area Chart, Aeronautical Chart 1: 500000, Aeronautical Navigation Chart – Small Scale, Plotting Chart and Radar Minimum Altitude Chart.

3.2 eTOD AREA 4 APPLICATIONS

The Annex 15 definition for Area 4 terrain intents to support the high demanding operational requirements (flare profile, rate of descent, etc) for CAT II/III approaches in terms of characteristics of the pre-threshold terrain areas. The Precision Approach Terrain Chart (PATC) is the current graphical depiction mean by which State authorities provide to operators information necessary to perform height determination during precision approaches. The area covered by PATC matches exactly eTOD Area 4, however Annex 4 requires that within PATC area all elevations (terrain and objects) that differ with more than 3m (10ft) from the runway centreline profile shall be indicated.

Note: Although Annex 14 '*Aerodrome Design and Operations*' – Vol. I recommends establishment of a Radio Altimeter Operating area located in the pre-threshold area of a precision approach runway in order to accommodate aeroplanes making auto-coupled approaches and automatic landings, the length of the area i.e. at least 300m is not matching Area 4 longitudinal profile of 900m.

4. JEPPESEN PERSPECTIVE TOWARDS ICAO eTOD BENEFITS

4.1 JEPPESEN AS eTOD USER

For several years, Jeppesen has been doing considerable research and development work on collection, management, systems interfaces and display of terrain and obstacle information. Starting with the basic terrain data provided by the Shuttle Radar Topography Mission (SRTM), Jeppesen has been significantly augmented the quality of the SRTM datasets by applying sound methods, intelligent mathematical algorithms as well as other datasets with very high accuracy. The final result was the generation of a worldwide terrain envelopes databases with designated confidence levels of 10^{-3} (routine), 10^{-5} (essential) and 10^{-8} (critical) – called TerrainScape Level 1, 2 and 3 respectively.

Furthermore, Jeppesen efforts have been focused on creation of a single-source geo-spatial data repository of terrain, terrain high-points and man-made obstacles in order to ensure that all chart images (En-route High and/or Low, Terminal and VFR/GPS 1:500000 charts) utilize a single common terrain source of the highest quality with known quality characteristics. In parallel, we are concentrating our development

efforts on the data that air-framers and aircraft operators require to support new on-board systems designed to enhance situational awareness in the air and on the airport surfaces e.g. data-driven electronic charts, Airport Mapping (AMDB), Electronic Flight Bag (EFB), Airspace and Procedure Design, Opsdata analysis, TAWS/MSAW & Flight Simulation (Terrain + Navdata ARINC 424), Synthetic Vision System (SVS) displays, etc.

Practically, our evolving navigation applications where eTOD information is an important product component will continue to fully support the end state of the ICAO Global ATM concept.

4.2 JEPPESEN'S AREA 1 TERRAIN AND OBSTACLE DATA PROGRAM

Jeppesen recognizes that the terrain and obstacle requirements of ICAO Annex 15, Chapter 10 challenge many Civil Aviation Authorities (CAA) and Air Navigation Service Providers (ANSP) around the world. Also, Jeppesen understands that certain States may not have processes established to deliver eTOD information to other users or may wish to outsource this responsibility.

Therefore, we have established processes, in cooperation with States that contract with Jeppesen, to maintain a State's Area 1 terrain and/or obstacle database and deliver it as required. It should be noted that our Terrain Area 1 data model has resolved the issues in relation to cross-border harmonisation as we have consistently applied same DO-200A/ED-76A quality-driven processes.

Finally, it can be mentioned that Jeppesen eTOD service for CAAs and ANSPs offers the possibility for States to notify compliance with Chapter 10 in its AIP (see also reference in GEN 1.7 '*Differences from ICAO SARPS'*).

— END —

Agenda Item 4: Standards and procedures for performance-based navigation operations approval

Proposed revision to CA 91-001 – Aircraft and Operators Approval for RNAV 10 (RNP 10) Operations

4.1 The Fourth Workshop/Meeting of the SAM Implementation Group (SAM/IG/4) (Lima, Peru, 19 - 23 October 2009) took note of the content of AC 91-001 concerning aircraft and operators approval for RNAV 10 (RNP 10) operations.

4.2 Regarding the FDE availability prediction programme required for aircraft equipped with dual GNSS approved as primary means of navigation in oceanic or remote areas, paragraph 8.3.1 b) 1) (d) of **AC 91-001** states the following: The authorised dual GNSS equipment must be installed by virtue of a technical standard order (TSO) and **an approved FDE availability prediction programme must be used**. The maximum allowable time in which it is foreseen that FDE capability will not be available is 34 minutes. The maximum service downtime must be included as a condition for RNP approval.

4.3 The note to this paragraph states: *If the maximum FDE service downtime for the foreseen RNP 10 operation is expected to be exceeded, the operation must be re-scheduled for a time when FDE is available or the RNP operation must be conducted based on an alternate means of navigation.*

4.4 Likewise, paragraph 8.3.1 b) 7) (a) of the aforementioned circular, concerning the use of a single INS/IRU and a single GNSS approved as primary means of navigation in oceanic or remote areas, states that the GNSS must be authorised in accordance with TSO-C129 and **must have an approved fault detection and exclusion (FDE) availability prediction programme**. Maximum allowable time in which it is foreseen that FDE capacity will not be available is 34 minutes. The maximum service downtime must be included as a condition for RNP 10 approval.

4.5 Likewise, Volume II, Part B, **Chapter 1 – Implementation of RNAV 10,** of **ICAO Doc 9613 – Manual on performance-based navigation (PBN)** (third edition - 2008) contains the following paragraphs concerning the FDE prediction programme:

4.6 Paragraph 1.3.4.2.1.4: The flight manual must indicate that a given GNSS facility meets the requirements of the appropriate aviation administration. The dual GNSS equipment approved according to the TSO must be installed and an **approved FDE availability programme** must be used. The maximum allowable time for FDE unavailability is 34 minutes on any occasion. The maximum service downtime must be included as a condition for RNP 10 approval.

Note.- If the maximum FDE service downtime for the foreseen RNP 10 operation is expected to be exceeded, the operation must be re-scheduled for a time when it is available or RNP 10 must be based on an alternate means of navigation.

4.7 Paragraph 1.3.4.2.4: Aircraft equipped with a single INS or IRU or a single GNSS, meet RNP 10 requirements with no time limitations. The INS or IRU must be approved according to 14 CFR, Part 121, Appendix G. The GNSS must be authorised in accordance with TSO-C129a and must have an **approved FDE availability prediction programme.** The maximum allowable time of FDE unavailability is 34 minutes on any occasion. The maximum service downtime must be included as a condition for RNP 10 approval. The flight manual must indicate that the particular INS, IRU or GPS facility meets the requirements of the appropriate aviation administration.

The Meeting, when reviewing the background submitted in this matter, expressed the following comments:

4.8 The operators do not have a prediction program for FDE availability en route, approved and applied to the SAM Region.

4.9 The authorities have no regulations that allow them to adopt a *prediction program for FDE availability.*

4.10 The FAA / VOLPE program, does not consider the airspace outside the United States.

4.11 The AUGUR program (EUROCONTROL), although it considers the airports and navaids in the SAM Region, it stipulates that calculations are only valid for the ECAC region.

4.12 The shortage in the Region of not counting with a prediction program for FDE availability en route, or the adequate approval procedures, was identified

In view of the above, the Meeting approved the following conclusion:

Conclusion SAM/IG/5-X Prediction Program for the FDE Availability

To make progress in the study and application of the tool AUGUR (EUROCONTROL) by the States of the region.

4.13 Considering that AUGUR tool (EUROCONTROL), incorporates the Airports and Navaids in the SAM, it is suggested that through the Regional Office of ICAO, make contact with EUROCONTROL in order to establish the feasibility of extending the validity of calculating prediction made with the AUGUR tool for the different stages of flights, in the SAM Region.

4.14 Through the ICAO Regional Office, establish contact with the FAA, in order to receive guidance on the procedures for approval of a prediction program for the FDE availability and the procedures used by their operators when performing operations such as RNAV based in GNSS out of United States.

4.15 That the ICAO Regional Office, consider the possibility of leading a process of developing a prediction program for the FDE availability for the SAM Region for its use in all flight phases.

Progress made within Project RLA/99/901 in terms of performance-based navigation

4.16 The Meeting recalled that at the Second Workshop/Meeting of the SAM Implementation Group (SAM/IG/2) (Lima, Peru, 3-7 November 2008), the meeting took note of the work programme presented by the Technical Committee (TC) of the Latin American Regional Safety Oversight Cooperation System (SRVSOP) for the development of PBN advisory circulars, and of the contents of AC 91-002 concerning RNAV 5 approval of aircraft and operators.

4.17 It also noted that continuing with the work programme approved for PBN implementation, the SRVSOP TC developed the following AC for submission to the SAM/IG/5 meeting:

- ✓ AC 91-004 – Approval of aircraft and operators for RNP 4 operations.

4.18 AC 91-004 - Approval of aircraft and operators for RNP 4 operations defines the criteria for RNP 4 approval of aircraft and operators in oceanic or remote airspace with 30-NM lateral and longitudinal separation minima. The implementation of the 30-NM lateral and longitudinal separation minima in oceanic or remote airspaces with RNP 4 will benefit operators in terms of a larger number of optimum routes, reduced delays, increased flexibility, and reduced costs without sacrificing safety. ATS providers will derive benefits from the efficient use of airspace and increased air traffic flow, providing the following related documents:

- ✓ Attachment A: CA 91-004 – Approval of aircraft and operators for RNP 4 operations.
- ✓ Attachment B: RNP 4 Work Aid.
- ✓ Attachment C: Revision of AC 91-002 - Approval of aircraft and operators for RNAV 5 operations.
- ✓ Attachment D: Revision of RNAV 10 (RNP 10) Work Aid.
- ✓ Attachment E: Revision of RNAV 5 Work Aid.
- ✓ Attachment F: Revision of RNAV 1 and RNAV 2 Work Aid.

The Meeting analyzed the different Appendices, agreeing the following:

4.19 From the analysis made to Appendix A, corresponding to Circular 09-004 proposal for the approval to operators and aircrafts to perform RNP4 operations, the meeting took note and proposed to the secretariat to be sent to the States for analysis and comments.

4.20 From the analysis to Appendices C, D and E, it was suggested the need to modify some of the texts for a better understanding.

That texts and paragraphs given below, be amended for a better understanding by inspectors responsible for the issuance of authorizations to operators and aircrafts within the PBN framework:

Appendix C
AC 91-002 R2
10.2
c) route corresponds to the authorization. Flight crews must cross-check the cleared flight plan by comparing charts or other applicable resources with the navigation system textual display and the aircraft map display, considering the name of WP, sequence, direction and distance to next WP and total distance, if applicable. If required,(NOTAM, AIP, Letters of Navigation or other resources) the exclusion of specific navigation aids must be confirmed with the purpose to avoid the inclusion in the position calculation by the aircraft navigation system.

10.3
a)
6) All pilots are expected to maintain route centrelines, as depicted by on-board lateral deviation indicators and/or flight guidance, during all RNAV 5 operations, unless authorized to deviate by ATC or under emergency conditions. For normal operations, cross-track error/deviation (the difference between the RNAV system-computed path and the aircraft estimated position relative to the FTE path) must be limited to ± ½ the navigation accuracy associated with the procedure or route (2.5 NM). Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after procedure/route turns, up to a maximum of one-times the navigation accuracy (5 NM),

1.3
Appendix E
RNAV 5 Job Aid
Part 4
 # 3

RNAV 5 system requirements
Documents that show the aircraft equipment.
One (1) RNAV navigation system comprising of:
one or a combination of the following navigation sensors:
VOR/DME, DME/DME, INS o IRS,
and GNSS;
- *an RNAV computer;*

1.4 As indicated in the AC 91-001, in point 8.3.1.b) 3) (b), the Meeting considers that as indicated in the job aid RNP 10 detailed in Appendix D of this document, it must be indicated the Non-Applicability of point # 4g

Appendix D
RNP 10 Job Aid
Part 5
4g

Not Applicable
Aircrafts with Transport category which qualifies for the suffix / E, as defined in the United States AIM

Proposed revision to AC 91-002 – Aircraft and Operators Approval for RNAV 5 Operations

4.21 *The* Meeting took note on the content of the AC 91-002 concerning the approval of aircraft and operators for RNAV 5 operations, which was submitted in the Fourth Workshop/Meeting of the SAM Implementation Group (SAM/IG/4) (Lima, Peru, 19 - 23 October 2009).

4.22 *The* ICAO PBN Manual, Doc 9613, Volume II, Part B, Chapter 2, item 2.3.6 states that if the aircraft is equipped with, and uses, a navigation database, it must contain updated data appropriate for the region in which the foreseen operation is to be carried out, and must include the navigation aids and the regulatory waypoints for the route foreseen.

4.23 *Advisory* Circular 91-002 "Aircraft and operators approval for RNAV 5 operations", in its item 6.4 f), states that a navigation database is not part of the required RNAV 5 functions and that, in absence of such database, manual WPT entry will be required, thus significantly increasing the potential of error in WPTs.

4.24 In this regard, the meeting agreed that not using a suitable navigation database, results in an significant workload for flight crews, and introduces a potential source of error in defining the flight path, increasing considerably the error of defining the path (PDE) and thus, the TSE Total System Error.

4.25 Considering that Doc 9613 and their sources of information do not establish the requirement for database navigation for RNP RNAV 5 and 10 specifications, the meeting proposed to incorporate a text, which makes mandatory the use of a database if the operator achieve operational approval based on a RNAV system that may use a navigation database.

4.26 *In* view of the above, the Meeting proposes to include the following Note in paragraphs shown below:

1.-
In CA 91-002

13. Navigation Data Bases

> *Where the Navigation Database is installed and used, it must be updated and appropriate for the region where the operation is performed and should include the navigation aids and WP required for the route.*

Note 1: If the on-board RNAV system has the capacity to use a navigation database, it must be used, according to the provisions of this section

2.-
In AC 91-001

13. Navigation Data Bases

13.1

Note 1: If the on-board RNAV system has the capacity to use a navigation database, it must be used, according to the provisions of this section.

When analyzing the pending activities related to OPS/AIR, the Meeting made the following comments:

1.- 4.1., It was verified that it was only pending the issuance of advisory circulars related to RNP 4, RNP 2 and advanced RNP1 navigation specifications, as reported here in this part of the Appendix.

2.- 4.2., it was discussed the convenience to maintain in force the conclusion SAM/IG/4-2 and to encourage States to promptly publish its rules, and in particular, the one related to the navigation specification RNAV 5.

3.- 2.12 y 3.1, we see that there are still states that have not given the status of their fleet nor the status of the issuance of national standards for approval of operators and aircrafts

In view of the above, the Meeting approved the following conclusion:

Conclusion SAM/IG/5 -2

> *That the Secretariat, through their official channels, encourage those States to publish national standards for approval of operators and aircrafts for PBN operations and, in particular, for RNAV 5 navigation specification, as well as to send to the ICAO Regional Office, details on the potential capacity of their fleets, if still not done.*

When reviewing the activities that the Coordination Committee of Project RLA/06/901 approved during its third meeting, the meeting was of the opinion that *the compliance of the activities for the year 2010 be analyzed and verified . It was also deemed appropriate to continue with the instruction to the operations and air navigation inspectors in the operational approval process and aircraft operators to conduct operations within the PBN concept. In that sense, the Secretariat was requested to the extent possible, to undertake a third course on approval of operators and aircraft during the year 2010, in which is considered both RNAV and RNP specifications, so that inspectors attending, acquire the skills required in a single period of training.*

REGISTRY FORM FOR APPROVAL OF PBN OPERATIONS

In the analysis of PBN action plan, it was noted the need to establish a database with the approval of aircrafts and operators RNAV5. In this sense, a form was evaluated same that will be analyzed in CARSAMMA. The draft form is shown in Appendix A to this part of the Report.

