SAM/IG/19

INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Office

Regional Project RLA/06/901

NINETEENTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP

(SAM/IG/19)

FINAL REPORT

Lima, Peru, 22 to 26 May 2017

INDEX

HISTORY OF THE MEETING

ii-1 PLACE AND DURATION OF THE MEETING

The Nineteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/19) was held at the premises of the ICAO South American Regional Office in Lima, Peru, from 22 to 26 May 2017, under the auspices of Regional Project RLA/06/901.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mr. Oscar Quesada, Deputy Regional Director of the ICAO South American Office, Lima, greeted the participants for the continuous support provided to activities developed at regional scale by the South American Office, as well as the civil aviation authorities and national and private organizations of the ICAO South American Region for the continuous support to the activities of the SAM Implementation Group.

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

The Workshop/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. Roque Diaz Estigarribia, delegate from Paraguay and Mr. Ivan de Leon, delegate from Panama, were elected as Chairman and Vice-Chairman of the Meeting.

Mr. Onofrio Smarrelli acted as Secretary assisted by Messrs. Fernando Hermoza, RO/ATM/SAR and Roberto Sosa RO/ANS/SFTY.

In addition the Secretariat counted with the support of Mr. Julio Pereira and Mrs. Martha Soto, Rapporteurs of the PBN/AFTN Group; Omar Guarnalusse, Rapporteur of the CNS group; and Jorge Merino of automation.

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: Follow-up to conclusions and decisions adopted by SAM/IG meetings, the new Electronic Air Navigation Plan (eANP) and the Plan SAM

Agenda Item 2: Optimization of the SAM airspace
- a) PBN en-route
- b) PBN in Terminal Areas
- c) PBN proceedings

Agenda Item 3: Implementation of Air Traffic Flow Management (ATFM)
a) Procedures for coordination between ATFM units
b) Analysis of the use of RPL

Agenda Item 4: Assessment of operational requirements to determine the implementation of improvements in communications, navigation and surveillance (CNS) capabilities for operations in route and terminal area

Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

Agenda Item 6: Other business

ii-6 ATTENDANCE

The Meeting was attended by 63 participants from 11 States of the SAM Region (Argentina, Brazil, Bolivia, Brazil, Chile, Ecuador, Panama, Paraguay, Peru, Suriname, and Venezuela), and as Observers 1 State from CAR Region (United States), 3 International Organizations (CANSO, IATA and IFALPA) and 7 Observers from the aeronautical industry (AIREON, ATECH, HARRIS CORPORATION, JEPPENSEN, ROCKWELL COLLINS ARINC, SITA, SITA ON AIR. The list of participants is shown in page iii-1.

ii.7 LIST OF CONCLUSIONS

No.	Title	Page
SAM/IG/19-1	Application of flow management initiatives (TMIs) in situations that temporarily affect ATS capacity in a designated airspace or airport used by international aviation	3-5
SAM/IG/19-2	Implementation of procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans	5-4

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS

ARGENTINA
1. María Estela Leban (beca)
2. Carlos Omar Torres (beca)
3. Jorge Roberto Cornelio
4. Rodrigo Carlos Devesa
5. Guillermo Cocchi
6. Omar Gouarnalusse
7. Gustavo Chiri
8. Matías Valdata
9. Juan Pablo Duval
10. Javier Schenk

BOLIVIA
11. Jesús Israel Vilca Jiménez (beca)
12. César Varela (beca)

BRASIL / BRAZIL
13. Paulo Eduardo Albuquerque Magella
14. Alessander de Andrade Santoro
15. Jose Izidro Apolinário
16. Luiz Antonio Dos Santos
17. José Airton Patrício
18. Murilo Albuquerque Loureiro (beca)
19. João Marcelo de Castro Monteiro

CHILE
20. Alfonso De La Vega Sepúlveda (beca)

ECUADOR
21. Andrés Sebastián Muñoz Moreira (beca)
22. Luis Marcelo Valencia Taco (beca)

ESTADOS UNIDOS / UNITED STATES
23. Raúl Chong
24. Leandro Friedman (FAA)

PANAMÁ
25. Abdiel Humberto Vásquez Sucre
26. Iván De León Almengor
27. Ana Teresa Montenegro de De León (beca)

PARAGUAY
28. Liz Rocío Portillo Castellanos (beca)
29. Roque Díaz Estigarribia
30. Eleno Ramón Centurión Benítez (beca)
31. Víctor José Alexis Morán
32. Zulma Noemí Román

PERÚ
33. Paulo Vila Millones
34. Martha Soto Ansaldi
35. Sady Orlando Beaumont Valdez
36. Rodrigo Aguirre Herrera
37. Tatiana Mendoza Tinco
38. Laura Rojas Rojas
39. Libio Benítes Condori
40. Eloy Tafur Carbajal
41. José Luis Paredes
42. Dante Samaniego Bilbao
43. Carlos Marín Vásquez
44. Tomás Macedo Cisneros
45. Raúl Anastacio Granda
46. Jorge Merino Rodríguez
47. Jorge Raez Ancaya
48. Sara Siles La Rosa

SURINAM/SURINAME
49. Atwaroe Kalawatie
50. Manodj Ramparichan

VENEZUELA
51. Reinaldo Alfonso Escobar Monsalve (beca)
52. Omar Enrique Linares (beca)

AIREON
53. Dennis Yaeger

ATECH
54. Eno Siewerdt

CANSO
55. Javier Alejandro Vanegas Pérez

HARRIS CORPORATION
56. Demetrius Zuidema

IATA
57. Julio de Souza Pereira
58. Raymundo Hurtado (LATAM)

IFALPA
59. Juan Pablo Mazzieri

JEPPESEN
60. Scott Blum

ROCKWELL COLLINS ARINC
61. Manuel Góngora

SITA
62. Rezaei Mazinani

SITA ON AIR
63. Adriana Mattos

OACI / ICAO
64. Onofrio Smarrelli
65. Fernando Hermoza
66. Roberto Sosa

Agenda Item 1: Follow-up to conclusions and decisions adopted by SAMI/IG meetings, the new Electronic Air Navigation Plan (eANP) and the SAM Plan

1.1 Under this agenda item, the Meeting reviewed the following papers:

a) WP/02 – *Follow-up to valid conclusions formulated by SAMI/IG meetings and pending activities* (presented by the Secretariat);
b) WP/03 – *Development of the new CAR/SAM Electronic Air Navigation Plan (eANP)* (presented by the Secretariat); and
c) WP/04 – *Regional Plan to sustain air transport in the SAM Region* (presented by the Secretariat).

Conclusions and Decisions adopted by SAM/IG meetings

1.2 The Meeting reviewed the valid conclusions and decisions, as well as pending activities of the workshops/meetings of the SAM Implementation Group (SAM/IG), which are presented as **Appendix A** to this agenda item. The list of conclusions and activities comprise:

a) the tasks to be carried out and/or the corresponding conclusion in the areas under analysis;
b) the specific tasks which will lead to compliance of the main task;
c) expected results from each task;
d) finalisation dates;
e) parties responsible for their execution;
f) supporting members for the task; and
g) status of implementation of the same, and when needed for a better understanding, an explanatory comment on the status of implementation.

1.3 The Meeting also completed the table shown in **Appendix B** to this agenda item, which lists the tasks to be carried out by the States for implementation monitoring purposes.

Progress made in the development of the new CAR/SAM Electronic Air Navigation Plan (eANP)

1.4 The Meeting took note that, on 22 March 2017, ICAO had circulated the proposal of amendment to the CAR/SAM Air Navigation Plan, Volume II (Doc 8733) e-ANP (Version 3), containing modifications, comments, and observations received from the States concerning previous proposals of amendment sent by ICAO on 17 May and 7 December 2016.

1.5 Regarding the revised version of Volume II of the eANP (Version 3), comments were received in the SAM Region from Bolivia, Brazil, Chile, Colombia, and Suriname. Bolivia reported new changes in Part III CNS and SAR, Brazil in Part VI SAR, Chile had no comments, Suriname had changes in Part III CNS, and Colombia had changes in Part II AOP, Part III CNS, and Part V MET. Furthermore, as a result of the CNS mission conducted to Argentina in March 2017, changes were reported in the tables of Part III CNS.

1.6 The Meeting also took note that, as a result of the CAR/SAM PBN harmonisation, modernisation, and implementation meetings, a set of RNAV routes had been optimised, which would entail changes to Part IV ATM.

1.7 In this sense, the Meeting took note that ICAO would circulate a new amendment to Volume II of the eANP (Version 4) containing the changes mentioned in the paragraphs above.

1.8 The Meeting felt that it was important for the eANP focal points designated by the States to make sure that the information corresponding to their State, contained in Volume II of the eANP, is updated, so that the plan contains accurate information and continuous amendments are avoided.

1.9 The Meeting was informed that a work meeting of the ASBU project panel team (ASBU PPT) in charge of updating the 2019 GANP version had been held on the first week of May 2017 at ICAO Montreal Headquarters, during which the templates for ASBU blocks B0 and B2 had been approved and consolidated. Based on the work being carried out by the ASBU PPT, the new draft version of the GANP was expected to be ready by early 2018.

1.10 The Meeting expressed its concern over the frequent changes made to the Global Air Navigation Plan (GANP) and considered that these should be introduced over a longer period of time so as to allow the States to align thereto.

1.11 Finally, the Meeting took note that a seminar/workshop on ASBU implementation was to be held on 15-19 August 2017 in Lima, Peru, to cover primarily the following topics:

- Global and regional outlook on the Aviation System Block Upgrades (ASBU) methodology
- Outlook of the industry on the ICAO roadmap for CNS/ATM systems and avionics
- Planning, implementation and monitoring of the Aviation System Block Upgrades (ASBU) methodology
- Updating of the SAM PBIP and the national plans, aligned with the ASBU

Regional Plan to sustain air transport in the SAM Region

1.12 The Meeting took note that a regional plan was being drafted in the SAM Region to serve as a management tool to support decision-making by States and ensure the sustainable development of air transport from 2020 to 2035, and thus contribute to the attainment of several of the Sustainable Development Goals (SDG) established by the United Nations to further the prosperity of human beings and environmental protection.

1.13 Based on a diagnosis of the current status (through a gap analysis), the plan would establish the activities and action to be carried out in order to reach a “desired future” (vision), shown in **Appendix C** to this part of the report, through defined objectives, metrics and goals. The goals, indicators and metrics of the plan are based on the following four axes:

- Connectivity
- Institutional strengthening
- Safety
- Environment

1.14 The Meeting took note that the plan would be structured in interrelated levels: the first would be a high-level, easy-to-read document of attractive format, accompanied by graphs, mainly addressed to State high authorities and the general public; the second level would be a document containing more detailed information, to be accessed through hyperlinks in the first-level plan document; and the third level would be accessed through hyperlinks in the second-level document, and would contain specific information, such as the regional air navigation and safety implementation plans, and other plans of the aviation community addressed to the aeronautical community concerned.

1.15 The Meeting took note that, so far, the chapters on connectivity and institutional strengthening had been partially completed, and work had started on the chapters on safety and environment. It was expected that the first and second levels, as well as the air navigation and safety plans corresponding to the third level of the plan would be presented at the Fifteenth Meeting of Civil Aviation Authorities (RAAC/15), tentatively scheduled to be held in November 2017, for endorsement by the States and the industry.

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
3. Implementation of Performance Based Navigation (PBN) in the SAM Region							
3-26	**Conclusion SAM/IG/12-2 PBN approach instrument procedures** That SAM States: a) publish the navigation specification corresponding to such SIDs and STARs RNAV not having such indication at present; b) complete the implementation of APV procedures for all instrument flight runway ends, whether as primary approach or as support to precision approach, with a view to completing 70% of PBN approaches by 2014 and 100% by 2016; and c) advise the Regional office of any changes in the status of implementation of instrument approach procedures, whether conventional or PBN, in each SAM/IG meeting, in order to update regional efficiency indicators.	Implement APV procedures for all instrument flight runway ends.	70% of APV approaches 100% of APV approaches Information papers in SAM/IG meetings	2014 2016 2016	States	RO/ATM	**CONCLUDED** States took note on actions in literals a, b and c are under the implementation process. Follow-up to the implementation will continue being registered in Control table of PBN implementation provided in SAM/IG/19.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-29	**Conclusion SAM/IG/14-4 Follow-up of the PBN goals established in the Bogota Declaration** a) complete the template contained in Appendix E to this part of the report; b) do the calculations and/or collect data on (estimated and actual) fuel and CO_2 savings, using the IFSET tool for the estimates; c) send the data cited in a) and b) to the SAM Regional Office before 30 June and 31 December each year.	Complete details of PBN implementation at each international airport contained in the Air Navigation Plan Calculate fuel and CO2 savings achieved with the optimization of the air spaces	Submission of data to Regional office	SAM/IG/19	STATES	RO/ATM	**CONCLUDED** Note: Literal a) completed. Literal b) for the estimation of fuel savings and C O_2 emissions, another tools approved by the Stares can be used Follow-up to States implementation will continue being registered in Appendix B of this working paper
3-30	**Conclusion SAM/IG/14-5 National PBN implementation plans** That SAM States submit their updated national PBN implementation plans to the SAM/IG/15 meeting, using the model National PBN implementation plan shown in Appendix I to this part of the Report	Updating of PBN National Implementation Plans	PBN Plan updated	SAM/IG/18	STATES	RO/ATM	**CONCLUDED** Accomplished by 93% of States. Follow-up in table of pending tasks

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
3-31	**Conclusion SAM/IG/14-6 Projects and/or action plans for PBN redesign of the main South American TMAs** That SAM States: a) send the **Project and/or Action Plans for PBN redesign of the main TMA(s)** selected by their Administration, in order to complete the SAM PBN Project that is contained in **Appendix J** to this part of the Report, to the SAM Regional Office by 31 December 2014; b) send the corresponding updates to the aforementioned Project and/or Plans to the SAM Regional Office as soon as possible, so as to ensure harmonisation of activities under the SAM PBN Project.	Determination of the selected air spaces to be optimized with the implementation of PBN	Inform selected airspace for its redesign or optimization Report updates	SAM/IG/21	STATES	RO/ATM	**VALID** States that has presented during SAM/IG/18 their actions plans for redesign selected air spaces with base on PBN are: ARG, BOL, BRA, CHI, ECU, GUY, PAN, PAR, PER, URU and VEN
3-37	**Conclusion SAM/IG/18-01: PANS-OPS recommendations for harmonising instrument procedures in the SAM Region** That SAM States implement and apply, as soon as possible, the recommendations of the PANS-OPS group, shown in Appendix B to this part of the report, with a view to harmonizing instrument procedures and the associated processes, and enhance safety.	Apply recommendations made by PANS-OPS Group (Appendix B to the Report on Agenda Item 2 SAM/IG/18)	Recommendations made by PANS-OPS Group	SAM/IG/21	STATES	RO/ATM	**VALID**

4. Standards and procedures for performance based navigation operations approval							
4-12	**Conclusion SAM/IG/14-9 Aircraft and operator PBN capacity database** That the ICAO SAM Office send to SAM States information on the use of the aircraft and operator PBN capacity database, requesting that the aforementioned database be completed by 15 March 2015.	Complete the implementation of the capacity of aircraft and operators PBN database; and circulate a letter to States requesting to complete the data.	a) Application accessible from web b) Data base updated	SAM/IG/21	RO/TC		**VALID** At the end of last year headquarters offered to generate this application within the provided applications worldwide. In this sense it is foreseen that in October the specialist of headquarters begin the development of the application to have it online as soon as possible. Regarding the airworthiness of the SRVSOP area, it is expected that this me made during the renewal of airworthiness certificates to maintain the database completed.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5- ATFM implementation							
5-11	**Conclusion SAM/IG/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.	Implement ATFM teleconferences	Coordination between FMU/FMP carried out.	Permanent	States	RO/ATM	**VALID** REDDIG II had included and operating a telephone IP sub-network addressed to ATFN. It has capacity for 16 users. With the implementation of the new Brasilia node, the capacity is expanded to 17 users. States are exchanging significant information on the operational status of their air spaces and airports by e-mail on daily basis.
5-16	**Conclusion SAM/IG/6-8 ATFM AIP SUPP/AIC Model** That the States of the ICAO South American Region, when preparing their national AIC, use as a reference the ATFM AIP SUPP/AIC model shown in Appendix E to this part of the report.	Prepare AIC	Harmonised publications in the SAM Region	October 2016	States	RO/ATM	**CONCLUDED** This task was included in the ATFM action plan and is permanent. Any FMU or FMP post implementation has been made in connection with a publication of IP and AIC.

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
5-24	**Conclusion SAM/IG/14-10 ATFM preparatory activities** That SAM States do their utmost to: a) increase the number of ATFM-trained personnel to the extent required to fulfil ATFM functions; and b) provide ATFM training to their personnel through national courses conducted by instructors trained in courses provided within the framework of Project RLA/06/901, with a view to multiplying training.	Establish the minimum staff to provide the ATFM system Deliver at national level the ATFM training courses	Sufficient human resources Trained national staff	Permanent	STATES	RO/ATM	**VALID only paragraph (b)** Task described in paragraph (a) is finalized
5-26	**Conclusion SAM/IG/15-4: Reduction of the longitudinal separation between aircraft in the SAM airspace** That, taking into account the operational benefits to be gained from reducing the longitudinal separation of aircraft in the SAM airspace, States: a) investigate the possibility of reducing the longitudinal separation of aircraft at 40 NM between adjacent FIRs using the Mach number technique; b) their application be included in the Letters of Operational Agreement; and	Analysis of the application of the longitudinal separation of 40 NM Sign of MoUs and/or LOAs	Implementation	SAM/IG/18	States	RO/ATM	**VALID** See implementation progress on Appendix D of Agenda Item 2 of SAM/IG/18 Report.

	c) the Secretariat include this implementation in the GREPECAS ATFM Project and its Action Plan.						
No.	**Task to be developed**	**Specific tasks**	**Deliverables**	**Finalization date**	**Responsible**	**Supporting members to the task**	**Status of implementation**
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							
6-23	**Conclusion SAM/IG/17/01: Implementation of actions to maintain the security in REDDIG II** That REDDIG II member States and the REDDIG II Administration analyse the implementation of the initial actions described in Appendix A to this agenda item in order to maintain the required security in REDDIG II and submit the results of this analysis at the Twentieth meeting of the Coordination Committee of Project RLA/03/01 (RCC/20 March 2017) for approval.	Actions oriented to keep security in REDDIG II	Actions oriented to keep security in REDDIG II implemented	Mach 2017	REDDIG II member States REDDIG II Administration	REDDIG II Administration	**CONCLUDED** The RCC/8 Meeting of the REDDIG (Regional Project RLA/03/901) approved the initial analysis of risk threats and an action plan for the implementation of the proposed actions

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
6-24	**Conclusion SAM/IG/17/02: Analysis of the REDDIG II connection configuration for the transport of SITA data link services** That REDDIG II member States that have implemented or are in the process of implementing the ground-air data link service and the REDDIG II and SITA administration hold the necessary teleconferences to analyse the REDDIG II connection configuration shown in Appendix B to this agenda item, starting on 21 June 2016, and submit the results of the analysis at the SAM/IG/18 meeting.	Asses the configuration of REDDIG II connection for the transport of SITA data link services	Configuration of REDDIG II connection for the transport of SITA data link services	October 2016	REDDIG II member States	REDDIG II Administration	**CONCLUDED** Configuration of REDDIG II connection for the transport of SITA data link services implemented.
6-25	**Conclusion SAM/IG/18/02: Nomination and registration of SAM candidates for EUROCONTROL AMC** That SAM States that have installed AMHS systems and have not yet registered, by nominated candidates for external operators of the Eurocontrol ATS messaging management centre (AMC) do so as soon as possible by submitting to the ICAO South American Office the names of the nominees, so that the States may keep an updated version of the adopted AMHS addresses for all AMHS users	Registry of external operators to AMC Eurocontrol	External operators nominated by States from SAM Region that are registered	December 2017	States	RO/CNS	**VALID** At present, States that have nominated external operators are: Brazil, Colombia, Ecuador, Paraguay, Perú and Venezuela

	worldwide.						
7. Operational implementation of new ATM automated systems and integration of the existing systems							
7-13	**Conclusion SAM/IG/14-17 Updating of FASID Table CNS4** That SAM States send to the Secretariat at the ICAO SAM Office the updated FASID Table CNS4 by 15 December 2014.	Updating of the FASID Table CNS 4	FASID Table CNS 4 updated	15 Dec 2014	SAM Region States	ICAO SAM Office	**CONCLUDED** Changes in FASID Table CNS 4 received were introduced in new CNS II-CARSAM-5 table regarding systems of surveillance plans of Vol II of eANP.
7-14	**Conclusion SAM/IG/15-07 Activities to migrate from the AIDC pre-operational to the operational phase between ACCs Colombia, Ecuador and Peru** That, Colombia, Ecuador and Peru carry out the activities referred to in paragraph 5.12 of this agenda item for the migration from the AIDC pre-operational phase to the operational, between the ACC Bogota and the ACC Guayaquil, the ACC Bogota with the ACC Lima and the ACC Lima with the ACC Guayaquil, in order to begin with the operational phase on 3 August 2015.	Migration phase from the AIDC pre-operational between ACC Lima – ACC Guayaquil ACC Lima – ACC Bogota ACC Bogota - ACC Guayaquil	AIDC pre-operational phase	3 August 2015	Concerned States: Colombia Ecuador Peru	Secretariat ICAO	**VALID** On 3 August 2015, the AIDC between ACC Lima and ACC Guayaquil started testing operations. Operational phase began on 31 March 2016 and was interrupted in July 2016 returning to pre-operational phase- Pending operational test phase between Lima ACC-Bogota ACC and Guayaquil ACC – Bogota ACC in pre-operational phase since August 2015

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
7-15	**Conclusion SAM/IG/15-08 Provision of facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States** That the Aeronautical Authorities of the SAM Region States involved in the implementation of the AIDC systems interconnection, in order to comply with the requirements of the Bogota Declaration in this regard, provide the necessary facilities for the staff designated for the implementation of this activity, especially the focal points, could carry out the work within the time specified in the schedules of activities listed in Appendix C of this agenda item.	Provision of facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States	Facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States	December 2016	States	Secretariat ICAO	**VALID** The lack of support to the focal points in the implementation process, by the aeronautical authorities is still evident.
7-17	**Conclusion SAM/IG/18/03: Designation of ADS B focal points** That, in order to coordinate regional ADS B planning and implementation activities in the SAM Region, the States designate focal points and send the information to the ICAO South American Office no later than 30 December 2016.	Designate ADS B focal points	ADS B nominated focal points	30 December 2016	States	RO/CNS	**VALID** During the SAM/IG/19 meeting Panamá and Peru nominated focal points

No.	Task to be developed	Specific tasks	Deliverables	Finalization date	Responsible	Supporting members to the task	Status of implementation
8. Follow up to conclusions and decisions adopted by SAM/IG meetings, results of the thirty-eighth session of the ICAO Assembly (A38) and thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13) and progress made in the development of the new electronic Air Navigation Plan (e-ANP)							
8-1	**Conclusion SAM/IG/13-1 Alignment of the national air navigation plans with the ICAO Global Air Navigation Plan (GANP) and SAM Performance-Based Air Navigation Implementation Plan (PBIP)** That SAM States amend their national air navigation plans, with the aim of aligning them with the new ICAO Global Air Navigation Plan (GANP, 4th Edition) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) approved at the thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13), and present any progress made in October 2014, at SAM/IG/14 meeting.	Amend the air navigation national plans to have them aligned with the new ICAO Global Air Navigation Plan.	National air navigation plans aligned with ASBU	SAM/IG/21	States	ICAO SAM Office	**VALID** Argentina (initial phase), Brazil, Chile, Colombia, France and Venezuela have reported the completion of their national plans aligned with the ASBU.
8-3	**Conclusion SAM/IG/13-3 Designation of a national focal point for the drafting of the new regional e-ANP** That, with the aim that SAM States can coordinate with the ICAO SAM Regional Office the provision of the data necessary for the drafting of the new regional electronic air navigation plan (e-ANP):	Designate focal points	Focal point	1 Aug 2014	States	RO/ATM	**VALID** Secretariat sent letter SA280 on 12 June 2014. Information of Guyana, Panama, and Suriname is still pending.

	a) The ICAQ SAM Regional Office will send a State letter in early June 2014, requesting the nomination of a national focal point; and b) SAM States will officially inform by 1 August 2014 the name of the designated focal point, and provide a brief resumé, telephone number and electronic mail of the incumbent.						

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
Conclusion SAM/IG/13-1 – Alignment of the national air navigation plans with the ICAO Global Air Navigation Plan (GANP) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) That SAM States amend their national air navigation plans, with the aim of aligning them with the new ICAO Global Air Navigation Plan (GANP, 4th Edition) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) approved at the thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13), and present any progress made in October 2014, at SAM/IG/14 meeting.	O/G	O/G	YES	YES	YES	O/G	YES	NO	O/G	O/G	O/G	NO	O/G	YES	Panama foresees completion for SAM/IG/20 Peru foresees completion by December 2017. Orientation was provided by the Secretariat to Suriname to carry out activites

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Conclusion SAM/IG/13-3 – Designation of a national focal point for the drafting of the new regional e-ANP That, with the aim that SAM States can coordinate with the ICAO SAM Regional Office the provision of the data necessary for the drafting of the new regional electronic air navigation plan (e-ANP): a) The ICAO SAM Regional Office will send a State letter in early June 2014, requesting the nomination of a national focal point; and b) SAM States will officially inform by 1 August 2014 the name of the designated focal point, and provide a brief resumé, telephone number and electronic mail of the incumbent.	**YES**		**YES**	**YES**	**YES**	**YES**	**YES**			**YES**	**YES**	**YES**	**YES**	**YES**	Pending information from Bolivia, Guyana and Panama
Conclusion SAM/IG/13-8 – Actions on air traffic flow control measures That in view of air traffic flow operational restrictions, SAM States adopt following measures: a) consider the text on flow control measures used in the ATS 06/14 Multilateral Meeting, or similar, for inclusion in the Letters of Operational Agreement between ATS dependencies; b) consider of utmost priority to take necessary and urgent actions to avoid the adoption of unilateral flow restrictions that could severely affect air traffic flow;	**YES**	**YES**	**YES**			**YES**				**YES**	**YES**		**YES**		**Argentina:** Used text shown under paragraph a) in their national Letters of Agreement, as well as with Bolivia, Chile and Paraguay, Uruguay and Brazil. **Bolivia**: Used text shown under paragraph a) in their LOAs with Argentina and Paraguay. **Ecuador:** Used the text shown under paragraph a) in their LOA between Guayaquil and Bogota and Bogota-Lima **Paraguay**: Used the text shown under paragraph a) in their LOAs with Bolivia, and Argentina.

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
c) implement air traffic flow control measures, if necessary, based on well-founded studies of ATS sector capacities, and coordinate same previously with ATC dependencies responsible for ATS supply in adjacent FIRs. d) consider the application of gradual control measures using as far as possible separations based on distance, by taking advantage of existing ATS surveillance tools; e) use in messages established for communicating flow control measures, terminology and format as detailed in Manual on Air Traffic Flow Management for CAR/SAM Regions, Version 1.1, October 2010, Chapters 12 and 13.															**Argentina and Chile set agreements for the establishment of ATFM measures.** **Conclusion SAM/IG/19 - 01 was agreed for strengthening the FMP /FMU by giving them faculties to coordinate with ATC and adjacent dependencies.**
Conclusion SAM/IG/13-9 IATA safety events indicators for SAM States Encourage States to develop, jointly with operators, Secretariat and other ATM community stakeholders deemed relevant, the methodology allowing the use of the data on safety events and indicators registered by airlines through IATA, in order to identify and mitigate any potential risk to operations, setting goals, priority areas and action plan.	O/G		**YES**	**YES**			**YES**								Argentina is preparing a convention for the use of data safety events and indicators registered by airlines through IATA.