In addition, the Secretariat raised the need to create a regional database, possibly based on CARSAMMA, for which it requested a form on which the Regional Authorities report the approval status of the various PBN Navigation Specifications.
Having regard to this requirement, and considering that CARSAMMA data request is not yet known, OPS / AIR group, based on their experience, proposed the Secretariat the following form as a draft:

APPENDIX A

REGISTRY FORM FOR APPROVAL OF PBN OPERATIONS

CARSAMMA FORM XX
REGISTRY FORM FOR APPROVAL OF PBN OPERATIONS

1.- Identification

Registration Status	Operator	Operator Status	Aircraft type	Aircraft Series	MSN

2.- PBN Approval

Approval Yes/No	Specification	Code	Approval Date	Expiration Date
	RNP 10			
	RNAV 5			
	RNAV 2			
	RNAV 1			
	RNP 4			
	RNP 2			
	RNP 1 basic			
	RNP 1 advanced			
	RNP APCH			
	RNP AR APCH			
	APV Baro Vnav			

3.- Additional Information _____
_____

Responsible Authority _____

Date of Issuance _____

Filling Instructions:

1.- The directions for filling fields identifying the operator and aircraft, are the same set for the CARSAMMA F2 Form.

2.- In the first column indicate the status of the operational authorization to operate according to each of the specifications detailed in the second column.

3.- In the third column, insert a code that will establish which equipment was authorized the operation with; this code should be consistent with those established for filling the Flight Plan.

4 .- In the fourth and fifth columns indicate the dates of issuance of each of the authorizations and its expiration date if applicable, otherwise indicate N / A.

5 .- The field "Additional Information" has been included in case the Issuer Authority wish to make any relevant indication.

Note: The information contained herein this form must match with the "Specifications of Operations" described that every aircraft has to carry aboard.

APPENDIX B

OPERATIONS SPECIFICATIONS

CASE 1 – APPROVAL WITH VOR-DME SENSORS

OPERATIONS SPECIFICATIONS

	YES	NO		
Navigation specifications for PBN operations	X		RNAV 5 **1. Stay within VOR-DME range**	OACI, DOC 9613 OACI CA 91-002
Otros			----------	

CASE 2 – APPROVAL WITH DME-DME SENSORS

OPERATIONS SPECIFICATIONS

	YES	NO		
Navigation specifications for PBN operations	X		RNAV 5 **1. Stay within DME-DME range**	OACI, DOC 9613 OACI CA 91-002
Others			----------	

CASE 3 – APPROVAL WITH GNSS SENSORS

OPERATIONS SPECIFICATIONS

	YES	NO		
Navigation specifications for PBN operations	X		RNAV 5 **1. GPS GPS as primary means of navigation**	OACI, DOC 9613 OACI CA 91-002
Others			----------	

CASE 4 – APPROVAL WITH IRS/INS SENSOR AS BACK-UP OF CONVENTIONAL SENSORS

OPERATIONS SPECIFICATIONS

	YES	NO		
Navigation specifications for PBN operations	X		RNAV 5 **1. Stay within VOR-DME o DME-DME range** **2. Use of INS/IRS system up to 2 hours since the last automatic updating of VOR-DME or DME-DME**	OACI, DOC 9613 OACI CA 91-0002
Others			----------	

Agenda Item 5: Implementation of air traffic flow management (ATFM) in the SAM Region

5.1 The Meeting recalled that the SAM/IG/02, 03 and 04 Workshops/Meetings, among other matters, analysed the matters related with ATFM implementation in the South American Region and the related activities.

5.2 SAM/IG/4 analysed different matters related with the ATFM, among them the lack of availability of a specific methodology to calculate the airports and ATC sectors capacity. The Meeting also analysed the information provided by the States regarding the processing and display of data for flow management purposes, surveillance and automation systems to support ATFM, the means available to capture meteorological data, communication systems and CDM processes, coordination between units, the ATFM manual, among other matters. It also analysed the tasks to be carried out by the Regional Project and the ATFM Action Plan.

5.3 From the discussions and exchange of points of view on this matter, the SAM/IG/4 Meeting concluded on the need to include a series of tasks in the ATFM action plan, and at the same time requested the Secretariat to take actions so that they are executed within the framework of Regional Project RLA/06/901, when appropriate.

5.4 Among the tasks that were identified to be developed, were the continuation of the development of the Second part of the ATFM Manual for the SAM Region, an ATFM Course, and a Collaborative Decision Making (CDM) Workshop oriented towards the ATFM.

5.5 The ATFM course was held in Rio de Janeiro, Brazil, from 22 to 26 March 2010 with the attendance of 18 experts of the Region. There were discussed different aspects of implementation of flow management units and flow management posts (FMU/FMP) in each State as part of the action plan for implementation of the ATFM approved for the South American Region. The First CDM Workshop was also carried out from 29 to 31 March 2010, with the attendance of 27 experts. Both events were carried out at the Air Navigation Management Centre, CGNA, facilities in Brazil, Rio de Janeiro.

5.6 With regard to the ATFM Manual, this activity was carried out from 6 to 17 July 2009, with the participation of Messrs. Ronald Fischer and Guilherme Francisco de Freitas Lopes, from United States and Brazil, respectively. The same has been presented to the first GREPECAS CNS/ATM Meeting, being adopted by the CAR and SAM Regions. The second part of this manual will continue to be developed.

Pre-operational weekly ATFM Teleconferences between SAM States

5.7 One of the most highlighting matters in the ATFM course was the exchange of information among concerned States, and in this connection, it was agreed to initiate weekly teleconferences of a pre-operational nature, in order to put into practice the procedures analysed and studied during the referred course.

5.8 In order to facilitate the participation of States, Boeing provided the use of a free service to carry out the teleconferences through AT&T. To this end, each State was assigned with a number 0800 from AT&T. In this sense, each State was allocated with a 0800 number in order to access to this service without charge. It should also be mentioned that due to the lack of local access to this AT&T service in Bolivia, Ecuador, Guyana, Paraguay and Suriname, the corresponding numbers have not been assigned yet, and consequently other access possibilities are being analysed. The list of updated numbers assigned, is shown in **Appendix A** to this part of the report.

5.9 Since this is a trial stage, it was agreed to keep the exchange of information simple, and to carry out the same on Mondays, Tuesdays and Wednesdays at 1400UTC in three (3) Groups, integrated by SAM Region States, as shown in **Appendix B** to this part of the Report. The airports on which there would be interest by States for exchange of information is also shown in the same Appendix.

5.10 **Appendix C** also shows an international briefing model form and a form filling guide for teleconferences, which will be used by the participants in the teleconference.

5.11 In this initial phase, the focal points ***for ATFM coordination***, participating in the teleconference will send the international briefing form completed with their data to other participants or to any alternative e-mail, with an advance of 30 minutes before the teleconference (14, 00 UTC), to maximize the efficiency of it. This procedure will start to be implemented from 8 June 2010. ICAO Secretariat was requested to send to focal points ***for ATFM coordination***, the Excel file so it can be completed and submitted by the participants of the teleconferences.

5.12 ATFM Implementation Group considered these ATFM pre-operational teleconferences continue to be weekly, due to communications infrastructure problems faced by some States.

5.13 Likewise, it was of the opinion that it would be convenient that starting SAM/IG/6 Meeting, an analysis of the daily application of these teleconferences be made. In this connection, the Meeting formulated the following Conclusion:

Conclusion SAMIG/5-7 ATFM Teleconferences in the SAM Region

That SAM States continue to hold weekly ATFM teleconferences between flow management units or flow management positions (FMU / FMP) to improve the exchange of information among participating States.

5.14 The Meeting also studied different alternatives that might enable direct participation of States that do not have free-charge telephone costs, as explained in paragraph 5.8 above.

5.15 Among these alternatives, the possibility to carry out teleconferences through REDDIG was evaluated, together with the Implementation Group for the improvement of communications, navigation and surveillance (CNS) capabilities, for en-route and terminal area operations.

5.16 The REDDIG itself does not have this capability to carry out the teleconference function, and would require a telephone line, connected to each one of the REDDIG nodes, at first through E1 digital link, in view that the teleconference capacity is for a minimum of 20 users.

5.17 Telephone lines connected to the REDDIG at the moment mostly have teleconference capability to a few users, and the necessary updating is required to carry out the teleconference function to the required capacity.

5.18 To this respect, the Implementation Group for the improvement of CNS capabilities should include within its activities a study contemplating the alternatives to carry out teleconferences to support Regional ATFM requirements.

5.19 In this regard, the Meeting requested that the CNS implementation group for the improvement of CNS includes within their activities a study of alternatives for conducting teleconferences through REDDIG to support the requirements of the Regional ATFM.

ATFM Action Plan

5.20 **Appendix D** shows an updated Action Plan for the Implementation of ATFM in Airports and Airspace (ATC Sector) of the SAM Region.

FMU Organisation in Uruguay

5.21 The Meeting noted that the Uruguayan Administration has taken flow control measures based on flow control procedures, without having an appropriate ATFM organisation for their rationalisation taking into consideration all the elements required for their implementation.

5.22 In this regard, and in summary, it was noted that the flow procedures applied by the ACC Montevideo have been due to operational deficiencies in the field of communications or navaids and other less frequent imbalances between demand and capacity.

5.23 Based on the above, and taking into account the SAM ATFM Plan being developed under RLA/06/901 project programmes, the Uruguayan Administration deemed it advisable to start planning the organisation and objectives of an FMU at the Montevideo Control Centre in order to meet ATFM needs in the Montevideo FIR. More information about the organization and objectives is shown in **Appendix E** to this part of the report.

Organization of FMU in Paraguay

5.24 Paraguay reported on the progress of tasks and work in the field of ATFM implementation in the Asuncion FIR. It was noted that flow management units were created at airports in Asuncion and Ciudad del Este. **Appendix F** to this part of the report shows the objectives of these FMUs.

Results from studies of runway capacity at major airports in Brazil

5.25 Brazil reported on the results of studies in their major airports. The Meeting considered that the information presented is valuable and therefore decided to incorporate it as **Appendix G** to this part of the report.

Results from studies of runway capacity at the Jorge Chavez Airport (Lima-Peru)

5.26 Peru reported on studies conducted at the Jorge Chavez Airport. The study resulted in certain rush hours current demand exceeds the capacity estimated for both the use of runway 15/33 as for the movement of aircrafts on the platform. Given the nature of the information, the Meeting decided to include it as **Appendix H** to this part of the report.

Nomination of focal point for coordination ATFM

5.27 In order to coordinate ATFM activities in the SAM Region, it is necessary for States to nominate a person as a focal point; this person will coordinate with other focal points nominated in the Region, the necessary actions for the development of ATFM in SAM Region. **Appendix I** of this part of the report contains the updated list of focal points that has been received in the Regional Office.

Course Runaway Capacity Calculation and ATC Sector

5.28 Considering the need to promote seminars and courses to the ATFM community, taking into account the concept Demand Analysis and Airport Capacity for the implementation of ATFM, the Secretariat is requested to consider in year 2011, under Project RLA/06/901, the inclusion of the Course Runway Capacity Calculation and ATC Sector, to be held in the first semester.

APPENDIX A

Start of Global Access Session

Following is information from Global Access, a list of numbers from Global Access and a list of numbers for Global Customer Services in order of Country.

If a country has number for Direct AT&T Direct, the audioconference requires a two-stage access. First dial AT&T Direct Number. Second, dial toll free telephone access number
Access code for all States is: **6476271#**

Country	Direct AT&T Number	Telephone access Number	Type of access	Global Access Comment
Argentina		0800-777-3427	Free call access	
Brazil		0800-891-2781	Free call access	
Chile		1230-020-5543	Free call access	
Colombia		01-800-5-1-81059	Free call access	
Panama		001-888-482-6001	Free call access	
Peru		0800-53-960	Free call access	
Uruguay		000-411-002-3427	Free call access	
Venezuela		0800-102-9106	Free call access	

APPENDIX B

GROUPS FOR ATFM TELECONFERENCE

In order to carry out weekly teleconferences in the South American Region, States that have availability to carry out teleconferences were grouped into 3 Groups, as follows:

GROUP 1
Integrated by Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay

DATE: EVERY MONDAY
START: 12/04/2010 - TIME: 14:00 UTC

Exchange of information will be made based on weather conditions of airports selected shown below and relevant information that might have any impact in air traffic flow towards selected destinations.

AIRPORTS ARGENTINA
· EZEIZA - CÓRDOBA - AEROPARQUE (Jorge Newbery) - MENDOZA

AIRPORTS BOLIVIA
· LA PAZ - COCHABAMBA - VIRU VIRU

AIRPORTS BRAZIL
· GUARULHOS - GALEÃO - PORTO ALEGRE –

AIRPORTS CHILE
· SANTIAGO - IQUIQUE - ARICA

AIRPORTS PARAGUAY
· ASUNCION – CIUDAD DEL ESTE

AIRPORTS URUGUAY
· MONTEVIDEO (Carrasco) - PUNTA DEL ESTE (Laguna del Sauce)

GROUP 2
Integrated by Bolivia, Brazil, Chile, Colombia, Ecuador and Perú

DATE: EVERY TUESDAY - START: 13/04/2010
TIME: 14:00 UTC

Exchange of information will be made based on weather conditions of airports selected shown below and relevant information that might have any impact in air traffic flow towards selected destinations.

AIRPORTS BOLIVIA
· LA PAZ - COCHABAMBA - VIRU VIRU

AIRPORTS BRAZIL
· GUARULHOS - GALEÃO - PORTO ALEGRE –

AIRPORTS CHILE
· SANTIAGO - IQUIQUE - ARICA

AIRPORTS COLOMBIA
· BOGOTA - BARRANQUILLA - CALI

AIRPORTS ECUADOR
· QUITO - GUAYAQUIL

AIRPORTS PERU
· LIMA - CUZCO - PISCO

GROUP 3

Integrated by Brazil, Colombia, Ecuador, Panamá, Perú and Venezuela

DATE: EVERY WEDNESDAY - START: 14/04/2010
TIME: 14:00 UTC

Exchange of information will be made based on weather conditions of airports selected shown below and relevant information that might have any impact in air traffic flow towards selected destinations.

AIRPORTS BRAZIL
· GUARULHOS - GALEÃO - BELO HORIZONTE – CONFINS - MANAUS

AIRPORTS COLOMBIA
· BOGOTA - BARRANQUILLA - CALI

AIRPORTS ECUADOR
· QUITO - GUAYAQUIL

AIRPORTS PANAMA
· TOCUMEN - HOWARD - GELABERT

AIRPORTS PERU
· LIMA - CUZCO - PISCO

AIRPORTS VENEZUELA
· CARACAS

APPENDIX C

TELE-CONFERENCE FORM

1. STATE: _____

2. REPRESENTATIVE: _____

3. DATE/TIME: _____

4. AERODROME: _____

4.1 Without delay ☐
With delay ☐ Time:_____

4.1.1 Aerodrome Characteristics:

a. RWY: _____ Nº NOTAM_____

b. Nav. Aids :_____ Nº NOTAM_____

c. Impacts: _____

4.1.2 Meteorology

a. Significant phenomena: _____

b. Impact: _____

4.1.3 Others: _____

5. FIR: _____

5.1. With delay ☐ Time:_____ Without delay ☐

5.1.1. Operational failures: NOTAM Nº _____

a. Communications: ☐

b. ATS surveillance: ☐

c. Others: ☐

5.1.2. **Human Resources**: ☐

_____

Restricted Airspace: ☐ NOTAM Nº _____

GUIDELINES TO FILL-IN THE TELE-CONFERENCE FORM

1. STATE

Fill-in with ICAO FIR identification letters

2. REPRESENTATIVE

Person designated transmitting the information.

3. DATE/TIME

Complete with the date and time (ddmmaa) / and UTC Time format. ***Example: 100510/1400***

4. AERODROME

Fill-in with ICAO Aerodrome identification letters

4.1. WITH DELAY/WITHOUT DELAY

Mark corresponding FIR with an **X** and only if there is delay specify time in hh/mm. ***Example: 01.00***

4.1.1. AERODROME CHARACTERISTICS

Complete Item a and b, if "with delay" was marked and specify NOTAM Nº restricting it. The Format to fill-in the runway will be RWY Nº and … de RWY and side (if parallel runways exist). ***Example: 17R***

4.1.2. METEOROLOGY

Complete items a and b if necessary and specify significant phenomena affecting aerodrome or airspace and report the impact of the same.

4.1.3. OTHERS

Specify any other anomaly which might affect the service.

5. FIR

Complete with the corresponding FIR name.

5.1. WITH DELAY/WITHOUT DELAY

Mark the corresponding field with an X and only if case of delay, specify time.

5.1.1. OPERATIONAL FAILURES

Complete items a, b and/or c with an **X** if necessary and specify NOTAM Nº restricting it.

5.1.2. HUMAN RESOURCES

Mark with an **X** and complete, if appropriate to specify the human resources being faced.

5.1.3. RESTRCTED AREAS

Mark with an **X** if restricted areas exist and specify the NOTAM number restricting it.

APPENDIX D

ACTION PLAN FOR THE IMPLEMENTATION OF ATFM AT SAM AIRPORTS

A: AIRPORT				
Task description	**Start**	**End**	**Responsible party (designate individual or organisation in charge)**	**Remarks**
1. Airport demand/capacity analysis	**Sep 2008**	**Apr 2010**		
1.1 Prepare ATFM survey	N/A	Aug 2008	Project RLA/06/901 Regional Office	**Finalised**
1.2 Send survey to the States of the Region	Aug 2008	SAM/IG/2	Regional Office	**Finalised**
1.3 Analyse the methodology presented by Brazil for estimating airport capacity	June 2008	SAM/IG/2	ATFM/IG	**Finalised** and analyzed through WP/08, WP/16.
1.4 Send response to survey	N/A	SAM/IG/2	States	**Finalised** Except for French Guyana, Guyana, and Suriname.
1.5 Assess survey results	N/A	SAM/IG/3	ATFM/IG	**Finalised**
1.6 Course offered by Brazil on Airport Capacity Estimate	Mar 2009	Mar 2009	Brazil	**Finalised** The course was carried out from 23 – 27 March 2009, as planned
1.7 Development of the Methodology for the Calculation of Airport and Airspace Capacity in the SAM Region	Nov 2008	Jan 2009	Brazil and USA RLA/06/901	**Finalised** Presented at SAM/IG/4
1.8 Carry out exercise of Calculation of Runway Capacity in the SAM Region as per the Course offered by Brazil	Sept 2009	SAM/IG/6	States	**Valid** Through Conclusion SAM/IG/4-5, the guidance material for the application of a common methodology for the calculation of airport and ATC sectors capacity was approved. Bolivia, Brazil, Colombia, Paraguay, Peru and Venezuela presented their preliminary exercise.

A: AIRPORT				
Task description	**Start**	**End**	**Responsible party (designate individual or organisation in charge)**	**Remarks**
1.9 Carry out Calculation of Airport and Airspace Capacity of main airports by States.	Sept 2009	SAM/IG/7	States	**Valid** Brazil, Paraguay and Peru presented the data.
1.10 Identify airports where periods exist where the demand is greater than existing capacity including simulations, if necessary, by States.	Sept/Oct 2009	SAM/IG/7	States	**Valid** Brazil, Paraguay and Peru presented the data.
1.11 Determine operational factors affecting airport demand and capacity to optimise utilisation of existing capacity, including simulations, is necessary.	Sept/Oct 2009	SAM/IG/7	States	**Valid** Brazil, Paraguay and Peru presented the data.
2. Coordination with the ATM community				
2.1 Present initial AIC model	SAM/IG/2	SAM/IG/2	ATFM/IG	**Finalised**
2.2 Publish initial AIC	SAM/IG/2	Next AIRAC date/2009 after SAM/IG/3	States	**Finalised**
2.3 Promote seminars to the ATFM community, taking into account the CDM concept for ATFM implementation, and begin the relevant coordination		December 2010	States	On 29 to 31 March 2010, the First CDM Workshop was carried out in Rio de Janeiro, Brazil, with the participation of 27 experts. The second ATFM/CDM Workshop will be carried out in Rio de Janeiro during 26 and 27 November, 2010
2.4 Inform the GREPECAS ATM Subgroup			N/A	The CNS/ATM/SG Meeting (Lima, Peru 15 to 19 March 2010) received information on the progress in the ATFM area up to date in the SAM Region (see 5.4)
3. Infrastructure and database		**Aug 2008**		**Valid**
3.1 Send the results of the survey developed by the hired expert to the Automation Group.		Dec 2008		**Finalised**
3.2 Send to the Automation Group the information obtained by the expert hired on the data bases used in the Brazil, United States and Eurocontrol units	Jan 2009	TBD		**Valid**

A: AIRPORT				
Task description	**Start**	**End**	**Responsible party (designate individual or organisation in charge)**	**Remarks**
3.3 Coordinate implementation activities with the Automation Group			ATFM/IG	**Permanent**
4. Policy, standards, and procedures			**Nov 2008**	
4.1 Hire expert to draft the manuals on ATFM measures for airports and FMU and FMP procedures			N/A	Task included in 4.2
4.2 Hiring of an expert for the elaboration of the ATFM Manual		February 2009	Regional Office	**Finalised**. Task developed from 6 to 17 July 2009
4.3 Detailed development of ATFM Manual chapters	Dec 2008	SAM/IG/5	Regional Office	**Finalised** Approved partial draft, including ATFM concepts for airspace and airports at SAM/IG/2 Meeting. Presented at SAM/IG/4
4.4 Detailed development of the second part of ATFM Manual Chapters.	Dec 2009	Jun 2010	Regional Office (RLA/06/901)	**Valid**
4.5 Present the model AIC Supplement		SAM/IG/6	ATFM/IG	**Valid**
4.6 Approve the AIC Supplement		SAM/IG/6	ATFM/IG	**Valid**
4.7 Publish the AIP Supplements		AIRAC date prior to SAM/IG/7	States	**Valid**
5. Training				
5.1 Draft ATFM training plans and submit them		SAM/IG/5	States	**Valid**
5.2 Train the team on decision-making at airports		Aug 2009	States	**Valid**
5.3 Hire expert to draft Manual on the Introduction to ATFM for the ATM Community		TBD	Regional Office	Guidelines to inform ATM community on ATFM and CDM general concepts. These guides may be provided in courses, seminars or others TBD.

A: AIRPORT				
Task description	**Start**	**End**	**Responsible party (designate individual or organisation in charge)**	**Remarks**
5.4 Present and assess the Manual for the Introduction to ATFM for the ATM Community		SAM/IG/6	RLA/06/901	Through the hiring of experts, the ATFM manual was developed. The CNS/ATM/SG Meeting adopted the manual for the CAR and SAM Regions. It has been planned to develop a second part of such manual.
5.5 Train the members of the ATM community in the CDM and ATFM concepts		TBD	States	The ATFM SAM Course was held in Rio de Janeiro, Brazil, from 22 to 26 March, 18 experts participated and the holding of tele-conferences was agreed, same which started on 12 April with excellent results. The Second SAM ATFM Course will be held in Rio de Janeiro from 23 to 25 November 2010
5.6 Train FMP/FMU staff for application of ATFM measures for airports		SAM/IG/7	States	**Valid**
5.7 Monitor the training of the ATM community		Jul 2010	States	**Valid**
6. Final implementation decision				
6.1 Identify and review factors that may affect the implementation decision		SAM/IG/6	ATFM/IG	**Valid**
6.2 Declare the pre-operational implementation in the defined area			States	**Valid**
6.3 Declare the final operational implementation in the defined area		TBD	States	**Valid**
7. Monitor system performance	**SAM/IG/7**	**SAM/IG/8**		**Valid**
7.1 Draft the ATFM post-implementation follow-up programme at airports	SAM/IG/6	SAM/IG/7	ATFM/IG	**Valid**
7.2 Implement the ATFM post-implementation follow-up programme at airports	SAM/IG/7	SAM/IG/X	States	**Valid**

A: AIRPORT				
Task description	**Start**	**End**	**Responsible party (designate individual or organisation in charge)**	**Remarks**
Tentative pre-operational implementation date		**N/A**	**Oct 2010**	
Tentative definitive implementation date		**N/A**	**Dec 2010**	

Note:

E	States
SAM/IG	SAM Implementation Group
ATFM/IG	ATFM Implementation Group
OR	Regional Office

ACTION PLAN FOR ATFM IMPLEMENTATION IN THE SAM REGION				
B- AIRSPACE (ATC Sector)				
Task description	**Start**	**End**	**Responsible party(designate individual or office in charge)**	**Remarks**
1. Airspace demand and capacity analysis				
1.1 Analyse the methodology to estimate ATC sector airspace capacity presented by Brazil	Jun 2008	SAM/IG/2		**Finalised**
1.2 Prepare an airspace demand survey	TBD	TBD		
1.3 Attend the course on Airspace Capacity Estimate (ATC Sector).	Mar 2009	States		**Finalised**
1.4 Carry out the States estimate airspace ATC sector capacity at the major airports	Sept. 2009	SAM/IG/7		**Valid**
1.5. Identify airspace sectors where demand sometimes exceeds capacity, including simulations by the States, if necessary	**TBD**	**TBD**		
1.6 Identify factors affecting airspace demand and capacity in order to optimise the use of existing capacity, including simulations if necessary	**TBD**	**TBD**		
1.7 Present conclusions on the existing airspace capacity.	**TBD**			
2. Coordination with the ATM community	**Sep 2008**	**Aug 2009**		
2.1Consider by the ATM community the implementation of ATFM in airspace	Sep 2008	Dec 2010		**Valid**
3. Infrastructure and database	**TBD**	**Dec 2013**		
3.1 Send requirements to the Automation Group, as stipulated in Appendix B of the ATFM CONOPS	TBD	TBD		
3.2 Coordinate implementation activities with the Automation Group	N/A	Dec 2013		
4. Policy, standards, and procedures	**TBD**	**Jun 2013**		
4.1 Develop ATFM policies, taking into account the objectives and principles established in the CAR/SAM ATFM CONOPS	**TBD**	**TBD**		

ACTION PLAN FOR ATFM IMPLEMENTATION IN THE SAM REGION				
B- AIRSPACE (ATC Sector)				
Task description	**Start**	**End**	**Responsible party(designate individual or office in charge)**	**Remarks**
5. Training	**TBD**	**May 2013**		
5.1 Train the team on airspace data collection	Jun 2009	March 2011	States	**Valid** A runway capacity and ATC sector will be held in Rio de Janeiro, Brazil, in March 2011.
5.2 Air Traffic Flow Management Course	Mar 2010	Nov 2010	Brazil	Hosted by RP RLA/06/901 The Second ATFM Course will be held in Rio de Janeiro, Brazil, from 23 to 25 November 2010.
5.3 Train personnel in ATFM strategic measures for airspace	**TBD**	TBD		
5.4 Prepare plans and ATFM training material	TBD	TBD		
5.5 Conduct training of personnel involved.				
6. Final implementation decision	**N/A**	**Sep 2013**		**Valid**
6.1 Analyse factors affecting the implementation decision	**N/A**	**TBD**		
6.2 Declare pre-operational implementation in the area defined	**N/A**	**TBD**		
6.3 Declare definitive operational implementation in the area defined	**N/A**	**TBD**		
7. Monitor system performance	**TBD**	**N/A**		
7.1 Draft ATFM post-implementation follow-up programme	TBD	Aug 2013		**Valid**
7.2 Implement ATFM post-implementation follow-up programme	Dec 2013	N/A		
Tentative pre-operational implementation date	**N/A**	**Jul 2013**		
Tentative definitive implementation date	**N/A**	**Dec 2013**		

APPENDIX E

ORGANISATION OF THE MONTEVIDEO FMU

INTRODUCTION

ATFM implementation in the Uruguayan airspace has the following objectives:

a) to prevent air traffic demand from exceeding the declared capacity of air traffic control services.

b) to contribute to a safe, orderly, and expeditious air traffic, maximising ATC capacity, and making sure that traffic volume is consistent with the capacity declared by the authorities.

ORGANISATION

1. RESPONSIBLE AUTHORITY: DTTA (Head of the Air Traffic Technical Department)

AREA OF RESPONSIBILITY: MONTEVIDEO FIR

OBJECTIVE: Ensure compliance with ATFM management objectives by the relevant bodies.

2. ENTITY RESPONSIBLE FOR THE PROVISION OF ATFM: MONTEVIDEO FMU

AREA OF RESPONSIBILITY: MONTEVIDEO FIR

OBJECTIVES:

- Maximise declared capacity
- Monitor and balance traffic flows in the areas of responsibility
- Implement TMIs
- Provide demand data for the development of the three ATFM phases
- Be in direct contact with FMP/FMC
- Provide operators and users in general with precise and real-time information about the development of the ATFM plan
- Receive AIS/AIM, meteorological information.

LOCATION: Premises of the Montevideo Air Traffic Control Centre, Carrasco International Airport, Canelones, URUGUAY

RELATED SECTIONS

- Determination of runway and ATC sector capacity
- Airspace management (organisation)
- Statistics

3. UNIT RESPONSIBLE FOR THE PROVISION OF ATFM FMP/FMC

AREA OF RESPONSIBILITY: ACC, adjacent ACCs, TMA, TWR.

OBJECTIVES:

- Inform the FMU about air traffic demand in ATC sectors, aeronautical and airport infrastructure
- Inform the FMU about meteorological conditions
- Identify situations of congestion
- Apply demand/capacity-balancing measures
- Advise the FMU of any changes in demand caused by irregular conditions.

LOCATION: Montevideo Air Control Centre (Supervision Console)

4. FLOW MANAGEMENT PROCEDURE

The AFTM shall be planned and managed in three stages:

a) **STRATEGIC STAGE**: Up to 7 days in advance

RESPONSIBLE PARTIES**:**

D.T.T.A
FMU
Aircraft operators

OBJECTIVES:

- Analyse planned demand and RPL
- Assess where and when demand will exceed available capacity
- Take steps to achieve this balance
- Ensure that the ATC authority provides adequate staffing at the sites and time required
- Schedule flights as applicable
- Identify potential problems and assess possible solutions
- Develop TMI procedures
- AIS/meteorology coordination

b) **PRE-TACTICAL STAGE**: From 6 days in advance to the day of the operation

RESPONSIBLE PARTIES:

FMU
FMP/FMC
Aircraft operators

OBJECTIVES:

- Review the strategic stage
- Make adjustments based on new information (FPL, meteorology, infrastructure)
- Adjust TMIs

c) TACTICAL STAGE: Day of the operation

RESPONSIBLE PARTY: FMP/FMC

OBJECTIVES:

- Seek balance, based mainly on demand (FPL, RPL).
- Other factors: Meteorology, infrastructure, schedule modification, resources.

5. CDM (COLLABORATIVE DECISION MAKING)

PARTICIPANTS: FMU FMP/FMC
Aircraft operators
Military operators
Airport operators
AIS/AIM
Meteorology

OBJECTIVES:

- Improve ATFM and airport capacity management, reducing delays and getting ahead of events through better resource management.