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Conclusion SAM/IG/14-4 Follow-up of the PBN goals established in the Bogota Declaration a) complete the template contained in Appendix E to this part of the report; b) do the calculations and/or collect data on (estimated and actual) fuel and CO_2 savings, using the IFSET tool for the estimates; c) send the data cited in a) and b) to the SAM Regional Office before 30 June and 31 December each year.	**YES** **YES**	**YES**	**YES** **YES**	**YES** **YES**		**YES**	**YES**				**YES**			**YES**	There is a new templated proposed by Peru which was approved by SAM/IG/18. States have to update data in the new template. The SAMIG/19 meeting introduced a new template for including data of runways of AOP of eANP. States shoud update data in the new template.
Conclusion SAM/IG/14-5 National PBN implementation plans That SAM States submit their updated national PBN implementation plans to the SAM/IG/15 meeting, using the model National PBN implementation plan shown in Appendix I to this part of the Report	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	Panama foreseen to complete its PBN national plan by Dec 2017
Conclusion SAM/IG/14-9 Aircraft and operator PBN capacity database That the ICAO SAM Office send to SAM States information on the use of the aircraft and operator PBN capacity database, requesting that the aforementioned database be completed by 15 March 2015.													**YES**		Letter pending submitting to States; in parallel consultation through the SRVSOP is being made to States to receive procedures as how to keep database updated once it is published. Brazil informed that they coordinate with CARSAMMA data base, therefore it should be analyze if it matches with this conclusion.
Conclusion SAM/IG/14-10 ATFM preparatory activities That SAM States do their utmost to:															Paragraph (a) concluded

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
a) increase the number of ATFM-trained personnel to the extent required to fulfil ATFM functions; and b) provide ATFM training to their personnel through national courses conducted by instructors trained in courses provided within the framework of Project RLA/06/901, with a view to multiplying training.	**YES** **YES**	**YES** **YES**	**YES** **YES**	**YES** **YES**	**YES**	**YES**			**YES**	**YES** **YES**	**YES** **YES**	**YES** **NO**	**YES** **YES**	**YES** **YES**	
Conclusion SAM/IG/14-13 - AMHS interconnection trial procedures That SAM States, when conducting AMHS interconnection trials, use as a reference the list of procedures aligned with the SAM AMHS interconnection guide shown in **Appendix B** to this agenda item.	**YES**	**O/G**	**YES**	**O/G**	**O/G**	**O/G**	**N/A**	**O/G**	**O/G**	**YES**	**YES**	**O/G**	**O/G**	**YES**	Implementation of procedure in progress.
Conclusion SAM/IG/14-17 - Updating of FASID Table CNS4 That SAM States send to the Secretariat at the ICAO SAM Office the updated FASID Table CNS4 by 15 December 2014.	**YES**	**NO**	**O/G**	**YES**	**NO**	**NO**	**NO**	**NO**	**YES**	**YES**	**YES**	**NO**	**NO**	**YES**	Activity incomplete.
Conclusion SAM IG/14-18 - Exception in the insertion of alternate aerodromes **That:** a) Airlines operating to the United States that will apply exceptions to the insertion of the alternate aerodrome, insert "ZZZZ" in box 16 of the FPL and specify ALTN//NIL in box 18. b) States include such procedures in the respective AIPs.	**O/G**	**O/G**	**YES**	**NO**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Conclusion SAM/IG/15-07: Activities to migrate from the AIDC pre-operational to the operational phase between ACCs Colombia, Ecuador and Peru That, Colombia, Ecuador and Peru carry out the activities referred to in paragraph 5.12 of this agenda item for the migration from the AIDC pre-operational phase to the operational, between the ACC Bogota and the ACC Guayaquil, the ACC Bogota with the ACC Lima and the ACC Lima with the ACC Guayaquil, in order to begin with the operational phase on 3 August 2015.	**N/A**	**N/A**	**N/A**	**N/A**	**O/G**	**O/G**	**N/A**	**N/A**	**O/G**	**N/A**	**O/G**	**N/A**	**N/A**	**N/A**	**VALID** AIDC operational phase remains
Conclusion SAM/IG/15-08: Provision of facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States That the Aeronautical Authorities of the SAM Region States involved in the implementation of the AIDC systems interconnection, in order to comply with the requirements of the Bogota Declaration in this regard, provide the necessary facilities for the staff designated for the implementation of this activity, especially the focal points, could carry out the work within the time specified in the schedules of activities listed in Appendix C of this agenda item.	**O/G**	**N/A**	**O/G**	**O/G**	**O/G**	**O/G**	**N/A**	**N/A**	**O/G**	**O/G**	**O/G**	**N/A**	**O/G**	**O/G**	**VALID**

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Conclusion SAM/IG/16-01: Model amendment to the letter of operational agreement on AIDC between two centres That SAM States, when implementing AIDC between adjacent ATS units, make the corresponding amendments to the letters of operational agreement using as a model the amendment to the letter of operational agreement between the Lima ACC and the Guayaquil ACC for the operation of AIDC, shown in Appendix A to this agenda item.				**O/G**	**YES**	**YES**			**YES**		**YES**				**CONCLUDED** The model amendment to the letter of operational agreement on AIDC at moment is being used by Colombia, Ecuador, Panama and Peru
Conclusion SAM/IG/17/01: Implementation of actions to maintain the security in REDDIG II That REDDIG II member States and the REDDIG II Administration analyse the implementation of the initial actions described in Appendix A to this agenda item in order to maintain the required security in REDDIG II and submit the results of this analysis at the Twentieth meeting of the Coordination Committee of Project RLA/03/01 (RCC/20 March 2017) for approval.	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	**N/A**	**O/G**	**O/G**	**O/G**	**O/G**	**O/G**	RCC/20 approved an action plan to keep REDDIG II safe. Some activities have already been executed such as the installation of antivirus in the NMS, another are in progress.
Conclusion SAM/IG/17/02: Analysis of the REDDIG II connection configuration for the transport SITA data link services That REDDIG II member States that have implemented or are in the process of implementing the ground-air data link service and the	**O/G**	**N/A**	**O/G**	**O/G**	**N/A**	**O/G**	**O/G**	**N/A**	**N/A**	**N/A**	**O/G**	**N/A**	**O/G**	**N/A**	REDDIG II connection configuration was approved. SAM Region States members of REDDIG that decide to use SITA services with data link, could use it through REDDIG II

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
REDDIG II and SITA administration hold the necessary teleconferences to analyse the REDDIG II connection configuration shown in Appendix B to this agenda item, starting on 21 June 2016, and submit the results of the analysis at the SAM/IG/18 meeting.															
Conclusion SAM/IG/18-01: PANS-OPS recommendations for harmonising instrument procedures in the SAM Region That SAM States implement and apply, as soon as possible, the recommendations of the PANS-OPS group, shown in Appendix B to this part of the report, with a view to harmonizing instrument procedures and the associated processes, and enhance safety.	**O/G**	**O/G**	**O/G**			**O/G**			**O/G**	**O/G**					States are expected to report on the application of recommendation during the meeting
Conclusion SAM/IG/18/02: Nomination and registration of SAM candidates for EUROCONTROL AMC That SAM States that have installed AMHS systems and have not yet registered, by nominated candidates for external operators of the Eurocontrol ATS messaging management centre (AMC) do so as soon as possible by submitting to the ICAO South American Office the names of the nominees, so that the States may keep an updated version of the adopted AMHS addresses for all AMHS users worldwide.	**NO**	**NO**	**SI**	**NO**	**SI**	**SI**	**NA**	**NO**	**NO**	**SI**	**SI**	**NO**	**NO**	**SI**	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
Conclusion SAM/IG/18/03: Designation of ADS B focal points That, in order to coordinate regional ADS B planning and implementation activities in the SAM Region, the States designate focal points and send the information to the ICAO South American Office no later than 30 December 2016.	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**SI**	**NO**	**SI**	**NO**	**NO**	**NO**	

Agenda Item 2: Optimization of the SAM airspace
a) PBN en-route
b) PBN in terminal areas
c) PBN procedures

2.1 Under this agenda item, the Meeting analysed the following papers:

a) WP/05 - *Follow-up to PBN implementation in relation to the goals of the Declaration of Bogota and other implementations related to airspace optimization* (presented by the Secretariat);
b) WP/15 - *ICAO assistance to encourage the exchange between SAM and CAR adjacent States with a view to subscribing the corresponding operational agreement* (presented by Venezuela);
c) WP/16 - *PBN concept of operations for SAM airspace - Period 2017 - 2019* (presented by the Secretariat);
d) NI/05 - *Reducción de las emisiones de CO_2 en la atmósfera, debido al cambio en el flujo de TMA Salvador* (presented by Brazil - Spanish only);
e) NI/06 - *Actualización del módulo 5LNC de la base de datos ICARD* (presented by the Secretariat - Spanish only); and
f) NI/03 - *Curso avanzado de procedimientos de vuelo* (presented by Uruguay - Spanish only).

Follow-up to PBN implementation in relation to the goals of the Declaration of Bogota and other implementations related to airspace optimization

2.2 The Meeting took note that the Third Meeting of Air Navigation and Safety Directors (Lima, Peru, 22-24 August 2016) reviewed, *inter alia*, the status of implementation of PBN with respect to route optimisation, terminal areas, PBN approach procedures, as well as the reduction of CO_2 emissions as part of the goals approved by the RAAC/13 meeting (Bogota, Colombia, 4-6 December 2013) through the Declaration of Bogota (Conclusion RAAC/13-8 - *Implementation of air navigation and safety priorities*).

2.3 Regarding the progress made, the Meeting was informed as follows:

Updating of PBN national plans

2.4 Regarding PBN national plans, compliance reached 100%. **Table 1** below contains the updated information:

2016	ARG	BOL	BRA	CHI	COL	FGY	ECU	GUY	PAN	PAR	PER	SUR	URU	VEN
100%	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 1 – States that have submitted their updated PBN national plans

PBN en-route

2.5 The progress made in the implementation of RNAV routes in upper airspace was 65%, exceeding the goal of 60% established in the Declaration of Bogota. In order to get a more clear idea,

Table 2 below shows the number of regional routes in the upper airspace, both conventional and PBN, as well as the percentage of PBN routes attained.

Total ATS routes in upper airspace	Conventional routes	PBN routes	% of PBN routes implemented	Indicator of the Declaration of Bogota: % PBN routes
145	52	93	**65%**	60%

Table 2 - ATS routes in upper airspace (conventional and PBN)

2.6 It was noted that significant efforts had been made in 2016 to coordinate amongst CAR and SAM States to improve ATS routes. In this sense, two PBN harmonisation, modernisation and implementation meetings were held (Fort Lauderdale - United States, and San Jose - Costa Rica), resulting in proposals for the optimisation or implementation of a set of interregional RNAV routes, which included four parallel RNAV routes in Brazilian airspace, which will optimise aircraft flow from CAR and NAM airports to Rio de Janeiro, Sao Paulo and *vice versa.*

2.7 This implementation also involves the administrations of Guyana, Suriname and Venezuela, where a first implementation phase with AIRAC date 17 August 2017 had been agreed. Within the context of the aforementioned meetings, emphasis was placed on coordination amongst CAR and SAM States for harmonised implementation of 40 NM longitudinal separation.

2.8 A proposal of amendment to the eANP concerning optimised or implemented ATS routes was being processed. The reports of the two PBN implementation and harmonisation meetings can be found at the following websites:

http://www2010.icao.int/NACC/Pages/meetings-2016-PBN.aspx

http://www2010.icao.int/NACC/Pages/meetings-2016-pbncar.aspx

2.9 Note was taken of the holding of a third ICAO/IATA/CANSO PBN harmonisation, modernisation, and implementation meeting for the NAM/CAR/SAM Regions during the second half of 2017. It is anticipated that the set of proposals for route optimisation to be consolidated at the ATS/RO/8 meeting, in relation to Version 04 of the route network, will be submitted to the aforementioned meeting for coordination and harmonisation.

PBN in TMAs

2.10 The States have taken on the task of developing action plans for the use of PBN in the redesign of selected TMA airspaces. Tentative implementation dates were not updated at the Meeting, and these will have to be reported to the Secretariat through the teleconferences by 15 June. The status of implementation is shown in **Table 3**.

2.11 Argentina made a presentation on the implementation of PBN flight procedures at various international and domestic airports, totalling more than 140 to be designed during the year. Argentina recognised the complexity involved in the modernisation of the Baires TMA. It was noted that a team consisting of ANAC, EANA, DNCTA, DECEA-Brazil, Aerolíneas Argentinas, Austral, and LATAM, was in charge of PANS-OPS activities in Argentina, which was acknowledged by the Meeting. In this

regard, Argentina stated that it was in a position to update its PBN Plan, which would be delivered to the Secretariat as soon as possible.

PBN – "Full implementation" airspaces			
State			**Implementation**
Argentina	BAIRES		TBD
Bolivia	Cochabamba		TBD
	La Paz		TBD
	Santa Cruz		TBD
	Sucre		TBD
	Oruro		TBD
	Potosí		TBD
Brazil	Brasilia		12 Nov 2015 (implemented)
	Belo Horizonte		12 Nov 2015 (implemented)
	Sao Paulo (modifications)		12 Nov 2015 (implemented)
	Salvador		27 Apr 2017 (implemented)
	Manaus		17 Aug 2017
	(PBN SUR)	Curitiba	12 Oct 2017
		Florianópolis	
		Joinville	
		Navegantes	
		Porto Alegre	
		São Paulo (modifications)	
		CW FIR route network	
Chile	Santiago (Sur)		08 Dec 2016 (implemented)
	Santiago FIR route network		
Colombia	Bogota		TBD
Ecuador	Guayaquil		21 Jul 2016 (implemented)
Panama	Panama		TBD
Paraguay	Asunción		17 Aug 2017
Peru	Arequipa		TBD
	Cuzco		TBD
	Juliaca		TBD
	Puerto Maldonado		TBD
Uruguay	Carrasco y Laguna del Sauce		TBD
Venezuela	Maiquetía		TBD

Table 3 - Tentative dates established by the States for the implementation of PBN redesign of selected airspaces

2.12 Based on the results of the First PANS-OPS workshop carried out to analyse, together with procedure designers, the best design practices, the amendments to ICAO Doc 8168 and Circular 336 regarding RNAV and RNP arrivals, departures, and approaches, **Appendix A** to this part of the report contains a table for monitoring the adoption by the States of the recommendations of the aforementioned workshop, in compliance with Conclusion SAM/IG/18-1. The States attending the Meeting completed the table, leaving pending only the data of those States that could not attend, which would have to be delivered to the Secretariat by 15 June 2017.

Implementation of SIDs, STARs and PBN approach procedures - Control sheet

2.13 Regarding the implementation of SIDs, STARs, and PBN approach procedures, the commitment assumed in Resolution A37-11 of the ICAO Assembly was not met, since regional implementation only reached 75%. Consequently, the States agreed to work harder to achieve this goal.

2.14 Regarding CCO implementation, it was noted that 20% implementation had been achieved and 22% for CDO.

2.15 It was underscored that at some international airports, the strict implementation of a STAR might not be efficient. Accordingly, the meeting agreed that, under such circumstances, and after conducting the corresponding analysis, each State could send a note reporting this fact and designate it as "*not applicable*" in the same PBN procedure implementation control sheet. The Meeting emphasised the convenience of optimising controller and pilot workload, establishing SIDs with different transitions instead of having many SIDs for departures from the same runway.

2.16 The goal of the Declaration of Bogota of having PBN SID/STAR routes in at least 60% of international aerodromes of the Region was exceeded. Furthermore, progress continues to be made in the implementation of these routes. It is expected that the optimisations to be considered for Version 04 of the route network will further the achievement of this objective.

2.17 The Meeting took note of the new PBN Implementation Control Table presented by the Secretariat, describing the criteria for proper completion, including the suggestion made by Peru and approved at the SAM/IG/18 meeting to include a status option in addition to "1 = *implemented*" or "2 = *not-implemented*", which is "N/A = *not applicable*", in order to identify thresholds where SID, STAR and/or PBN approach implementation is not feasible due to obstacles or some other specific reason (for example, prevailing wind), thus offering a more detailed portrayal of the status of implementation.

2.18 It was noted that the new table already included runway type data (NPA, PA1, NINST, etc.) extracted from the eANP AOP Table, allowing for the crossing of information with this document and, eventually, for the introduction of the required updates.

2.19 The Secretariat stated that the Control Table should be consistent with the PBN implementation plan of each State, since the implementation information must include public and private procedures (*tailored)*. Furthermore, the XLS table delivered to the participating States is a tool for planning implementation at domestic aerodromes, in case the State so requires for its own purposes. The States that were unable to attend would receive the table by email.

2.20 The Meeting noted what emphasized IATA regarding the importance of coordinating and sharing information for adequate PBN implementation planning.

2.21 During the Meeting, Argentina, Brazil, Bolivia, Panama, Paraguay, Peru, and Venezuela reviewed the information on PBN implementation in compliance with Resolution A37-1 of the ICAO Assembly and the goals of the Declaration of Bogota. The Secretariat will continue coordinating with PBN focal points that have not yet submitted information, in order to present a consolidated table at the ATS/RO/8 meeting.

Reduction of CO_2 emissions as a result of PBN implementation in TMAs

2.22 Regarding the reduction of CO_2 emissions, the Meeting took note that the reduction achieved in 2015 had been of **23,351 tonnes of CO_2**. In accordance with Conclusion SAM/IG/14-4, States were expected to present, by 30 June, their partial calculations of fuel and CO_2 emission savings for the first half of the year, obtained as a result of the 2016 implementation plans.

Activities and resources approved with the support of Project RLA/06/901 for 2017

2.23 The Meeting was informed of the activities approved by the Tenth Meeting of the Coordination Committee of Project RLA/06/901 (RCC/10) for 2017:

- **Version 04 - SAM route network aligned with the PBN Concept of Operations,** with a view to applying the Concept of Operations for the PBN route structure (ATS, SID and STAR routes) en-route and in TMAs, to be developed in Lima, Peru, by two experts of the Region, on 5-23 June 2017.

- **Workshop on ASBU implementation and PBIP revision,** to examine the PBIP revision and the National Air Navigation Plans aligned with the ASBU. This workshop will be carried out in Lima, on 14-18 August 2017.

- **ATSRO/8 workshop/meeting,** to conduct a preliminary revision and consolidation of Version 04 of the route network optimisation and approve the final version to be implemented, scheduled to be held in Lima, on 21-25 August 2017.

- **ATFM meeting**, to harmonise and adjust coordination procedures, apply ATFM initiatives and messages, memoranda of understanding, to be held in Lima on 11-13 September 2017.

- **Second PANS-OPS implementation workshop,** in order to continue harmonising and coordinating PBN instrument procedures in the SAM Region, advanced RNP and CDO/CCO, to be held in Lima, 18-22 September 2017.

- **SAM/IG/20 meeting,** in order to continue with the activities for the implementation of the action plans developed by the Project in the AGA, AIM, ATM, CNS and MET areas. This meeting will be held in Lima on 16-20 October 2017.

- **Workshop on longitudinal separation optimisation,** in order to develop an implementation plan for reducing longitudinal separation from 40 to 20 NM in SAM airspace and sign the respective Letters of Operational Agreement, to be held in Lima, on 6-10 November 2017.

Strategy for the implementation of PBN in the SAM Region

2.24 The Meeting took note of the information provided by the Secretariat on PBN implementation follow-up actions, which will consist of the following activities/events:

a) Approval by the Meeting of Civil Aviation Authorities (RAAC) of the Concept of Operations for the PBN route structure (ATS, SID and STAR routes) for the period

2018-2020, including the implementation strategy, the navigation specification to be applied en route and in TMAs, as well as metrics and indicators.

b) Revision and consolidation of Version 04 of the ATS route network at the ATSRO/8 meeting.

c) PBN implementation in TMAs - SAM/IG meetings and monthly teleconferences (last Thursday of each month).

d) Harmonisation and coordination of PBN instrument procedures in the SAM Region – PANS-OPS workshops.

e) Longitudinal separation optimisation - multilateral and bilateral meetings.

f) Coordination and harmonisation of the route network and longitudinal separation between the CAR/SAM Regions - NAM/CAR/SAM inter-regional implementation meetings and teleconferences.

2.25 The Meeting discussed the importance of defining metrics and indicators that would reflect implementation, not only in quantitative terms but also in terms of performance and efficiency. However, it was noted that metrics that were difficult to assess or calculate should not be selected.

Implementation of reduced longitudinal separation in the Region and signing of Letters of Operational Agreement

2.26 The Secretariat reminded the participants that, at the SAM/IG/18 meeting, letters of agreement had been updated or memorandums of understanding had been signed in compliance with the commitments assumed at the SAM/IG/17 meeting for reducing longitudinal separation to 40 NM for GNSS-equipped aircraft. In case one or the two aircraft involved in a longitudinal separation lacked GNSS capability, then the separation to be applied to that traffic would be 80 NM.

2.27 **Appendix B** to this part of the report contains the agreements reached between adjacent FIRs. It is expected that the process of updating of the letters of agreement or signing of memorandums of understanding will continue in the next months, at the aforementioned PBN events. Chile stated that coordination is starting for the signing of these agreements with Peru, Argentina, and Bolivia. The objective is to move on to a second stage to reduce longitudinal separation to 20 NM, as foreseen in Doc 4444.

2.28 Some FIRs like French Guiana and Atlantico have oceanic separation in most of their FIR, although further coordination is required with adjacent States in the CAR Region, as highlighted by the representative of Venezuela. The Meeting agreed that said coordination should be finalised at the Third ICAO/IATA/CANSO PBN/NAM/CAR/SAM meeting.

2.29 The reported status of implementation with the ACCs of adjacent States is as follows:

2017 86%	ARG	BOL	BRA	CHI	COL	FGY	ECU	GUY	PAN	PAR	PER	SUR	URU	VEN
	YES	YES	YES	NO	YES	NO*	YES	YES	YES	YES	YES	YES	YES	YES

*Note: French Guiana applies oceanic separations with neighbouring States

PBN focal points of the regulator and air navigation service provider

2.30 The table containing the PBN focal points of the regulator and the air navigation service provider (ANSP) for coordination and teleconferencing purposes is shown in **Appendix C** to this part of the report.

Amendment to ATC bilingual phraseology of Document 4444

2.31 The Meeting took note that the SAM/IG/18 had been informed that, on 1 March 2016, the ICAO Air Navigation Commission had approved Amendment 7 to Doc 4444, which included Amendments 7-A and 7-B to the 15th edition of the PANS-ATM, effective on 10 November 2016. Given the importance of the use of standard ATC phraseology and the changes introduced by the Amendment to Doc 4444, the AACs of the Region had to take measures such as the publication of an AIC indicating the new phraseology, specifying its effective date, the issuance of a NOTAM, and the appropriate pilot and controller induction process. The States attending the Meeting completed that data in the table shown in **Appendix D**, which shows the status of implementation, leaving pending the data corresponding to those States that were unable to attend the Meeting, which would deliver the data to the Secretariat by 15 June 2017.

2.32 The Secretariat reminded the Meeting that, for the purpose of disseminating Amendment 7 to Doc 4444, the States could use Appendices A and B to working paper SAM/IG/18-WP/09, which refer to brochures that explain the changes in ATC bilingual phraseology, available at:

http://www2010.icao.int/SAM/Documents/2016-SAMIG18/SAMIG18_NE09.pdf

2.33 As an example of the implementation of Amendment 7 to Doc 4444, Appendix G to working paper SAM/IG/19-WP/05 contains the AIC published by NAVCANADA. Likewise, the Brazilian regulation (MCA 100-16) that incorporates the amendment can be found in the following link (Portuguese only):

http://publicacoes.decea.gov.br/?i=publicacao&id=4428

PNB Concept of Operations for SAM airspace (CONOPS)

2.34 The Secretariat noted that, in order to support compliance with the Declaration of Bogota while providing a conceptual frame of reference for updating the SAM-PBIP, to be completed on the current year, it had been deemed advisable to have two experts of the SAM Region staying at the South American Regional Office during the month of November 2016 to develop the PBN Concept of Operations (CONOPS) for SAM airspace, within the framework of Project RLA/06/901.

2.35 The draft CONOPS contained in Appendix A to working paper SAM/IG/19-WP/16 is directly related to ICAO strategic objectives, in accordance with the Global Air Navigation Plan:

a) Safety: Improve the safety of global civil aviation.

b) Air navigation capacity and efficiency: Increase the capacity and improve the efficiency of the global civil aviation system.

c) Economic development of air transport: Promote the development of a sound and economically viable civil aviation system.

d) Environmental protection: Minimise the adverse effects of civil aviation activities on the environment.

2.36 It was also noted that the development of Version 04 of the ATS route network had been scheduled for 2017, putting emphasis on greater integration with the SIDs/STARs of the main TMAs. Consideration would also be given to the incorporation of RNP 2 and RNP 4 navigation specifications in the Region, as analysed in the CONOPS.

2.37 For the development of the CONOPS, consideration was given to ASBU block 0 modules that are related to the implementation projects of the Region, aligning the CONOPS to such modules:

a) ASBU B0-APTA - *Optimization of approach procedures including vertical guidance;*

b) ASBU B0-FRTO - *Improved operations through enhanced en-route trajectories*;

c) ASBU B0-CCO and BO-CDO - *Improved flexibility and efficiency in climb and descent profiles with application of continuous climb operations (CCO) and continuous descent operations (CDO).*

2.38 The CONOPS assumes that the main navigation element will be performance-based navigation, mainly supported by GNSS, although conventional navigation aids will still be used as a reversal and contingency measure. Communications will mainly be oral via VHF for continental airspace and, in oceanic airspace HF communications will be replaced with specific applications such as CPDLC or SATVOICE. Efforts will continue to be made to modernise CNS systems.

2.39 Likewise, cargo and passenger aircraft operators will continue modernising their fleets and on-board equipment. Consequently, airspace planning will be based on PBN, applying the "*Best equipped, best served*" concept. It is considered that the Flexible Use of Airspace concept will be an enabling element for serving the various interests and requirements of the different airspace users.

2.40 The concept contemplates that the implementation of PBN-based ATS route network versions will continue to be the main characteristic of en-route airspace optimisation in the SAM Region. This implementation involves a collaborative process amongst the States, adjusting to the main traffic flows and with emphasis on the establishment of trunk routes. It is expected that, at the end of the period foreseen in the CONOPS, the continental upper airspace of the SAM Region, or part of it, will be exclusionary for PBN with RNAV 5 navigation specification, and where increased airspace capacity is required, RNP 2 or A-RNP will be implemented. RNP 4 / RNP 2 will be implemented in oceanic routes when so required in order to apply 23 NM lateral separation in parallel routes.

2.41 PBN implementation will continue at the main TMAs of the Region. Operations with non-PBN-approved aircraft will continue to be accepted. The establishment of PBN exclusionary TMAs will depend on the complexity and density of the air traffic they support. SID and STAR design will be based mainly on RNAV 1 and RNP 1. In more complex environments, it is expected that more advanced

specifications would be used, such as A-RNP. Likewise, it is expected that RNP AR for SIDs will be available within the timeframe of the CONOPS.

2.42 The Meeting approved the contents of the project presented and concluded that, taking into account the processing that was still pending, the period of application of the CONOPS would need to be modified to 2018-2020. Consequently, it was deemed advisable to submit the project to the RAAC/15 meeting in November 2017 for final approval.

5LNC module of the ICARD database

2.43 The Secretariat reminded the Meeting that the ICARD database was established in 2010, and was made available to the States through the ICAO website. One of the objectives of the database is to enable the efficient and safe implementation of the 5-letter name code (5LNC) for proper planning of routes and flight procedures, while supporting ATS speech communications and aeronautical data management.

2.44 In early 2015, it was noted that States had updated their significant point data in the ICARD. However, that had generated situations that could affect safety, such as the existence of a significant number of duplicated names, points with similar phonetics located very close to each other or on the same route, scarcity of points with easy pronunciation, and differences between the 5LNC data registered in ICARD and the data published in the AIPs.

2.45 In March 2017, ICAO started updating the ICARD database, specifically the 5LNC module. The updating of the route designator module was still underway, expecting its completion by the second semester of 2017. The new platform of the 5LNC module is faster and more reliable. It also offers graphical and search facilities, and provides lists that may be downloaded in XLS and PDF format, such as lists of all the 5LNC names of a State or an ICAO Region, even indicating duplicated codes, which are estimated in the thousands worldwide. Many of these duplications have been generated due to the implementation of routes or procedures with 5-letter names that were not reserved and assigned through the ICARD central base.

2.46 The updated platform can generate proximity alerts for points with similar letters or phonetics, and provides ownership checks to prevent a situation in which a code that is being assigned is already in use or has already been reserved for another State. It is very important that States review all the names of the points currently published in their AIP, in routes and procedures, and compare them with the set of codes reserved for the State. Likewise, users must compare the information with other available sources, such as aeronautical charts an aeronautical websites. If a State identifies that it is using 5LNC in its airspace that were not obtained through ICARD or that are not part of the batch reserved for that State, it should start a gradual process to replace these points with ICARD points, ensuring proper selection, and reporting to the Regional Office for the respective validation and release of the names in ICARD.

2.47 The States must report to the Regional Office the points that were properly reserved an assigned through ICARD, but which are no longer in use because of the elimination of, or changes to, the route/flight procedure, so that they can be released in ICARD. Likewise, they must keep the list of accountable planners up-to-date, so that the Regional Office may coordinate and control the assignment of subscriptions to ICARD.

Advanced course on flight procedures developed in Uruguay

2.48 The Meeting was informed through a paper submitted by Uruguay, that a Basic - Advanced Course on flight procedures had been developed under the support of DINACIA and in

coordination with ICAO, the Basic one being referred to procedures based on conventional radio aids (VOR, NDB, ILS, DME) and the Advanced one to that oriented to PBN navigation (RNAV-RNP, RNP AR, Baro VNAV).

2.49 It was noted by the Meeting that other PANS-OPS training options were available in Argentina and Brazil, which allowed to conclude that the shortage of these courses observed in the last five years, had been considerably mitigated.

Reduction of CO_2 emissions in the atmosphere as a result of change in TMA flow

2.50 Brazil informed that PBN SOUTH Project was one of the main modification projects in the Brazilian airspace structure, covering the whole Curitiba FIR and the Terminal Control Areas - TMA Curitiba, Florianopolis and Porto Alegre. The CTR areas Joinville and Navegantes will be incorporated into Florianopolis and Curitiba TMAs respectively, with implementation date expected for 12 October 2017.

2.51 Likewise, within the PBN SOUTH Project of Brazil, changes in the circulation of Manaos and Salvador TMAs, by applying four corner concepts, CCO/CDO, terminal entering and leaving dedicated sectors, etc., were also being implemented.

2.52 After the scenarios design, the simulation in real time-STR was carried out and CDM meetings with all stakeholders were held, thus obtaining a movement that would bring benefits to the entire user community. The definition of Salvador scenario for runways 10/28, allowed the calculation of CO_2 emissions reduction, using all updated procedures. For this procedure, the IFSET tool was used, resulting in a reduction of 612 tons/year of CO_2 emissions. These data will be considered by the Secretariat as part of the Regional CO_2 savings inventory.