METHODOLOGY:

- Meetings
- Exchange of updated information
- Management measures
- Dissemination

6. TMI (traffic management initiative)

RESPONSIBLE PARTY: FMU FMP/FMC

OBJECTIVES:

- Apply traffic demand management techniques based on system capacity

TYPES:

- Altitude
- In-flight holding
- Ground delay programmes
- Ground stop
- Miles in trail
- Minutes in trail
- Re-routing

7. RELATED SECTIONS

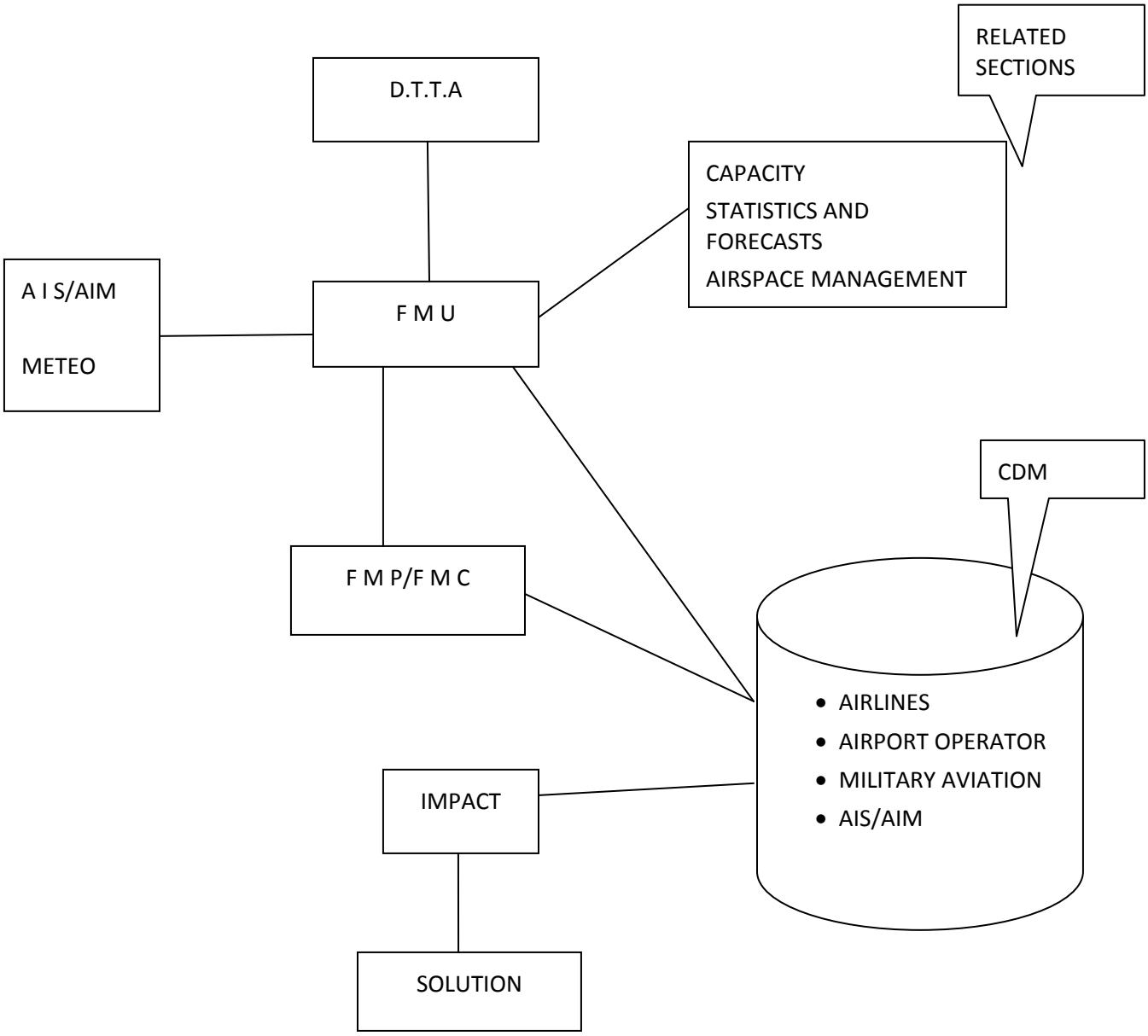
A) Responsible for determining capacity

a. ATC section determines sector capacity
b. ATC section determines runway capacity
c. Airport operator determines airport capacity

B) Responsible for statistics

- Overflights (arrivals and departures)
- Landings
- Take-offs
- Commercial aviation
- General aviation
- Military aviation

C) Responsible for advising on the development and restructuring of routes and airspaces with a view to optimising air traffic flow


RELATED SECTIONS
D.T.T.A
CAPACITY
STATISTICS AND FORECASTS
AIRSPACE MANAGEMENT
A I S/AIM
METEO
F M U
CDM
F M P/F M C
AIRLINES
AIRPORT OPERATOR
MILITARY AVIATION
AIS/AIM
IMPACT
SOLUTION

APPENDIX F

FMU

SILVIO PETTIROSSI AND GUARANI AIRPORTS

OBJECTIVES:

1 Plan, coordinate, promulgate and execute ATFM measures, keeping in mind the different planning phases, within its area of responsibility.

2 Provide reports and daily statistics of ATFM operations, of delays and all information relevant to ATC and Aircraft Operators (AO).

3 Provide reports and daily statistics of ATFM operations and of delays with operational-administrative purposes.

4 Coordinate and cooperate with the ATC and aircraft users to ensure an effective and equitable service to proceed with ATFM incident reports.

5 Provide adequate tools for information processing and facilitate planning, decision making, management and control, as per policies established by CFMU.

6 Control the application of standards established for data processing in aerodromes of the State.

APPENDIX G

RESULTS ON STUDIES MADE IN BRAZILIAN AIRPORTS

1.1 Al The saturation of the operational capacity of airport infrastructure has emerged as one of the biggest problems faced by domestic and international airports. In order to maintain the air traffic flow near optimum operating conditions, avoiding in this way, the saturation of available capacity, the Brazilian Centre for Management of Air Navigation is conducting frequent studies on runway capacity at major airports in the country. These studies take into account, among other factors, the Modus Operandi submitted by the ATC unit, existing airport infrastructure and operational standards submitted by the airlines. At the end of each job, are presented views that reveal the values of capacity of the set of runaways, the factors affecting the capacity and the recommended actions to optimize the use of existing airport infrastructure, and how to improve it.

2 Capacity of the main airports in Brazil

2.1 Guarulhos Airport

2.1.1 Capacity of the set of runaways

2.1.1.1 In the study carried out, it has been taken into account the statutory minimum separation between aircraft landing and taking off (5NM), and has been applied the calculation method of runway capacity developed by Brazil.

2.1.1.2 TWR-GR uses as standard operation mode only the takeoffs from runways 09L/27R and landings only on runways 09R/27L.

2.1.1.3 After collecting the data and the monitoring of operations, CGNA has found a 53MOV/H capacity.

2.1.2 Periods when demand exceeds the declared capacity

2.1.2.1 Currently, the demand in the Guarulhos airport does not exceed the capacity of the whole runaway, not having, therefore, periods when the demand exceeds the capacity stated.

2.1.3 Deficiencies in airport infrastructure

Construct TWY rapid departures for 09/27 runaways that will reduce the runway occupancy time.
Construct TWY parallel to the main runaway, aiming to facilitate the movement of towed aircraft, overtaking during the shooting and the organization of transit when the change of headers is made.
Adjust the operability of the ramp to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.2 Galeão Airport

2.2.1 Capacity of the set of runaways

2.2.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.2.1.2 The Galeão Airport has 04 operational standards based on the runways in use. The most widely used and that allow better use of the runway system are: DEP RWY 10 and ARR RWY 15 or DEP RWY 33 and ARR RWY 28. With the adoption of these operational standards operational, the CGNA has found a 56MOV/H capacity.

2.2.2 Periods when demand exceeds the declared capacity

2.2.2.1 Currently, there are no periods when the demand exceeds the capacity of the runway system.

2.2.3 Deficiencies in airport infrastructure

2.2.3.1 Galeão Airport has a good set of runaways and of fast output TWY; this allows to absorb a high traffic demand.

2.2.3.2 The aircraft platform has enough positions to meet current demand, as alternated flights.

2.3 Brasilia Airport

2.3.1 Capacity of the set of runaways

2.3.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.3.1.2 In Brasilia, runways 11L/29R and 11R/29L are parallel and allow independent operations. The BR-TWR mainly use a runaway for ARR and other for DEP. Capacity values are close, regardless of the runaways that are selected to absorb the ARR and DEP. With the adoption of these operational standards operational, the CGNA has found a 56MOV/H capacity.

2.3.2 Periods when demand exceeds the declared capacity

2.3.2.1 Currently, there are no periods when the demand exceeds the capacity of the runway system. However, rush periods have been identified , when the movement schedule has approached to the capacity declared.

2.3.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaways 11R/29L and 11L that will reduce the runway occupancy time.
Construct a second viaduct that connects the aircraft platform to the runway 11R/29L.
Adjust the operability of the ramp to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.4 **Confins Airport**

2.4.1 **Capacity of the set of runaways**

2.4.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.4.1.2 After collecting the data and the monitoring of operations, the CGNA has found a capacity of 33MOV/H, considering a take-off between two consecutive landings, as foreseen by the mathematical model developed by Brazil.

2.4.2 **Periods when demand exceeds the declared capacity**

2.4.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform.

2.4.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaway 16/34 that will reduce the runway occupancy time.
Construct a second TWY parallel to Runaway 16/34.
Restructure the TWY system to allow better access to parking lots, helping to increase the fluidity, safety of operations and avoiding the risk of congestion in the respective platforms.
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.5 **Porto Alegre Airport**

2.5.1 **Capacity of the set of runaways**

2.5.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.5.1.2 After collecting the data and the monitoring of operations, the CGNA has found a capacity of 33MOV/H, considering a take-off between two consecutive landings, as foreseen by the mathematical model developed by Brazil.

2.5.2 **Periods when demand exceeds the declared capacity**

2.5.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform. However, in case of bad weather, the repressed demand exceeds the capacity of existing platform.

2.5.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaway 11/29 that will reduce the runway occupancy time
Construct TWY parallel to Runaway 11/29
Construct TWY access to the header 29
Build unique tracks for vehicles, eliminating the access of TWY and the main runway
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.6 **Curitiba Airport**

2.6.1 **Capacity of the set of runaways**

2.6.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.6.1.2 Curitiba Airport has runaways 15/33 and 11/29 that intersect. However, depending on the irregular floor of the runway 11/29, the CAT C and D aircrafts operate on the runway 15/33. As a result, the capacity analysis has been made considering only functions on the runway 15/33. After data collection and accompanying operations, CGNA has found a capacity of 29MOV/H, considering a take-off between two consecutive landings, as foreseen in the mathematical model developed by Brazil.

2.6.2 **Periods when demand exceeds the declared capacity**

2.6.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform. However, in case of bad weather, the repressed demand exceeds the capacity of existing platform.

2.6.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaways 15/33 and 11/29 that will reduce the runway occupancy time.
Construct TWY parallel to Runaway 15/33 y 11/29.
Construct TWY access to the header 15.
Make the operation viable in Runaway 11/29.

2.7 Salvador Airport

2.7.1 Capacity of the set of runaways

2.7.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.7.1.2 Salvador Airport has runaways 17/35 and 10/28. However, depending on the small size of the runaway 17/35 of on the absence of aid, the CAT C and D aircrafts operate on the runway 10/28. As a result, the capacity analysis has been made considering only functions on the runway 10/28. After data collection and accompanying operations, CGNA has found a capacity of 31MOV/H, considering a take-off between two consecutive landings, as foreseen in the mathematical model developed by Brazil.

2.7.2 Periods when demand exceeds the declared capacity

2.7.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform. However, the Centre of Management of Air Navigation continues to develop strategic planning of the mesh distribution for peak season, aiming to align demand with capacity declared, once in summer, comes a significant increase in flights.

2.7.3 Deficiencies in airport infrastructure

Align the TWY B head 10 so that the aircraft when being in the holding position in said TWY not constitute an obstacle for those approaching for landing.
Construct TWY to allow direct access to military platform when the Runaway 10 is in use.
Construct TWY parallel to Runaway 10/28.
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.
Find mechanisms that will enable the TWR-SV to have total visibility of the runway 17/35, which is currently blocked due to construction of the new passenger terminal.

2.8 Recife Airport

2.8.1 Capacity of the set of runaways

2.8.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.8.1.2 After collecting the data and the monitoring of operations, the CGNA has found a capacity of 33MOV/H, considering a take-off between two consecutive landings, as foreseen by the mathematical model developed by Brazil.

2.8.2 **Periods when demand exceeds the declared capacity**

2.8.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform.

2.8.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaways 36 that will reduce the runway occupancy time.
Construct TWY parallel to the runway to lead the aircrafts that come from the military platform to the runaway 18.
Construct TWY with paving and proper positioning to bear military aircrafts, with equal or greater carrier than B707, which are intended for the military platform.
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.9 **Campinas Airport**

2.9.1 **Capacity of the set of runaways**

2.9.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.9.1.2 After collecting the data and the monitoring of operations, the CGNA has found a capacity of 33MOV/H, considering a take-off between two consecutive landings, as foreseen by the mathematical model developed by Brazil.

2.9.2 **Periods when demand exceeds the declared capacity**

2.9.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform, although there has been a considerable increase in traffic volume in Campinas. However, in case of adverse weather conditions, pent-up demand exceeds the capacity of existing platform.

2.9.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaways 15/33 that will reduce the runway occupancy time.
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

2.10 **Manaus Airport**

2.10.1 **Capacity of the set of runaways**

2.10.1.1 In the study carried out, it has been considered the statutory minimum separation between aircrafts landing and taking off (5NM), and method of calculation of runway capacity developed by Brazil, has been applied.

2.10.1.2 After collecting the data and the monitoring of operations, the CGNA has found a capacity of 29MOV/H, considering a take-off between two consecutive landings, as foreseen by the mathematical model developed by Brazil.

2.10.2 **Periods when demand exceeds the declared capacity**

2.10.2.1 Currently, there are no periods when the demand exceeds the runaway system capacity and the aircraft platform,

2.10.3 **Deficiencies in airport infrastructure**

Construct TWY rapid departures for runaways 10/28 that will reduce the runway occupancy time
Construct TWY parallel to Runaway 10/28.
Adjust the operability of the platform to forecast demand, avoiding congestion and saturation.
Doctrine airlines about the need to reduce the average time runway occupancy during takeoff and landing operations.

APPENDIX H

Cálculo de capacidad aeroportuaria del aeropuerto Internacional Jorge Chávez

1.1 Desde inicios del 2009, CORPAC realizó mediciones de tiempo de ocupación de pista en el aeropuerto Jorge Chávez y luego del curso realizado en Brasil, se capacitó a una cantidad de personal óptima para continuar con la toma de datos.

1.2 Luego de procesar la información recabada y procesarla de acuerdo con la metodología adoptada y lo recomendado en el manual de ATFM CAR/SAM, se buscaron identificar variables de manera conjunta con la empresa administradora del aeropuerto (Lima Airport Partners-LAP) que pudieran influir en los resultados finales.

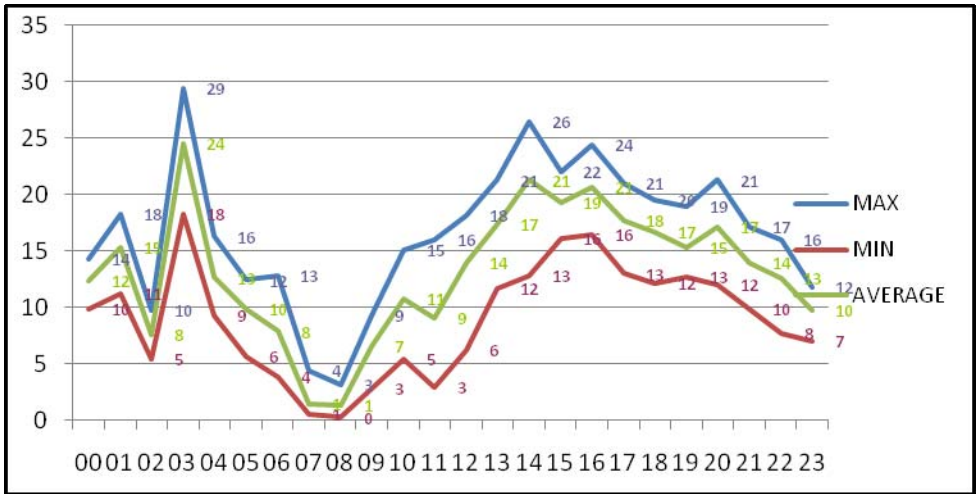
1.3 SITUACIÓN ACTUAL

De acuerdo a los últimos estudios realizados, en determinadas horas pico la demanda actual excede la capacidad estimada (resultado variable dependiendo del valor considerado en las tablas del numeral 2.1 y 2.2 de este documento), tanto para el uso de las pistas 15/33 como para el movimiento de aeronaves en la plataforma (dato proporcionado por LAP de acuerdo al acta de reunión ATM.ATFM.001).

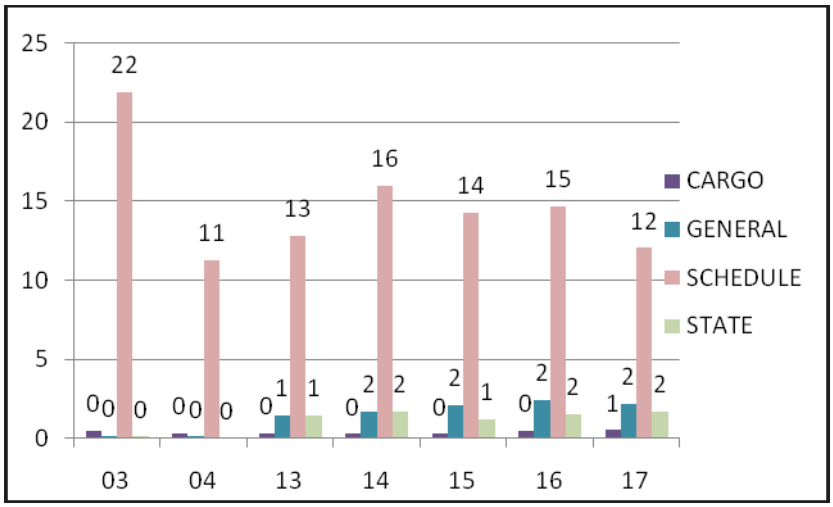
1.4 En cuanto a la utilización de pista, normalmente las horas que cuentan con el mayor número de operaciones del día, son entre las 02:30Z y 03:30Z (1 hora), sin embargo en cuanto a la capacidad de plataforma, esta llega a estar saturada o muy próximo al punto de saturación, entre las 0230Z y las 0500Z (2 horas y 30 minutos); esta diferencia de tiempo genera una restricción de acceso de aeronaves al terminal y por lo tanto impacta en el desarrollo normal del flujo de las operaciones de aterrizaje/despegue o en el área de maniobras. Aproximadamente entre 70% y 80% de operaciones estas horas, son de llegadas y muchas aeronaves permanecen en tierra luego del aterrizaje, ocupando los puestos de estacionamiento hasta después de la hora pico. El porcentaje de despegues entre el mismo lapso de tiempo es del 20% al 30% del total. La característica de este flujo de transito, registra un parque aéreo homogéneo, en el que las categorías de aeronaves son muy similares ayudando a que la complejidad sea media, si se compara con la hora pico de la mañana.

1.5 La hora que registra mayor complejidad para las operaciones de aterrizaje/despegue es de 14:00Z a 17:00Z, ya que las operaciones son realizadas con una mayor variedad de aeronaves de distintas categorías (velocidad), y se mantiene durante un periodo más prolongado que en el primer caso.

1.6 La siguiente tabla, cuenta con datos del movimiento de aeronaves utilizados. En la línea azul se aprecia la mayor cantidad de operaciones de la muestra, la línea roja la cantidad de operaciones mínima y la verde el promedio de ambos en 24 horas.



1.7 Los tipos de vuelo registrados en promedio durante el día, ayudan a establecer con facilidad un pronóstico de flujo de transito en la hora de mayor movimiento de operaciones de aterrizaje y despegue (por la noche), tal como se aprecia en la tabla siguiente:



2 CÁLCULO DE CAPACIDAD DE PISTA.

2.1 De acuerdo a la metodología adoptada para el cálculo de capacidad de pista, se obtienen los siguientes resultados:

% ENTRE ARR/DEP	SEPARACION ENTRE 2 LLEGADAS CONSECUTIVAS ST= 14NM (*) / SMR = 10NM		SEPARACION ENTRE 2 LLEGADAS CONSECUTIVAS ST =12NM (*) / SMR = 8NM		SEPARACION ENTRE 2 LLEGADAS CONSECUTIVAS ST = 9NM (*) / SMR = 5NM	
50% ARR 50% DEP	CAPACIDAD DE RWY (# ACFT's)	CAPACIDAD AL 80% (# ACFT's)	CAPACIDAD DE RWY (# ACFT's)	CAPACIDAD AL 80% (# ACFT's)	CAPACIDAD DE RWY (# ACFT's)	CAPACIDAD AL 80% (# ACFT's)
RWY 15	19	15	23	18	33	26

Nota: ST = SS + SMR

2.2 En el caso que se requiera utilizar la pista 33 para despegues y la 15 para aterrizajes, la cantidad de aeronaves consideradas sería la siguiente:

% ENTRE ARR/DEP	**SEPARACION ENTRE 2 LLEGADAS CONSECUTIVAS = 24NM (considerando 20NM/THR como punto máximo de TKOF)**		**SEPARACION ENTRE 2 LLEGADAS CONSECUTIVAS = 18NM (considerando 14NM/THR como punto máximo de TKOF)**	
50% ARR 50% DEP	**CAPACIDAD DE RWY (# ACFT's)**	**CAPACIDAD AL 80% (# ACFT's)**	**CAPACIDAD DE RWY (# ACFT's)**	**CAPACIDAD AL 80% (# ACFT's)**
RWY 15/33	9	7	11	9

2.3 Para los cálculos de ambos casos se consideraron los siguientes datos básicos:

a) Porcentaje de utilización de pista considerado para el 2009:
- RWY15 = 88%
- RWY33 = 12%

b) Combinación/Mix de aeronaves (categorías de acuerdo al Doc. OACI 8168):
- Categoría A = 01%
- Categoría B = 19%
- Categoría C = 63%
- Categoría D = 17%

c) Punto máximo en aproximación (RWY 15) para permitir un despegue:
- de RWY15 = DALNA
- de RWY33 = 20NM/THR (primer caso)
- de RWY33 = SIGAS (segundo caso)

d) Tiempo medio de ocupación de pista 15:
- Categoría A = 42 segundos
- Categoría B = 94 segundos
- Categoría C = 92 segundos
- Categoría D = 101 segundos

e) Tiempo medio de ocupación de pista 33 (solo Despegues):
- Categoría A = No registra
- Categoría B = 111 segundos
- Categoría C = 73 segundos
- Categoría D = 90 segundos

APÉNDICE I/APPENDIX I

NOMINACIÓN DE PUNTO FOCAL PARA LA COORDINACIÓN ATFM
NOMINATION OF FOCAL POINT FOR ATFM COORDINATION

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Agenda Item 6: Assessment of operational requirements in order to determine the implementation of communications and surveillance (CNS) capability improvements for en-route and terminal area operations

Follow-up to the interconnection of AMHS systems in the SAM Region

6.1 The Meeting took note of the progress in the interconnection of the AMHS systems between Argentina-Paraguay, Argentina-Brazil and Brazil–Paraguay. In addition, in follow-up to Conclusion SAM/IG/4-10, the memorandum of understanding (MoU) for the interconnection of AMHS systems between Argentina-Peru and Brazil-Peru was drafted, and the MoUs between Argentina-Brazil and Brazil-Paraguay were updated.

6.2 The Meeting noted that the MoU between Argentina-Peru would be reviewed for the approval of the aeronautical authorities of the States involved in the interconnection, and signed by the time of SAM/IG/6 meeting. The MoU between Brazil-Peru will be examined for approval by the respective aeronautical authorities, and signed during the Bolivia, Brazil, Chile and Peru ATM Multilateral Meeting to be held in Lima, Peru, from 6 to 10 September 2010.

6.3 With regard to the drafting of MoUs for the interconnection of AMHS systems between Argentina-Chile, Brazil-Colombia, Chile-Peru and Colombia-Peru, The Meeting noted that, in accordance with Conclusion SAM/IG/4-10, these should have been completed and signed during SAM/IG/5 meeting.

6.4 In view that the MoUs for the interconnection of AMHS systems between the States indicated in the above paragraph had not been completed in the due date, the Meeting deemed it advisable to extend their implementation and subscription to the SAM/IG/6 meeting.

6.5 Taking into account that Panama has an AMHS system installed, the Meeting deemed it convenient that said State coordinate with the aeronautical administration of Colombia for the drafting of an MoU for the interconnection of AMHS systems, and that it be delivered by the SAM/IG/6 meeting date.

6.6 **Appendix A** to this Agenda Item presents the action plan for the interconnection of AMHS systems, revised by the Meeting.

Study for the regional implementation of a new communications system

6.7 The Meeting took note of a preliminary analysis made to carry out a study on the implementation of a regional satellite, ground, or mixed (satellite and ground) digital network, with views to support current voice and data aeronautical fixed services requirements, radar data and flight plans exchange, as well as ATN ground-ground applications among SAM States/Territory, scheduled to be implemented in the short and medium term. The preliminary analysis took the following parameters as a premise for the study: availability, BER, Band Width (BW), current technology (equipment installed), types of services to be implemented and a unique communications service provider. In this respect, the action plan for the study of a SAM digital network was revised accordingly. The revised action plan is shown in **Appendix B** to this Agenda Item.

Study of the calculated line-of-sight coverage of VOR/DME stations in the SAM Region

6.8 The Meeting took note of the study carried out on the calculated line-of-sight coverage of VOR/DME stations in the SAM Region. The study consisted in the elaboration of coverage maps and a database referring to coverage calculations of all VOR/DME installed in the SAM Region. In order to determine the coverage of VOR/DME stations, software tools such as Radio Mobile, SRTM3 and DTED digital databases were used. Furthermore, special coverage calculation programmes were mainly based on Windows Visual Basic Excel, Note Pad and Google Earth for coverage display.

6.9 The results of the task carried out include, for each of the stations analysed, the following information:

a) Obstacle database;
b) An Excel degree-by-degree coverage database up to FL250;
c) A polar coverage map up to FL250, with a 5-degree filter; and
d) Conversion of the Excel database to KML in order to permit the display of VOR/DME line of site coverage in Google Earth.

6.10 During the Meeting, a CD with information indicated in the above paragraph was handed over. To this effect, the Meeting considered that States should examine the information presented therein, with the aim that same is used as a contributory element for the PBN feasibility study (RNAV 5, RNAV 1 and RNAV 2). In this respect, the Meeting formulated the following conclusion:

Conclusion SAMIG/5-8 Review of the SAM VOR/DME stations line-of-sight coverage database

That the SAM States/Territory:

a) Review the information in the database delivered during the Meeting containing line-of-sight diagrams of the VOR/DME stations corresponding to their State;

b) Send the comments corresponding to the database to the ICAO South American Regional Office no later tan 30 June 2010;

c) Use the calculated line-of-sight coverage data as an element for the PBN operations feasibility study (RNAV 5, RNAV 1 and RNAV 2).

6.11 The Meeting considered that the study on line-of-sight coverage should be extended to include coverage at levels above FL250. Likewise, the Meeting considered that a coverage diagram for ground-air communications should be prepared, as well as for radar surveillance systems. Since this study has not been considered in the approved 2010 RLA/06/901 project budget, the requirement would be submitted to the fourth committee coordination meeting of Project RLA/06/901 for approval and implementation in 2011.

Information on SAM States CNS improvements

6.12 The Meeting was informed that since late 2009, Argentina had implemented a domestic real-time Navaid Remote Indicator System in its national IP network, thus demonstrating the effectiveness of an IP network in the addition of the services. At the moment, the Argentinean IP network, in addition to the real-time navaid monitoring application, has the following applications: AMHS, AIDC over AMHS (on trial, until operational agreements between ACCs are carried out), radar signal transportation (partial), an operational meteorological application at a remote control position of Ezeiza ACC (FDP/RDP Aircom 2100 Indra) in Aeroparque Jorge Newbery and, in the San Fernando aerodrome, ATS speech service (partial).

Requirement for a teleconference service at REDDIG to support ATFM

6.13 For the implementation of ATFM, the Meeting considered it necessary to implement a teleconference service for the flow management units or flow management position (FMU/FMP) to be implemented in all SAM States, and that the possibility of using REDDIG were studied upon. The telephone conferences would be carried out on a daily basis between all units of the Region; therefore, there would be an initial requirement of a teleconference function for twenty users. In this respect, the Meeting deemed it convenient to draft a study on the implementation of the mentioned service, by initially using REDDIG and other necessary equipment. The result of the study would be presented at SAM/IG/6 meeting.

APPENDIX A

ACTION PLAN FOR THE INTERCONNECTION OF AMHS SYSTEMS IN THE SAM REGION

ITEM	ACTIVITY	RESPONSIBLE	EXPECTED RESULT	STATUS	FINALIZATION DATE
1	2	3	4	5	6
1	Review of the ATN Regional Plan as regards AMHS implementation	Secretariat	Revised ATN ground ground applications plan (Table CNS 1Bb)	Completed	Jun 2009
2	Review and assignment of intra-regional routers IP addressing	Secretariat	Assignment of IP addressing	Completed	Jun 2009
3	Review of CAAAS addressing plan	SAM States	Revised CAAS addressing Plan	Completed	Jun 2009
4	Prepare interconnection protocol tests to determine bandwidth required for transmission of AMHS messages between MTAs through REDDIG	RLA/06/901 project CNS Expert	Protocol interconnection tests. A guide for the operational interconnection of AMHS systems was drafted	Completed	Dec 2009
5	Preparation of Guide for the Operational Interconnection of AMHS Systems in the SAM Region	RLA/06/901 project CNS Expert	Guide for the operational interconnection of AMHS systems in the SAM Region	Completed	Oct 2009
6	Drafting of a model MoU for the interconnection of AMHS	Argentina	Model MoU for the interconnection of AMHS	Completed	Oct 2009
7	MoU for the interconnection of AMHS currently implemented in the SAM Region: a) Argentina-Brazil b) Argentina-Chile c) Argentina-Peru d) Argentina-Paraguay e) Brazil-Colombia f) Brazil-Paraguay g) Brazil-Peru h) Chile-Peru i) Colombia-Perú j) Colombia-Panama	SAM States involved	MoU for interconnection of AMHS systems between SAM States having AMHS implemented.	Valid a, d & f) Completed	Dec 2010
8	Phase I Interconnection trials between MTAs of: a) Argentina-Brazil b) Argentina-Paraguay c) Brazil-Paraguay Types of tests to carry out: Network transportation; Network connectivity; Message exchange; Preparatory phase.	Argentina, Brazil, Paraguay and REDDIG Administration	Interconnection trials between Argentina, Brazil and Paraguay MTAs	Valid a) network transportation and connectivity trials carried out with the Manaos node. MoU was updated, since Brazilian entrance node will be Curitiba. Network connectivity, and transport and exchange of messages tests will be repeated b) network transportation and connectivity, and message exchanges trials carried out.	Aug 2010

ITEM	ACTIVITY	RESPONSIBLE	EXPECTED RESULT	STATUS	FINALIZATION DATE
1	2	3	4	5	6
				c) MoU was updated, as entrance node to Brazil will be Curitiba, and the network connectivity, and transport and exchange of messages tests will be carried out.	
9	Phase II Interconnection trials between MTAs of: a) Argentina-Chile b) Argentina-Peru c) Brazil-Colombia d) Brazil-Peru e) Chile-Peru f) Colombia-Peru g) Panama-Colombia Types of tests: Network transportation; Network connectivity; Message exchange; Preparatory phase.	Argentina, Brazil, Chile, Colombia, Panama y Perú	Interconnection trials between AMHS systems listed in column 2 of this table.	Valid a) Network transportation tests carried out b) Network transportation and connectivity tests carried out. Draft MoU was presented. c) Network transportation and connectivity tests carried out. Draft MoU was presented. d) Network transportation and connectivity tests carried out. Draft MoU was presented. e) No tests were carried out. f) Network transportation and connectivity tests carried out as per EUR AMHS Manual, Appendix E. g) No tests were carried out.	a) Nov 2010 B) Oct 2010 c) Oct 2010 d) Oct 2010 f) Nov 2010 g) Dec 2010
10	Operational interconnection implementation at the following MTAs: a) Argentina-Paraguay b) Argentina-Brazil c) Argentina-Chile d) Argentina-Peru e) Brazil-Colombia f) Brazil-Paraguay g) Brazil-Peru h) Chile-Peru i) Colombia-Peru j) Panama-Colombia	Argentina, Brazil, Chile, Colombia, Panama, Paraguay and Peru	Operational implementation of AMHS systems.	Valid a) In accordance with MoU b) In accordance with MoU d) In accordance with MoU f) In accordance with MoU g) In accordance with MoU	a), b), d) f y g) Dec 2010 c),e), h) & i) Dec 2011

APPENDIX B

ACTION PLAN FOR THE IMPLEMENTATION OF A NEW DIGITAL NETWORK FOR THE SAM REGION

ACTIVITIES	ACTION TO BE TAKEN BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
1 Identify current voice and data services requirements, as well as those scheduled to be implemented in the short, medium and long term in the SAM Region, in support of air navigation	SAM/IG Group for the implementation of CNS improvements	List of services requirements in support of air navigation for the SAM Region, including those scheduled for the short, medium and long term	SAM/IG/5	Current: In accordance with the Action Plan for the Improvement of CNS Systems Future; a) AIDC; b) New radar data requirements c) Audioconference for operational purposes; d) AIM; and e) ADS-B/Multilateration.
2 Analysis of band width required for the services identified in Activity 1	SAM/IG Group for the implementation of CNS improvements	Amount of band width required to support the requirements specified in Activity 1	SAM/IG/5	Tests will be carried out to determine bandwidth necessary for new applications
3 Determination of costs for the band width increase in REDDIG	SAM/IG Group for the implementation of CNS improvements	Implementation costs of new REDDIG services	SAM/IG/5	Will be determined after the tests described in ítem 2
4 Study of the new REDDIG technological platform and determination of its cost	SAM/IG Group for the implementation of CNS improvements	Definition of the REDDIG technological platform	SAM/IG/5	The studies will be carried out by the expert to be hired

ACTIVITIES	ACTION TO BE TAKEN BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
5 Study of a ground SAM IP structure supporting the services required and defined in Activity 1, as well as of the band width requirements defined in Activity 2	SAM/IG Group for the implementation of CNS improvements	Definition of a SAM ground IP network model structure	SAM/IG/5	During the meeting, Brazil presented a simplified analysis on technical, infrastructure, technological and cost-benefit aspects between satellite and ground links. Thorough studies will be carried out by the expert to be hired.
6 Determination of costs for the implementation of Activity 5	SAM/IG Group for the implementation of CNS improvements	Implementation costs of SAM ground IP network structure	SAM/IG/5	During the meeting, Brazil presented a simplified analysis on technical, infrastructure, technological and cost-benefit aspects between satellite and ground links. Thorough studies will be carried out by the expert to be hired.
7 Study on the structure of a mixed (ground and satellite) SAM digital network structure	SAM/IG Group for the implementation of CNS improvements	Model definition	SAM/IG/5	Thorough studies will be carried out by the expert to be hired.
8 Determination of the costs for the implementation of Activity 7	SAM/IG Group for the implementation of CNS improvements	Implementation costs of a mixed (ground and satellite) digital network structure	SAM/IG/5	Thorough studies will be carried out by the expert to be hired.
9 Comparisons between the network infrastructure models specified in Activities 4, 5 and 7	SAM/IG Group for the implementation of CNS improvements	Comparative study between the ground IP and mixed (satellite and ground) satellite network models	SAM/IG/5	Thorough studies will be carried out by the expert to be hired.