APPENDIX A

PANS-OPS/1 WORKSHOP RECOMMENDATIONS

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
IFPP Panel Inasmuch as possible, to seek regional harmonisation (SAM) in the use of documentation developed by States of recognised capacity in global air navigation, such as the United States (FAA) and European Community member countries (EUROCONTROL and EASA), while waiting for ICAO documentation.	OG	OG	OG			YES			YES	OG					Argentina: Applies Resolution 457 of year 2016, which included the use of TERPS-FAA Concepts for IFP designs.
Changes in the denomination of approach procedures (Circular 336) That States, when implementing the changes foreseen in Circular 336, take into account the processes for the development of the transition plan and the impact assessment, and publish an AIC on this issue, in coordination with all stakeholders..	YES														Argentina: Yes Rest of States: Pending recommendation is assumed as indicated in ICAO bulletin suspending Circular 336
Procedure validation That SAM States consider the adoption of documentation on ground and flight validation of procedures, similar to that applied by Argentina.	YES	YES	NO		OG				YES	OG					Brazil counts with a consolidated ground validation process

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
RNAV1/RNP/1 in SID/STARs That SAM States use RNAV-1 and RNP-1 in PBN SIDs/STARs, even in non-radar environments, since RNAV-1 is used exclusively with GNSS.	YES	OG	YES			YES			YES	OG					
RNAV-1 and RNP-1 in RNAV/ILS approaches That SAM States use RNAV-1 and RNP-1 in RNAV/ILS procedures, including non-radar environments, since RNAV-1 is used exclusively with GNSS.	YES	OG	YES			YES			YES	OG					
Advanced RNP (A-RNP) That SAM States study the application of A-RNP at airports that have problems with DEP minima for reasons related to obstacles or aeronautical noise, which can be resolved with an RF Leg and/or values of less than 1 NM and down to 0.3 NM.	YES	OG	OG			NO			OG	OG					
ATC gradient That SAM States, when applying the ATC gradient, take into account the following: a) To be applied only at domestic airports; b) Prior CDM process among stakeholders; **c)** Assess the convenience of publishing different charts to	YES	NO	NO			OG			OG	OG					

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
enhance situational awareness of controllers and pilots.															
Identification of SIDs/STARs • That airspace planner should assess the best way of designating SIDs/STARs (with or without transition) through CDM with all stakeholders; • SAM States should apply the concept of transition in RNP AR procedures that have many intermediate fixes (IF), assessing their impact on the graphic representation in the chart and any possible problem in automated ATC systems.	YES	NO	YES			OG			OG	OG					
Minimum altitudes of SIDs That SAM States: a) Publish, as an additional safety mechanism, the minimum altitudes in the SIDs, in critical segments on account of obstacles, to allow the pilot to monitor such altitude through the FMS; **b)** Establish the proper connection between the SIDs and the ATS route network to ensure obstacle clearance.	YES	OG	OG			YES			OG	OG					

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Level segments to intercept the ILS glide slope That SAM States: a) Whenever possible, use level segments in the intermediate approach so that the aircraft may lose power and get ready for an ILS approach procedure, ensuring interception of the glide slope "below the path"; **b)** If a level segment cannot be established, then a reduced slope in the intermediate segment should be used to allow the aircraft to lose power. Likewise, interception of the glide slope "below the path" shall be ensured.	YES	YES	YES			YES YES			OG	OG					
Elimination of publication of procedures on paper That SAM States assess the possibility of eliminating or substantially reducing publications on paper, especially the AIP, including air navigation procedures (routes, STARs, SIDs, IAC, etc.) with a view to allowing monthly updates, savings in printing/paper, and more expeditious publication and updating of such publications.	NO	OG	NO			OG			OG	OG					

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Retirement of information on ceiling and MDA/MDH from approach charts That SAM States publish the OCA/OCH in instrument approach procedures and **not** publish MDA/MDH and ceiling, in accordance with ICAO documentation (Annex 6, Doc 8168 and Doc 9365), to ensure harmonisation in the SAM Region..	NO	YES	YES			OG			YES	OG					
Application of CCO/CDO techniques at airports with low traffic volume That SAM States: a) Publish an AIC and/or instruct air traffic controllers to authorise the approach direct to the IAF from a distance of approximately 200 NM from the airport, especially if there are no terrain and obstacle issues, in order to allow the pilot to calculate the ideal point of descent, using the IAF as a reference, and request it from the ATCO. **b)** Develop the corresponding STARs and SIDs, trying to apply CCO/CDO techniques within the possibilities of each scenario under consideration.	NO YES	NO	YES			YES YES			OG	OG					

APPENDIX B

LONGITUDINAL SEPARATION LEVEL OF IMPLEMENTATION IN THE SAM REGION

ARGENTINA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
CORDOBA	IQUIQUE	OG				
	LA PAZ	YES	01/01/17			
	EZEIZA			YES	13/10/2016	
	MENDOZA			YES	13/10/2016	
	RESISTENCIA			YES	13/10/2016	Some problems with VHF Com.
RESISTENCIA	ASUNCION	YES	01/01/17			
	LA PAZ	YES	01/01/17			
	CORDOBA			YES	13/10/2016	
	CURITIBA	YES	01/01/17			
	EZEIZA			YES	13/10/2016	
	MONTEVIDEO	YES	01/01/17			
EZEIZA	COMODORO RIVADAVIA			YES	13/10/2016	
	MENDOZA			YES	13/10/2016	
	PUERTO MONTT	OG				
	CORDOBA			YES	13/10/2016	
	RESISTENCIA			YES	13/10/2016	
	MONTEVIDEO	YES	01/01/17	YES	2010	PAPIX, KUKEN and DORBO 20NM
MENDOZA	EZEIZA			YES	13/10/2016	
	SANTIAGO	OG				
	CORDOBA			YES	13/10/2016	
COMODORO RIVADAVIA	EZEIZA			YES	13/10/2016	
	PUNTA ARENAS	OG				
	PUERTO MONTT	OG				

BOLIVIA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
LA PAZ	AMAZÓNICO	YES	01/01/17			
	ASUNCION	YES	01/01/17			
	CURITIBA	YES	01/01/17			
	CORDOBA	YES	01/01/17			
	LIMA	OG				
	IQUIQUE	OG				
	RESISTENCIA	YES	01/01/17			

BRAZIL						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
AMAZÓNICO	BRASILIA	---	---	---	---	10NM
	BOGOTÁ	YES	13/10/16			
	CAYENNE	---	---	---	---	10 Minutes
	CURITIBA	---	---	---	---	10NM
	GEORGETOWN	YES	07/01/16			
	LA PAZ	YES	01/01/17			
	LIMA	YES	31/03/16			COM/SUR required, does not apply, overflights from/to La Paz FIR
	MAIQUETIA	YES	23/10/16			
	PARAMARIBO	YES	13/10/16			
	RECIFE	---	---	---	---	10NM
	ATLANTICO	---	---	---	---	10 Minutes
BRASILIA	AMAZÔNICO	---	---	---	---	10NM
	CURITIBA	---	---	---	---	5NM
	RECIFE	---	---	---	---	5NM
CURITIBA	ASUNCION	YES	Mar/2016			
	AMAZONICO	---	---	---	---	10NM
	BRASILIA	---	---	---	---	5NM
	LA PAZ	YES	01/01/17			
	MONTEVIDEO	YES	01/01/17			
	RECIFE	---	---	---	---	5NM
	RESISTÊNCIA	YES	01/01/17			
	ATLÂNTICO	---	---	---	---	10 Minutes
RECIFE	AMAZÔNICO	---	---	---	---	10NM
	BRASÍLIA	---	---	---	---	5NM
	CURITIBA	---	---	---	---	5NM
	ATLÂNTICO	---	---	---	---	10 Minutes
ATLÁNTICO	AMAZÔNICO	---	---	---	---	10 Minutes VHS Com. problems
	CURITIBA	---	---	---	---	
	RECIFE	---	---	---	---	
	CAYENNE	---	---	---	---	

CHILE						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
SANTIAGO	IQUIQUE					5NM
	LIMA	OG				
	MENDOZA	OG				
	PUERTO MONTT					5NM
IQUIQUE	CORDOBA	OG				
	LA PAZ	OG				
	LIMA	OG				
PUERTO MONTT	SANTIAGO					5NM
	PUNTA ARENAS					5NM
	EZEIZA	OG				
	COMODORO RIVADAVIA	OG				
PUNTA ARENAS	PUERTO MONTT					5NM
	COMODORO RIVADAVIA	OG				

COLOMBIA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
BOGOTÁ	AMAZÔNICO	YES	13/10/16			
	CENAMER					No available information
	GUAYAQUIL	YES	13/10/16			Reduced separation of 40 NM is applied. Memorandum of Understanding among ATC service providers signed.
	LIMA	YES	31/03/16			COM SUR required, does not apply overflights
	MAIQUETIA	YES				Informed on 23/3/2017
	PANAMÁ	YES	Oct/16			
	BARRANQUILLA					No available information
BARRANQUILLA	MAIQUETIA	YES				Informed on 23/3/2017
	PANAMÁ	YES	Oct/16			
	BOGOTÁ					No available information
	KINGSTON					No available information
	CURAÇAO					No available information

ECUADOR						
ACC	ACC ADJ	Longitudina separationl				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementatio n	
GUAYAQUIL	BOGOTÁ	YES	13/10/16			Reduced separation of 40 NM is applied. Memorandum of Understanding among ATC service providers signed.
	LIMA	YES	31/03/16			COM/SUR required, does not apply overflights. Updated with signing of LoA during SAM/IG/18, limitations on overflights is eliminated since 10/11/16.
	CENAMER	NO	---	N/A	---	Oceanic Separation

FRENCH GUIANA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
CAYENNE	AMAZÔNICO	---	---	---	---	10 Minutes
	PARAMARIBO	---	---	---	---	10 Minutes
	PIARCO					No available information

GUYANA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
GEORGETOWN	AMAZONICO	YES				
	PIARCO					No available information
	MAIQUETIA	OG				
	PARAMARIBO	YES				

PANAMÁ						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
PANAMÁ	BOGOTÁ	YES	Oct/16			
	BARRANQUILLA	YES	Oct/16			
	CENAMER	OG	Oct/16			

PARAGUAY						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
ASUNCION	CURITIBA	YES	Mar/16			
	LA PAZ	YES	01/01/17			
	RESISTÊNCIA	YES	01/01/17			

PERU						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
LIMA	AMAZONICO	YES	31/03/16			COM/SUR required, does not apply overflights to/ from La Paz FIR
	BOGOTÁ	YES	31/03/16			COM/SUR required, does not apply overflights
	SANTIAGO	OG				
	IQUIQUE	OG				
	GUAYAQUIL	YES	31/03/16			COM/SUR required, does not apply overflights. With updated LoA signed during SAM/ IG/18, overflights limitation is eliminated since 10/11/16.
	LA PAZ	OG				

SURINAME						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
PARAMARIBO	AMAZÓNICO	YES	13/10/16			OG
	GEORGETOWN	YES	29/03/16			Signed
	PIARCO	N/A				Oceanic Separation
	CAYENNE	N/A	---	---	---	Oceanic Separation

URUGUAY						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
MONTEVIDEO	CURITIBA	YES	01/01/17			
	EZEIZA	YES	01/01/17	YES	2010	PAPIX KUKEN DORBO 20NM
	RESISTENCIA	YES	01/01/17			

VENEZUELA						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
MAIQUETIA	AMAZONICO	YES	23/10/15			
	BOGOTA	YES				Informed on 23/3/2017
	BARRANQUILLA	YES				Informed on 23/3/2017
	PIARCO					Negotiating
	CURAZAO	NO				Curazao does not accept.
	SAN JUAN	NO				San Juan has no conditions to implement
	GEORGETOWN	OG				

APPENDIX C / APÉNDICE C

LIST OF CONTACTS FOR OPERATIONAL PBN FOCAL POINTS

LISTA DE CONTACTOS PARA PUNTOS FOCALES PBN

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
ARGENTINA*	Carlos Omar Torres Administración Nacional de Aeronáutica Civil (ANAC) Inspector ANS Tel: +54 11 5941 3000, Ext. 69193 E-mail: ctorres@anac.gov.ar Rodrigo Devesa Diseño de Espacio Aereo (EANA) Tel: +54 11 4320 2010 Cel: +54911 4088 6542 E-mail: rdevesa@eana.com.ar Guillermo Ricardo Cocchi Director de Servicios de Navegación Aérea (DSNA) Tel: +54 11 5789 8453 E-mail: dsna@faa.mil.ar
BOLIVIA (Plurinational State of) / **BOLIVIA (Estado Plurinacional de)***	Luis Benjamín Rojas Santa Cruz Dirección General de Aeronáutica Civil (DGAC-BOLIVIA) Especialista Planificación de Espacios Aéreos y Procedimientos de Vuelo Tel.: +591 4 422 1696 Cel.: +591 7203 5429 E-mail: lrojas@dgac.gob.bo

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
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CHILE*	Alfonso De La Vega Encargado Sección Navegación Aérea Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2439 2952 E-mail: adelavega@dgac.gob.cl Hector Ibarra Martínez ATC Planificador ATM Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2836 4020 E-mail: hibarra@dgac.gob.cl Marco Abarca Daza ATC Diseñador de Procedimientos Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2290 4718 E-mail: mabarca@dgac.gob.cl

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
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GUYANA	Chaitrani Heeralal E-mail: dans@gcaa-gy.org

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
PANAMÁ*	Ana Teresa Montenegro de De León Jefe Planificación de Espacio Aéreo Autoridad Aeronática Civil Edif. N° 646 Av. Demetrio Korsi Calle Héctor Conte Bermúdez Albrook, Panamá Tel: +507 315 9834 E-mail: anadeleon@aeronautica.gob.pa
PARAGUAY*	José Luis Chávez Subdirector Gerente Servicios Aeronáuticos Dirección Nacional de Aeronáutica Civil Edif. Centro de Control de Área Unificado – Mariano Roque Alonso Av. Mompox c/ José Félix Bogado Tel: +59521 758 5022 Cel: +595 99 1 249 969 E-mail: joselch@gmail.com Eleno Centurión Jefe Sección MAP Dirección Nacional de Aeronáutica Civil Edif. Centro de Control de Área Unificado – Mariano Roque Alonso Av. Mompox c/ José Félix Bogado Tel: +59521 7585003 Cel: +595994 342037 E-mail: elenocenturion@hotmail.com

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
PERÚ*	Sady Orlando Beaumont Valdez Inspector Navegación Aérea Dirección General de Aeronáutica Civil (DGAC) Ministerio de Transportes y Comunicaciones Jirón Zorritos 1203 Lima, Perú Tel: +51 1 615 7880 E-mail: sbeaumont@mtc.gob.pe Tomás Ben-Hur Macedo Cisneros Experto PANS-OPS en el Área de Normas y Procedimientos Controlador de Tránsito Aéreo CORPAC S.A. Callao, Perú Tel: +511 414 1442 E-mail: tmacedo@corpac.gob.pe
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State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
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VENEZUELA (Bolivarian Republic of) / **VENEZUELA (República Bolivariana de)***	Omar Enrique Linares Planificador de Espacios Aéreos Instituto Nacional de Aviación Civil - INAC Aeropuerto Internacional Simón Bolívar Edificio ATC, piso 1, Oficina AIS Maiquetía, Vargas República Bolivariana de Venezuela Tel: +58 212 355 2898 E-mail: o.linares@inac.gob.ve ollinaresomar2@gmail.com Pablo Rattia Rodríguez Planificador de Espacios Aéreos Instituto Nacional de Aviación Civil - INAC Aeropuerto Internacional Simón Bolívar Edificio ATC, piso 1, Oficina AIS Maiquetía, Vargas República Bolivariana de Venezuela Tel: +58 426 531 0616 E-mail: p.rattia@inac.gob.ve

** Updated SAM/IG/19 / Actualizados en la SAM/IG/19*

APPENDIX D

ADOPTION AND DISSEMINATION OF AMENDMENT 7 TO DOC. 4444

INDICATE IF AMENDMENT 7 TO DOC. 4444 HAS BEEN ADOPTED AND DISSEMINATED

Notes:

a) Insert YES or NO in the field corresponding to the State. If answer is NO, please include comments
b) Insert the legislation of the State in which the Amendment was adopted and the means of dissemination of the information (AIC, NOTAM, etc.)

STATES	YES / NO	LEGISLATION	MEANS OF DISSEMINATION (AIC NOTAM, ETC)	COMMENTS / REMARKS
ARG	YES	PROGEN ATM	OFFICIAL AIC BULLETIN	VALIDITY NOV 2018 RES. N°269 RES 270
BOL	YES	ATS 01 03 PROCED. MANUAL	DGAC INF.CIRCLAR 144-2016 SEPT. 2016	VALIDITY NOV 2016
BRA	YES	MCA 100-16	AIC N 10/16	VALIDITY NOV. 2016 Conferences with ATCO were held
CHI	YES	DAP 11 00	ENMD	VALIDITY NOV 2017
COL				
ECU	NO			
FGI				
GUY				
PAN	YES	MANUAL OF PROCEEDINGS	AIC	VALIDITY NOV 2017
PAR	YES	DINAC R4444 ATM	WEB PAGE	RES N° 2325/2016 DEC 2016
PER				
SUR				
URU				
VEN	YES		AIC	VALIDITY NOV 2016

Agenda Item 3: Implementation of air traffic flow management (ATFM)
a) Procedures for coordination between ATFM units
b) Analysis of the use of RPL

3.1 Under this agenda item, the following papers were analysed:

a) WP/06 - *ATFM project (ASBU: B0-SEQ, B0-FRTO, B0-NOPS and B0-ACDM)* (presented by the Secretariat);
b) WP/14 - *ATFM protocol* (presented by Uruguay);
c) NI/11 - *ATFM en el Estado Peruano* (presented by Peru - Spanish only);
d) WP/17 - *ATFM implementation in the SAM Region* (presented by IATA);
e) WP/12 - *CANSO ATFM data exchange network for the Americas (CADENA)* (presented by CANSO);
f) NI/07 - *Acciones en desarrollo para la implantación del uso flexible del espacio aéreo en el espacio aéreo brasileño* (presented by Brazil - Spanish only); and
g) IP/10 - *SkyFusion* (presented by IATA and HARRIS CORP.).

ATFM project (ASBU: B0-SEQ, B0-FRTO, B0-NOPS and B0-ACDM)

3.2 When addressing this item, the Meeting took note of the runway capacity calculation table that showed that 85% of the States of the Region had carried out these calculations.

States that have carried out runway capacity calculations

	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN
May 2017 85%	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES

3.3 The Meeting also agreed on the convenience of showing ATC sector capacity calculations separately. The States attending the Meeting provided this information, as shown in the following table:

States that have carried out ATC sector capacity calculations

	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN
May 2017	NO	NO	YES	YES	**	YES	NO	**	YES	NO	YES	NO	**	YES

**Note: Information pending by the States

3.4 The Meeting took note that, during the first week of April 2017, Ecuador had presented updated runway capacity calculations for Guayaquil, Quito, Manta and Latacunga. Likewise, ATS capacity calculations had been made for the Guayaquil APP/ACC, Quito APP and Manta APP. The results of these calculations are summarised in **Appendix A** to this part of the report.

3.5 During the discussions, the Meeting highlighted the importance for States to have ATC sector and runway capacity calculations for designing FMPs/FMUs and for coordinating suitable ATFM initiatives (TMI) when so required to address air traffic capacity/demand imbalances, as described below in this part of the report.

3.6 To date, 63% of the States of the Region have implemented ATFM, as shown in the following table:

Percentage of States that have implemented ATFM in Flow Management Units (FMU) or Flow Management Positions (FMP)

	ARG	BOL	BRA	CHI	COL	FGY	ECU	GUY	PAN	PAR	PER	SUR	URU	VEN
May 2017 63%	NO	NO	YES	YES	YES	NO	YES	NO	YES *	YES	YES	NO	YES	YES

*Panama (FMP in the Panama FIR between 12:30 UTC and 01:00 UTC)

3.7 Argentina informed the Meeting about the activities being carried out to complete ATFM implementation, which included personnel training to continue and expand ATC sector, runway, and airport capacity calculations. It was recognised that these activities involved various levels of the aeronautical administration and included airport management and airline operators.

3.8 Suriname expressed that the operational reality of its State, with one single international airport and an FIR that showed no capacity/demand imbalances, did not warrant the need for ATFM implementation. The Meeting agreed that, beyond the attainment of the objectives of the Declaration of Bogota, the States should focus on the basic implementation of at least one FMP or having personnel to fulfil these functions in the area control centre, that is properly trained and empowered to coordinate with the ATFM services of adjacent States any situation that might require the implementation of ATFM initiatives.

3.9 The data contained in the Strategic Planning Table shown in **Appendix B** to this part of the report was reviewed. In this sense, the Meeting noted that the material and reference documents for regional implementation of ATFM required gradual updating, taking into account the recent publication of ICAO Doc 9971, now consisting of three parts, and the reference documentation published in other Regions since 2013.

3.10 The States updated the list of ATFM focal points that appears in **Appendix C** to this part of the report and reviewed the scheduled tasks and activities still pending implementation in the ATFM Project Description, shown in **Appendix D** to this part of the report.

3.11 In turn, the ATFM survey data was updated, as shown in **Appendix E** to this part of the report.

Analysis of the use of RPL

3.12 The Meeting took note of some problems identified in the Region with the use of repetitive flight plans since, due to the process involved, they could generate some inconsistencies in ATS automated management. The States considered the need to monitor this problem, while also focusing on the mitigation of errors and duplication of flight plans, as discussed under agenda item 5.

ATFM protocol

3.13 Note was taken of the proposal submitted by Uruguay, whose delegates could not attend the Meeting for administrative reasons, concerning the need to implement a mechanism to verify ATFM planning, implementation and post-implementation monitoring processes in the States. To this end, an ATFM verification protocol design was presented. The Meeting took note of the proposal of Uruguay, and considered that the material could serve as the basis for the ATFM meeting/workshop for the harmonisation of coordination procedures, to be held in September 2017. The protocol is contained in **Appendix F** to this part of the report.

ATFM implementation in Peru

3.14 The Meeting took note that, on 25 January 2016, Peru had implemented Air Traffic Flow Management (ATFM) in the Lima FIR for demand/capacity balancing, for maximising use of available capacity, and for maximising airspace and airport efficiency at national level.

3.15 Based on the positive results obtained through the use of the CDM methodology in strategic planning for the solution of ATFM-related problems, Peru was implementing a series of activities throughout 2017 with the purpose of applying collaborative decision-making (CDM) processes.

3.16 It was recognised that, during the first quarter of 2017, ATC units in Peru had issued NOTAMs as a flow control measure to offset operational limitations. However, the civil aviation authority, in coordination with the air traffic service provider, is taking the necessary actions to eliminate the incorrect use of NOTAMs given the domino effect it has at interregional level, and to implement other ATFM initiatives specified in Doc 9971.

3.17 The analysis conducted by the Meeting on the use of NOTAMs for flow control in Peru and in other SAM States is further described below in this part of the report.

3.18 In 2016, in order to promote ATM implementation in the Region, Peru had communication and held teleconferences with the administrations of neighbouring countries to coordinate and assess proposals, suggesting the incorporation of ATFM measures in the existing Letters of Operational Agreement.

3.19 In this regard, convinced of the importance of establishing a regional ATFM system in the SAM Region based on communication and coordination agreements, a draft ATFM Memorandum of Understanding (MoU) between adjacent States was submitted to the consideration of the Meeting, its purpose being to facilitate coordination in the Region, as shown in **Appendix G** to this part of the report.

3.20 The Meeting agreed that the draft Memorandum should serve as the basis for the material to be developed for the ATFM meeting/workshop for the harmonisation of coordination procedures, to be held in September 2017.

3.21 Due to the emergency experienced in the Northern part of Peru as a result of the Coastal El Niño phenomenon which brought about heavy rains and flooding in March 2017, it was noted that Peru had activated humanitarian, civic action, and additional support flights by the military aviation and the airlines, generating a significant increase of tactical demand. Accordingly, a series of measures had been adopted to accommodate demand in order to ensure the safety of air operations, facilitate the operation of humanitarian flights, and organise traffic. To this end, civil/military

cooperation and coordination were fundamental. A summary of this case appears in **Appendix H** to this part of the report.

Inappropriate use of NOTAMs for flow management

3.22 As has been discussed within the framework of GREPECAS and the SAM/IG, it was reaffirmed to the Meeting that NOTAMs are temporary warnings of short duration to provide stakeholders with information that is important for operations, and is not part of the ATFM measures foreseen in ICAO Doc 9971.

3.23 In this regard, the Meeting considered that a NOTAM that proposes time-in-trail separations, especially those applied regardless of the flight level, in order to mitigate CNS system failures or lack of personnel, must be considered as a reactive measure rather than an ATFM initiative, and should be applied for a brief period of time in face of an unforeseen event, giving way to ATFM initiatives (TMI) based on ATC sector capacity studies, assessing demand projections, and coordinating in advance with ATC and ATFM units responsible for flow management in the FIRs of adjacent States.

3.24 It was recalled that flow control was developed in support of the air traffic control service, as a process for regulating and adjusting air traffic, based on a series of technical assessments. At present, this process has evolved towards the ATFM concept, in which a series of pre-assessed initiatives are applied for demand/capacity balancing and to optimise available capacity. Therefore, it is necessary to define the functions and roles of ATC units and ATFM within this environment.

3.25 Consequently, the use of NOTAMs as a measure for flow control should be avoided. Instead, a thorough assessment should be made of expected demand and of capacity reduction in the corresponding sectors and airports so that ATFM units may implement TMIs in accordance with operational requirements, communicating them on a timely basis through the use of ATFM messaging established in ICAO Doc 9971.

3.26 The Meeting noted that the use of this type of NOTAMs had an impact on the predictability that is desirable in flight planning by air operators. In many cases, this resulted in the need for additional fuel as a preventive measure in case of any delays along the route, speed restrictions or unpredictable diversions, undermining the efficiency of operations.

3.27 Within this context, IATA expressed to the Meeting that ICAO Annex 11, Doc 9426 and Doc 8126 permit the use of NOTAMs in the event of short-term contingency actions due to interruption or partial interruption of air traffic services and related supporting services, but this should not be confused with ATFM measures.

3.28 In case it were necessary to implement contingency measures (ATS interruptions), the States should proceed in accordance with the Contingency Plan published in the AIP and the corresponding Letter of Agreement between the ATC units involved, using a NOTAM as a means of communication. On the other hand, in case ATFM measures were required (in accordance with ICAO Docs 9971, 4444, 9426), the ATFM MESSAGE should be used as a means of communication.

3.29 In order to implement an effective set of ATFM measures, in accordance with ICAO Doc 9971, the Meeting took note that it was essential to follow all implementation phases rather than jumping directly to the use of improvised flow restrictions, applied according to the criteria of each ATC shift, as some States are currently doing. The Strategic, Pre-tactical and Tactical sequence should be followed, especially conducting a post-operational analysis, since an analytical process is carried

out during this last phase to measure, investigate and inform on the operational processes and activities, which is fundamental for the development of best practices and/or teachings that will further improve operational processes and activities.

3.30 Based on the foregoing, the Meeting formulated the following Conclusion:

Conclusion SAM/IG/19-1: Application of flow management initiatives (TMIs) in situations that temporarily affect ATS capacity in a designated airspace or airport used by international aviation

That SAM States make utmost efforts to:

a) Strengthen the functions of Flow Management Positions (FMPs) or Units (FMUs) with resources and trained personnel empowered to coordinate with ATS services the application of ATFM initiatives (TMIs) in situations that generate air traffic capacity/demand imbalances caused by scheduled or unforeseen events;

b) Issue instructions and/or directives that ensure that any ATFM initiative (TMI) to be coordinated is taken from ICAO Doc 9971, using the least restrictive methods available to minimise the impact on international flights, in coordination with ATFM units or those replacing them in adjacent SAM States;

c) Refrain from using NOTAMs to establish flow control measures, with the only exception when they are required as part of ATS mitigation actions for a period not to exceed twenty-four (24) hours, during which period NOTAMs should be replaced with ATFM initiatives generated and agreed by FMPs/FMUs, and which should be managed through ATFM messages; and

d) Submit the actions carried out in accordance with the paragraphs above to the ATFM workshop/meeting and the SAM/IG/20 meeting, scheduled for the second semester of 2017.

3.31 The Meeting deemed it important and convenient to present a working paper to the GREPECAS/18 meeting, analysing the need to coordinate ATFM initiatives between adjacent States of the SAM and CAR Regions.

Teleconferences

3.32 The Meeting decided to take up that agreed upon in Conclusion SAM/IG/5-7 - *ATFM teleconferences in the South American Region*, whereby SAM States are to hold weekly ATFM teleconferences between Flow Management Units or Flow Management Positions (FMU/FMP) in order to improve the exchange of information, the consensus of the States being to have a weekly teleconference organised by the Secretariat, using a *webinar*-type tool.

3.33 Furthermore, if a situation as that described in the Conclusion presented in this part of the report were to occur, and in order to have a quick means of notification to coordinate a teleconference convened by a State affected by a capacity imbalance, it was agreed to establish and maintain a group of ATFM contact points to facilitate priority communications through Smartphone, ATFM coordination through REDDIG teleconferencing, and/or *webinar*-type teleconferencing.

3.34 Likewise, the decision was made to start coordination with CANSO through the Secretariat with the purpose of requesting the basic documentation, protocols or manuals of the CADENA initiative (more information on this initiative is provided in paragraphs 3.38 to 3.41 below) with a view to participating as observers and on a trial basis, in a cycle of sessions of CADENA, given the interest in carrying out communication activities and CDM practices with CAR States that are participating in CADENA, as well as with other organisations such as IATA, ACI, etc.

ATFM meeting/workshop for harmonising coordination procedures

3.35 Taking into account the information discussed during the Meeting, emphasis was placed on the importance of the ATFM meeting/workshop for harmonising coordination procedures, to be held in September 2017. The objective of this meeting is to sign memorandums of understanding (MoU) between ATFM facilities of adjacent States. For the activities of the meeting/workshop, consideration was given to the inclusion of apron capacity calculations as a topic for discussion, and the adoption of the MoU model proposed by Peru.

3.36 The Meeting also felt that the ATFM meeting/workshop should include a presentation on the way in which static and dynamic apron capacities were developed in collaboration with airport operators in Peru.

3.37 The Meeting highlighted the importance of harmonising all the activities of the States in terms of the ATFM strategic, pre-tactical, tactical, and post-operational phases, including ATFM planning and operational management, ATFM messages, etc. Accordingly, the proposal was made to invite CAR States to participate in this meeting/workshop, and the Secretariat was asked to assess and coordinate the feasibility of extending the invitation to CAR States and to the ICAO Regional Office in Mexico.

CANSO's CADENA initiative

3.38 CANSO presented to the Meeting the *ATFM data exchange network for the Americas* (CADENA), which seeks to promote universal situational awareness through timely communications, collaboration and coordination of operational data and information to the ANSPs, airspace users, and other stakeholders. According to this concept, ANSPs operate as independent entities, and are interconnected by the information exchange network, forming a virtual node in support of an efficient ATFM.