ACTIVITIES	ACTION TO BE TAKEN BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
10 Determination of SAM network infrastructure model, on the basis of results of Activity 9	SAM/IG Group for the implementation of CNS improvements	Definition of a SAM network infrastructure model	SAM/IG/5	The expert hired will propose REDDIG member States with the most convenient model, for their analysis and approval.
11 Acceptance process for the implementation of the network infrastructure model determined by Activity 10, through a public bidding process	SAM/IG Group for the implementation of CNS improvements	Acceptance of the public bidding process for the implementation of a SAM network infrastructure	SAM/IG/5	The expert hired will propose REDDIG member States with the most convenient model, for their analysis and approval.
12 Preparation of technical specifications for the implementation of the SAM network infrastructure specified in Activity 10	SAM/IG Group for the implementation of CNS improvements	Technical specifications for the implementation of a SAM network infrastructure	SAM/IG/6	Experts will be hired to draft definite technical specifications.
13 Presentation of technical specifications to a bidding process	SAM/IG Group for the implementation of CNS improvements	Public bidding process for the implementation of the SAM network structure	Dec 2011	
14 Evaluation of offers presented	SAM/IG Group for the implementation of CNS improvements	Assessment of offers	Mar 2012	
15 Determination of winning bidder	SAM/IG Group for the implementation of CNS improvements	Designation of winning bidder for the netwok implementation	Jun 2012	

Agenda Item 7: Operational implementation of new ATM automated systems and integration of the existing systems

Interconnection of ATM automated systems in the SAM Region

7.1 The Meeting examined the progress made in the activities scheduled for the interconnection of automated systems between Argentina-Uruguay, Argentina-Brazil and Brazil-Uruguay, on the basis of the Memoranda of Understanding (MoU) that were drafted and signed in follow-up to Conclusion SAM/IG/3-8 - *Preparation of specific implementation plans for the interconnection of automated systems.*

Interconnection of automated systems between Argentina and Uruguay

7.2 The Meeting noted that the MoU signed between the aeronautical administrations of Argentina and Uruguay for the interconnection of automated systems establishes the exchange of radar data between the Montevideo ACC and the Ezeiza ACC. The exchange of radar data consists in carrying the secondary radar information from Quilmes (Argentina) to the Montevideo ACC. For the exchange of radar data, the Asterix protocol is foreseen. In turn, Uruguay would be carrying secondary radar information from Durazno to Ezeiza ACC. AIDC implementation between Montevideo ACC and Ezeiza ACC for the automatic hands off of flight plan would be effected once AIDC is implemented in Montevideo ACC; Ezeiza ACC already has an AIDC system installed.

7.3 With regard to the progress in the works pertaining to the interconnection of radar data between Argentina and Uruguay, Argentina informed the Meeting that on the week of 12 April 2010 the radar data information from Quilmes was arriving to Uruguay.

7.4 In addition, Uruguay informed the Meeting it was working to carry the radar data information from Durazno to Ezeiza, estimating to finish by March 2011. As regards the implementation of AIDC, this is currently ready in Ezeiza, but in Montevideo same will only be available by 2011. In this respect, the MoU between Argentina and Uruguay was updated with the afore-indicated information.

Interconnection of automated systems between Argentina and Brazil

7.5 The Meeting noted that the MoU signed between the aeronautical administrations of Argentina and Brazil, specified that the interconnection of automated systems would be carried out between the Resistencia and Curitiba ACCs. With regard to the exchange of radar data, Argentina would be carrying information of the Resistencia secondary radar to Curitiba, while Brazil could carry information from the Santiago and Foz de Iguazu secondary radars to Resistencia. Asterix protocol will be used for the exchange of radar data.

7.6 The Meeting was informed on the change of installation dates of some of the systems indicated in the MoU, such as the radar in Resistencia, which would be installed by October 2011, and the installation of the Asterix protocol at the Curibita ACC, in March 2011. In this respect, during the Meeting the MoU between Argentina and Brazil was updated, with the afore indicated information.

Interconnection of automated systems between Brazil and Uruguay

7.7 The Meeting took note that the interconnection of automated systems between Brazil and Uruguay consisted in the implementation of radar data exchange, and the automatic hands off of flight plans through the AIDC application. For the exchange of radar data, information will be carried from the Durazno secondary radar to the Curitiba ACC, and information from the Santiago and Congucu secondary radars to the Montevideo ACC. Asterix protocol will be used for the exchange of radar data.

7.8 Uruguay informed it was working to enable the sending of radar data from Durazno to the Curitiba ACC. In addition, the Meeting was informed that the Sagitario System with Asterix protocol was being installed in the Curitiba ACC, and that same would be completed by March 2011. In this respect, the MoU was amended by changing the radar data integration date for said date.

Interconnection of automated systems between Brazil and Venezuela

7.9 The Meeting recalled that automated systems interconnection trials were carried out in September 2006 between the Amazonico (Manaos) and Maiquetia ACCs, whose results were successful. From Venezuela, information from the Maiquetia secondary radar was sent to the Manaos ACC; and to the Maiquetia ACC, integrated radar data information was sent from the Amazonico ACC.

7.10 During the Meeting, Brazil and Venezuela started a draft for the interconnection of radar data between the ACC Maiquetia and Amazônico ACCs. The Venezuelan secondary radars involved in the interconnection will be from San Carlos de Rio Negro, Santa Elena de Uairen and Puerto Ayacucho. From Brazil, the Boa Vista and São Gabriela da Cachoeira radars will be carried to the Maiquetía ACC. It has been scheduled that by SAM/IG/6 meeting, the MoU for the interconnection of automated systems between Brazil and Venezuela will be available.

Action plan for the implementation of ATM automated systems

7.11 **Appendix A** to this Agenda Item presents the updated action plan for the interconnection of automated systems in the SAM Region.

Implementation of the new flight plan format in the SAM Region

7.12 The Meeting took note of the information presented in WP/16 and its Appendices A, B and C, with the aim of becoming aware of Amendment 1 to the PANS/ATM, the guidelines for the operation of the new flight plan during the transition phase, and the strategy adopted in the CAR/SAM Regions for implementation of Amendment 1.

7.13 In this regard, the Meeting was of the opinion that the contents of said working paper serve as a basis for the agenda of the Seminar/Workshop for the Implementation of Amendment 1 to the 15th Edition of the PANS/ATM, to be held in Lima from 13 to 15 September 2010.

7.14 The Meeting examined the action plans for the implementation of Amendment 1, prepared by Panamá, Paraguay and Uruguay in follow-up to Conclusion SAM/IG/4-8. With respect to this topic, the Meeting proposed that the Secretariat put at disposal all plans presented by States, at the ICAO SAM Regional Office Web site.

7.15 The Meeting examined the table in Appendix E to WP/16, which shows an initial analysis to the impact that the implementation of the new flight plan format will have on the automated systems involved in the flight plan process.

7.16 The result of the review is shown in **Appendix B** to this part of the Report. In this sense, the Meeting formulated the following conclusion:

Conclusion SAM/IG/5-9 Analysis on the impact of Amendment 1 to the PANS/ATM on the automated systems

That the SAM States, through their national committees, take into account the contents of Appendix B, with views that it serve as reference for an initial analysis on the impact it will have on the automated systems involved in the flight plans process, in view of the implementation of the new flight plan format in accordance with Amendment 1 to the PANS/ATM, and that they send the results to the ICAO SAM Regional Office by 30 August 2010, for their presentation at the Seminar/Workshop for the Implementation of Amendment 1 to the 15th Edition of the a PANS/ATM, to be held in Lima from 13 to 15 September 2010.

7.17 The Meeting examined the list of focal points presented in **Appendix C** to this part of the Report. In this sense, the Meeting proposed that a reminder be sent to the States who had not provided information in this regards, as well as urging States to prioritize the implementation of a national committee, composed by air navigation services providers and users, with the aim of coordinating the tasks for the implementation of the new format, through coordination meetings.

7.18 The Meeting recognized the importance that the SAM States designate the people involved in the subject pertaining to the implementation of Amendment 1 to the 15th Edition of the PANS/ATM, to assist to the seminar/workshop to be held in Lima from 13 to 15 September 2010.

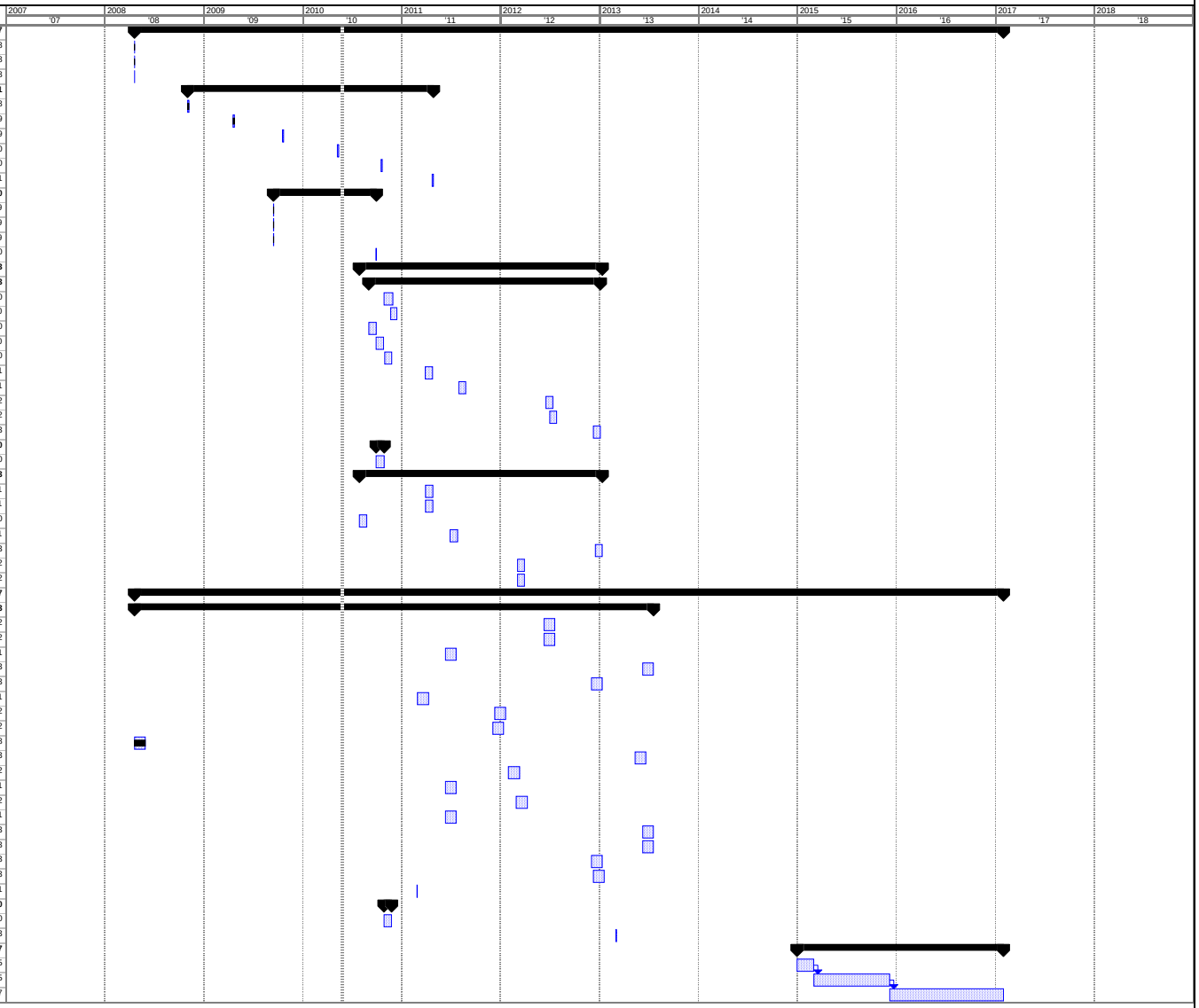
7.19 In this sense, it considered important counting with the presence, at the seminar/workshop, of representatives from companies in the Region developing the logical support for automated systems, for them to report on the evolution of their work and, if possible, to provide a technical/financial evaluation to held States in defining whether it is viable to count during the transition period with both a CURRENT and NEW format processing methods.

7.20 The Meeting analyzed and considered appropriate the action plan for the follow-up to the SAM implementation of Amendment 1 to the ICAO PANS/ATM (Doc. 4444) shown in **Appendix D** to this Agenda Item.

7.21 The Meeting considered important indicating that ICAO Headquarters has developed a Web site called *Flight Plan Implementation Tracking System* (FITS), which registers the status of implementation of the new dispositions in all flight information regions (FIR). This Web site publishes information related with the subject and includes topics relative to the implementation, which are available for the focal points designated by the States/Territories/International Organizations to exchange information on the matter.

APPENDIX A / APENDICE A

ID	Nome da tarefa	Duration	Start	Finish
1	**Plan de Interconexión Región SAM**	**2292 days?**	**Mon 4/21/08**	**Tue 1/31/17**
2	Aprobación del Plan	1 day?	Mon 4/21/08	Mon 4/21/08
3	Creación de la Equipo de Gestión	1 day?	Mon 4/21/08	Mon 4/21/08
4	Ejecución	1 day?	Mon 4/21/08	Mon 4/21/08
5	**Reuniones de coordinación**	**650 days?**	**Mon 11/3/08**	**Fri 4/29/11**
6	SAM/IG/2	5 days?	Mon 11/3/08	Fri 11/7/08
7	SAM/IG/3	5 days?	Mon 4/20/09	Fri 4/24/09
8	SAM/IG/4	5 days?	Mon 10/19/09	Fri 10/23/09
9	SAM/IG/5	5 days?	Mon 5/10/10	Fri 5/14/10
10	SAM7IG/6	5 days?	Mon 10/18/10	Fri 10/22/10
11	SAMIG/7	5 days?	Mon 4/25/11	Fri 4/29/11
12	**Establecimiento de MoU**	**272 days?**	**Wed 9/16/09**	**Thu 9/30/10**
13	Argentina - Uruguay	1 day?	Wed 9/16/09	Wed 9/16/09
14	Argentina - Brasil	1 day?	Wed 9/16/09	Wed 9/16/09
15	Brasil - Uruguay	1 day?	Wed 9/16/09	Wed 9/16/09
16	Brasil -Venezuela	1 day?	Thu 9/30/10	Thu 9/30/10
17	**Interconexión de Plan de Vuelo**	**641 days**	**Fri 7/30/10**	**Fri 1/11/13**
18	**OLDI**	**611 days**	**Fri 9/3/10**	**Fri 1/4/13**
19	EZEIZA-SANTIAGO	23 days	Fri 10/29/10	Tue 11/30/10
20	BOGOTA - GUAYAQUIL	18 days	Mon 11/22/10	Wed 12/15/10
21	BOGOTA - PANAMA	20 days	Fri 9/3/10	Thu 9/30/10
22	BOGOTA - BARRANQUILLA	20 days	Thu 9/30/10	Wed 10/27/10
23	BARRANQUILLA - PANAMA	20 days	Mon 11/1/10	Fri 11/26/10
24	SANTIAGO - CORDOBA	20 days	Wed 3/30/11	Tue 4/26/11
25	AMAZÓNICO-BOGOTÁ	20 days	Mon 8/1/11	Fri 8/26/11
26	LIMA - SANTIAGO	20 days	Mon 6/18/12	Fri 7/13/12
27	LIMA - GUAYAQUIL	20 days	Mon 7/2/12	Fri 7/27/12
28	LIMA - BOGOTA	20 days	Mon 12/10/12	Fri 1/4/13
29	**DOC 44444**	**22 days**	**Thu 9/30/10**	**Fri 10/29/10**
30	AMAZONICO - MAIQUETIA	22 days	Thu 9/30/10	Fri 10/29/10
31	**AIDC**	**641 days**	**Fri 7/30/10**	**Fri 1/11/13**
32	CURITIBA-EZEIZA	20 days	Thu 3/31/11	Wed 4/27/11
33	CURITIBA - MONTEVIDEO	20 days	Thu 3/31/11	Wed 4/27/11
34	EZEIZA-CORDOBA	20 days	Fri 7/30/10	Thu 8/26/10
35	EZEIZA - MONTEVIDEO	20 days	Thu 6/30/11	Wed 7/27/11
36	LIMA - AMAZONICO	20 days	Mon 12/17/12	Fri 1/11/13
37	ASUNCIÓN - CURITIBA	20 days	Mon 3/5/12	Fri 3/30/12
38	ASUNCIÓN - EZEIZA	20 days	Mon 3/5/12	Fri 3/30/12
39	**Intercambio de Datos Radar**	**2292 days?**	**Mon 4/21/08**	**Tue 1/31/17**
40	**Conexión Directa al Centro - ASTERIX**	**1370 days?**	**Mon 4/21/08**	**Fri 7/19/13**
41	CORDOBA – SANTIAGO	30 days	Mon 6/11/12	Fri 7/20/12
42	MENDOZA – SANTIAGO	30 days	Mon 6/11/12	Fri 7/20/12
43	EZEIZA – PUERTO MONTT	30 days	Mon 6/13/11	Fri 7/22/11
44	PUNTA ARENAS – C. RIVADAVIA	30 days	Mon 6/10/13	Fri 7/19/13
45	AMAZONICO – BOGOTA	30 days	Mon 12/3/12	Fri 1/11/13
46	CURITIBA – MONTEVIDEO	30 days	Tue 3/1/11	Mon 4/11/11
47	BOGOTA – GUAYAQUIL	30 days	Mon 12/12/11	Fri 1/20/12
48	BOGOTA – PANAMA	30 days	Mon 12/5/11	Fri 1/13/12
49	BOGOTA – BARRANQUILLA	30 days	Mon 4/21/08	Fri 5/30/08
50	BOGOTA – LIMA	30 days	Mon 5/13/13	Fri 6/21/13
51	BOGOTA – MAIQUETÍA	30 days	Tue 1/31/12	Mon 3/12/12
52	BARRANQUILLA – PANAMA	30 days	Mon 6/13/11	Fri 7/22/11
53	BARRANQUILLA – MAIQUETÍA	30 days	Wed 2/29/12	Tue 4/10/12
54	LIMA – SANTIAGO	30 days	Mon 6/13/11	Fri 7/22/11
55	LIMA – GUAYAQUIL	30 days	Mon 6/10/13	Fri 7/19/13
56	LIMA – AMAZONICO	30 days	Mon 6/10/13	Fri 7/19/13
57	ASUNCIÓN – CURITIBA	30 days	Mon 12/3/12	Fri 1/11/13
58	ASUNCIÓN – EZEIZA	30 days	Mon 12/10/12	Fri 1/18/13
59	MONTEVIDEO-EZEIZA	1 day?	Mon 2/28/11	Mon 2/28/11
60	**ICD Propietário**	**20 days**	**Fri 10/29/10**	**Thu 11/25/10**
61	AMAZONICO - MAIQUETIA	20 days	Fri 10/29/10	Thu 11/25/10
62	Inter-Centro ASTERIX 62,63 (TBD)	1 day?	Mon 3/4/13	Mon 3/4/13
63	**RADNET (TBD)**	**544 days**	**Thu 1/1/15**	**Tue 1/31/17**
64	Especificación	44 days	Thu 1/1/15	Tue 3/3/15
65	Adquisición	200 days	Wed 3/4/15	Tue 12/8/15
66	Instalación	300 days	Wed 12/9/15	Tue 1/31/17



Projeto: PLAN ACCIÓN INTERCONEX
Data: Mon 5/24/10

Tarefa | Divisão | Andamento | Etapa | Resumo | Resumo do projeto | Tarefas externas | Etapa externa | Prazo final

APPENDIX B

TENTATIVE ANALYSIS OF THE IMPACT OF THE IMPLEMENTATION OF THE NEW FLIGHT PLAN FORMAT (AMENDMENT 1 TO THE 15TH EDITION OF ICAO DOCUMENT 4444) ON AUTOMATED FLIGHT PLAN PROCESSING SYSTEMS

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Flight Plan Form Box 7: Aircraft identification (7 characters maximum)	Alphanumeric characters with no hyphens or symbols will be used for aircraft identification	No effect.	No effect.	No effect.	No effect.	No effect.	No effect.
Flight Plan Form Box 8: Flight rules and flight types (one or two characters)	a) The classes of flight rules that the pilot intends to apply are more clearly described (I, V, Y, Z). b) The letters for identifying the flight type are maintained, and it is indicated that the flight status must be specified in Box 18 after the STS indicator or when neessary to indicate other reasons after the RMK indicator.	a) and b) no change, no effect.	a) and b) no change, no effect.	a) and b) no change, no effect.	a) and b) no change, no effect.	a) and b) no change, no effect.	a) and b) no change, no effect.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part A)* **Equipment and Capabilities** **A** GBAS landing system	Letter A is assigned to the GBAS landing system. There was no previous assignment for this letter.	It would affect if the AFTN FPL template does not consider the letter A, because it is not assigned to any function in the current flight plan format.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would affect if the FDPS does not consider letter A since this letter is not assigned to any function in the current plan.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since the RDPs currently installed do not have any processing associated to letter A.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 **(**Part A)* **B** LPV (APV with SBAS)	Letter B is assigned to specify an LPV-capable aircraft (APV with SBAS). There was no previous assignment for this letter.	It would affect if the AFTN FPL template does not consider the letter B, because it is not assigned to any function in the current flight plan format.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would affect if the FDPS does not consider letter B since this letter is not assigned to any function in the current plan.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since the RDPs currently installed do not have any processing associated to letter B.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part A)* **E1, E2 and E3** **E1**: ACARS FMC WPR **E2**: ACARS D-FIS **E3**: ACARS PDC	Letter E had not been assigned before. A numeric value is inserted next to letter E.	It should be affected since the current AFTN FPL template does not contemplate a numerical value in Box 10.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would be affected given the new functions allocated to letter E, which does not exist in the current FPL.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter E because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part A)* **J1, J2, J3, J4, J5, J6 and J7** **J1**: CPDLC ATN VDL Mode 2 **J2**: CPDLC FANS 1/A HFDL **J3**: CPDLC FANS1/A VDL Mode A **J4**: CPDLC FANS1/A VDL Mode 2 **J5**: CPDLC FANS1/A SATCOM (INMARSAT) **J6**: CPDLC FANS/1/A SATCOM (MTSAT) **J7**: CPDLC FANS 1/A SATCOM (Iridium)	A numerical value is inserted in addition to letter J, and letter J, which originally identified data link, now identifies the various means for CPDLC.	It should be affected since the current AFTN FPL template does not contemplate a numerical value in Box 10.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would be affected given the new functions allocated to letter J, which does not exist in the current FPL format.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Could be affected if this system uses letter J of the current flight plan format in its processing.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part A)* **M1, M2 and M3** **M1**: ATC RTF SATCOM (INMARSAT) **M2**: ATC RTF (MTSAT) **M3**: ATC RTF (Iridium)	Letter M is associated to satellite RTF. A number identifying the satellite system used is inserted next to letter M.	It should be affected since the current AFTN FPL template does not contemplate a numerical value in Box 10.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would be affected given the new functions allocated to letter M, which does not exist in the current FPL format.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter M because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part A)* **P1-P9** Reserved for RCP	Letter P links communication performance requirements. A number is inserted next to letter P to identify the various performance requirements.	It should be affected since the current AFTN FPL template does not contemplate a numerical value in Box 10.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would be affected given the new functions allocated to letter P, which does not exist in the current FPL format.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter P because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part A)* **R** Approved PBN	Letter R is associated to the approved PBN, and was previously associated to RNP type certification. When letter R is used, PBN values reached are specified in Box 18 after the PBN/ indicator.	Might not be affected since the AFTN FPL template would accept in Box 18 the text associated to letter R of Box 10.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	It would be affected since the PBN values achieved are inserted in Box 18 after the new PBN/ indicator, which is not considered in the current plan.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Could be affected if the RDP system uses letter R of Box 10 as well as the corresponding information of Box 18 in its processing.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part A)* **W** Approved RVSM	Letter W is assigned to identify RVSM approval.	Should not be affected because the AFTN FPL template should accept letter W since this letter is assigned to the ATS prescription in the current format.	No change, should not be affected	No change, should not be affected	No change, should not be affected	No change, should not be affected	No change, should not be affected

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 **(**Part A)* **X** Approved MNPS	Letter X is assigned to identify MNPS.	Should not be affected because the AFTN FPL template should accept letter X since this letter is assigned to the ATS prescription in the current format.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected given the new assignment of letter X in Box 10.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter X because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part A)* **Y** VHF with 8.33Khz separation capability	Letter Y is assigned to identify the capability of the VHF system to operate with a 8.33 Khz separation.	Should not be affected because the AFTN FPL template should accept letter Y since this letter is assigned to the ATS prescription in the current format.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected given the new assignment of letter Y in Box 10.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter Y because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part A)* **Z** Other equipment installed on board or other capabilities	In addition to other equipment installed on board, the term for other capabilities is also inserted. Other equipment or capabilities must be specified in the flight plan, in Box 18, after a new DAT/ indicator.	Should not be affected since letter Z is considered in the current flight plan format. Information associated with Box 18 should neither be affected since the AFTN template accepts text in this box.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should not be affected since a new DAT/ indicator is introduced in Box 18 associated to letter Z, but this information is not processed.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Could be affected if the RDP system uses letter Z of Box 10 as well as the corresponding information of Box 18 in its processing.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part B)* **E Transponder-Mode S**	Letter E indicates: Transponder Mode S, including aircraft identification, pressure altitude, and extended squitter capability (ADS-B).	Could be affected since letter E is a new letter not contained in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since letter E is not contained in the current flight plan format for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter E because it does not exist in the current format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part B)* **H Transponder-Mode S**	Letter H indicates Transponder Mode S, including aircraft identification, pressure altitude, and improved surveillance capability.	Could be affected since letter H is a new letter not contained in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since letter H is not contained in the current flight plan format for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter H because it does not exist in the current format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part B)* **I Transponder-Mode S**	Letter I indicates Transponder Mode S, including aircraft identification, but with no pressure altitude capability.	Could be affected since letter I is a letter contained in the current flight plan for surveilance equipment and capabilities, but with another significance.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since letter I is a letter contained in the current flight plan for surveilance equipment and capabilities, but with another significance.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter I of the current format, because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part B)* **L Transponder Mode S**	Letter L in the new format indicates Transponder Mode S, pressure altitude, extended squitter (ADS-B) and enhanced surveillance capabilities	Could be affected since letter L is a new letter not contained in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since letter L is not contained in the current flight plan format for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter L because it does not exist in the current format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 10 (Part B)* **X Transponder Mode S**	Letter X in the new format indicates Transponder Mode S, with no aircraft identification or pressure altitude capability.	Could be affected since letter X is a new letter not contained in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since letter X is a letter contained in the current flight plan for surveilance equipment and capabilities, but with another significance.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process letter X of the current format, because it is not assigned to any function in the current flight plan format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part B)* **ADS-B B1 and B2** **B1**: ADS-B with specialised 1090Mhz ADS-B out capability **B2**: ADS-B with specialised 1090Mhz ADS-B out and ADS-B in capability **U1 and U2** **U1**: ADS-B out capability using UAT **U2**: ADS-B out and in capability using UAT **V1 and V2** **V1**: ADS-B out capability using VDL-4 **V2**: ADS B out and in capability using VDL-4	Letters B, U, and V indicate new capabilities for ADS-B depending whether the equipment broadcasts in 1090Mhz, UAT, or VDL 4. Numbers are inserted next to the letters to identify ADS-B out and ADS-B out and in capabilities.	Could be affected since the letters and numbers assigned for ADS-B are new and are not assigned in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the letters and numbers associated to ADS-B are new and are not assigned in the current flight plan for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the letters and numbers associated to ADS-B because such letters and numbers do not exist in the current format.	The system and the IHM should not be affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 10 (Part B)* **ADS-C** **D1 and G1** **D1**: ADS-C with FANS1/A capabilities **G1**: ADS–C with ATN capabilities	D and G are new letters to which a numeric value is added, and indicate ADS-C with FANS1/A capabilities and ADS-C with ATN capabilities.	Could be affected since the letters and numbers assigned for ADS-C are new and are not assigned in the current flight plan for surveilance equipment and capabilities.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the letters and numbers associated to ADS-C are new and are not assigned in the current flight plan for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 10 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 10 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the letters and numbers associated to ADS-C because such letters and numbers do not exist in the current format.	The system should not be directly affected since flight plan display is not dependent upon the content of Box 10. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 **SUR/ indicator**	Additional surveillance applications should be listed in Box 18 after the SUR/ indicator.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 10 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the SUR/ indicator is not contained in the current flight plan for surveillance equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the SUR/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 **STS/ indicator** **ALTRV** **ATFMX** **FFR** **FLTCK**	The reason for special management by ATS, for instance search and rescue mission, as follows: **ALTRV**: for a flight conducted according to an altitude reservation **ATFMX**: for a flight whose exemption from ATFM measures has been approved by the appropriate ATS authorities **FFR**: Fire fighting **FLTCK**: flight check for calibration of navigation aid.	Should not be affected since the STS/ indicator exists. Likewise, should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected in view of new assignments for the STS/ indicator.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since the STS/ indicator is contained in the current flight plan format, but the RDP do not process the STS/ indicator as it is not assigned to any function in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 **(**Cont.) **STS/ indicator** **HAZMAT** **HEAD** **HOSP**	**HAZMAT**: for a flight carrying hazardous material **HEAD**: a flight with Head of State status **HOSP**: for a medical flight declared by the medical authorities.	Should not be affected since the STS/ indicator exists. Likewise, should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected in view of new assignments for the STS/ indicator.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since the STS/ indicator is contained in the current flight plan format, but the RDP do not process the STS/ indicator as it is not assigned to any function in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 (Cont.) **STS/ indicator** **HUM** **MARSA** **MEDEVAC** **NONRVSM**	**HUM**: for a flight conducting a humanitarian mission. **MARSA**: for a flight for which a military entity assumes the responsibility for its separation from military aircraft **MEDEVAC**: for a medical emergency evacuation that is critical to save lives. **NONRVSM**: For a flight that has no RVSM capability and intends to operate in RVSM airspace.	Should not be affected since the STS/ indicator exists. Likewise, should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected in view of new assignments for the STS/ indicator.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since the STS/ indicator is contained in the current flight plan format, but the RDP do not process the STS/ indicator as it is not assigned to any function in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 (Cont.) **STS/ indicator** **SAR** **STATE**	**SAR**: for a flight conducting a search and rescue mission **STATE**: for a flight performing military customs or police services.	Should not be affected since the STS/ indicator exists. Likewise, should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appear in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected in view of new assignments for the STS/ indicator.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since the STS/ indicator is contained in the current flight plan format, but the RDP do not process the STS/ indicator as it is not assigned to any function in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 **PBN/ indicator** **RNAV specification** **A1**: RNAV10 (RNP10) **B1**: RNAV5 All of the allowed sensors **B2**: RNAV5 GNSS **B3**: RNAV5 DME/DME **B4**: RNAV5 VOR/DME **B5**: RNAV5 INS or IRS **B6**: RNAV5 LORAN C	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