3.39 The ANSPs that participate in CADENA manage air traffic flow and address related issues through a standard set of principles and procedures established by the process of that management. Likewise, the website of the Operational Information System (IOS) is being developed for the provision of information on delays and trends, current/planned traffic management measures, daily operating plan, restrictions, and a regional traffic management registry. CADENA organises weekly ATFM planning conferences, following CDM processes among some regional ANSPs and stakeholders. Meteorology, staffing, sectorisation, limitations, equipment downsizing, restrictions, special events, and airport configuration, are some of the topics openly discussed and shared amongst CADENA members, airlines and airports.

3.40 According to the representative of CANSO, since CADENA started operations in August 2016, initial improvements have been identified, such as a reduction in delays caused by weather conditions and congestion of the ATC sector, a reduction in fuel consumption and CO_2 emissions, an improvement in airport acceptance and ANSP connectivity rates, support to the ATFM

implementation process and roadmap, support to advanced TMM notification, improvement in operational planning, and reconfiguration of sectors, amongst other benefits.

3.41 The Meeting noted the importance of information exchange amongst stakeholders in support of an efficient air traffic flow management. It also recognised that, once CADENA reaches a level of maturity, it could be part of the initiatives that support this exchange of information in the SAM Region. CADENA could also improve the flow of information for CDM between the CAR and SAM Regions.

Actions underway for the implementation of the flexible use of airspace in Brazil

3.42 Brazil noted that, based on the experience gained, mainly in the Big Events (FIFA cup, Olympic Games), Brazil is moving towards the standardisation and implementation of the FUA concept, not only for airspace organisation, but also for flow management within the created structures, in such a way that services provided in each ATFM operational planning phase will benefit all the aeronautical community in an efficient and safe manner.

3.43 Emphasis was placed on the need for specific application of the FUA concept in various parts of the Brazilian airspace, in areas where the general aeronautical flow absorbs the need for joint operation of training and military activities in flight testing areas, in recreational areas, in areas of national interest, etc.

3.44 The formulation and implementation of the concept are fundamental for the development of the human and operational resources that will permit the shared use of airspace during the ATFM strategic, pre-tactical and tactical phases.

3.45 Although significant progress has been made in Brazil with the sharing of certain airspaces through letters of operational agreement, the existence of various special activity areas associated to the inexistence of a consolidated concept in national publications made coordination amongst users very complex, which resulted in airspace segregation during long activation periods.

3.46 The growth in the demand for specific portions of airspace by various users forces the Brazilian State to work towards the implementation of the flexible use of airspace concept in the national ATM system, seeking to meet national requirements and ensure an orderly, safe, and timely implementation aligned with the ICAO Global ATM Concept of Operations.

3.47 One relevant experience acquired by the Brazilian State over the years in regard to the flexible use of airspace involves the progress made in terms of coordination among the users of the XAVANTES SBR 431/432 areas and DECEA. In this example, the drafting of a letter of operational agreement made possible, under the coordination of CGNA, the flow within certain schedules between the two main terminal control areas of the country (Rio de Janeiro and Sao Paulo).

3.48 This progress was possible only because consideration was given to the FUA concept, although indirectly, for segmentation and for area activation/utilisation criteria, applying a less restrictive configuration for civil aviation flights.

3.49 Therefore, through the implementation of the FUA concept, the Brazilian State seeks to optimise the processes and procedures for strategic and tactical coordination amongst the entities responsible for the different types of operation, in order to optimise civil traffic paths, improving the efficiency of user operations, reducing CO_2, emissions, while still focusing on the requirements of military operations, all within an operationally safe environment.

3.50 Detailed information on the benefits of FUA and the forthcoming development of this initiative in Brazil is shown in information paper SAM/IG/19-NI/07.

SkyFusion

3.51 A presentation was made on the SkyFusion tool, which provides situational awareness and communication services that integrate the ATFM, CDM and SWIM concepts. This tool is being developed through cooperation between IATA and Harris Corp., and may be an interesting option for those States that require a given technological support for their ATFM implementation process.

3.52 The tool is designed to provide cloud-based information exchange as well as common communications to the users, and to facilitate real-time cooperation and decision-making. Information paper SAM/IG/19-IP/10 offers more detailed information in this regard.

APPENDIX A

RUNWAY CAPACITY CALCULATIONS

FOR AERODROMES

GUAYAQUIL (JOSE JOAQUIN OLMEDO)

QUITO (MARISCAL SUCRE)

MANTA (ELOY ALFARO) Y

LATACUNGA (COTOPAXI)

ATS SECTOR CAPACITY CALCULATIONS

APP GUAYAQUIL

APP QUITO

APP MANTA

(ECUADOR – Validity August 2017)

Fecha de Validez: Agosto 2017

(AAR) Aeródromo Internacional José Joaquín Olmedo de Guayaquil.				
CAPACIDAD DE PISTA	**%**	**ARR**	**DEP**	**TOTAL**
Capacidad de Pista	100%	15	14	29
Condiciones Normales	95%	14	13	27
Mal Tiempo	80%	12	11	23

(AAR) Aeródromo Internacional Mariscal Sucre de Quito				
CAPACIDAD DE PISTA	**%**	**ARR**	**DEP**	**TOTAL**
Capacidad de Pista	100%	16	15	31
Condiciones Normales	95%	15	14	29
Mal Tiempo	80%	13	12	25

(AAR) Aeródromo Eloy Alfaro de Manta.				
CAPACIDAD DE PISTA	**%**	**ARR**	**DEP**	**TOTAL**
Capacidad de Pista	100%	15	14	29
Condiciones Normales	95%	14	13	27
Mal Tiempo	80%	12	11	23

(AAR) Aeródromo Internacional Cotopaxi de Latacunga.				
CAPACIDAD DE PISTA	**%**	**ARR**	**DEP**	**TOTAL**
Capacidad de Pista	100%	10	9	19
Condiciones Normales	95%	7	6	13
Mal Tiempo	80%	8	7	15

Fecha de validez: Agosto 2017

APP GUAYAQUIL				
Capacidad	**Condiciones**	**Simultáneamente**	**Intervalo de 15 Minutos**	**Cada hora**
100%	**Valores calculados**	9	17	68
95%	**Normales**	9	16	65
80%	**Mal tiempo**	7	14	54

sector ACC1				
Capacidad	**Condiciones**	**Simultáneamente**	**Intervalo de 15 Minutos**	**Cada hora**
100%	**Valores calculados**	19	23	40
95%	**Normales**	18	21	40
80%	**Mal tiempo**	15	18	40

Nota. Tiempo promedio de permanencia en el sector 31 Minutos

Cálculo capacidad sector ACC2 GUAYAQUIL				
Capacidad	**Condiciones**	**Simultáneamente**	**Intervalo de 15 Minutos**	**Cada hora**
100%	**Valores calculados**	**8**	**17**	**68**
95%	**Normales**	**8**	**16**	**65**
80%	**Mal tiempo**	**7**	**14**	**54**

Cálculo capacidad sector APP QUITO				
Capacidad	**Condiciones**	**Simultáneamente**	**Intervalo de 15 Minutos**	**Cada hora**
100%	**Valores calculados**	8	17	68
95%	**Normales**	8	16	65
80%	**Mal tiempo**	7	14	54

Cálculos capacidad sector APP MANTA				
Capacidad	**Condiciones**	**Simultáneamente**	**Intervalos de 15 minutos**	**Cada Hora**
100%	Máximo de Capacidad	7	17	68
95%	Normales	6	16	64
80%	Mal tiempo	5	14	54

APPENDIX B

STRATEGIC PLANNING TABLE FOR THE DEVELOPMENT OF ATFM														
CONC. PPRC/3-5 action of compliance	**ARG**	**BOL**	**BRA**	**CHI**	**COL**	**ECU**	**FGY**	**GUY**	**PAN**	**PAR**	**PER**	**SUR**	**URU**	**VEN**
	Month/ Year	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**	**Month/ Year**
1- Replica of ATFM courses to speccialized personnel	09/2015 to 11/2015	10/2015	Imp.	09/2015 07/2016	Imp.	1st Quarter 2015	2015		04/2015 02/2016	11/2016	02/2016		02/2015	07/2016
2- Bilateral Letters of Agreement with appropriate ATFM procedures without impacting on safety	04/2016	02/2014	Imp.	2nd. Quarter 2017	Imp.	2nd. Sem. 2016	2015		1st. Trim/ 2016	10/2015	05/2016			
3- Implementation of Flow Control Positions or Units (FMPs/FMUs)	2nd. Sem./2016 SABE	1st. Sem./2016	Imp.	Imp. FMP ACC/ 2016	Imp. unified ACC	2016	2016		06/2016	Imp.	07/2016		Imp.	Imp.

APPENDIX C / APÉNDICE C

LIST OF CONTACTS FOR OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS

LISTA DE CONTACTOS PARA PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
ARGENTINA*	Maria Estela Leban Jefe de Departamento Administración Nacional de Aviación Civil (ANAC) Tel: +54 911 58 338379 E-mail: mleban@anac.gob.ar	Nicolas Borovich Jefe de Departamento Planificación Tel: +5411 43203947 Cel.: +54911 31199377 Email: Nborovich@eana.com.ar Juan Pablo Duval Jefe del Departamento Servicios de Tránsito Aéreo Tel.: +5411 5789 8400, Ext 68451 Cel. + 54 1 128 728 238 E-mail: dsna@faa.mil.ar
BOLIVIA (Plurinational State of) / **BOLIVIA (Estado Plurinacional de)***	ATCO Jesús I. Villca Jiménez Inspector ATM/SAR Dirección General de Aeronáutica Civil (DGAC) Teléfono: +591 2 211-4465 Cel.: +591 72023263 E-mail: jvillca@dgac.gob.bo	ATCO. Marco Sergio Barrios Barzola Supervisor ACC La Paz Jefe Navegación Aérea Reg. La Paz Tel/Fax: +591 2 281-0203 (ACC/La Paz) Tel/Fax: +591 2 282-1717 (Nav. Aérea) Tel: +591 2 223-8339 (Home/domicilio) Cel.: +591 7 052-3884 E-mail: mbarrios@aasana.bo masebarbar@hotmail.com

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
BRAZIL / BRASIL*	Sidnei Nascimento De Souza Jefe de Operaciones del CGNA Centro de Gerenciamento e Navegação Aérea – CGNA. Tel.: +55 21 2101-6531 Cel.: +55 21 99499-1658 Cap José Airton Patricio Centro de Gerenciamento e Navegação Aérea – CGNA Oficial ATM Tel.: +55 21 2101-6448 Cel.: +55 21 98554-4425 E-mail: patriciojap@cgna.gov.br	Gerente Nacional – GNAC Tel.: +55 21 2101-6409 E-mail: gnac@cgna.gov.br Gerente Nacional de Fluxo – GNAF Tel.: +55 21 2101-6546 E-mail: grt@cgna.gov.br Gerencias Regionais – GER Tel.: +55 21 9949-6492 / +55 21 2101 98554 3598 E-mail: gr1@cgna.gov.br / gr2@cgna.gov.br
CHILE*	Jorge Caro Gálvez Dirección General de Aeronáutica Civil Dirección de Aeródromos y Servicios Aeronáuticos (DASA) Sub Departamento de Servicios de Tránsito Oficina ATFM (FMU) Tel.: +56 2 2836-4022 E-mail: jcarog@dgac.gob.cl	FMP ACC Santiago Tel.: +56 22836-4017 ACC Santiago Cel.: +56 99158-1865 Supervisor ATC de turno E-mail: sup.accu@dgac.gob.cl

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
COLOMBIA*	Mauricio José Corredor Monroy Unidad Administrativa Especial de Aeronáutica Civil (UAEAC) Jefe Grupo ATFCM Tel.: + 57 1 296-2628 E-mail: mauricio.corredor@aerocivil.gov.co Skype: mauricio.jose.corredor.monroy	Unidad de Gestión de Afluencia de Tránsito Aéreo y Capacidad – FCMU COL (DE 1100 A 0500 UTC) E-mail: cfmu.dsna@aerocivil.gov.co Please copy to / Favor copiar a: E-mail: cns.fmu@aerocivil.gov.co aga.fmu@aerocivil.gov.co Telefonos: MANAGER: +57 1 296-2656 CNS: +57 1 296-2100 AGA: +57 1 296-2200 DEPARTURE FLOW MANAGEMENT: : +571 296-24 06 Celular MANAGER: +57 317 517-10 46 AGA: +57 317 363- 88 11 CNS: +57 318 330-73 74

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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FR. GUIANA / GUYANA FRANCESA	Jean Michel Pubillier French West Indies and French Guiana Air Navigation Services Office: +596 596 42 24 88 GSM: +596 696 93 60 72 Email: jean-michel.pubillier@aviation-civile.gouv.fr	Hervé Thomas Head of ATC Services Cayenne Office: +596 594 35 93 04 GSM: +594 694 91 63 63 Email: hervé.thomas@aviation-civile.gouv.fr

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
GUYANA		
PANAMA*	Flor Silvera Directora de Navegación Aérea Tel +507 315-9846 / +507 6982-1215 E-mail: fsilvera@aeronautica.gob.pa	Supervisor de turno del Centro de Control Administración de Aeronáutica Civil Tel.: +507 315 9871 E-mail: cerap@aeronautica.gob.pa Ivan Chesgter De Leon Sub Director de Navegación Aérea Tel. ofic: +507 3159802 Cel: +507 6686 3279 E-mail: ideleon@aeronautica.gob.pa

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
PARAGUAY*	ATCO. Delia Cristina Giménez Aranda Jefe Departamento Evaluación de Sistemas CNS/ATM Dirección Nacional de Aeronáutica Civil (DINAC) Mcal. Lopez /22 de setiembre Edif. Ministerio de Defensa Nacional Asunción Paraguay Tel./Fax: +595 21205365 Cel.: +595 981841794 Email: atm_gna@dinac.gov.py	**1. Unidad de Flujo (SGAS) – FMU SGAS (Unidad Operativa)** Current responsible / Responsable actual de dicha Unidad: ATCO. Alejandro Amarilla Tel./Fax: +595 21 758-5110 Tel.: +595 971180665 E-mail: fmu.asu@gmail.com Mariano Roque Alonso-Paraguay Edificio Centro de Control de Área - Unificado **2. Unidad de Flujo (SGES) – FMU SGES (Unidad Operativa)** Current responsible / Responsable actual de dicha Unidad: Lic. ATCO. David Gavilán Tel./Fax: +595 615973144 Cel.: +595 983 830-404 E-mail: daga_978@hotmail.com Minga Guazú-Paraguay Aeropuerto Internacional Guaraní.

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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SURINAME	Mr. Soeknandan Andre Chief Air Traffic Services Tel.: +59 7 530-433 Cel.: +59 7 7 216-108 Fax: +59 7 491-743 E-mail : atmcnslvd@yahoo.com	Mr. Gaddum R Coordinator ATS Supervisor ATS unit Zanderij Phone: Operations : +597 032-5208 Cel: +597 853-1681 E-mail: g.rperez@hotmail.com
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
VENEZUELA (Bolivarian Republic of) / **VENEZUELA (República Bolivariana de)***	Maribel Mayora Vallenilla Responsable ATFM Tel: +58 212 303-4532 (13:00 – 21:00 UTC) Cel: +58 416 611-0607 (H24) E-mail: atfm@inac.gob.ve m.mayora@inac.gob.ve Omar Enrique Linares Planificador de Espacios Aéreos Instituto Nacional de Aviación Civil – INAC Aeropuerto Internacional Simón Bolívar Edificio ATC, piso 1, Oficina AIS Maiquetía, Vargas República Bolivariana de Venezuela Tel: +58 212 355 2898 E-mail: o.linares@inac.gob.ve ollinaresomar2@gmail.com	Harrynson Salazar Jefe ACC-Maiquetía Tel: +58 212 355-2912 (13:00 – 21:00 UTC) Cel: +58 416 632-6204 (H24) E-mail: Ha.Salazar@inac.gob.ve ACC-Maiquetía Tel: +58 212 355-2216 (H24) Cel: +58 416 623-6427 (H24)

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
Others / Otros	**INTERNATIONAL ORGANIZATIONS / ORGANIZACIONES INTERNACIONALES**	**ICAO / OACI**
	Julio de Souza Pereira Assistant Director, Safety Flight Operations IATA Avda. Ibirapuera, 2332, cj 22 Torre I Sao Paulo, Brasil Tel: +55 11 21874236 Mob: +55 11 993800953 Email: pereiraj@iata.org	Fer nando Hermoza Hübner RO/ATM/SAR Tel.: +511 611 8686, Ext. 106 E-mail: fhermoza@icao.int Roberto Sosa España RO/ANS & SFTY Tel.: +511 611 8686, Ext. 104 E-mail: rsosa@icao.int

*Updated SAM/IG/19 / Actualizados en la SAM/IG/19

APPENDIX D

PROJECT B1: IMPROVE DEMAND/CAPACITY BALANCING

SAM Region	**PROJECT DESCRIPTION (DP)**	DP N° B1	
Programme	**Title of the Project**	**Start**	**End**
Air traffic flow management (ATFM) *(Programme Coordinator: Fernando Hermoza Hübner)*	*Improve demand/capacity balancing* *Project Coordinator: Martha Soto Ansaldi*	2012	2016
Objective	Avoid overloading the ATC and airport systems, while strengthening safety, taking into account the reduction in the number of delays caused by meteorological and traffic conditions, thus reducing fuel consumption and contaminating emissions. Likewise, improve prediction and management of surplus demand for services in ATC sectors and aerodromes.		
Scope	The scope of this project establishes that ATFM implementation should start with airport and airspace monitoring in order to identify significant increases in ground delays and in-flight holding, as well as bottlenecks (ATC sector, runway, apron, and airport facilities). Furthermore, capacity calculation and air traffic demand analysis are important elements to improve demand/capacity balancing.		
Metrics	• % of States that have calculated runway and ATC sector capacity. • % of States that have implemented ATFM in Flow Management Units (FMU) or Flow Management Positions (FMP).		

Strategy	Project execution defines ATFM implementation in the SAM Region through an airspace demand and capacity analysis, taking into account that States that are in the process of implementation shall coordinate with the ATM community to define the actions required for ATFM implementation. The infrastructure and the database, as well as the policy, standards, and procedures, are important components for the execution of this Project.
Goals	• SAM States with experts trained in the calculation of runway capacity and airspace (ATC SECTOR) capacity of States' airspace regions. • ATFM system performance oversight plan. • CAR/SAM inter-regional coordination.
Rationale	GREPECAS considered that early ATFM implementation should ensure optimum air traffic flow to or through certain areas during periods in which demand exceeded or was expected to exceed the available capacity of the ATC system. Therefore, the ATFM system should reduce aircraft delays, both in flight as on the ground, and avoid system overload.
Related projects	• Automation.

Project deliverables	Relationship with the performance-based regional plan (PFF)	Responsible party	Status of implementation*	Delivery date	Comments
Assess the progress made in the ATFM implementation work programme	B0-NOPS	Programme Coordinator		2016	Permanent Task
Calculation of airspace (ATC SECTOR) capacity.	B0-NOPS	Juarez Franklin Gouveia		SAM/IG/9	Brazil and Colombia submitted their studies.
List of airspace sectors subject to periods in which demand exceeds the existing capacity, including, if necessary, simulations by the States.	B0-NOPS	Juarez Franklin Gouveia		SAM/IG/9 SAM/IG/10	Brazil and Colombia submitted their studies.
List of operational factors affecting demand and airspace capacity for the optimisation of the existing capacity, including simulations, if necessary.	B0-NOPS	Juarez Franklin Gouveia		SAM/IG/9	Brazil and Colombia submitted their studies. Brazil, Paraguay and Peru presented data at the SAM/IG/11 meeting.
Definition of the common elements of situational awareness	B0-NOPS	Paulo Vila		2012	The States that exchange information are: Chile, Colombia, Paraguay and Venezuela.

Personnel trained in strategic ATFM measures for airspace	B0-NOPS	Project RLA/06/901		2010	In 2010, an ATFM/CDM course was conducted in Brazil with the participation of several States. In March 2009, a course on runway and ATC sector capacity calculation was conducted in Brazil. In 2012, a course for training instructors on runway and ATC sector capacity calculation was conducted in Lima.
List of factors affecting the implementation decision	B0-NOPS	Programme Coordinator		2010	The following causes were identified at the SAM/IG/11 meeting: - States that do not have the requirement or the need to implement ATFM; - Budgetary and organisational reasons; - Lack of personnel specifically devoted to ATFM activities; - The personnel responsible for ATFM is involved in other functions.
Update the calculation of airspace (ATC SECTOR) capacity and runway capacity.	B0-NOPS	Programme Coordinator		November 2015	85% of States updated ATC sectors and runway capacity calculations. Guyana and Suriname lack capacity calculation; French Guiana lack ATC sectors calculation.

Airspace monitoring processes. Air traffic demand analysis. ATFM standards and procedures of an FMU/FMP. Implementation of preliminary ATFM measures. Implementation of TMI. ATFM messaging. Coordination of special events. Civil/military coordination processes and ATFM exemption procedures.	B0-NOPS	CGNA Course Project RLA/06/901		November 2014	Completed on schedule
Replication of ATFM courses at national level	B0-NOPS	States		15/05/2015	States replicated the ATFM courses at national level.
ATFM measures during the realization of Olympic and Paralympic Games Rio 2016 in Brazil	B0-NOPS	Brazil		13/05/2016	Detail of Brazilian AIC can be found under following link on the internet: http://publicacoes.decea.gov.br/?i=publicacao&id=4339
ATFM Implementation Status	B0-NOPS	Programme Coordinator		31/10/2016	56% of States implemented ATFM.
ATFM tool information	B0-NOPS	IATA		SAM/IG/18	Completed
CTOT use demonstration	B0-NOPS	Project Coordinator		SAM/IG/18	Show benefits of ground delays application in ATFM management. Example Cuzco and Lima
Demonstration of possible indicators to measure system performance	B0-NOPS	Project Coordinator		SAM/IG/18	Practical examples

Benefits of the application of preliminary CDM strategic processes	B0-NOPS	Project Coordinator		SAM/IG/18	Examples of practical coordination
Review of ATFM Manual messages	B0-NOPS	Project Coordinator		SAM/IG/19	
Resources required	Designation of experts in the execution of some of the deliverables.				

*

Grey *Task not started*
Green *Activity underway as scheduled*
Yellow *Activity started with some delay but expected to be completed on time*
Red *It has not been possible to implement this activity as scheduled; mitigating measures are required*

APPENDIX E

ATFM SURVEY

ATFM SURVEY	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
1 . Regarding the SAM ATFM implementation plan, confirm if FMUs/FMPs have been established. If YES, indicate which is the responsible unit. If the answer is NO, indicate what are your plans for ATFM implementation based on regional requirements.	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**			**YES**	**YES**	**YES**		**NO**	**YES**	Panama: The responsible is the Control Centre Supervisor
2. Confirm if you have personnel trained in the ATFM implementation plan and if this staff is currently performing the corresponding functions according to the implementation plan.	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	Pending Guyana and Suriname.

ATFM SURVEY	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
5. How many airports in your State/country have apron capacity calculations? List the main ones. If the answer is NONE, indicate which airports you think require such calculations.	**0**	**0**	**1**	**0**	**0**	**0**	**1**		**1**	**0**	**17**		**0**	**0**	**Brazil:** Apron capacity calculations have been performed for one airport (Guarulhos international airport in São Paulo-SP). This information was provided by GRU- (Guarulhos Airport Administration). **Chile:** We believe that SCEL, SCIE, and Loa de Calama require this calculation. **Colombia**: None. It is required for several airports since airport capacity is not being managed to address growing demand. **Ecuador**: None of the airports in the country has apron capacity calculations. However, it is estimated that the airports of Quito, Guayaquil, require these calculations. **Panama**: MPTO. **Paraguay**: These calculations have not been performed due to lack of experts (specialists) duly trained for this purpose. Calculations are required for the two international airports mentioned above: "Silvio Pettirossi" in Asuncion and "Guaraní" in Minga Guazú. **Peru**: Cusco 7 C/D and 4 A/B positions. Calculations has been performed in 17 airports in the country. **Uruguay**: SUMU and SULS. **Venezuela**: None. We still do not have personnel duly trained to conduct these calculations, and do we have airdromes to perform calculation: international airport of Maiquetía, Margarita and Barcelona
6. Number of operations per hour at the airport considered to be the most important one:															**Chile**: SCEL **Peru:** SPIM.
Runway capacity	**SAEZ** **SACO** **See Obs.**	**SLLP 16**	**SBGR 52**	**SCEL 40**	**SKBO 70**	**SEQU 29**	**6**		**MPTO 44**	**SGAS 23**	**SPJC 35**		**SUMU 25** **SULS 18**	**SVMI 34**	Argentina: SAEZ: RWY: 11: 29 aircraft/hour 29: 27 aircraft/hour 35: 13 aircraft/hour 17: 15 aircraft/hour SACO: RWY: 18: 13 aircraft/hour 36: 21 aircraft/hour

ATFM SURVEY	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Apron capacity	**NO**	**NO**	**SBGR 90**	**NO**	**NO**	**NO**	**NO**	**NO**	**MPTO 49**	**NO**	**SPJC**	**NO**	**NO**	**NO**	
7. For the airport considered to be the most important one, number of trained personnel capable of providing, in terms of operations per hour, calculations for:															
Runway capacity	**20**	**12**	**18**	**15**	**4**	**1**	**3**		**2**	**1**	**8**		**5**	**2**	
Apron capacity	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**3**	**NO**	**NO**	**NO**	
ATS sector capacity	**5**	**10**	**18**	**4**	**4**	**1**	**3**		**2**	**1**	**8**		**5**	**2**	Argentina will train more staff in June 2017-

Updated SAM/IG/19

APPENDIX F

ATFM PROTOCOL

Ref. Doc	Tasks description	Answer	Orientation	Remarks
ATFM Manual Chapter 4	1. Have you developed an ATFM Implementation Plan?	Yes No Does not apply	Examine planning: • start date • equipment • date of implementation • lessons learned	
2. Analysis of airspace demand and capacity				
ATFM Manual Chapter 4 4.2	2.1 Have you duly defined capacity of airport and ATC sectors?	Yes No Does not apply	1. Show registers 2. Identify which sectors already count with capacity calculation	
ATFM Manual Chapter 4 4.2	2.2 Have you developed the estimated calculation of airspace capacity (ATC SECTOR) and its Terminal Areas?	Yes No Does not apply	1. Identify, prioritize and notify the sectors requiring capacity caclulation. 2. Identify sectors exceeding their capacity	
3**. Coordination with ATM Community**				
ATFM Manual Chapter 6 6.1.1	3.1 Do you foster seminars to the ATFM community, considering the airspace capacity concept for the ATFM implementation, and initiate pertinent coordination?	Yes No Does not apply	Examine attendance registers	
ATFM Manual Chapter 6 6.1.3	3.2 Have you considered the exclusion of ATFM measures for some type of aircraft?	Yes No Does not apply	Examine the operations of aircrafts and under which condition or state such have been excluded from ATFM implementation	

Ref. Doc	Tasks description	Answer	Orientation	Remarks
ATFM Manual Chapter 6 6.8.1.2	4.1 Do you develop form/contents for operational agreements among centralized ATFM units for the balance between interregional demand and capacity?	Yes No Does not apply	Examine evidences of operational agreements	
5. **Training**				
ATFM Manual Chapter 7 7.6	5.1 Do you prepare plans and ATFM training material?	Yes No Does not apply	Examine plans, programmes and registers	
6. **Final implementation decision**				
ATFM Manual Chapter 8	6.1 Did you revise factors which may affect the implementation decision?	Yes No Does not apply	Examine factors and risk evaluation	
PBN implementation plan	6.2 Have you declared pre-operational implementation within defined area?	Yes No Does not apply	Examine AIC	
PBN implementation plan	6.3 Have you declared definitive operational implementation within defined area?	Yes No Does not apply	Examine AIC	

APPENDIX G

MODELO DE MEMORANDO DE ENTENDIMIENTO (MoU) ENTRE EL ESTADO "A" Y EL ESTADO "B"

A FIN DE PROMOVER EN LA REGIÓN SAM EL ESTABLECIMIENTO DE UN SISTEMA REGIONAL ATFM

(Spanish only)

MODELO DE MEMORANDO DE ENTENDIMIENTO (MoU) ENTRE EL ESTADO "A" Y EL ESTADO "B"

A FIN DE PROMOVER EN LA REGIÓN SAM EL ESTABLECIMIENTO DE UN SISTEMA REGIONAL ATFM

El Estado "A" y el Estado "B", en adelante denominados "las Partes";

RECONOCIENDO:

La importancia de la Gestión de Afluencia de Tránsito Aéreo en contribución a la seguridad de las operaciones, así como al desarrollo del crecimiento sostenido de la aviación en la Región y el considerable volumen de tránsito aéreo y su constante crecimiento; resaltando su influencia como gestor del desarrollo socio-económico de los Estados;

DESEOSOS de desarrollar lazos de cooperación significativos entre las Partes a fin de promover el establecimiento de un sistema Regional ATFM con el objeto de mantener la fluidez del tránsito y lograr un desarrollo seguro, eficiente y sostenible en la Región;

ACUERDAN lo siguiente:

ARTÍCULO I
Objetivos

1. Las Partes convienen en que cooperarán estrechamente y se consultarán en asuntos de interés mutuo a fin de alcanzar sus objetivos comunes, entre los que figuran los siguientes:
   a) Establecer procedimientos de **coordinación** entre las dependencias encargadas de la Gestión de Afluencia de Tránsito Aéreo o las que hagan su vez.
   b) Establecer procedimientos de **comunicación** entre dependencias encargadas de la Gestión de Afluencia de Tránsito Aéreo o las que hagan su vez.
   c) Establecer **planes de contingencia** aplicando las **iniciativas ATFM** con el fin de salvaguardar la seguridad de las operaciones y mantener la eficiencia del sistema ATM.
   d) Establecer **metas cuantificables** para la medición de la efectividad de las iniciativas de gestión de tránsito (TMI) aplicadas.

2. Las Partes convienen en colaborar de buena fe, mediante la participación conjunta y concertada de conformidad con las disposiciones del presente Memorando, a fin de cumplir los objetivos enunciados.