* Part A - Radiocommunication and navigation and approach aid equipment and capabilities
Part B - Surveillance equipment and capabilities

Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 (Cont.) **PBN/ indicator RNAV specification** **C1:** RNAV2 with all sensors **C2:** RNAV2 with GNSS **C3:** RNAV2 DME/DME **C4:** RNAV2 DME/DME/IRU	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 **(**Cont.) **PBN/ indicator RNAV specification** **D1:** RNAV 1 with all sensors **D2:** RNAV1 GNSS **D3:** RNAV1 DME/DME **D4:** RNAV1 DME/DME/IRU	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 **(**Cont.) **PBN/ indicator RNP specification** **L1**: RNP-4 **O1**: Basic RNP with all allowed sensors **O2**: Basic RNPGNSS **O3**: Basic RNP 1 DME DME **O4**: Basic RNP1 DME/DME /IRU	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 **(**Cont.) **PBN/ indicator RNP specification** **S1:** RNP APPCH **S2:** RNP APPCH with Baro VNAV	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 (Cont.) **PBN/ indicator RNP specification** **S1:** RNP APPCH **S2:** RNP APPCH with Baro VNAV	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 (Cont.) **PBN/ indicator RNP specification** **S1:** RNP APPCH **S2:** RNP APPCH with Baro VNAV	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 **(**Cont.) **PBN/ indicator RNP specification** **T1**: RNP AR APPCH with RF **T2**: RNP AR APPCH without RF	PBN/ Indication of RNAV and RNP capability. The number of descriptors listed in column 1 that apply to the flight is indicated, using a maximum of eight entries, that is, a total of no more than 16 characters.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should be affected since the information contained in this Box 18 appears in the format contemplated for RPLs in Box Q (Doc 4444, Appendix 2, Section 6, Chapter 16).	Should be affected since the PBN/ indicator is not contained in the current flight plan for navigation equipment and capabilities.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the PBN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 DLE/ indicator	**DLE** New indicator related to en-route delay or holding. En-route significant points where delay is expected to occur are to be inserted, followed by the duration of the delay, using four digits for time, in hours and minutes.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appears in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the DLE/ indicator does not appear in the current flight plan.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the DLE/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.
Box 18 ORGN/ indicator	The 8-letter AFTN address of the originator and other details of the appropriate contact, when the flight plan originator cannot be easily identified as stipulated by the appropriate authority.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appears in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the ORGN/ indicator does not appear in the current flight plan.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the ORGN/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 TALT/ indicator	Four-letter ICAO indicators for alternate take-off aerodromes as specified in Location Indicators, Doc 7910 or the name of the alternate en-route aerodromes if no indicator is assigned. For aerodromes not listed in the relevant aeronautical information publication, indicate the location in LAT/LONG or bearing and distance with respect to the closest significant point as described in DEP/.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Should not be affected since the information contained in this Box 18 does not appears in the format contemplated for RPLs (Doc 4444, Appendix 2, Section 6, Chapter 16).	Could be affected since the TALT/ indicator does not appear in the current flight plan.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the TALT/ indicator because it is not contemplated in the current flight plan format.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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Flight Plan Amendment Message Types	Change Required	AFTN System	Repetitive Flight Plan System	Flight Data Processing System (FDP)	Flight Progress Strip Printing	Radar Data Processing System (RDP)	Flight Plan Display (IHM)
1	2	3	4	5	6	7	8
Box 18 DOF/ indicator	Date of departure of the flight in a six-digit format (YYMMDD), where AA is the year, MM the month, and DD is the day.	Should not be affected by this new indicator since Box 18 of the AFTN FPL template contains free text.	Non applicable	Should be affected since the DOF/ indicator does not appear in the current flight plan and the current reference is only the time data in Box 13.	Should not be directly affected because this system does not use this information contained in Box 18 in the printing process. If the flight plan is not printed, it would be because the FDP is affected by the change in Box 18 and, consequently, is not sending information to the printer.	Should not be affected since RDPs do not process the DOF/ indicator.	Should not be directly affected since this system does not use this information of Box 18 for flight plan display. If a flight plan is not being displayed, it would be because the FDP is affected by this change.

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APENDICE C / APPENDIX C

PUNTOS FOCALES PARA LA COORDINACIÓN DEL FORMATO DE PLAN DE VUELO / FOCAL POINTS FOR THE COORDINATION OF THE FLIGHT PLAN FORMAT

Estado/State Organization	Autoridad / Authority		E-mail	T / F
	Area	Nombre y título / Name and Title		
1	2	3	5	6
Argentina		**TBD**		
Bolivia		Fernando Azuga Departamento Navegación Aérea	f_azuga@yahoo.es	T: +5912 242 0844
Brasil	ATM/PBN	Jorge Wilson de Avila F. Penna Departamento de Control del Espacio Aéreo	adjpln@decea.gov.br	T: +5521 94997635 +5521 21016477
Chile		**TBD**		
Colombia	PBN	Gladys Mercedes Roa de la Cruz AIS	gladis.roa@aerocivil.gov.co	T: +571 266 3693 +571 266 2514
Ecuador		**TBD**		
French Guiana		Jean Jacques Deschamps Head, Technical Department for the ANSP in French Antilles and Guyana	jean-jacques.deschamps@aviation-civile.gouv.fr	
Guyana		Ms. Chaitrani Heeralall Director Air Navigation Services	dans@gcaa-gy.org	T: +592 261 2217 Fax: +592 261 2293
		Mr. Rickford Samaroo Manager ATS Operations	satcori@hotmail.com	T: +592 261 2564 Fax: +592 261 2279
Panamá		Sr. Arístides Villareal Jefe del Departamento de Telecomunicaciones	avillareal@aeronautica.gob.pa	T: +507 501 9825 F: +507 501 9848
Paraguay		Daysi Elizabeth Ferreira Cabanellas Jefa Interina de la Sección Normas y Reglamentos	norma_atm@dinac.gov.py tirikadai@gmail.com	T: +595 21 205 365
Perú		Paulo Vila Inspector CNS	pvila@mtc.gob.pe	T: +511 615 7880 F: +511 615 7881
Suriname		**TBD**		
Uruguay		José Pastoriza Rodríguez Adjunto Oficina Técnica de Tránsito Aéreo	jpastori@gmail.com	T:+5982 604 0251, Ext. 5200 F: +5982 6040251, Ext. 5201
Venezuela		Kender Ferrer Jefe OPS ACC MIQ Vicente Fiore Jefe de MMTO Radar Maiquetía	k.ferrer@inac.gob.ve v.fiore@inac.gob.ve	T: +58212 580 4444 F: +58212 4263317 687 T: +58212 4166235643

APPENDIX D

ACTION PLAN FOR THE IMPLEMENTATION OF THE NEW FLIGHT PLAN FORMAT – AMENDMENT 1 TO THE 15th EDITIOIN OF ICAO DOCUMENT 4444 (PANS/ATM)

ACTIVITIES	ACTION BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
Approval of Amendment 1 to the 15th Edition of PANS/ATM – Doc 4444 – (*Procedures for air navigation services – air traffic management)* (ICAO State letter 13/2.1-08/50 of 25 June 2008)	SAM States	Take note of the Amendment	December2008	Completed
Guidelines for the inclusion of the flight plan information as per Amendment 1 to the 15th Edition of PANS/ATM- Doc 4444 (ICAO State letter AN 13/2.1-09/9 of 6 February 2009	SAM States	Take note of the ICAO guidelines	June 2009	Completed
Draft a regional strategy for the implementation of Amendment 1 to the PANS/ATM	RLA/06/901 project	Regional strategy for the implementation of Amendment 1 to the 15th Edition of the ICAO PANS-ATM - Doc 4444	October 2009	Completed. The strategy approved by SAM/IG/4 meeting for its adoption in the SAM Region was approved for the CAR/SAM Regions at the meeting of the CNS/ATM Subgroup (March 2010)
Draft a national plan for the implementation of Amendment 1 to the PANS/ATM	SAM States	National plan for the for the implementation of Amendment 1 to the 15th Edition of the ICAO PANS-ATM - Doc 4444	End of April 2010	Only received from Panama, Paraguay and Uruguay. Brazil requested for an extension.
Nomination of focal points for the coordination between ICAO and States in the implementation of Amendment 1 to the PANS/ATM	SAM States	SAM States focal points for the coordination between ICAO and States in the implementation of Amendment 1 to the PANS/ATM	7 May 2010	See Appendix C to this Agenda Item.

ACTIVITIES	ACTION BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
Analyze the checklist of systems involved in the flight plan process to evaluate the impact of the implementation of the new flight plan format in the automated systems	SAM/IG meeting	Checklist of systems involved in the flight plan process and its impacto n the new flight plan format	SAM/IG/5	See Appendix B to this Agenda Item.
Carry out an analysis on the impact of the implementation of the new flight plan format in the SAM States automated systems	SAM States	Impact of the implementation of the amendment in the automated systems	End of August 2010	
Preparation of a SAM seminar/workshop for the implementation of Amendment to the PANS/ATM	ICAO Secretariat	Seminar/Workshop for the Implementation of Amendment 1 to the PANS/ATM	Lima, Peru, 13 to 15 September 2010	RLA/06/901 project will give two fellowships per member State for specialists in the operational and technical areas involved in the implementation of the Amendment
Hold national meetings between providers and users when implementing Amendment 1 to the PANS/ATM	SAM States	Establishment of a national schedule of meetings for the implementation of Amendment 1 to the PANS/ATM	Necessary national meetings for 2010-2012	The number of national meetings would be determined by the States
Prepare user and service provider personnel on the implementation of Amendment 1 to the PANS/ATM	SAM States	Service provider and user personnel trained on Amendment 1 to the PANS/OPS, under a national training programme	October 2010-November 2012	
Study the implementation of the transition to the new flight plan format (operation taking under consideration the current and new format)	RLA/06/901 project	Study the implementation of Amendment 1 to the PANS/ATM, during the transition phase	SAM/IG/6	

ACTIVITIES	ACTION BY	DELIVERABLE	TARGET DATE	REMARKS
1	2	3	4	5
Implementation of the new flight plan format in accordance with the strategy on the implementation of Amendment 1 to the 15th Edition of the PANS/ATM-Doc 4444	SAM States	Systems involved in the FPL process with capability to operate the new FPL format	End of June 2012	
Implementation of activities permitting systems involved in the FPL to operate with the current and new FPL	SAM States	Systems involved in the FPL process with capability to act upon the current and new flight plan during the transition period	End of 2012	If the new plan is implemented before June 2012, same will be only used on a trial basis (national, intra- and inter-regional), continuing to operate with the current flight plan format. In addition, during this period, pre-operational trials can be carried out (national, intra- and inter-regional)
Keep the Regional Office informed on the progress of activities, as well as on date changes in the action plans	SAM States	Unpdated informatin of the action plan	Continuous process until 15/12/2012	
Implementation of operational phase with the current and new flight plan	SAM States	Systems involved in the FPL process operating with the current and new format	1 July 2012 to 15 November 2012	The new FPL format should not become operational before 1 July 2012

Agenda Item 8: Other business

SAM Region Performance-Based Regional Implementation Plan

8.1 In order to adequate global planning to the Conclusions of the Eleventh Air Navigation Conference, mainly with regard to the Global ATM Operational Concept, as well as to the Industry Roadmap, ICAO initiated the development of the new Air Navigation Global Plan. In addition to including the Global ATM Operational Concept, the Global Air Navigation Plan is centred in a group of Global Plan Initiatives (GPI), providing the necessary conditions for implementations aimed at reaching benefits for the ATM Community at short and mid-term.

8.2 The meeting recalled all the process carried out in the Region since AP/ATM/12 Meeting for the drafting of a CAR/SAM Transition Plan towards the ATM System, up to the agreements reached during GREPECAS/15 Meeting.

Performance-based framework

8.3 GREPECAS/15, in reviewing the performance framework at a regional and national level, observed that the ICAO planning objective seeks to achieve a performance-based global air traffic management (ATM) system, through the implementation of air navigation systems and procedures in a gradual and effective manner, in terms of cost and collaboration.

8.4 In order to facilitate the implementation of performance based ATM global system, the Meeting took note that ICAO had achieved significant progress in the preparation of pertinent guidance material. Among the documents, there are: a) the Global Air Traffic Management Operational Concept (Doc 9854), b) Air Traffic Management Systems Requirements (Doc 9882), c) Manual on Global Performance of the Air Navigation System, and d) Global Air Navigation Plan (Doc 9750).

8.5 As regards performance regional planning, the work will be based on the Global Air Navigation Plan and on the Global Performance Manual. The result of this process shall be a management form entitled: “Performance Framework Form (PFF) or performance objectives” to serve as guidelines in implementation tasks.

8.6 The Transition Plan towards the ATM System in the CAR/SAM Regions initially developed these forms, which were further used to describe the ATM Committee tasks, and was also used as reference for the work carried out by ICAO regarding PFF.

Drafting of a SAM regional ATM performance-based implementation plan

8.7 Based on the above, through Conclusion 15/1 – *Development of Performance-Based Regional and National Plans,* GREPECAS was requested to develop a performance-based regional plan, as per the Air Navigation Global Plan, and the Global ATM Operational Concept. This plan should include the identification of the performance regional objectives and performance framework forms to be completed for all air navigation areas, such as ATM, CNS, AIM, MET and AGA/AOP, and also, that States, Territories and International Organisations develop performance-based national plans keeping in mind the users’ needs, as per the performance regional objectives included in the Air Navigation Regional Plan. These national plans should include the identification of national performance objectives and performance framework to be completed for all air navigation areas, such as ATM, CNS, AIM, MET and AGA/AOP.

8.8 In its first meeting (Lima, Peru, 15 to 19 March 2010), the GREPECAS CNS/ATM/SG analysed all the information available, and in view that the NAM/CAR Regions have already approved by the Civil Aviation Directors the NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (NAM/CAR RPBANIP) and that the SAM Region is implementing some of the performance objectives approved by GREPECAS, it was of the opinion that the SAM Region should draft a performance-based implementation plan that includes all air navigation areas, as well as the metrics that enable the measuring of performance objectives.

8.9 In view of the above, the Meeting formulated Decision CNS/ATM/1-1 *Regional Performance-Based Implementation Plan for the South American Region*, indicating that SAM Region States, with the assistance of ICAO, taking as a basis the documentation available in the SAM and CAR Regions:

a) Draft a regional ATM performance-based implementation plan, in accordance with the Global Air Navigation Plan, and the ATM Global Operational Concept, which includes performance regional objectives the performance framework forms (PFF) to be completed for all air navigation areas, such as ATM, CNS, AIM, MET and AGA/AOP, and the corresponding metrics that enable measuring achievement of performance objectives implementation by the end of 2010; and

b) Develop performance-based national plans harmonised with the SAM Implementation Regional Plan, not later than June 2011.

8.10 Taking into account the above, during the Regional Project RLA/06/901 Third Regional Coordination Committee Meeting, a task was proposed for the development of this implementation plan, which was approved by the Meeting. Consequently, during the current year, the assistance of five (5) experts will be requested for the development of a draft document, which would be presented to the SAM/IG/6 Meeting, for its revision and corresponding actions.