ARTÍCULO 2
Alcance del Memorando

1. El presente Memorando establece un marco de cooperación entre las Partes y determina las condiciones y modalidades en cuyo contexto colaborarán las Partes para lograr sus objetivos comunes.
2. El presente Memorando constituye el entendimiento íntegro de las Partes con respecto a sus objetivos.
3. El presente Memorando en ningún caso altera o modifica las cartas de acuerdo operacionales que ya existen entre las Partes.

ARTÍCULO 3
Responsabilidades

1. Las dependencias encargadas de brindar el servicio ATFM (o las que hagan su vez), serán responsables de:
   a) Coordinar entre sí antes de implantar iniciativas de Gestión de Tránsito (TMI) que puedan afectar la seguridad y la fluidez de las operaciones.
   b) Notificar a las demás dependencias a cargo del servicio ATFM antes de implantar las TMI, cuales son los parámetros de la Gestión de Afluencia y cuál será la duración de la medida.
   c) Utilizar la mensajería ATFM por medio de los canales que las Partes estimen convenientes (red AFTN, AMHS, correos electrónicos, etc.) para comunicar la aplicación de las TMI.
   d) Incluir el tipo de TMI en el plan de operaciones ATFM, cuando sea probable que la contraparte se vea afectada por esas medidas.
   e) Verificar que la contraparte esté informada de la aplicación de las TMI.

ARTÍCULO 4

Duración

Este Memorando de Entendimiento se mantendrá vigente, aun cuando existan cambios en las autoridades de las Partes, hasta que se firmen Cartas Acuerdo Operacionales ATFM, las cuales incluirán los puntos establecidos en este MoU o hasta que ambas partes acuerden su finalización.

ARTÍCULO 5

Enmiendas

Este Memorando de Entendimiento podrá ser enmendado o modificado por mutuo consentimiento de las Partes. Cualquiera de dichas enmiendas o modificaciones será hecha por escrito y debidamente firmada por ambas Partes.

ARTÍCULO 6

Solución de Controversias

Toda diferencia o controversia respecto a la interpretación o la aplicación de este Memorando de Entendimiento se solucionará mediante negociación entre las Partes, por medio de los canales de comunicación convenidos.

ARTÍCULO 7

Entrada en Vigor

Este Memorando de Entendimiento entrará en vigor inmediatamente después de la firma de las partes.

Suscrito en (*Ciudad*), (*fecha en texto claro*)

Firmado en representación de “A”

_____

Coordinador ATFM del Estado “A”

Firmado en representación de “B”

_____

Coordinador ATFM del Estado “B”

APPENDIX H

APLICACIÓN METODOLOGIA CDM
CASO: EMERGENCIA EN LA ZONA NORTE DEL PERÚ

(Spanish only)

APPENDIX H

APLICACIÓN METODOLOGIA CDM
CASO: EMERGENCIA EN LA ZONA NORTE DEL PERÚ

1. Descripción

Frente a la emergencia suscitada en la zona norte del Perú debido al Fenómeno del Niño Costero que causó lluvias torrenciales e inundaciones, el Estado a través de la aviación militar inició la operación de vuelos con status de ayuda humanitaria hacia las zonas afectadas, a partir del 17 de marzo pasado. Asimismo como apoyo al Estado Peruano, otros Estados destinaron aeronaves para realizar vuelos de ayuda humanitaria en los días posteriores.

En vista de la situación, las compañías aéreas activaron vuelos de ayuda humanitaria y vuelos extra de apoyo a fin de conectar la zona norte con el resto del país, debido al severo deterioro de las vías terrestres.

En consecuencia, se incrementó notablemente el número de operaciones diarias en el aeropuerto de Lima y en las ciudades afectadas, ocasionando demoras en las salidas del aeropuerto Jorge Chávez principalmente, generando congestión en la plataforma y calles de rodaje; adicionalmente el ACC LIMA emitió NOTAM aplicando control de afluencia al tránsito que ingresa, sobrevuela y sale de la FIR LIMA, aumentando las separaciones en minutos, independientemente de los niveles asignados en algunos casos elevando la situación de congestión hacia el espacio aéreo y las FIR adyacentes.

Por otro lado se suscitaron situaciones que contribuyeron a agravar el esquema antes mencionado, como la falta del personal ATC en el ACC de Lima, fallas en el sistema radar y en los sistemas de comunicaciones, cierres de pista en aeropuertos del interior debido a la grave afectación por las lluvias, emergencias y urgencias con aeronaves en el espacio aéreo de la FIR LIMA y un accidente en un aeródromo del país.

En este escenario, la DGAC adoptó medidas de **planificación** a fin de acomodar la demanda táctica reservando espacio para que esta sea absorbida sin exceder la capacidad, a fin de garantizar la seguridad de las operaciones aéreas, facilitar la operación de los vuelos de ayuda humanitaria hacia las zonas afectadas y ordenar el tránsito.

Entre estas medidas:

a) Se reforzó la vigilancia y monitoreo en las dependencias ATS.

b) Se estableció una estrecha coordinación civil - militar con el objeto de coordinar acciones para descongestionar el aeropuerto y el espacio aéreo, y atender requerimientos específicos por parte de la aviación militar.

c) Con la colaboración de las compañías aéreas, se acordó reducir el número de operaciones programadas en itinerario de 35 a 30 operaciones por hora durante el horario pico de la mañana a fin de dejar un espacio razonable para la operación de los vuelos de ayuda humanitaria.

d) Asimismo se acordó realizar los vuelos de apoyo extra en los horarios valle.

e) Se estableció un nexo de comunicación constante entre la aviación militar y las líneas aéreas a fin de minimizar el impacto operacional en cuanto a puntualidad, eficiencia y consumo de combustible.

2. **Análisis de las operaciones aéreas en el AIJCH durante el mes de marzo 2017**

Para un mejor entendimiento se muestra a continuación un análisis de las operaciones aéreas durante el mes de marzo del 2017, con la finalidad de evaluar los efectos del incremento de las operaciones a raíz de los eventos mencionados líneas arriba:

a) El número de operaciones se incrementó en un 12.6%, 60 operaciones diarias adicionales en promedio, teniendo un promedio de 480 operaciones diarias del 01 al 16 de marzo y un promedio de 540 operaciones diarias del 17 al 31 de marzo.

Período	**Número de Operaciones**
01 – 16 marzo 2017	480
17 – 31 marzo 2017	540

b) El número de operaciones militares se incrementó en 215%, 43 operaciones diarias adicionales en promedio, teniendo un promedio de 20 operaciones diarias del 01 al 16 de marzo y un promedio de 63 operaciones diarias del 17 al 31 de marzo.

Período	**Número de Operaciones**
01 – 16 marzo 2017	20
17 – 31 marzo 2017	63

c) Del 17 al 25 de marzo durante el horario pico, se registraron hasta 39 operaciones por hora (solo aviones), siendo a la fecha la capacidad declarada de la pista de 37 operaciones por hora al 100%.

d) Si se contabilizan los helicópteros se alcanza un total de hasta 41 operaciones por hora, lo cual no afecta la capacidad de pista dado que estos aterrizan y despegan desde sus bases o calles de rodaje.

e) El número máximo alcanzado de operaciones (39) se da en el escenario de salidas y llegadas balanceadas, sin exceder las 18 llegadas.

f) De acuerdo a la última actualización de la capacidad de pista del AIJCH realizada en agosto del 2016, la capacidad de pista al 100% es de 39 operaciones por hora y al 95% de 36 operaciones por hora, este último estudio se realizó con la finalidad de evaluar el efecto de las medidas estratégicas implementadas durante el proceso de implantación ATFM, sin embargo esta capacidad aún no ha sido declarada debido a las limitaciones de capacidad del terminal.

Número de operaciones	% de utilización
39	100%
36	95%

3. CONCLUSIONES

a) Se realizaron en promedio 43 operaciones (salidas/llegadas) diarias de ayuda humanitaria militares nacionales y extranjeras.

b) Se realizaron en promedio 17 operaciones (salidas/llegadas) diarias de ayuda humanitaria y apoyo extra de compañías aéreas.

c) Se comprobó que las medidas estratégicas implementadas durante el proceso de implantación ATFM en los años 2015 y 2016 tales como:

   i) Abandono de pista vía calle de rodaje de salida rápida CHARLIE;

   ii) Despegues de aeronaves de categoría “C” vía intersección de calle de rodaje BRAVO con la pista principal;

   iii) Balance y ordenamiento de itinerarios;

   contribuyeron a incrementar la capacidad de la pista del AIJCH en 2 operaciones adicionales por hora al 100%, aumentando la eficiencia y garantizando la seguridad operacional.

d) Se comprobó la necesidad de implantar oficialmente el CDM del Estado Peruano a fin de mantener las coordinaciones con la comunidad aeronáutica y tomar las mejores decisiones en colaboración, en apoyo a la solución de problemas y optimización de las medidas aplicables para cada escenario, para este caso las medidas aplicadas por la DGAC contribuyeron a la eliminación de los NOTAM que intentaban controlar la afluencia de tránsito durante el periodo de emergencia.

e) Para este evento se resalta la importancia de la coordinación civil–militar.

Agenda Item 4: Assessment of operational requirements to determine the implementation of improvements in communication, navigation, and surveillance (CNS) capabilities for operations en-route and terminal area

4.1 Under this agenda item, the following working and information papers were examined:

a) WP/07 **–** *Follow-up to REDDIG II activities* (presented by the Secretariat);
b) WP/08 – *Follow-up to the implementation of the AMHS interconnection* (presented by the Secretariat);
c) WP/09 – *Implementation of the ICAO "Frequency finder" application* (presented by the Secretariat);
d) WP/20 – *Space-based ADS-B surveillance data and its distribution via REDDIG II* (presented by AIREON);
e) IP/09 - *Status of SITA AMHS Gateway interconnections* (presented by SITA);
f) NI/12 - *Avance en las mejoras de vigilancia y comunicaciones aeronáuticas de la FIR Oceánica Lima* (presented by Peru - Spanish only); and
g) IP/13 – Status of GBAS implementation in Brazil (presented by Brazil).

4.2 The aforementioned working and information papers covered the following topics:

- Activities carried out under the SAM ATN architecture project, D1.
- Activities carried out under the ATN ground/ground and air/ground applications project, D2.
- Other CNS activities.

ACTIVITIES CARRIED OUT UNDER THE ATN ARCHITECTURE PROJECT – D1

Progress made in the implementation of REDDIG II

4.3 The Meeting took note of the main activities carried out since the SAM/IG/18 meeting concerning:

- Pending activities in REDDIG II
- LEVEL 3 ground network
- Training activities and technical-operational meeting
- REDDIG II security analysis
- Analysis of the connection setup in REDDIG II for SITA data link services
- Relocation of the REDDIG II node of Bogota
- New REDDIG node in Ezeiza
- Satellite ADS-B services in REDDIG II
- MEVAIII/REDDIGII interconnection activities

Pending activities in REDDIG II

4.4 In order to solve the problem of random freezing in some REDDIG II nodes, between November 2016 and April 2017, INEO replaced the LNBs in eleven (11) nodes of REDDIG II other than those reported at the SAM/IG/18 meeting.

4.5 Consequently, REDDIG availability has increased substantially since November 2016, since the problems generated by the replaced elements have been resolved.

4.6 Furthermore, the recurrent failure in the Modem Master of the Manaus NCC has been addressed. In this regard, the latest version of the required software has been received and is being installed this week.

4.7 In order to be able to conduct the FSAT of the satellite segment during the second half of this year (the ground segment was already approved in December 2015), INEO must solve the following minor problems:

- Configuration of the IP administrative channel in the Asunción node in Paraguay
- Procedure for calculating satellite bandwidth (BW or 'payload') consumption in each network station.
- Software/files for initial installation of NMS servers and "WhatsUp Gold" in all network stations.
- Correction of database server connections to introduce redundancy in the Manaus node.
- Solution of "Ethernet Switch-A" malfunction in the Brasilia node.

LEVEL 3 ground network

4.8 Using the *"Active Monitors"* tool of the monitoring and control application of the Manaus, Ezeiza and Lima stations, the monthly (numerical and graphical) availability of each of the ground circuits of LEVEL 3 is being calculated since January 2016, and is being used to calculate compliance with the respective SLA (Service Level Agreement).

4.9 **Appendix A** shows the performance for all 2016, as well as for the first 2 months of 2017.

Training activities and technical-operational meeting

Advanced course on REDDIG II operation

4.10 This course is addressed to technical staff in charge of the operation and maintenance of the REDDIG station, who have already followed the basic course. Emphasis will be placed on the operation and supervision of the Skywan 1070/7000 modem, on a theoretical-practical description of the 'Line Up Manager' software, and on troubleshooting of station components. This course is scheduled to be held in Manaus, Brazil, on 13-16 June 2017.

Course on IP networks applied to REDDIG

4.11 The course is aimed at technical personnel with knowledge of IP networks and who are responsible for the operation and maintenance of the REDDIG station. The course will be offered in Manaus, on 16-20 October 2017. Arrangements will be made for the course to be prepared and given by two participants who took part in the 2 Cisco courses mentioned above.

Sixth REDDIG II technical-operational meeting

4.12 The Sixth REDDIG II technical-operational meeting will be held in Manaus, Brazil, on 12 June 2017, one day before the advanced course on REDDIG II operation.

REDDIG II security analysis

4.13 The Twentieth REDDIG Coordination Meeting (RCC/20) agreed that the *ad hoc* group in charge of analysing REDDIG II security, comprised of Argentina, Brazil, Colombia, French Guiana (France), Paraguay, and Peru, should prepare an action plan specifying the implementation dates for the actions proposed for mitigating identified threats that could affect the security of REDDIG II. The threats analysed by the SAM/IG/18 meeting are presented again as **Appendix B** to this agenda item.

4.14 The Meeting took note that on 5 May 2017, the *ad hoc* group held a teleconference to agree on the following actions:

Regarding internal threats

4.14.1 *Installation of boundry switches and routers:* a redundant router, together with an "Ethernet switch", shall be installed in each REDDIG II node to support all VLANs of all existing and future IP services. In order to standardise the configuration and technical characteristics of routers and switches, IP addressing, firewalls, and the NAT application in each REDDIG II node, the *ad hoc* group agreed that Mr. Christian Vittor, of Argentina, should conduct an initial study by 30 May 2017. This initial study would be circulated to the delegates of the *ad hoc* group for comments and submitted to the Sicth REDDIG II Technical-Operational Meeting to be held in Manaus, Brazil (12-16 June 2017) for discussion. This study would then be submitted to the RCC/21 meeting (March 2018) for approval and implementation through the REDDIG project (RLA/03/901).

4.14.2 *Implementation of VPN access in REDDIG II nodes:* In order to standardise VPN access in REDDIG II, it was agreed that Mr. Víctor Moran, of Paraguay should prepare a tutorial on the steps required for the implementation of VPN access in REDDIG II nodes, to be used as a reference. The tutorial would be presented on 30 May 2017 at the Sixth REDDIG II Technical-Operational Meeting (Manaus, 12-16 June 2017) for final review. At present, VPN has been installed in Brasilia, Manaus, Ezeiza, and Asunción.

4.14.3 *Installation of antivirus in the NMS:* At present, all REDDIG II nodes have antivirus installed in the management system, with the exception of the Georgetown, Paramaribo, and Maiquetía nodes. In this regard, the focal points of these States were urged to complete the installation as soon as possible; the date envisaged by the RCC/20 meeting was 14 April 2017.

4.14.4 *Updating of the NMS operating system:* the Meeting considered that the internal threats should include the regular updating of the operating system of the equipment hosting the system.

4.14.5 *Procedure concerning codes for accessing REDDIG II nodes:* the REDDIG Administrator would prepare a tutorial to be presented at the RTO/6 meeting on the procedure to be followed for the management, configuration and registration of REDDIG II access codes, which would be applicable following final acceptance of REDDIG II with INEO.

4.14.6 *Procedure for installing NMS back up hard disks:* INEO delivered the hard disks for each REDDIG II node. These hard disks will be used for storing NMS back-up files in each node. The hard disks have already been installed in all the nodes, except for Recife and Guayaquil, which still need to confirm reception thereof. The REDDIG Administrator will conduct the verification once the hard disks have been installed in all REDDIG II nodes.

Regarding external threats to REDDIG II

4.14.7 Mr. Andrés Arango, of Peru, with the support of the REDDIG Administration, was entrusted with conducting a survey of REDDIG II nodes in terms of the circuits connected to REDDIG II that might be part of a national public network. The first part of the survey would be ready by 30 May 2017, with the full survey to be completed for the RTO/6 meeting.

Analysis of the REDDIG II connection setup for SITA data link services

4.15 Regarding the setup of REDDIG II connections for the transport of SITA datalink services, the REDDIG group considered that, in the setup proposed by SITA, the router(s) in all the nodes involved in REDDIG II should be installed 'behind' the boundary router/switch of the 'gateway' node rather than directly to the REDDIG switch. Note was also taken of SITA's requirement to have two geographically alternate paths in REDDIG II from each node that requires the service.

Relocation of the REDDIG II node of Bogota

4.16 On 20-21 February 2017, INEO conducted an on-site inspection to present a new proposal for the relocation of the existing REDDIG II node of Bogota to the new ACC facilities in Bogota. Colombia considered that the relocation of the node should be carried out by INEO so as not to affect the REDDIG II guarantee, thus discarding the previous opinion that considered that technical personnel of the Aviation Administration of Colombia should carry out the relocation.

New REDDIG II node in Ezeiza

4.17 The installation of the new REDDIG II node in Ezeiza, at the site where the new control tower and ACC are being built within the premises of the international airport of Ezeiza, is foreseen for the first quarter of 2018. With respect to the relocation of the current REDDIG II node of Ezeiza to Córdoba, the date is still to be defined.

New services in REDDIG II

4.18 A new Santiago-Lima AMHS circuit was implemented and connectivity tests at P1 level have been conducted between: Brasilia-Montevideo, Ezeiza-Santiago, and Ezeiza-Montevideo.

Satellite ADS-B surveillance data and their distribution through REDDIG

4.19 The SAM/IG/18 meeting took note that Aireon (composed of Nav Canada, ENAV, IAA & Navair, and Iridium as technological partner) would offer starting in 2018, global ADS-B data coverage, based on the installation in each new Iridium NEXTY satellite flying in low earth orbit, a payload capable of receiving ADS-B messages sent in the 1090 MHz frequency, using a constellation of 66 satellites. The first 10 of these satellites were launched in January 2017, and received ADS-B messages in flight tests conducted by Nav Canada, the FAA, and Polaris. The latter would be interested in using REDDIG II to send the obtained surveillance information to the ANSPs concerned.

4.20 In this sense, the Twentieth REDDIG Coordination Meeting (RCC/20) considered that REDDIG II would be able to support network requirements for the distribution of satellite ADS-B surveillance data, such as availability, latency, multicasting, unicast, and surveillance data segregation to each ANSP connected to it.

4.21 The RCC/20 meeting also analysed the connection setup between the satellite ADS-B data processing centre and REDDIG II, and highlighted the convenience of using two communication channels acting in geographical redundancy. It was also felt that, when defining the two geographical points to be connected to REDDIG II, consideration should be given to the sun outage effect on REDDIG II to ensure that only one location is affected.

4.22 Regarding bandwidth usage, it was noted that ADS-B messages were small in terms of bytes and that the link between AIREON and the ANSPs did not require much bandwidth.

4.23 In this sense, in order to determine if the remaining bandwidth available in REDDIG II satellite and ground networks would support this additional bandwidth requirement to distribute satellite ADS-B data *in a setting in which all REDDIG II member States required satellite ADS-B services to support national procedures in the en-route, approach and terminal areas*, the RCC/20 meeting asked AIREON to analyse the bandwidth requirement for such environment.

4.24 In this regard, taking into account the aforementioned environment, and considering air traffic level projections for 2030, Aireon estimated that the total bandwidth requirement would be 2,061 Kbps for a period of 24 hours.

4.25 The Meeting considered that the REDDIG Administration should conduct a study to determine whether the current bandwidth of the REDDIG satellite and ground networks would support these extreme bandwidth conditions, and submit the results to the SAMIG/20 meeting.

Implementation cost for the distribution of satellite ADS-B data

4.26 In order to determine the possible economic benefits to be derived by ANSPs (air navigation service providers) from the satellite ADS-B data obtained through REDDIG II, Aireon estimated the cost of implementing the original design (where ANSPs would receive data directly from the Aireon Processing and Distribution Centre), comparing it with data distribution through REDDIG II. The results are shown in the following table:

Estimated costs using REDDIG II	**U$S**
a. SDP deployment and testing (2 SDPs) – one-time cost	320,000
b. Telecommunication costs at 2 locations (1 line in each location) / annual- recurrent cost	95,000
c. Acceptance test of the installation service by the ANSP – one-time cost	112,000

Estimated cost per ANSP (direct connection)	**U$S**
a. SDP at the ANSP site – one-time cost	300,000
b. Telecommunication cost per ANSP (dual line) / annual- recurrent cost	95,000
c. Acceptance test of the installation service by the ANSP	112,000

4.27 Where

a) *SDP deployment and testing expenditures (Service Delivery Point)*:

Use of REDDIG II: for implementation of two REDDIG nodes, and deployment of a single SDP in two (2) REDDIG connection points (see Figure 4 WP/20). This will give access to Aireon global ADS-B data from REDDIG II after the ANSP has signed up. The cost includes the hardware for two (2) single-chain SDPs, one single MPLS 2MB Ethernet point-to-point circuit for each SDP; SDP software; and site acceptance test (SAT) (one visit to each location), to verify that the site is installed and operating properly.

Direct connection by ANSP: For implementation in an ANSP, and deployment of a redundant SDP at an ANSP facility to connect to Aireon global ADS-B data. The cost includes the hardware for redundant SDPs, two MPLS 2 MB Ethernet point-to-point circuits for the ANSP SDP; site acceptance test (SAT) and SDP software test to verify the installation and proper operation of the site.

b) *Cost of telecommunications:* annual recurrent costs for two (2) MPLS connections established and tested during SDP installation, as stated above. The cost shown in the table is an estimate, which can vary depending on the locations selected for the SDP and the availability of MPLS connections in the selected regions.

c) *Cost of the installation service acceptance test (ISAT):* this is a one-time cost for each ANSP registered to receive the service. The ISAT is conducted by Aireon prior to the testing and evaluation by the ANSP, in a single trip to the ANSP location, and data on tests relevant to the ANSP.

4.28 It may be noted that, using REDDIG II, the cost items described in sections a and b of the table would be shared by the countries participating in the system, and would be paid individually if each ANSP installs the system directly with its own SDPs and communication lines. The foregoing shows that all SAM ANSPs would derive financial benefits from using REDDIG *as the means* for receiving satellite ADS-B data.

4.29 Charges by Aireon for the delivery of ADS-B surveillance data to ANSPs would be based on a fixed annual cost and would be calculated as follows:

- Hours of flight over the airspace of the corresponding ANSP/FIR.
- Density of traffic overflying the corresponding ANSP/FIR airspace.
- Airspace area: oceanic or ground

4.30 Costs vary among ANSPs since each airspace has its own traffic volume. Accordingly, ANSPs may subscribe to airspace portions or to all of their controlled airspace. Therefore, these specific costs have not been included in these preliminary calculations. More information on this topic is presented under agenda item 5.

MEVAIII/REDDIG II interconnection activities

4.31 In this regard, arrangements were made for the conduction of AMHS trials between the Bogota MTA and the Panama MTA through the MEVA III/REDDIG II interconnection. The MEVA III service provider configured the Panama and Bogota nodes for the trial period at no cost for REDDIG II (maximum circuit of 64Kbits/sec). Following the trials, the MEVA III provider would submit the cost of that service. Likewise, Brazil started coordination with the FAA to migrate the Brasilia-Atlanta AFTN circuit to AMHS. The FAA is analysing the proposed solution. Likewise, Peru will start coordinating with the FAA to migrate the Lima-Atlanta AFTN circuit to AMHS.

FOLLOW-UP TO THE ACTIVITIES UNDER PROJECT D2 – ATN GROUND-GROUND AND AIR-GROUND APPLICATIONS

Ground-ground applications

Follow-up to the operational interconnection of AMHS systems

4.31 AMHS deployment started in early 2006 in the Region. At present, with the exception of Fre2nch Guiana, all the countries have adopted the system. At national level, Bolivia and Chile only have AFTN circuits installed.

4.33 At present, out of nine (9) regional interconnections implemented in early 2017, six (6) are operational and three (3) had to switch back to AFTN. Likewise, eight (8) connections are at the pre-operational level and are expected to become fully operational during the second semester of 2017. The goal is to migrate all AFTN circuits of Table CNS-II of the AFTN Plan, Volume II of the Regional Air Navigation Plan as a matter of priority stipulated in the Declaration of Bogota, using the REDDIG II platform.

4.34 The Meeting took note of the progress made by each State to activate their respective AMHS interconnections, highlighting the start-up of the operational interconnection between the Brasilia MTA and the Bogota MTA, and the successful operational tests conducted between the Brasilia MTA and the Madrid MTA, which is the first inter-regional interconnection of the SAM Region. This interconnection would start operating by mid-June 2017. The Meeting congratulated the aeronautical administrations involved in said interconnections. **Appendix C** presents the reported progress and the action taken for implementation in each State.

General considerations on the AMHS interconnection

4.35 The Meeting updated the table with information on AMHS interconnection requirements, dates and status of implementation, as shown in **Appendix D**, and the list of focal points for AMHS interconnection, as shown in **Appendix E**.

Status of interconnection with the SITA AMHS gateway

4.36 The Meeting took note of the progress made in the interconnection of the SITA AMHS gateway with the AMHS systems worldwide, and coordination with Eurocontrol AMC. The SITA AMHS connections with the SAM Region are through Argentina (Ezeiza) and Brazil (Brasilia). The network-level connection with Argentina has been completed, an IOT document has been established, and IOT tests have been completed 70% approximately, their completion being expected by the end of May 2017. The IOTs and POTs with Brazil and Argentina are to be completed by the third quarter of 2017.

4.37 The Meeting was informed that, in order to help with the implementation of these activities, a document had been prepared by the AMC and the ICAO Regional Office of Paris (AFSG-Operations Group). The document is presented as an attachment to IP/09. The Meeting stressed the importance for States that had not yet designated external operators for AMC to do so as soon as possible, in order to comply with Conclusion SAMIG 18/2 ("Designation and registration of candidates of the SAM Region to the AMC of Eurocontrol").

Advanced AMHS course

4.38 The Meeting deemed necessary and appropriate to carry out an advanced AMHS course during the first semester of 2018 in Lima, Peru. The course would last one week and would be mainly focused on AMHS operation. At the next meeting of the Coordination Committee of Project RLA/06/901, a request will be made for funds to purchase the course, cover one scholarship per project member State, and the cost of simultaneous interpretation.

Other CNS matters

Implementation of the ICAO "Frequency finder" application

4.39 The Meeting took note that “Frequency Finder” (FF) is an ICAO application that facilitates frequency assignment and planning by the States and Regional Offices, which will gradually replace the Access databases for the COM 1, 2 and 3 lists.

4.40 It has a modular structure, and its final version wil include modules to support the following main functions:

- *Planning of frequencies for voice communications and ground-air datalink in VHF (VHF COM list)*: the current version includes a complete module to assist in VHF ground/air assignment planning (VHF COM 3 list) operating in the 117. 975 – 137 MHz frequency band

- *Planning of frequencies for VHF/UHF radio aids (ILS, VOR, DME and GBAs):* the VHF NAV list module has been included and is under final evaluation. This module tests the compatibility of ILS and VOR frequencies, using the criteria applied in other ICAO Regions, except for the EUR Region. Several modifications are anticipated before completing the module.

- *Planning of frequencies for NDB (NDB list*): it is expected that the respected module will be completed and introduced by the end of 2017.

- *Planning of frequencies for HF voice and data communications (HF list):* same as above.

- *Planning of SSR interrogator-identifier codes (SSR list):* the support module is available and will be completed in the near future, including the creation of a global list of SSR codes in Mode S. At present, the module allows for calculating the compatibility of II codes in Mode S.

Workshop to support the selection of frequencies using FF

4.41 The Meeting took note that, in order to support SAM States in the selection of frequencies, a workshop had been carried out in Lima, Peru, on 6-10 March 2017, on the use of the new tool. The workshop focused on frequency planning issues, the effective use of the aeronautical frequency spectrum, the revision of the SAM aeronautical frequency assignment plan, and the use of the new ICAO management tool for the assignment of VHF communications (COM 3 list).

4.42 The workshop was attended by 23 delegates of 10 SAM States (Argentina, Bolivia, Brazil, Chile, Ecuador, Panama, Paraguay, Peru, Uruguay and Venezuela). During the workshop, the participants acquired practice in the use of the tool and made an initial updating of list COM 3 of each participating State. The agenda of the event is shown in **Appendix E** to this agenda item. For those States that did not attend the workshop (Colombia, French Guiana, Guyana and Suriname), initial training was provided via web with the participation of French Guiana, Guyana and Suriname.

Database updating using FF

4.43 The Meeting took note that, since 13 March 2017, the FF programme constitutes a frequency management and selection tool (initially in VHF COM). In this sense, the States would designate a focal point for FF management and coordination with the CNS officer of the SAM Regional Office for the introduction of changes to the VHF COM database (COM 3 list). The focal point must be a professional in the area of communications of the respective administration, with experience in aeronautical frequency management.

4.44 The Meeting was informed that, on 16 March 2017, the ICAO SAM Regional Office had circulated LT2/4.42-SA106 requesting SAM States to send the updated COM 3 list and the name of the designated focal point for the frequency finder by 15 May 2017. **Appendix F** presents the list of focal points to date. So far, updates to the COM 3 list have been received from Argentina, Brazil, Ecuador, French Guiana, Peru, Suriname, Uruguay and Venezuela. It is important for all States to send the updated information so as to avoid co-channel and adjacent frequency interference.

Progress made in the introduction of improvements to surveillance and aeronautical communications in oceanic areas of the Lima FIR

4.45 The Meeting took note that, in May 2017, the air navigation service provider of Peru (CORPAC SA) had implemented an update to the AIRCON system of the ATC simulator of Lima. It had also included in its acceptance testing activities, the verification of ADS-C and CPDLC functionalities using air-ground data link services. The updating process will continue in the Lima ACC automated system, to be completed by mid-second half of 2017.

4.46 The Meeting was also informed that CORPAC S.A. was preparing the Terms of Reference for hiring the "Connectivity service for the implementation of ADS-C surveillance and CPDLC communications in the Lima FIR airspace". The respective call for bids should take place this year within the context of the Public Procurement Law of Peru. In parallel, ADS C/CPDLC tests have been agreed with ARINC for the AIRCON ATC simulator starting in May 2017, and similar tests were being coordinated with SITA.

Status of the GBAS project in Brazil

4.47 The Meeting was informed that, starting in November 2016, DECEA had started to coordinate a new phase of efforts with the objective of enabling the use of the SLS-4000 in Brazil until December 2018, involving several organisations such as ICEA, FAA, USTDA, Honeywell, Mirus Tech, SDTP Foundation, Boston College, Boeing and Gol Airlines. In March 2017, a memorandum of cooperation was signed between DECEA and the FAA for research in the ionosphere, ensuring the participation of FAA experts in satellite navigation, ionosphere data collection, and data analysis.

4.48 The Meeting took note that this new project, which started in November 2016 and expected to be completed in December 2018, had as its main objective to configure the SLS-4000 station for operation in SBGL with its best performance. Among the actions planned for the project are:

- Development of Safety Case for GBAS;
- GBAS certification;
- Updating the ionospheric threat model;
- Identification of the behaviour of the ionosphere in different parts of the Brazilian territory;
- Air carrier participation in flight campaigns;
- Collection and analysis of data on L5 frequency.

APPENDIX A

Level3_Unavailability Credits_2016

	January 2016		February 2016		March 2016		April 2016		May 2016		June 2016		July 2016		August 2016		September 2016		October 2016		November 2016		December 2016		TOTAL
	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	Availability	USD Credit	USD Credit
SAEZ																									-
SBBR																					98,99%	8,52			**8,52**
SBCT											99,20%	4,13	99,60%	0,87									99,01%	5,74	**10,74**
SBMN	96,48%	45,36	96,05%	51,83	94,55%	74,31	97,20%	34,52	90,97%	127,98	97,85%	24,78	98,82%	10,26	86,87%	189,45	92,01%	112,43	93,77%	85,93	96,84%	39,94	98,17%	19,89	**816,67**
SBRF			99,59%	1,15					92,31%	77,62					96,58%	32,76					99,06%	6,68			**118,21**
SCEL							99,44%	2,20																	**2,20**
SEGU	93,57%	50,87																							**50,87**
SGAS	97,78%	34,56	99,60%	1,75			97,00%	48,64			99,40%	5,45													**90,40**
SKED																					95,69%	42,13			**42,13**
SLLP																	97,98%	46,39					98,52%	31,78	**78,17**
SMPM							99,41%	16,76																	**16,76**
SOCA	16,68%	1.620,00					99,62%	4,59																	**1.624,59**
SPIM							99,48%	1,85																	**1,85**
SUMU			98,75%	17,08			95,41%	77,31							99,20%	9,00			93,22%	116,73					**220,12**
SVMI							97,13%	56,33			89,77%	217,55	92,82%	150,69									99,53%	3,74	**428,32**
SYGC							99,52%	7,05																	**7,05**
TTZP			99,39%	1,91			99,46%	0,79							99,37%	2,34	94,97%	81,47			97,84%	29,92			**116,42**

Note: SLA-Availability for all nodes: 99.70%
Except for SBMN and TTZP : 99.50%

TOTAL USD 3.633,02

APPENDIX B

INITIAL ANALYSIS OF RISK THREATS

THREATS	IDENTIFIED	CONSIDERATIONS	PROPOSED ACTIONS
INTERNAL TO THE REDDIG (satellite subnetwork and ground subnetwork)	LEVEL 3 MPLS ground subnetwork	The ground network runs over VPN MPLS, provided by a provider, Level 3. The Administrator or users of REDDIG II do not manage the network devices, let alone the network itself, which is supposed to be meshed, and with QoS for prioritising the relevant packages.	***** The service provider of the ground subnetwork (Level 3) should inform if security standard RFC 592 is being applied. (activity done) ***** NAT should be used in border routers of States between the REDDIG II node and the ground subnetwork of Level 3. Information could also be encrypted.
	Remote access through the public internet to the REDDIG II by VPN.	In REDDIG II, the INEO & LEVEL 3 consortium has considered that each REDDIG II node must have a VPN interface installed for remote access to network equipment (routers, MODEMs, amplifiers) in case of failure or changes in configuration. At present, VPN is operational in the nodes of Brasilia, Ezeiza, and Manaus. VPN has been installed in Montevideo (Uruguay) and Guayaquil (Ecuador), but it is not operational yet. The INEO & Level 3 consortium is using this access to correct problems with the equipment at node level or changes in configuration, and will continue to do so until the network is delivered to the Project (RLA/03/901), which will occur following final acceptance of the network. This access will also be used during the warranty period (two years following final acceptance of the network).	***** Once the network is transferred to ICAO, VPN access will be manual upon request of the REDDIG Administrator. This will reduce hazards resulting from continuous connection of REDDIG II to public IP networks.
	Human factors	Great caution should be exercised during human intervention at the nodes, introduction of new software configuration settings, loading of information stored in the equipment, etc., to avoid potential viruses contained in CDs or memory sticks.	***** Since tampering occurs through the network management system (NMS), the Whatsup Gold software antivirus should be constantly updated. ***** Once the network is fully managed by ICAO, all access passwords will be changed. It should be noted that, at that point, all network operators know the passwords of all REDDIG II nodes. Only the Network Administrator and the NCC staff that are duly authorised by the Administrator through the assignment of a login and password, will have access to the network. The management, configuration, and recording of activities will be the responsibility of the Network Administrator. ***** Personnel in change of node maintenance will only have access to their own node, using a personal login and password assigned by the Administrator. ***** All networking equipment configuration activities will be recorded in a server, to which the Administrator will have access. All access and changes by authorised personnel will be recorded therein.
		Changes made by users to REDDIG networking equipment configuration settings, when such changes are not desirable or affect services.	* Automatic backup of all network equipment at predefined time settings, in order to keep the latest configuration in case of contingencies. * The group also considered the need for the NMS server to continuously record the configuration settings of the various pieces of equipment in order to keep track of previous versions, thus ensuring the possibility of going back to a previous version in case the new version presents any problem.
EXTERNAL TO THE REDDIG II	External to the REDDIG, that is, at the level of users accessing the network	This refers to REDDIG II users. The types of services that enter the REDDIG from the users' side are speech and data circuits, and are the most vulnerable in terms of network security.	* In order to identify potential hazards, a survey of circuit connections to REDDIG II input interfaces should be conducted. This survey would make it possible to determine if any circuits or services entering the network come from a public network. * Services and circuits should be interconnected through a border router rather than directly to REDDIG routers. * Border routers should have the appropriate firewalls. * Conduct a study of a standard firewall to be installed in all border routers so as to standardise the level of security in all points of access to the REDDIG nodes.
Other considerations	The aspects to be considered are related to the protection of REDDIG II frequencies.	Other aspects to be considered in order to avoid risks to the REDDIG II.	* Prepare an inventory of licensed equipment (satellite frequency spectrum) in each node. *Registration of State licensed equipment locally and/or in the MIFR, reflected in a database (software). *Continuous monitoring and tracking of the radioelectric spectrum used in REDDIG nodes, in order to avoid causing, or being subject to, interference. *With the support of the ITU, exert control of interference threats, invoking ITU RR Article 45 CS and 15.1. *Work group duly trained in interference control and mitigation. * Implementation of security policies. * Keep the network topology duly updated and available. * Assign login and passwords to those responsible for each node, so as to limit and control the facilities granted for the management of networking devices of the network. *In principle, establish two groups: administrators with access to the whole network; and designated users with access solely to the equipment of their node. *Prevent forceful attempts to access the network through the establishment of time parameters for entering the respective code in the device.
	Aspects to be considered for the implementation of an adequate security policy.		

APPENDIX C

Argentina

Regarding AMHS interconnection Ezeiza-Lima, successful operational tests were carried out between Ezeiza and Lima MTAs, presenting problems with Lima AMHS system in AMHS messages transmitted by Argentina containing optional information in the header of the messages. On this respect Argentina informed that not using header could be an option but does not represent an acceptable solution, since for Argentina is a must and it is used for operative proposes; deleting it should suppose a change in Argentina's operating procedures. Further information regarding optional information in headers could be found in section 3.3.3, Chapter 3, Part II of ICAO Doc 9880. Operational tests will resume the week of 29 May until the problem is solved.

Successful operational tests were carried out in the AMHS interconnection Ezeiza-Montevideo but a problem arises in the Gateway when transmitting AFTN information. Taking into account the AMHS positive tests between Brazil and Uruguay and that equipment from Brazil and Argentina are from the same manufacturer, Argentina coordinated consultations with Brazil in order to apply similar solutions with AMHS connections for Ezeiza and Motevideo. Operation is foreseen by July 2017.

Interconnection Brazilia-Ezeiza and Ezeiza-Santiago foreseen operating by July 2017.

With respect to AMHS interregional connections, Argentina informed beginning coordination with Spain for the AMHS circuit implementation. This circuit will be implemented through a communications service provider and will be with MPLS transport mechanisms. Regarding the circuit with Johannesburg migration from AFTN to AMHS, it could begin on 2018 once the modernization of Ezeiza's CAFSAT node is completed. In the meanwhile, Argentina proposed South Africa (teleconference of 9 May 2017) to carry out AMHS test through a VPN channel (see diagram in **Appendix A** to this Working Paper).

Bolivia

During the teleconference of 5 May 2017 Bolivia informed that initial tests with Peru will begin on 15 May 2017. Test has not begun yet. Bolivia's technical Focal Points from the tests are Mr. Hernan Tito and Mr. Luis Mamami. Bolivia reported having installed AFTN circuits nationwide.

Brazil

Brazil reported operations of AMHS interconnection between Brasilia and Bogota carried out on 10 May 2017. By June 2017 operational phase is foreseen between the AMHS interconnections of Brasilia with Georgetown and Montevideo. AMHS Asunción Brasilia was expected to enter into operational phase in July 2017. Return to the connection between Brasilia and Paramaribo AMHS would be once Suriname AMHS system complete is updating.

Regarding inter-regional AMHS connections, Brazil reported successful operational test between Brasilia and Madrid through the CAFSAT carried out on May 11, 2017. Operation is foreseen by June 2017. There have been network connection and IP connectivity tests between the MTA of Brasilia and the AMHS Gateway of SITA. Between Brasilia and Dakar coordination continues for the implantation of an AMHS circuit through VSAT AFISET network and in the same way the migration of the AFTN to AMHS Brasilia Atlanta circuit through the MEVA III REDDIG II interconnection.

Chile

Operational tests between Santiago MTA and Lima MTA will continue the week of May 8, 2017. Lima Santiago AMHS circuit is having problems with address SPZOYFYX since 6 March 2017. The Focal Points of Peru was urged to coordinate with the Focal Point of Chile to find a solution. This addressing problem has caused frequent falls of AMHS system in Chile. The status of MTA Ezeiza and MTA Santiago is described under Argentina's section.

Colombia

AMHS interconnection between Brasilia and Bogotá started operations on 10 May 2017. Operational tests between Brasilia-Bogota MTAs are currently under number 5 of test protocol as well as Bogota-Quito. Tests between Bogota-Caracas (Maiquetia) will be made once the AMHS new system if Maiquetia enters into operation by the second semester 2017. IP interconnectivity and tests between Bogota and Panama through MEVA III REDDIG II interconnection has been carried out. Operational tests are pending.

Ecuador

Only progress is reported under Colombia section.

French Guiana

France reported the acquisition of an AMHS system from COMSOFT which will be installed in Cayenne and would be operative on 2018, together with the beginning operations of this system in the whole SAM Region. Once the new system is operative, French Guiana will coordinate with Brazil and Venezuela the migration of the current AFTN circuits to AMHS.

Guyana

AIDC interconnection with Brazil is foreseen by June 2017.

Panama

Regarding the AHMS interconnection Bogota-Panama, focal points of Colombia and Panama together with the Administrator or REDDIG II and the MEVA III provider, implemented a circuit through the MEVA III/REDDIG II interconnection which is presented as **Appendix B** of WP/08. IP interconnectivity tests have been carried out between Bogota and Panama MTAs through MEVA III/ REDDIG II. Operational tests are pending.

Paraguay

AIDC interconnection with Brazil is foreseen by July 2017.

Peru

Connection with Argentina: Refer to Argentina section of this Appendix.

Connection with Venezuela: Tests were being made on March 2017 with a provisional system of Venezuela with no positive results. On the teleconference of 4 May 2017, the focal point of Venezuela informed that approximately by August 2017 the new AMHS system would be installed and the tests will continue.

Connection with Bolivia: Refer to Bolivia section of this Appendix.

Suriname

The AMHS system of Suriname is being updated by the provider (INTELCAN). By the end of May 2017, Paramaribo-Brasilia test will resume. AMHS connection tests between Paramaribo and Maiquetia MTAs has been postponed to the second half of the 2017 as stated by the focal point of Venezuela.

Uruguay

Regarding AMHS interconnection between Montevideo and Ezeiza, refer to Argentina's section of this Appendix. For AMHS interconnection Montevideo-Brasilia see section Brazil.

Venezuela

The Focal Point of Venezuela informed that the temporal AFTN system (COMSOFT) has been operating normally and the AMHS operational connection with Brasilia, Bogota, Georgetown, Quito, Lima and Paramaribo is expected by the end of the second semester of 2017 once the new AMHS system (CONSOFT) begins.

APPENDIX D

AMHS INTERCONNECTION REQUIREMENT AND DATE OF IMPLEMENTATION

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
Argentina	Bolivia	Jun 2018	Pending initial coordination
	Brazil	Jul 2017	Pending operational implementation. Final operational tests for AMHS interconnection between Brasilia and Ezeiza were successfully completed on 18 May 2016. Beginning of operational implementation foreseen July 2017.
	Chile	Jul 2017	Operational implementation foreseen by mid-2017.
	Paraguay	Mar 2012	Implemented and operational
	Peru	Jun 2017	Positive P1 connectivity between MTA Ezeiza y MTA Lima (March 2016). Pending operational tests foreseen by mid-2017.
	Uruguay	Jul 2017	Connectivity in Protocol P1 level between MTA Ezeiza – Montevideo, operational tests July 2017.
	Venezuela	Sep 2017	Implemented and operational (out of service- failure in AMHS Venezuela) since Dec 2016. Operational implementation when new AMHS system starts operations in August 2017.
Bolivia	Argentina	Jun 2018	Pending initial coordination
	Brazil	Dec 2017	Pending initial coordination
	Peru	Dec 2017	Initial coordination made.
Brazil	Argentina	Jul 2017	Pending operational implementation. Final operational tests for AMHS interconnection between Brasilia and Ezeiza were successfully completed on 18 May 2016. Operational implementation for Jul 2017.
	Bolivia	Dec 2016	Pending initial coordination
	Colombia	May 2017	Operational May 2017.
	Guyana	Jul 2017	Begun operations in Protocol P1 level on 16 December 2016 at 17:00 UTC. On mid-February 2017 returned to AFTN configuration. AMHS tests resume on May 2017.
	French Guiana	Jul 2018	An AMHS system is schedule to begin operations in 2018.
	Paraguay	Jul 2017	Tests of P1 interconnectivity started mid July 2016 MTA. Pending operational tests by Jul 2017.

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
	Peru	Dec 2015	Implemented and operational 14 December 2015
	Suriname	Jul 2017	Entered into operation on 15 Dec 2016 at 17:00 UTC. On mid-February 2017 returned to AFTN configuration. INTELCAN is updating the AMHS software and operational test will resume in Jul 2017.
	Uruguay	Jun 2017	IP connectivity completed. (First week October 2016). IP Protocol tests successfully concluded the week of 28 Nov 2016 (30 Nov and 1 Dec). It is expected to begin operations before the end of first semester 2017.
	Venezuela	Sep 2017	Successful operational tests. Operation foreseen Jun 2017
	Spain	May 2017	Pending operational implementation. Operational tests successfully completed, Connection made through CAFSAT. Operations foreseen May 2017.
	United States	Dec 2017	Technical coordination began May-Sep 2016. IP configuration under assessment by FAA.
Chile	Argentina	Jun 2017	Implementation foreseen by mid-2017.
	Peru	Dec 2016	Positive test made on early October 2016.
Colombia	Brazil	May 2017	Operational May 2017.
	Ecuador	Jul 2017	IP connectivity tests successfully made. Pending resume of operational tests
	Panama	Dec 2017	Circuital interconnection has been configured through MEVA III/REDDIG II (mid-February 2017). Initial tests May 2017.
	Peru	Sep 2010	Implemented and operational
	Venezuela	Sep 2017	Pending operational tests August 2017 when Venezuela implemented its new AMHS system.
Ecuador	Colombia	Jul 2017	IP connectivity tests successfully made. Pending resume of operational tests.
	Peru	Jul 2012	Implemented and operational
	Venezuela	Sep 2017	Pending operational tests in 2017 when Venezuela has implemented its new AMHS system.
French Guiana (France)	Brazil	Jul 2018	New AMHS system for early 2018
	Venezuela	Jul 2018	New AMHS system for early 2018
Guyana	Brazil	Jul 2017	Began operations on 15 Dec 2017 at

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
			17:00 UTC. At mid-February 2017 returned to AFTN configuration. AMHS tests will resume on May 2017.
	Suriname	Jun 2011	Implemented and operational
	Venezuela	Sep 2017	Pending operational tests in 2017 when Venezuela has implemented its new AMHS system.
Panama	Colombia	Dec 2017	Circuital interconnection has been configured through MEVA III/REDDIG II (mid-February 2017). Initial tests May 2017.
Paraguay	Argentina	Mar 2012	Implemented and operational
	Brazil	Jul 2017	IP interconnectivity tests began mid July 2016. Pending of operational tests on July 2017.
Peru	Argentina	Jun 2017	Positive P1 connectivity between MTA Ezeiza y MTA Lima (March 2016). Operational phase foreseen by mid-2017.
	Bolivia	Dec 2017	Initial coordination made
	Brazil	Dec 2015	Implemented 14 December 2015
	Chile	Dec 2016	Entered into operations the second half of Dec 2016.
	Colombia	Sep 2010	Implemented
	Ecuador	Jul 2012	Implemented
	Venezuela	Sep 2017	Pending operational tests when Venezuela has implemented its new AMHS system
Suriname	Brazil	Jul 2017	Began operations on 15 Dec 2017 at 17:00 UTC. At mid-February 2017 returned to AFTN configuration. INTELCAN is updating AMHS software and operational tests will resume on Jul 2017
	Guyana	Jun 2011	Implemented and operational
	Venezuela	Dec 2016	Pending operational tests when Venezuela has implemented its new AMHS system.
Uruguay	Argentina	Jul 2017	Positive P1 connectivity between Ezeiza and Montevideo achieved. Operational tests in July 2017.
	Brazil	Jun 2017	IP connectivity tests completed (first week October 2016) Protocol P1 successfully concluded the week of 28 November 2016 (30 November and 1

STATES	AMHS INTERCONNECTION REQUIREMENTS	DATE OF IMPLEMENTATION	COMMENTS
			December). It is expected to begin operations before the end of the first semester 2017.
Venezuela	Argentina	Jun 2016	Implemented and operational (out of service- failure in AMHS Venezuela) Pending operational tests when new AMHS system starts operations on August 2017.
	Brazil	Sep 2017	Pending operational tests when new AMHS system starts operations.
	Colombia	Apr 2017	Pending operational tests when new AMHS system starts operations on August 2017.
	Ecuador	Dec 2016	Pending operational tests when new AMHS system starts operations on August 2017.
	Guyana	Sep 2017	New AMHS system will be installed in French Guiana at early 2018.
	French Guiana	Jul 2018	AMHS pending implementation
	Peru	Sep 2017	Pending operational tests when new AMHS system starts operations on August 2017.
	Suriname	Sep 2017	Pending operational tests when new AMHS system starts operations on August 2017.

Green highlighted AMHS interconnection operative
Light green: almost operational

APÉNDICE E / APPENDIX E

NATIONAL FOCAL POINTS/PUNTOS FOCALES NACIONALES
IMPLEMENTATION OF INTERCONNECTION OF AMHS SYSTEM /IMPLANTACIÓN INTERCONEXIÓN DE SISTEMAS AMHS

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
ARGENTINA	EANA /ANAC	Hernan Gabriel Canna	Especialista CNS EANA	(54 11) 4480-2362	hcanna@eana.com.ar
		Javier Shenk	Gerente CNS (Communication, Navigation and Surveillance) EANA	54911 28370135	Jschenk@eana.com.ar
		Moira Callegare	Jefe departamento CNS (ANAC)	(54 11) 594-13097	mcallegare@anac.gob.ar
BOLIVIA	AASANA	Remigio Blanco	Responsable de Telecomunicaciones AASANA	(591 2) 237-0340	rblanco@aasana.bo
BRAZIL/ BRASIL	DECEA	Eduardo Alberto do Nascimento Fontes	Coordinación técnica SDTE/DECEA	552121016620	eduardoeanf@decea.gov.br
		Tomy Marques de Souza	Asesor de Comunicaciones	(5521) 21016392 (5521)982547971	tomytms@decea.gov.br
COLOMBIA	UAEAC	Gabriel Guzmán	Especialista de Comunicaciones	(571) 296-2940 (57) 317-656 7202	gabriel.guzman@aerocivil.gov.co
		Robinson Quintero	Especialista de Comunicaciones	(57) 1 296 2241	robinson.quintero@aerocivil.gov.co
CHILE	DGAC	Christian Vergara	Especialista comunicaciones	(56 2) 836-4005 (56 2) 644-8345	cvergara@dgac.gob.cl
ECUADOR	DAC	Raul Avellan	Especialista CNS coordinador sistema AMHS	(593 4) 269-2829 (593 9) 9530-2735	raul.avellan@aviacioncivil.gob.ec

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
GUYANA	Guyana Civil Aviation	Mortimer Salisbury	Supervisor - AN & T	(592) 261-2569	mbsalisbury2000@yahoo.com
GUYANA FR./FRENCH GUIANA					
PANAMA	Autoridad Aeronáutica Civil (AAC)	Daniel de Avila	Supervisor Dep. de COM	507 315 9877	deavila@aeronautica.gob.pa
		Abdiel Vásquez	Jefe Depart. CNS	507) 315-9877/78/44	abvasquez@aeronautica.gob.pa
PARAGUAY	DINAC	Víctor Morán Maldonado	Jefe Departamento de Comunicaciones	(595 21) 758 5208	moranchu@gmail.com
		Aldo Pereira	Jefe departamento técnico AMHS	595217585257 / +595217585255	aldopereira26@gmail.com
PERÚ	CORPAC	Jorge Garcia	Jefe de Comunicaciones	5112301000 Ext 3131	jgarcia@corpac.gob.pe
		Raul Anastasio Granda	Supervisor Comunicaciones AMHS-AFTN Área de Comunicaciones Fijas Aeronáuticas	(511) 230-1018	ranastacio@corpac.gob.pe
SURINAM/ SURINAME	Ministry of Transport, Communication and Tourism, Civil Aviation Department	Mitchell Themen	CNS Technical Division	(597) 325-123 (597) 325-172 (597) 497-143	mickiano@live.com
URUGUAY	DINACIA	Raul Pelayo	Jefe de Comunicaciones		wiledda@hotmail.com
VENEZUELA	INAC	Vicente Fiore	Coordinador área técnica	58 212 3551412 58 4166235643	vfffedullo@gmail.com
		Norelys Blanco	Servicios Integrados COM Maiquetía (SIM-COM)	58 212 3552010	norelys.blanco@inac.gob.ve

APPENDIX F

SAM WORKSHOP ON THE USE OF THE NEW ICAO FREQUENCY FINDER TOOL

(Lima, Peru, from 6 to 10 March 2017)

AGENDA

1. Introduction

2. Aeronautical Frequency Planning

- World Radiocommunication Conference (WRC) Process
- Explaining the Planning Criteria
- Current SAM Frequency Allotment Plan

3. Frequency Finder (FF) Tool

- Frequency Finder Tool Requirements
- FF Basic Function
- FF Installation

4. Frequency Finder (FF) Tool Exercises

- Performing Basic Exercises (scenarios prepared)
- Updating the States Frequencies in the Global Database
- Download and Review the Assignment in the Global Database

5. FF Deployment and Implementation Plan

- CAR/SAM Digital Regional Air Navigation Plan (e-ANP)
- SAM States Implementation Plan and assignments
- Frequency Coordination/Interregional Issues

APPENDIX G

NATIONAL FOCAL POINTS/PUNTOS FOCALES NACIONALES FREQUENCY FINDER

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
ARGENTINA	ANAC	Diego Martín Frigerio	Inspector CNS	(5411) 59413000 EXT. 69744	dfrigerio@anac.gob.ar
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BRASIL	DECEA Subdepartamento Técnico – Divisão de Coordenação Técnica Rio de Janeiro - Brasil	Vahé Antoine Yaghdjian	Ing. Telecomunicaciones	Tel:(21) 2101 – 6487 / (21) 99955 – 3305	vahevay@decea.gov.br vahe.antoine@gmail.com
CHILE	DGAC	Ricardo Velásquez Aravena	Jefe de sección de servicios de vuelo	(56 2) 2290 4660 Anx 4661	rvelasquez@dgac.gob.cl
COLOMBIA					
ECUADOR	DGAC	Luis David Minango López	Especialista CNS I	(593) 2294 7400 ext 4538	davidminango@aviacioncivil.gob.ec
GUYANA					
GUYANA FR./ FRENCH GUIANA					
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STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
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SURINAM/ SURINAME	Department of Civil Aviation	Kofi Orlando Kenneth	Telecom technician	597498898 Ext 317 597085319	oomken80@gmail.com
URUGUAY	DINACIA	Horacio Berreta	Asesor técnico	598 99397173	horaciobk@gmail.com
VENEZUELA					

Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

5.1 Under this agenda item, the following papers were examined:

a) WP/10 - *Follow-up to the implementation of activities related to AIDC interconnection between adjacent ACCs* (presented by the Secretariat);
b) WP/11 - *Follow-up to the implementation of activities for improving ATM situational awareness in the SAM Region* (presented by the Secretariat); and
c) NE/19 - *Follow-up to the implementation of automated systems for FPL 2012 and analysis of errors and duplication of flight plans in the SAM Region* (presented by the Secretariat).

Follow-up to the implementation of activities related to AIDC interconnection between adjacent ACCs

5.2 The Meeting updated the activities carried out for the implementation of AIDC interconnections between adjacent ACCs, which are presented in **Appendix A** to this agenda item.

AIDC interconnection requirements table

5.3 Based on the information presented in Appendix A, the Meeting updated the table of AIDC interconnection requirements in the SAM Region and the status of implementation foreseen for the period 2017-2019, as shown in **Appendix B** to this agenda item.

List of focal points

5.4 The Meeting reviewed the list of AIDC focal points presented as **Appendix C** to this agenda item.

Interregional AIDC connections

5.5 The Meeting took note that Ecuador and Panama had carried out successful AIDC tests with CENAMER. At the same time, as follow-up to conclusion SAT/21-17 *Implementation of AIDC*, coordination had been start to begin tests between SAM and AFI Regions, specifically between Argentina (Ezeiza ACC) and South Africa (Johannesburg), and Brazil (Atlantic ACC) with Senegal (Dakar ACC) and South Africa (Johannesburg ACC).

5.6 The Meeting took note that AFI and SAM States were using the ASIA/PAC ICD (Interface Control Document); therefore there should be AIDC compatibility between ACC automated systems. Tests had not started because the AIDC in the Atlantic ACC of Brazil had not been completed yet and the CAFSAT AFTN channel in Argentina had been failing continuously. Tests were to be resumed on the second semester of 2017.

5.7 Taking into account the activities carried out to date, those scheduled and approved for 2017, and those considered for implementation during the period 2017-2019, the Meeting updated the action plan for the implementation of the AIDC interconnection, presented as **Appendix D** to this agenda item.

AIDC training events for 2018

5.8 The Meeting acknowledged the importance of analysing the application of module B1-FICE through FF ICE, and the harmonisation of AIDC within this new concept. In this regard, it considered the need to conduct a 3-day seminar on AIDC implementation and evolution, in Lima, Peru, at the beginning of the second half of 2018. In this regard, the Meeting requested that this event be submitted to the approval of the next meeting of the Coordination Committee of Project RLA/06/901. This event would require the participation of an expert in the area, one scholarship per member State, and simultaneous interpretation services.

5.9 The Meeting analysed the schedule of AIDC courses for Bolivia and Venezuela during the period 2018-2019, depending on the date in which these States have their new automated systems already operational in the respective ACCs. These courses would be conducted locally in the States. In this regard, the next meeting of the Coordination Committee of Project RLA/06/901 would be requested to organise a 1-week mission by two automation experts of the Region to conduct practical AIDC courses for the controllers of the Maiquetía and La Paz ACCs.

Considerations on AIDC implementation meetings

5.10 The Meeting considered that, given the wide range of topics to be discussed at AIDC implementation meetings, the fourth AIDC implementation meeting to be held in Lima, Peru, on April 2018 should have a duration of five days instead of three. Project RLA/06/901 supports these events with a scholarship for its member States. In this sense, the Meeting considered that the next meeting of the Coordination Committee of Project RLA/06/901 should approve the extension of the scholarships from three to five days.

Follow-up to the implementation of automated systems for FPL 2012 and analysis of errors and duplication of flight plans in the SAM Region

5.11 The Meeting analysed the following aspects related to the follow-up to the implementation of automated systems for FPL 2012 an the analysis of errors and duplication of flight plans in the SAM Region:

- Status of implementation of automated systems for FPL/2012
- Procedures for flight plan filing by SAM States
- Procedures to mitigate duplication/multiplicity of flight plans

Status of implementation of automated systems for FPL 2012

5.12 Regarding progress made in the implementation of automated systems for FPL 2012, the Meeting took note that Bolivia had started the implementation of an ATM automation project at the ATS units of La Paz, Cochabamba, Santa Cruz, and Trinidad, called CIDACTA. The automated system to be installed at those ATS units is the Thales TopSky, to be completed in 2019. By the end of 2017, the FDPs of the ACCs of Brazil would be in a position to process FPL 2012, thus eliminating the converters

currently installed. Chile had installed AFTN rather than AMHS terminals at national level, and did not have templates compatible with FPL 2012. Peru had started the modernisation of the Lima ACC (INDRA AIRCON 2100), which, *inter alia*, would correct existing limitations in the number of characters in box 10 of FPL 2012. The modernisation process was to be completed by the end of the third quarter of 2017. Finally, Paraguay and Venezuela expected to have an automated system in their ACCs that accepted FPL 2012 by the end of 2017.

5.13 The analysis of the status of implementation of automated systems in the SAM Region in compliance with Amendment 1 to Edition 15 of Doc 4444 (FPL2012) revealed that out of a total of 27 ACCs in the SAM Region, 67% had implemented the update in flight plan processors (FDP), 22% continued using converters, and the remainder still applied the manual solution, since the automated systems installed in the ACCs did not comply with FPL 2012 or they were inexistent. Regarding the implementation of AMHS/AFTN terminals with FPL 2012 templates capable of detecting completion errors, 67% of the States were in compliance.

5.14 In this regard, almost no progress had been made in the implementation of automation for FPL 2012 since the SAM/IG/18 meeting. **Appendix E** to this agenda item contains an updated table of the status of implementation of automation in compliance with amendment 1 to Edition 75 of Doc 4444.

Procedures for flight plan filing by SAM States

5.15 The Meeting updated the procedures used by the States of the Region for flight plan filing, as shown in **Appendix F** to this agenda item.

Procedures for mitigating flight plan duplication/multiplicity

5.16 The Meeting noted that the analysis of flight plan filing procedures used by the States of the Region revealed that many States had duplication of international flight plans of commercial airlines, since most of them were filed using two means: directly by flight planning systems contracted by airlines (Lido, Jeppesen) through the AFTN network, and addressed to the ACC FDP of the airport of departure; and in hard copy to the ARO/AIS offices as a regulatory requirement. These offices relay the information through the AFTN/AMHS network to the ACC FDP of the airport of departure. This results in duplication at the level of the FDPs, causing flight plan rejection or processing conflicts.

5.17 In this regard, the Meeting agreed with the AIDC/3 meeting in the sense that, in order to reduce flight plan duplication at the level of the ACC FDP of the airport of departure, the international flight plans sent through the AFTN network by flight planning systems hired by the airlines should be addressed to the corresponding ARO/AIS offices at the airport of departure so that they can be relayed via AFTN/AMHS to the corresponding ACC FDPs of the airport of departure. This process would be applied during a period of transition established by the States. Once effective reception of flight plans directly through the AFTN/AMHS by the flight planning systems hired by the airlines has been achieved, these could be directly related to the FDP, with copy sent to the corresponding ARO/AIS offices. Accordingly, the meeting formulated *Conclusion AIDC/3-1 - Procedure for reducing duplication/multiplicity of international flight plans*.

5.18 The Meeting noted that on 10 May 2017 a teleconference was held among AIDC focal points and AIS personnel to analyse the mitigation procedure, with 25 participants (AIDC focal points and AIS/ARO staff) from 9 SAM States (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru, Uruguay, and Venezuela).

5.19 As a result of the teleconference, it was agreed that the States would review and establish arrangements with the operators in order to follow the procedure indicated in paragraph 5.17 of this agenda item. Another solution that was proposed involved informing the aviation community about the procedure through aeronautical information circular (AIC).

5.20 Brazil deemed it convenient to first plan meetings with airline operators and, based on the results of such meetings, to issue an AIC with guidance on the filing and processing of FPLs.

5.21 The Meeting took note of the aeronautical information circular issued by Peru (AIC 04/2017 *"Filing of the Flight Plan via AMHS or AFTN for companies operating scheduled flights"* effective on 9 May 2017, shown in **Appendix G**. In this regard, the Meeting considered that the AIC developed by Peru, could be used by interested SAM States for the implementation of the procedure to mitigate duplication/multiplicity of flight plans in its second stage, that is, transmission of the flight plan directly to the ACC FDP, with copy sent to the ARO/AIS Office.

5.22 The Meeting agreed on the need to establish an AFTN address for receiving flight plans, which would be XXXXZPZX, which corresponds to ARO Offices. In this sense, the Meeting formulated the following conclusion:

Conclusion SAMIG/19-02 – Implementation of procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans

In order to implement procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans, the States:

a) should establish AFTN address XXXXZPZX, corresponding to the ARO/AIS Offices, as the only address for receiving flight plans.

b) could use as a reference the AIC model developed by Peru, shown in Appendix G to this agenda item, when filing the flight plan directly to the ACC FDP.

5.23 The Meeting agreed with Conclusion AIDC/3-2 – *National centre for the reception, processing and distribution of flight plans* formulated by the AIDC/3 meeting, which states that, in order to ensure efficient flight plan management, the States of the Region should study the possibility of implementing a national centre for the reception, processing and distribution of flight plans and associated messages. The flight plans received at this centre would be validated, corrected if possible and redistributed to the final addressees through the AFTN/AMHS network.

Follow-up to the implementation of activities of the Project for Improving ATM Situational Awareness in the SAM Region

5.24 Regarding activities for improving situational awareness, the Meeting took note of the development of a preliminary *Guide with technical considerations to support ATFM implementation*, with the support of Project RLA/06/901 and the Aeronautical Administration of Brazil, through which a one-week mission was conducted by an automation expert of Brazil from 28 November to 2 December 2016 to the ICAO South American Office. The Meeting considered that this document should be circulated to the States for review. The guide appears as **Appendix H** to this agenda item.

5.25 The Meeting also analysed the deliverables of project C2, shown in **Appendix I**, and updated them, with the addition of the aforementioned Guide.

5.26 The Meeting took note of the updates made by SAM States to Table CNS II CAR/SAM/5, Volume II. In this regard, Argentina reported some additional changes. The updated table appears in **Appendix J** to this agenda item. The Meeting also took note of the status of implementation of ADS-B in the SAM Region, as shown in **Appendix K** to this agenda item.

5.27 The Meeting took note that a seminar on ADS-B implementation in the CAR/SAM Regions would be conducted in Mexico City, on 25-27 September 2017, and that the RCC/11 had approved the granting of one scholarship per member State of Project RLA/06/901.

5.28 The Meeting discussed the benefits and operational advantages to be derived from the satellite ADS-B service, such as:

- Filling the existing gaps in surveillance systems of the States of the Region
- Coverage of boundary areas as an alternative to the exchange of surveillance data between adjacent States
- Coverage in oceanic areas beyond the reach of ground-based surveillance systems
- Surveillance solution for non-FIR airspace
- Constant updating of target position, rather than periodic updating provided by ADS-C

5.29 In this regard, the Meeting deemed it advisable to conduct a study to analyse the convenience and feasibility of adopting the satellite ADS-B service proposed by AIREON at regional level. The Meeting considered that this study could be carried out by an expert of the Region, with the support of Project RLA/06/901. In this sense, the conduction of a one-week mission to Lima, Peru, during the first quarter of 2018 would be submitted for approval to the next Coordination Meeting of Project RLA/06/901. It is expected that the study will be presented at the SAM/IG/21 meeting.

APPENDIX A

Argentina

The AIDC between the ACC of Cordoba and the ACC of Ezeiza continues in the pre-operational phase. Problems with the ABI message in both centers have been solved. Letter of operational agreement between Ezeiza ACC and Cordova ACC was amended regarding AIDC operation.

An AIDC training schedule is planned to carry out during the months of July, August and September 2017 addressed to the controllers of the ACCs of Comodoro Rivadavia, Mendoza and Resistencia. Once these trainings are completed, the pre operational phase of the AIDC between these centers shall be activated.

It is expected that by the end of the second semester of 2017, the national ACCs become in operational phase. The operational phase of the AIDC with the adjacent regional ACCs is expected to be in the period of 2018-2019.

AIDC tests at regional and interregional level would be carried out upon requests. In this respect, teleconference will be carried out for the respective coordination's.

Bolivia

By 2019, is expected that the automatization of the main ATS dependencies of Bolivia becomes operational. The automated systems to be installed are from the company Thales - model Top Sky. Once the automatization is in operation in ATS units, Bolivia will start the coordination's with the ACCs of the adjacent States for the AIDC test performance.

Brasil

The AIDC is in operational phase since mid-2016 between internal ACCs except Atlantic ACC. AIDC connection with Atlantic ACC is foreseen to be operational by the second semester 2017.

AIDC tests were carried out with the ACC of Asuncion, but the results were unsatisfactory. The tests will continue during the 2017. Successful operational tests were carried out between Brazil and Venezuela in order to exchange flight plans data and automated transfer using the messages of Document No. 4444. Operational phase is expected for June 2017.

Likewise, AIDC between Brazil and Peru has an addressing problem pending to be solved regarding internal messenger in order to determine which AIDC address will be used for the interconnection between Amazonico ACC and Lima ACC to begin pre-operational phase. This matter is expected to be solved by June 2017.

In 2017 Brazil published a national document for the operation of the AIDC: CIRCEA 100-75 - "AIDC operations between ATS units".

Chile

The ATS controller's staff of the ACC of Iquique involved with the AIDC operations have been already trained and would be ready to perform the tests between the ACC of Iquique and the ACC of Lima. In this regard, Peru informed to the ICAO SAM Office (Letter No. MTC CORPAC S.A.

GCA.GT.7.2.050.2017/04, dated March 10, 2017) that in view that in the ACC of Lima is being implemented the contract for updating the automated system by the company INDRA Sistema S.A., the AIDC tests between the ACC of Lima and the ACC of Iquique will be carried out from 19 to 23 June, 2017. The AIDC/3 Meeting considered the need of beginning the coordination's between Chile and Peru to elaborate a letter of operational agreement that includes the AIDC operations between the ACC of Lima and the ACC of Iquique.

The AIDC between the ACC of Puerto Mont and the ACC of Punta Arena *is* in pre-operational phase since November 2016.

Good disposition of Chile to carry out AIDC tests between Puerto Mont ACC and Punta Arenas ACC with the Comodoro Rivadavia ACC. The migration to the AIDC pre operational phase between the ACC of Iquique with the ACC of Cordoba will be done by the end of the second semester of 2017. The AIDC operations of the ACC of Santiago with the regional adjacent ACCs will be carried out once the software update of its automated system period 2018-2019 is installed.

Colombia

The AIDC interconnections implemented at the national and intraregional level are still in a pre-operational phase. The amendment of the letter of agreement between the ACC of Bogotá and the ACC of Lima was signed with the inclusion of the AIDC procedure in November 2016.

Ecuador

The operational implementation of the AIDC between the ACC of Guayaquil and the APP of Quito has been given since February 2017, signing an amendment to the operational letter on February 1, 2017. There have been positive tests between the ACC of Guayaquil and CENAMER and coordination's to migrate to a pre-operational phase will continue. In relation to the operation of the AIDC between the ACC of Lima and the ACC of Guayaquil, operations in the operational phase were interrupted until the update of the automated system of the ACC of Lima is completed; scheduled for October 2017. By the end of 2017, is expected to count with the operation of the AIDC between the ACC of Guayaquil and the APP of Manta and Shell. In March 2017, the problems in the exchange of AIDC messages between the automated systems of Ecuador and Colombia were solved, after which the respective coordination's between the focal points of each country and ATM officials of the States for the establishment of a schedule of activities until the third quarter of this year and continuity of the pre - operational phase.

French Guyana

The AIDC implementation with the ACCs of the adjacent States is foreseen to take place in the period of 2017 – 2019.

Guyana

The AIDC implementation with the ACCs of the adjacent States is foreseen to take place in the period of 2017 – 2019.

Panama

In the list of requirements of the AIDC of Panama with the regional dependencies of ATS the implementation of the AIDC with the Rio Negro and the APP of Cali was included. The Panamanian Aeronautical Administration signed a technical support contract with the company Thales for the revision and updating of the of automated system software installed in the ACC of Panama which includes the solution to the AIDC problem (Freezing of the application by the accumulation of messages) as well as the operational technical training. This process would be completed by November 2017. By this date, AIDC is expected to be in operational phase with all the adjacent ACCs.

Paraguay

Thanks to the support of the regional project RLA/06/901, during the week of November 28 to December 2, 2016, an AIDC workshop was held for the controllers involved in the ACC of Asunción. Training was provided for 26 (twenty-six) ATCOs and 2 (two) CNS Technicians for the correct use of AIDC as a coordination tool. The course was delivered by AIDC experts from Argentina and Peru. Also during the week of November 28, 2016, AIDC tests were conducted between the ACC of Asunción and the ACC of Resistencia. By the end of 2017 is expected to update the automated system software of the ACC of Asunción.

Peru

The activities of updating the automated system of the ACC of Lima have been initiated, which would be completed by October 2017.

Considering this updating process, Peru would proceed to carry out new AIDC tests with the following ACCs (Information reported through Letter No. MTC-CORPAC-S.A.-GCA.GT.7.2.050.2017/04 dated March 10, 2017):

AIDC Tests Bogotá from 12 to 16 June 2017
AIDC Tests Iquique from 19 to 23 June 2017
AIDC Tests Guayaquil from 26 to 30 June 2017

These dates could be met if tests are conducted from the ACC Simulator (already updated system), or from the operational ACC (old system). Peru shall inform ICAO shortly if it is planning a change in dates in order to perform tests from the operational ACC when the system is already updated.

With regard to pending tests between Amazonian ACC and Lima ACC, Peru expressed that a problem had arisen since Amazonico ACC's AIDC address, which was configured for the interconnection (SBAZZQZX), was different from the one received in messages (SBAZZQZR). In this regard, Brazil is analyzing the internal routing of messages in its territory to define the address to be used, so as to resume tests on June 2017.

Suriname

The AIDC implementation with the ACCs of the adjacent States is foreseen to take place in the period of 2018 – 2019.

Uruguay

The AIDC implementation with the ACCs of the adjacent States is foreseen to take place in the period of 2017 – 2019.

Venezuela

The AIDC implementation with the ACCs of the adjacent States is foreseen to take place in the period of 2018 – 2019. Operational tests have successfully carried out transferring ATS messages using messages from Doc 444 between Manaus ACC and Maiquetia ACC. It is expected to enter into operational phase in June 2017.

APPENDIX B

(AIDC) GROUND-GROUND DATA INTERCONNECTION LEVEL REQUIREMENTS IN THE SAM REGION

ARGENTINA						
ACC	ACC ADJ	Flight plan Interconnection levels *				Comments
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CORDOBA (AUT. INDRA AIRCON2100) (2007)	IQUIQUE	XI			X	Positive AIDC tests - March 2016 As a result of the tests, the transmission speed has to be incremented from 2400 to 9600 bit/seg AIDC foreseen to be operational at the end of the second semester of 2018.
	LA PAZ	XI			X	AIDC foreseen for period 2017-2019
	EZEIZA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the first semester of 2017
	MENDOZA	XI			X	AIDC pre-operational phase by the second semester of 2017
	RESISTENCIA	XI			X	AIDC pre-operational phase by the second semester of 2017
RESISTENCIA (AUT. INDRA AIRCON2100) (May 2016)	ASUNCION	XI			X	Positive AIDC tests were conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were conducted in the end of 2016. AIDC foreseen to be operational by the first semester of 2018.
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2017
	CURITIBA	XI			X	AIDC foreseen by the first semester of 2018
	EZEIZA	XI			X	AIDC pre-operational by the second semester of 2017
	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2018

EZEIZA (AUT. INDRA AIRCON2100) (2007)	COMODORO RIVADAVIA	XI			X	AIDC pre-operational by the second semester of 2017
	MENDOZA	XI			X	AIDC pre-operational by the second semester of 2017
	PUERTO MONTT	XI			X	AIDC by the first semester of 2018
	CORDOBA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the second semester of 2017
	RESISTENCIA	XI			X	AIDC pre-operational by the second semester of 2017
	JOHANNESBURG	XI			X	AIDC tests foreseen by the first semester of 2017
	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2018
MENDOZA (AUT INDRA AIRCON2100) (May 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2017
	SANTIAGO	XI			X	AIDC foreseen for period 2017-2019
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2017
COMODORO RIVADAVIA (AUT INDRA AIRCON2100) (June 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2017
	PUNTA ARENAS	XI			X	AIDC by the end of the second semester of 2017
	PUERTO MONTT	XI			X	AIDC by the end of the second semester of 2017

BRAZIL						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
AMAZÓNICO (MANAUS) AUTO. SAGITARIO ATECH	BRASILIA	XI			XI	AIDC implemented June 2016
	BOGOTÁ	XI			X	AIDC operational foreseen by December 2017
	CAYENNE	XI			X	AIDC foreseen for period 2017-2019
	CURITIBA	XI			XI	AIDC implemented July 2016
	GEORGETOWN	XI			X	AIDC foreseen for period 2017-2019

	LA PAZ	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	AIDC foreseen for December 2017
	MAIQUETIA	XI	X		X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2017-2019
	RECIFE	XI			X	AIDC implemented since 2 May 2016
	ATLÂNTICO	XI			X	July 2017
BRASILIA AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	RECIFE	XI			XI	AIDC implemented June 2016
CURITIBA AUTO. SAGITARIO ATECH	AMAZONICO	XI			XI	AIDC implemented July 2016
	ASUNCION	XI			X	AIDC foreseen for December 2017
	BRASÍLIA	XI			Xi	AIDC implemented July 2016
	LA PAZ	XI			X	AIDC foreseen for period 2018-2019
	MONTEVIDEO	XI			X	AIDC foreseen for the first semester of 2018
	RECIFE	XI			XI	AIDC implemented July 2016
	RESISTÊNCIA	XI			X	AIDC foreseen by the first semester of 2018
	ATLÂNTICO	XI			X	July 2017
RECIFE AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC Implemented on 2 May 2016
	BRASÍLIA	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	ATLÂNTICO	XI			X	July 2017
ATLÁNTICO AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			X	July 2017
	CURITIBA	XI			X	July 2017
	DAKAR	XI			X	AIDC TBD
	JOHANNESBURG	XI			X	AIDC TBD
	LUANDA	XI			X	AIDC TBD
	MONTEVIDEO	XI			X	AIDC foreseen for period 2017-2019
	RECIFE	XI			X	July 2017
	CAYENNE	XI			X	AIDC foreseen for period 2017-2019

BOLIVIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LA PAZ (MANUAL)	AMAZÔNICO	XI			X	AIDC foreseen for period 2018-2019
	ASUNCION	XI			X	AIDC foreseen for period 2018-2019
	CURITIBA	XI			X	AIDC foreseen for period 2018-2019
	CORDOBA	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	AIDC foreseen for period 2018-2019
	IQUIQUE	XI			X	AIDC foreseen for period 2018-2019

CHILE						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
SANTIAGO (AUTO THALES TOPSKY)	IQUIQUE	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	AIDC foreseen for period 2018-2019
	MENDOZA	XI			X	AIDC foreseen for period 2018-2019
	PUERTO MONTT	XI			X	AIDC foreseen for period 2018-2019
IQUIQUE (AUTO INDRA AIRCON 2100)	CORDOBA	XI			X	Positive AIDC tests - March 2016. Tests results indicate the requirement of increase transmission speed from 2400 to 9600 bit/sec. AIDC operational foreseen by the first semester of 2018
	LA PAZ	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	Positive AIDC tests conducted in February 2016. AIDC foreseen to be operational by the second semester of 2017

PUERTO MONTT (INDRA AUTOMATED)	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	PUNTA ARENAS	XI			X	AIDC pre operational since November 2016.
	EZEIZA	XI			X	AIDC by the first semester of 2018
	COMODORO RIVADAVIA	XI			X	AIDC by the first semester of 2018
PUNTA ARENAS (INDRA AUTOMATED)	PUERTO MONTT	XI			X	AIDC pre operational since November 2016
	COMODORO RIVADAVIA	XI			X	AIDC by the first semester of 2018

COLOMBIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
BOGOTÁ (AUTO INDRA AIRCON 2100)	AMAZÔNICO	XI			X	AIDC foreseen to be operational for December 2017
	CENAMER	XI			X	AIDC foreseen for period 2017-2019
	GUAYAQUIL	XI			XI	Positive AIDC tests conducted AIDC in pre-operational phase (August 2015).
	LIMA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015) Amendment to the operational agreement including the AIDC signed in November 2016.
	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by second semester 2017.
	BARRANQUILLA	XI			XI	AIDC pre-operational (March 2016)
BARRANQUILLA (AUTO INDRA AIRCON 2100)	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by second semester 2017.
	BOGOTA	XI			XI	AIDC pre-operational (March 2016)
	KINGSTON	XI			X	AIDC TBD

	CURAÇAO	XI			X	AIDC TBD
APP Rio Negro (AIRCON 2100)	PANAMA	XI			X	Tests on second semester 2017
APP Cali (AIRCON 2100)	PANAMA	XI			X	Tests on second semester 2017

ECUADOR						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GUAYAQUIL AUTO INDRA AIRCON 2100	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015)
	LIMA				XI	AIDC operational implementation (31 March 2016)
	CENAMER	XI			X	Positive AIDC tests conducted. AIDC foreseen for period 2017-2019

FRENCH GUIANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CAYENNE AUTO ADACEL AIDC not installed	AMAZÔNICO	XI			X	AIDC foreseen for period 2017-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2017-2019
	PIARCO	XI			X	AIDC foreseen for period 2017-2019
	DAKAR	XI			X	AIDC foreseen for period 2017-2019
	ATLANTICO	XI			X	AIDC foreseen for period 2017-2019

GUYANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GEORGETOWN AUTO INTELCAN AIDC not installed	AMAZONICO	XI			X	AIDC foreseen for period 2017-2019
	PIARCO	XI			X	AIDC foreseen for period 2017-2019
	MAIQUETIA	XI			X	AIDC foreseen for period 2017-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2017-2019

PANAMA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PANAMA (AUTO THALES)	BOGOTA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by second semester 2017.
	BARRANQUILLA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by second semester 2017.
	CENAMER	XI			X	Positive AIDC tests conducted. Pre operational phase. AIDC foreseen to be operational by the second semester 2017
	APP CALI	XI			X	Tests on second semester 2017.
	APP RIO NEGRO	XI			X	Tests on second semester 2017.

PARAGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
ASUNCION AUTO AIRCON 2100 INDRA	CURITIBA	XI			X	AIDC foreseen for December 2017
	LA PAZ	XI			X	AIDC foreseen for period 2018-2019
	RESISTENCIA	XI			X	Positive AIDC tests conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were held by the end of 2016. AIDC foreseen to be operational by the first semester 2018.

PERU						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LIMA AUTO AIRCON 2100 INDRA	AMAZONICO	XI			X	AIDC foreseen to be operational by December 2017
	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational phase (August 2015). Amendment to the operational agreement including the AIDC signed in November 2016.
	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	IQUIQUE	XI			X	Positive AIDC tests conducted in February 2016. AIDC foreseen to be operational by the second semester of 2017.
	GUAYAQUIL	XI			XI	AIDC operational (31 March 2016)
	LA PAZ	XI			X	AIDC foreseen for period 2018-2019

SURINAME						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PARAMARIBO (AUTO INTELCAN) AIDC not installed	AMAZÓNICO	XI			X	AIDC foreseen for period 2017-2019
	GEORGETOWN	XI			X	AIDC foreseen for period 2017-2019
	PIARCO	XI			X	AIDC foreseen for period 2017-2019
	CAYENNE	XI			X	AIDC foreseen for period 2017-2019

URUGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MONTEVIDEO (AUTO INDRA AIRCON2100)	CURITIBA	XI			X	AIDC foreseen by first semester 2018
	EZEIZA	XI			X	AIDC foreseen by the first semester 201
	RESISTENCIA	XI			X	AIDC foreseen by first semester 2018
	ATLANTICO	XI			X	AIDC foreseen for period 2017-2019
	JOHANNESBURG	X			X	AIDC TBD

VENEZUELA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MAIQUETIA (AUTO ATECH X4000) AIDC not installed	AMAZONICO	XI	XI		X	AIDC foreseen for period 2018-2019
	BOGOTA	XI			X	AIDC foreseen for period 2018-2019
	BARRANQUILLA	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC TBD
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019
	CURAZAO	XI			X	AIDC TBD
	SAN JUAN	XI			X	AIDC TBD

*** X PLANNED**
***XI IMPLEMENTED AND IN PRE-OPERATIONAL OR OPERATIONAL PHASE**

APPENDIX C

NATIONAL FOCAL POINTS/PUNTOS FOCALES NACIONALES
IMPLEMENTATION OF INTERCONNECTION OF AUTOMATED SYSTEMS/IMPLANTACIÓN INTERCONEXIÓN SISTEMAS AUTOMATIZADOS

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
ARGENTINA	EANA	Javier Schenk	Gerente CNS EANA	(549 11) 5848 6936	Jschenk@eana.com.ar
		Osvaldo Oscar Godoy	Jefe ANS Subregional Ezeiza	Cel (54911) 28836444 5411 44802309	ogodoy@eana.com.ar
		Daniel Coria	Coordinador nacional sistema automatizados	T.E:+5491135942686	dcoria@eana.com.ar
	DGCTA	Mario Correa	Jefe sistemas automatizados ATS	(5411) 43176015	mario_correa@yahoo.com.ar
	ANAC	Diego Agüero	Técnico automatización	(54911) 2258-7836 (5411) 5941-3000 Ext.69-128	daguero@anac.gob.ar
BOLIVIA	DGAC	Jaime Yuri Álvarez Miranda	Jefe Unidad CNS	Tel: +5912 2444450 int. 2651	jalvarez@dgac.gob.bo
BRAZIL/ BRASIL	DECEA	Luiz Antonio dos Santos	Asesor ATM	5521 2101 6088	luizantoniolas@decea.gov.br
		Murilo Loureiro	Asesor sistemas automatizados	(55 21) 2101-6658	loureiromal@decea.gov.br
COLOMBIA	UAEAC	Harlen Mejía	Jefe de Aeronavegación		harlen.mejia@aerocivil.gov.co
		Mauricio Ferrer	Especialista ATM sistemas automatizados		mauricio.ferrer@aerocivil.gov.co
		Pedro Alejandro Velasco	Jefe Grupo de Vigilancia Aeronáutica	(57) 317656-7203	pedro.velasco@aerocivil.gov.co

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
CHILE	DGAC	Pedro Pastrian	Especialista radar y sistemas automatizados	(56 2) 836-4005 (56 2) 644-8345	ppastrian@dgac.gob.cl
		Christian Vergara	Especialista comunicaciones	(56 2) 836-4005 (56 2) 644-8345	cvergara@dgac.gob.cl
		Gustavo Cáceres Moraga	Controlador Tránsito Aéreo Ofc. Operaciones ACCS	(56 2) 91581853 (56 2) 28364018	gcaceres@dgac.gob.cl
ECUADOR	DAC	Raul Avellan	Especialista CNS coordinador sistema AMHS	(593 4) 269-2829 (593 9) 9530-2735	raul.avellan@aviacioncivil.gob.ec
		Jorge Zúñiga	Programación FDP y coordinaciones	(593 2) 2604477	jorzu40@hotmail.com
		Eugenio Espinoza	Controlador ACC Guayaquil Radar	(593) 981269823	eugenio.espinoza@aviacioncivil.gob.ec
GUYANA					
GUYANA FR./ FRENCH GUIANA	Service de la Navigation Aérienne aux Antilles-Guyane (SNA-AG)	Michel Areno	Head French Guiana ACC	(594) 694455617	michel.areno@aviation-civile.gouv.fr
PANAMA	Autoridad Aeronáutica Civil (AAC)	Mario Antonio Facey Howard	Especialista radar y sistemas automatizados	(507) 315-9852/65	mfacey@aeronautica.gob.pa
PARAGUAY	DINAC	Digno Nelson Cardozo González	Técnico Especialista en Radar y Sistemas Automatizados	(595) 9217585016 Cel: (595) 961779106	nechicar@gmail.com
		Diego Ramón Aldana Fernández	Supervisor ACC/APP	(595) 21 645-707	diegoaldana@gmail.com

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
PERÚ	CORPAC	Johnny Ávila	Jefe equipos centro de control	(511) 230-1000 Anexo:1267	javila@corpac.gob.pe
		Jorge Eduardo Merino Rodríguez	Especialista ATM Controlador de Tránsito Aéreo	(51 1) 230-1000 Ext 1158 (511) 5750886 (Centro de Control Lima) (511) 5750995 Cel: 51 99737407	jmerino@corpac.gob.pe jemr69@yahoo.com
		Jaime Arturo Contreras Benito	Coordinador General del Centro de Control	(511) 630 1154 Celular: (51) 948 463 081	jcontreras@corpac.gob.pe
		Raul Anastacio Granda	Supervisor Comunicaciones AMHS-AFTN Área de Comunicaciones Fijas Aeronáuticas	(511) 230-1018	ranastacio@corpac.gob.pe
		Sara Siles La Rosa	Jefe del Área de Servicios de Información Aeronáutica CORPAC S.A.	(511) 230 1168 / (511) 230 1169 Cel: (51) 978 598 481	ssiles@corpac.gob.pe
	DGAC	Sady Beaumont Valdez	Inspector de Navegación Aérea	Tel: +511 6157880	sbeaumont@mtc.gob.pe
SURINAM/ SURINAME					
URUGUAY	DINACIA	Antonio Lupacchino	Especialista CNS sistemas automatizados	(598) 2604-0408 Ext.4520	alupacch@yahoo.com.ar
		Gustavo Turcatti	Jefe Departamento Operativo de Tránsito Aéreo	(598) 2604-0408 Ext.5111	blantur@gmail.com
VENEZUELA	INAC	Jean Carlos Lozano Garcia	Controlador tránsito aéreo ACC Maiquetía	(58 416) 7226428	jclozgar@hotmail.com

APPENDIX D

PLAN OF ACTIVITIES FOR THE IMPLEMENTATION OF THE AIDC INTERCONNECTION BETWEEN ADJACENTS ACCs

	Start	End	Responsible party	Status
1. **Establishment of initial activities for completing the technical implementation of AIDC**	**10/10/2014**	**16/10/2014**	**ICAO**	**Completed** The initial plan of activities for AIDC implementation is scheduled for 2015. The plan of activities contemplates the conduction of AIDC courses for air traffic controllers working at ACCs and the operational implementation of AIDC between adjacent ACCs. These activities will be conducted in Chile, Colombia, Ecuador and Peru. Interconnection tests between the Lima and Bogota ACCs were added to the list shown in paragraph 1.1.1.
1.1 Based on the results of AIDC tests conducted from February 2014 to June 2014, the technical documentation of the automated systems installed in the Region, and the SAM AIDC implementation guide, develop: 1.1.1 Plan of activities to complete technical feasibility tests for AIDC interconnection between: Santiago ACC - Lima ACC Guayaquil ACC - Lima ACC Bogota ACC - Guayaquil ACC 1.1.2 Contents of AIDC course for ATS controllers and programmers of AIDC automated system databases, to be conducted in Chile, Colombia, Ecuador and Peru.	10/10/14	16/10/14	ICAO	
2. Review of activities at the SAM/IG/14 meeting	**09/10/14**	**13/11/14**	**ICAO and SAM/IG group**	**Completed** The SAM/14 reviewed and approved the plan of activities for AIDC implementation
2.1 Submission of the plan of activities and contents of the AIDC course at the SAM/IG/14 meeting	09/10/14	13/11/14	ICAO	
2.2 Review and approval for submission at the Eighth Coordination Meeting of Project RLA/06/901	09/10/14	13/11/14	SAM/IG	

	Start	End	Responsible party	Status
3. Approval of activities by the RCC/8 meeting	**25/02/15**	**27/02/15**	**RLA/06/901 member States**	**Completed** The RCC/8 meeting held in Lima on 25-27 February 2015 approved the activities for initial implementation of AIDC interconnection in Chile, Colombia, Ecuador and Peru.
3.1 Submission of activities, with their respective cost, for approval.	25/02/15	27/02/15	RLA/06/901 member States	
4. Search and selection of experts	**24/11/14**	**28/01/15**	**ICAO**	**Completed** For the performance of the initial activities, three SAM experts with experience in database programming and operation of ACC automated systems were selected: **Rubén Silva of Argentina, Mauricio Ferrer of Colombia, and Jorge Merino of Peru**.
4.1 Search and selection of 4 experts from SAM States participating in Project RLA/06/901, with experience in the installation, operation and programming of AIDC databases, to perform the activities listed in item 1.	24/11/14	28/01/15	ICAO	
5. Missions to complete AIDC interconnection between States that started tests during the first semester of 2014	**06/04/15**	**01/05/15**	**3 automation experts ICAO**	**Completed** Missions were conducted for training purposes and to complete tests for AIDC interconnection and operation **Chile 6/4 to 10/4/2015** **Peru 13/4 to 17/4/2015** **Ecuador 20/4 to 24/4/2015** **Colombia 27/4 to 1/5/2015**

	Start	End	Responsible party	Status
5.1 Mission to Santiago de Chile	13/04/15	17/04/15	3 automation experts ICAO	**Completed** Implementation of AIDC activities at the Santiago ACC • AIDC practical course • AIDC interconnection tests between: *Santiago ACC and Lima ACC*
5.1.1 Complete AIDC technical implementation between the Santiago and Lima ACCs	13/04/15	17/04/15	3 automation experts ICAO	**Completed** Two-way communication was established in the AIDC interconnection tests between the Thales Top sky system of the Santiago ACC and the INDRA Aircon 2100 of the Lima ACC. The operational tests did not have positive results due to the AIDC limitations in the Santiago ACC. The practical course on AIDC and database programming was conducted, providing training to 16 controllers of the Santiago ACC and 2 aeronautical technicians.
5.1.2 Conduct AIDC course for ATS personnel of the Santiago ACC	13/04/15	17/04/15		
5.2 Mission to Lima:	13/04/15	17/04/15	3 automation experts	**Completed** Implementation of AIDC activities in the Lima ACC • AIDC practical course • AIDC interconnection tests

	Start	End	Responsible party	Status
				between: *Lima ACC - Santiago ACC* *Lima ACC - Guayaquil ACC* *Lima ACC - Bogota ACC*
5.2.1 Conduct AIDC course for ATS personnel of the Lima ACC	13/04/15	17/04/15	3 Automation experts ICAO	**Completed** The practical course on AIDC and database programming was conducted, providing training to 44 controllers of the Lima ACC.
5.2.2 Complete AIDC tests between the Lima ACC and the Guayaquil ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima and Guayaquil ACCs were successfully conducted.
5.2.3 Complete AIDC tests between the Lima ACC and the Bogota ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima and Bogota ACCs were successfully conducted.
5.3 Mission to Guayaquil	20/04/15	24/04/15	3 Automation experts of the SAM Region	**Completed** Implementation of AIDC activities at the Guayaquil ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation: Guayaquil ACC - Lima ACC Guayaquil ACC- Bogota ACC

	Start	End	Responsible party	Status
5.3.1 Complete AIDC technical implementation between the Guayaquil ACC and the Lima ACC	20/04/15	24/04/15	3 automation experts of the SAM Region	**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase.
5.3.2 Complete AIDC technical implementation between the Guayaquil ACC and the Bogota ACC	20/04/15	24/04/15		**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase
5.3.3 Conduct AIDC course for ATS personnel of the Guayaquil ACC	20/04/15	24/04/15		**Completed** The practical course on AIDC and database programming was conducted, providing training to 31 controllers of the Guayaquil ACC.
5.4 ***Mission to Bogota***	**27/04/15**	**01/05/15**	**3 automation experts**	**Completed** Implementation of AIDC activities in the Bogota ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation: *Guayaquil ACC - Lima ACC* *Guayaquil ACC - Bogota ACC*
5.4.1 Complete AIDC technical implementation between the Bogota ACC and the Guayaquil ACC	27/04/15	01/05/15	3 automation experts of the SAM Region	**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase

	Start	End	Responsible party	Status
5.4.2 Complete AIDC technical implementation between the Bogota ACC and the Lima ACC	27/04/15	01/05/15		**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase
6. First meeting of the AIDC operational implementation working group during the SAMIG/15 meeting	**11/05/15**	**15/05/15**	**RLA/06/901 member States**	**Completed.** As a result of AIDC technical implementation, the SAM/IG/15 established a group of activities to migrate from the pre-operational phase to the operational between the ACC Bogota, Guayaquil and Lima. Additionally the AIDC messages to be used were defined.
6.1 It is proposed that, as a matter of priority, the SAM/IG/15 meeting do the follow-up of AIDC implementation. Accordingly, the AIDC operational implementation working group will hold its first meeting.	11/05/15	15/05/15	RLA/06/901 member States	
7. AIDC operational implementation	**18/05/15**	**31/12/17**	Involved States	
7.1 Definition of the parameters of the AIDC database for the to AID operational interconnection between Colombia, Ecuador and Peru	25/05/15	29/05/15	Involved States	**Completed.**
7.2 Amend letter of operational agreement to include the AIDC for the coordination between the ACC Lima with AAC Bogota, ACC Bogota with ACC Guayaquil and ACC Lima with ACC Guayaquil	15/06/15	31/03/16	Involved States	**Valid.** Letter of operational agreement between the ACC Guayaquil and ACC Lima was amendent and signed. (Oct 2015). On Nov 2016, final review and sign of letter of operational agreement between ACC Lima and ACC Bogota was completed. Pending amendment of letter

	Start	End	Responsible party	Status
				of agreement between ACC Bogota and ACC Guayaquil.
7.3 Teleconferences to coordinate and follow-up the migration from the AIDC pre-operational phase to the operational for Colombia, Ecuador and Peru	June 2014	Monthly Tele-conferences at the beginning of each month until end 2017 depending on the progress, telecon-ference will be conducted upon needs	Involved States ICAO	**Valid.** Teleconferences are been carried out on monthly basis since June 2014. On 2016 teleconferences were conducted on: 19 January 23 May 19 February 3 June 18 March 6 September For 2017 teleconferences are foreseen for March, (made on 3 March) July, September and December.
7.4 Complete courses for the ACC Lima and Guayaquil, Bogotá ATS staff as well as staff ARO/AIS	18/05/15	29/02/16	Involved States	**Completed.**
7.5 Preoperational and operational Implementation of AIDC Guayaquil ACC - Lima ACC Bogota ACC - Guayaquil ACC Lima ACC - Bogota ACC Lima ACC – Santiago ACC*	18/05/15	31/12/17	States involved	**Valid.** Letter of operational agreement with corrections on AIDC between ACC Colombia, Ecuador, Panama and Peru were amended (October 2015). Letter of operational agreement between AAC Lima and Guayaquil with the inclusion of AIDC was signed

	Start	End	Responsible party	Status
				on 23 October 2015. Letter came into force on 31 March 2016. Establishing of a pre-operational period completing the ATS staff training. Operational implementation. AIDC between ACC Lima - ACC Guayaquil in operational phase from August 3, 2015, became operative on 31 March 2016. AIDC operations interrupted on September 2016 due to AIRCON 2100 system problems in Lima ACC. Automated system of Lima is being updated, esteemed to be completed by the beginning of the second semester 2017. The AIDC between the ACC Bogota and the ACC Lima and ACC Guayaquil is in pre-operational phase since May, 2015. * The AIDC operational implementation between the ACC Lima and ACC Santiago has postponed in view of the delay in the modernization of

	Start	End	Responsible party	Status
				the ACC Santiago automated Center (2017-2019).
8. Other AIDC implementations **Bogota ACC - Panama ACC** **Ezeiza ACC - Montevideo ACC** **Resistencia ACC - Asunción ACC** **Curitiba ACC – Resistencia ACC** **Iquique ACC – Lima ACC** **Cordoba ACC – Iquique ACC** **Amazonico ACC – Bogota ACC** **Amazonico ACC – Lima ACC** **Asuncion ACC – Curitiba ACC**	18/05/15	31/12/17	States involved	
8.1 Definition of parameters of the AIDC database for the operational interconnection of the AIDC		29/07/16	States involved	**Valid** Defined for AIDC between: Bogota ACC-Panama ACC, Iquique ACC-Cordoba ACC and Resistencia ACC-Asuncion ACC.
8.2 Amendment of letter of operational agreement to include the AIDC for coordination between ACCs.		31/12/17	States involved	**Valid**
8.3 Carry out teleconferences for coordination and follow-up to the migration from the AIDC pre-operational to operational fase		Monthly tele-conferences at the begining of each month until the end of 2017 Depending on the progress tele-	States involved ICAO	**Valid** Teleconferences conducted 19 January 23 May 19 February 3 June 18 March 6 September For 2017 teleconferences are foreseen for March, (made on 3 March) July, September and December.

	Start	End	Responsible party	Status
		conferences will be conducted upon need		
8.4 Practical courses addressed to the ATS AIS CNS personnel of the ACC involved, interconnection AIDC		30/11/16	States involved OACI	**Completed** AIDC Course (Panamá 22 -26 June) 2015 AIDC Course (Paraguay 28 November to 2 December 2016).
8.5 Conduction of AIDC interconnection test between adjacents ACCs		30/12/17	States involved	**Valid** Successful AIDC interconnection tests between Bogota and Panama. (June 2015). Tests will continue during the first semester 2017 in view of the improvement made in the automated system of Panama ACC. AIDC tests Iquique ACC and Lima ACC were successfully conducted on December 2015 and continued until October 2016. Tests will restart the second semester of 2017 with the Lima automated system update. AIDC tests Iquique ACC and Cordoba ACC were made in February 2016 with positive

	Start	End	Responsible party	Status
				results but the ABI message. Tests will continue one end-2017 since Argentina reported that AIDC domestic operations will be completed first. AIDC tests Amazonico ACC and Lima ACC were conducted in March 2016 with problems with ABI messages at the beginning which were overcome by Atech. Tests will continue on second semester 2017. AIDC tests Ezeiza ACC and Montevideo ACC (first semester 2017). AIDC tests Asuncion ACC and Resistencia ACC were made during the week of 28 November 2016 and will restart at the end of 2017. AIDC tests Curitiba ACC and Resistencia ACC (end of the second semester 2017). AIDC tests Curitiba ACC and Asuncion ACC (second semester 2017).

	Start	End	Responsible party	Status
				AIDC tests Bogota AAC and Amazonico ACC (Second semester 2017)
8.6 Implantation of pre-operational and operational AIDC		31/12/17	States involved	**Valid** AIDC between Bogota ACC and Panama ACC is in pre-operational phase since October 2015. Operational phase foreseen by end of the second semester 2017. AIDC between Ezeiza ACC and Montevideo ACC in pre-operational phase foreseen by first semester 2018. AIDC between Asuncion ACC and Resistencia ACC in pre-operational phase foreseen by the second semester 2017 and operational by second semester 2018. AIDC between Iquique ACC and Lima ACC will be in pre-operational and operational phases on the second semester 2018. AIDC between Iquique ACC and Cordoba ACC will be in pre-operational and operational

	Start	End	Responsible party	Status
				phases by the second semester 2018. AIDC between Curitiba ACC and Resistencia ACC in pre-operational and operational phases by the first semester 2018. AIDC between Amazonico ACC and Lima pre-operationa October 2016, operational by Second Semester 2018. AIDC between Amazonico ACC and Bogota ACC foreseen operational by Second Semester 2017. Remaining interconnections foreseen pre-operational by first semester 2017 and operational by the second semester 2017.
9. Workshop on implementation of ATM automation, ADS B, and multilateration	**22/09/15**	**25/09/15**	ICAO	**Concluded** NAN/CAR/SAM workshop held in Panama (22-25 September 2015). The implementation of inter-regional AIDC interconnections was analysed at the workshop.

	Start	End	Responsible party	Status
10. Second meeting of the AIDC operational implementation working group during SAMIG/16	**19/10/15**	**23/10/15**	ICAO	**Concluded**
10.1 It is proposed, as a matter of priority, the SAM/IG/16 meeting do the follow-up of AIDC implementation. Accordingly, the second meeting of the AIDC operational implementation working group will be held.	**19/10/15**	**23/10/15**	ICAO	**Concluded** Follow-up was made on the operational implementation and programming of activities for operational implementation in 2016.
11. **AIDC Implementation meetings**	01/01/17	31/12/19	Involved States ICAO	**Valid**
11.1 Implementation of 12 AIDC interconnections at inter-regional level and 9 interconnections distributed as follows: Colombia (3), Ecuador (1), Panama (1) and Venezuela (4).	01/01/17	31/12/19	Involved States ICAO	**Valid**
11.2 Inter-regional AIDC interconnections between SAM and AFI Regions: Argentina (1), Brazil (2), French Guiana (1) and Uruguay (1)	01/01/17	31/12/19	Involved States ICAO	**Valid**
12. **Introduction of FF ICE concept** Analysis of the application of B1-FICE Module in the Region: Increasing interoperability, efficiency and capability through FF ICE. First stage of application before exit.	24/04/17	01/01/19	SAM Region States and ICAO	**Valid**
13. **Monitoring to the AIDC interconnection implementation**	**2015**	**2019**	ICAO	
13.1 **AIDC Implementation Meeting** ✓ First AIDC Implementation Meeting ✓ Second AIDC Implementation Meeting ✓ Third AIDC Implementation Meeting	**March 2016**	**September 2019**	ICAO	**Valid** AIDC/1 (Lima, Peru, 28-30 March 2016) AIDC/2 (Lima, Peru, 21-23 September 2016) AIDC/3 (Lima, Peru, 24-26 April 2017) Approved by

	Start	End	Responsible party	Status
✓ Fourth AIDC Implementation Meeting ✓ Fifth AIDC Implementation Meeting				RCC/10 AIDC/4 (Lima, Peru, June 2018) AIDC/5 (Lima, Peru, September 2019)

APPENDIX E / APENDICE E

STATUS OF THE AUTOMATION IMPLEMENTATION TO GIVE EFFECT TO THE AMENDMENT TO THE FLIGHT PLAN FORMAT/

ESTADO DE IMPLANTACION DE LA AUTOMATIZACIÓN PARA DAR CUMPLIMIENTO DE LA ENMIENDA EN EL FORMATO DEL PLAN DE VUELO

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Argentina	Comodoro Rivadavia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
	Cordoba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Ezeiza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Mendoza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
	Resistencia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
Bolivia	Cochabamba /La Paz	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual It is foreseen by the end of 2019 an ATM automated system compatible with FPL/12 in the new Cochabamba ACC and La Paz ACC (back up) / Se tiene previsto para finales del 2019 un sistema automatizado ATM compatible con el FPL/12 en el nuevo ACC de Cochabamba y La Paz. ACC (respaldo)

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Brazil / Brasil	Amazónico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado (use of converter) / (uso de convertidor centralizado) An update in Sagitario ATM automated system (from ATECH Brazil) which includes the new FPL/12 flight plan format to deactivate the centralized inverter is scheduled for the end of 2017 in the ACC Amazonico, Atlantico, Brasilia, Curitiba and Recife./ Para finales del 2017 está prevista una actualización en Sagitario (sistema automatizado ATM de Brasil de la empresa ATECH) que incluye el nuevo formato de plan de vuelo FPL/12 y desactivar el convertidor centralizado.
	Atlántico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
	Brasilia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
	Curitiba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
	Recife	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
Chile	Iquique	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Punta Arenas	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automatizado /
	Puerto Montt	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Santiago	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
	Santiago Oceanico	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
Colombia	Barranquilla	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado
	Bogotá	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Ecuador	Guayaquil	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado
French Guiana (France) Guyana Francesa (Francia)	Rochambeau	No Implemented (AMHS terminal) / No Implantado (terminal AMHS)	Automated / Automatizado
Guyana	Timehri	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
Panama	Panama	Implemented / implantado (AMHS terminal))	Automated /Automatizado
Paraguay	Asunción	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual Automated at the end of 2017 /Automatizado a final del 2017
Peru	Lima	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Update automation system by the end of third quarter 2017/ Actualización Sistema automatizado finales del tercer trimester del 2017
Suriname/Surinam	Paramaribo	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated (out of service, working manually) / Automatizado (fuera de servicio, trabajando manualmente)
Uruguay	Montevideo	Implemented (AMHS terminal) / Implantado(terminal AMHS)	Automated / Automatizado
Venezuela	Maiquetia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado (use of converter) / (uso de convertidor) By the end of 2017 it is foreseen a new automation system in Maiquetía ACC/ Para finales del 2017 se estima operación del nuevo sistema automatizado del ACC de Maiquetía

- - - - - - - -

APPENDIX F

FLIGHT PLAN FILING PROCEDURES IN THE SAM REGION

ARGENTINA

Regarding the processing of FPLs in accordance with national regulations, paper forms can be initially filed at an ARO-AIS office and transmitted *via* AMHS to the units involved, or by phone or in flight through the A/G frequency.

The filing of RPLs is also regulated, as published in the AIP of Argentina. It should be noted that the filing of RPLs is not being used.

Additionally, the ACCs of Argentina have a flight data position, where an air traffic controller receives and controls FPLs through an AMHS channel.

In 2015, coordination started between the service provider and the operators LATAM Argentina and Aerolíneas Argentinas to study the possibility of using the information digitally produced by the flight planning systems hired by said operators, in the communication systems of the service provider, which produced the FPLs of all planned flights, which were then submitted by the operators in hard copy to the ARO/AIS offices involved.

To this end, coordination meetings were held between the aeronautical authority, ANAC, and the aforementioned actors. Personnel of the service provider and the operator conducted tests in early 2016 using the AMHS channel, with the inclusion of the ARO/AIS units of Aeroparque, Ezeiza and the INDRA automated centre at the EZE ACC.

These tests were successful, and use was extended to all ARO/AIS units in charge of planning the flights of the aforementioned companies.

This procedure permits reception of flight plans by the LIDO or JEPPESEN systems up to 4 hours before, with the advantage that they contain the data of the flight that will be actually conducted, significantly reducing errors in the data contained therein.

It should be noted that the aforementioned provision on FPL processing continues to be applied, and the control function of the ARO/AIS operator is not replaced by the systems hired by the operators.

BRAZIL

Brazil has as goal, to implement the centralized treatment of flight plans, as part of the implementation of SIGMA system (Air Movement Integrated System in use by CGNA – Air Navigation Management Centre). Under this concept, SIGMA validates the syntax, based on the analysis of the content of each field of the flight plan form (FPL) and in accordance with MCA 100-11- "*Preenchimento dos Formulários de Plano de Voo"*.

It also validates the semantics, which refers to the consistency among FPL boxes, based on the specifications of each flight, such as preferred routes, restricted aerodromes, enabled and activated airspaces, and others. All this automated process starts with the completion of the flight plan and ends when clicking on the VALIDATE button. If there is any inconsistency, the user will be informed in order to make corrections as needed.

At present Brazil accepts domestic flight plans through internet in its whole territory, as set by AIC-. 9N dated 15 May 2016 – "Sending flight plans by internet". Additionally 6 AIS – CAIS regional centres were implemented in Brasilia, Curitiba, Recife, Rio de Janeiro and Sao Paulo, as well as AIS offices in airdromes of Belo Horizonte, Campinas, Confins and Guarulhos that use SIGMA system in filling flight plans and making the semantic validation. Likewise, flight plans can also be received by phone, fax, or in person at the AIS offices or in CAIS.

In this framework, the FLP filling in AMHS terminals is made only as alternative in case of communication failure between the application and SIGMA system. In this process, the FLP validated will be analysed by SIGMA from a flow management perspective (demand vs. capacity) and, if approved, are directly transmitted to the ACCs, which relay them to the TWRs and APPs involved.

Another on-going project is the integration of automated systems of TWR and ACC/APP, using OLDI protocol and ADEXP messages, which allows more integrity of flight plan data used by centers involved.

Regarding the repetitive flight plan (RPL), Brazil applies this type of procedure for scheduled, charter, and postal flights authorised by ANAC, and is reproduced with the same basic characteristics for at least 10 (ten) flights, for a minimum period of 2 (two) months. RPLs are standardised through ICA 100-11 – Plano de Voo. A basic requirement for using RPLs is that data must be highly stable, so any changes can be easily made.

The RPL is filed using electronic media, the Internet, and, alternatively, by fax, or in person at the repetitive flight plan centre. Non-repetitive flight data, such as an alternate, range, and number of people on board, shall be sent prior to take-off, by radiotelephone, to the control tower, aerodrome of departure, or aeronautical telecommunication station.

Airlines must request the repetitive flight plan at least ten (10) days before the beginning of each of the periods described below:

a) from the first to the tenth day of the month;

b) from the eleventh to the twentieth day of the month; and

c) from the twenty-first to the last day of each month.

Changes, delays, and temporary cancellations can be made to a flight in a planned RPL series. Permanent modifications that involve the addition of new flights, the deletion or modification of flights, in the RPL lists will be presented in the form of a new flight plan with the same advance notice.

CHILE

All flight plans have to be sent to ARO offices via AFTN, e-mail or presenting ATC-1 (FPL) form on ARO fronting desk.
The regulation allows sending a flight plan by any written means. There is also the possibility to present a flight plan at ATC through radio frequency (AFIL).

The process is as follows:

- Flight plan presented by the user (pilot, dispatcher, airline, etc.)
- Flight plan accepted. Review and advisory by ARO office in this part of the process.
- Flight plan transmitted to all ATS dependencies involved in the route.

IFIS system (flight plan presentation through internet) is only available for domestic users of general aviation (small aircrafts). Air operators are not allowed to send FPL via IFIS. Flight plans filled by IFIS are validated by the system and directly registered in FDP of automated systems.

Flight plans send by operators of flight plan service are registered in FDP pf automated system.

ECUADOR

Based on the implementation of Amendment 1 to the Procedures for air navigation services – Air traffic management (PANS ATM - Doc 4444, 15th edition) of the International Civil Aviation Organization (ICAO), the implementation of new procedures and the content of the flight plan and its associated messages in Ecuador are defined as follows:

Procedures for filing a flight plan

- Flight plans will be physically filed at the AIS-AD room of the air navigation services at the aerodrome of departure.

- Filing of flight plans within Ecuadorian territory through the Internet flight information system (IFIS), whether by the pilot-in-command or his/her authorised representative, based on national technical aeronautical regulations on the filing of flight plans within Ecuadorian territory.

- When the operations office of the aircraft operator at the aerodrome of departure uses e-mail as the means to communicate with the AIS-AD room, the filing of the referential flight plan using this medium will be permitted, after which the original forms shall be filed on the same day, no later than 2300 UTC.

- The filing of the flight plan by telephone will not be accepted, nor its submission by individuals other than the pilot-in-command or his/her duly accredited and authorised representative.

The duration of the flight plans will be:

30 minutes for domestic FPL
60 minutes for international FPL

PANAMA

Panama has the THALES ANAIS system for flight plan processing.

In accordance with the AIP of Panama (ENR1.10-1), all users must file a flight plan in accordance with the flight plan format contained in Doc 4444, at least one hour before departure.

The user must notify ATM units of any changes (amendments) to the FPL, on a timely basis.

Users that have dispatch offices with a service capable of linking to the AMHS network shall transmit the FPL to the appropriate ATM units once approved by the authority.

Every AIS-AD unit that receives an FPL will immediately transmit it to the ATM services, addressed to MPZLZQZX and the airports and ACCs involved.

PARAGUAY

The operator files the flight plan in writing to the AIS unit.

The AIS unit transcribes the flight plan, which is addressed and transmitted *via* AMHS.

The flight plan is entered in the AMHS and, in turn, addressed to the automated system through a point-to-point connection to the FDP.

The FDP does the processing and sends the flight plan to the flight plan generation and correction position.

Obs: All flight plans entered in the automated system are sent *via* the AMHS.

An IFPL application (flight plan presentation via INTERNET) developed by company Radio COM is available for domestic flights.

PERÚ

Regular operators can present their flight plans (FPL) through AMHS or AFTN directly to the Lima ACC address, sending a copy to departing, arriving and alternative airdromes and to other ACC involved in the flight in according to AIC 04/2017. Operators working under requirements of this AIC are also responsible of issuing CHG, DLA or CNS corresponding messages.

For the rest of operators the procedure is as follows:

a) Flight plans (FPL), are presented in hard copy, e-mail, fax or telephone, directly to the ARO/AIS Office of departure airdrome.

b) The AIS expert in charge receives the FPL and analyses and verifies if it was duly completed according to ICAO Doc 4444. Likewise, he/she advises the pilot or the representative of the company on how to correct the FPL in case of errors, in correspondence with ICAO standards, documents and letters of agreement.

c) The AIS expert makes the transcription of the flight plan and transmits it through a FPD station to the ATS involved. A user agent (AMHS) will send the FPLs in case of failure of the FDP. A copy of the message is received by the FDP system, for its automatic processing and recording in the data base if accurate data has been entered

The FPL shall be submitted or sent at least 1 hour before the EOBT, and will remain in force until 1 hour after the EOBT. Then will be cancelled automatically. The operators are responsible for promptly manage any delay or change in the EOBT to avoid inconveniences at the departure of their flights.

The use of repetitive flight plans (RPL) is also allowed. Companies using RPL must submit them obligatorily one week prior the end of each month. These RPL correspond exclusively to commercial flight.

URUGUAY

The presentation of FPL is based on AIP Uruguay ENR 1.10-1.

International FPL

The presentation of the flight plan must be made without exception, before departure in the Operations Office (Flight Plan) at the departure airdrome which is responsible of filling the FPL in the system.

FPL reception

The Operations Department of DINACIA of Carrasco International Airport receives flight plans through the following means: 1) in person at the department' office, 2) by Fax # (598) 26040311, 3) by E-mail: plandevuelo@dinacia.gub.uy. All those FPLs are registered in the automated system.

National FPL

For domestic flights and/or when the operations office does not exist/functioning at the departing airdrome, FPL can be routed through the Aeronautical Telecommunications Station (CXK), through telephone 0800 PLAN (0800-7536 or 2604 0251 Ext. 5123.

RPL presentation is based on AIP Uruguay ENR 1.11-4.

The operator first will present by means and addresses indicated in ENR 1.11-5, the list of RPL and/or its corresponding amendments and them will be registered in the system.

FPL forms and RLP Doc 4444
Error types:

- Aircraft not entering FIR and not being alternated
- Duplicated plans
- Plan origin (no route, PBN)
- FPL missing (DEP, EST.)
- Data base (solution in progress)
- FLP form (free text)

VENEZUELA

Every aircraft that files a domestic or international flight plan, whether civilian, commercial, or military, must complete the physical flight plan format established to that end.

This flight plan must be presented to the appropriate AIS authority or unit, which will validate and authorise the flight plan.

Once the flight plan is authorised, the communications office will arrange for the entry of the flight plan into the AMHS or AFTN system so that it will reach the FDP.

Repetitive flight plans also exist in the automated system of the ACC. These flight plans are the commercial itineraries. However, these flight plans are also received by the AIS office (although not obligatory) and, when processed, generate duplication in the FDP system. Venezuela has incorporated Amendment 1 to Edition 15 of Doc 4444 into its flight plan.

APPENDIX G

AIC 04/2017

"Presentación del Plan de Vuelo vía AMHS o AFTN para las compañías que operen vuelos regulares"

Perú

SPANISH ONLY

TELÉFONO (511)2301170 / 4141170
TELEFAX (511)4141452 / 2301169
DIRECCIÓN TELEGRÁFICA
AFTN : SPJCYGYJ
COM: CORPAC S.A.
e-mail: aisperu@corpac.gob.pe

PERÚ

Corporación Peruana de Aeropuertos y Aviación Comercial S.A.
ÁREA DE INFORMACIÓN AERONÁUTICA
Apartado 680 LIMA 100 – PERÚ

AIC

04/17

MAY 09th, 2017

Nota.- La presente circular entrará en vigencia el día 09 mayo 2017, dejando sin efecto a la circular 05/14 (26.06.14).

04/17 PRESENTACIÓN DEL PLAN DE VUELO VÍA AMHS O AFTN PARA LAS COMPAÑIAS QUE OPEREN VUELOS REGULARES

1. INTRODUCCIÓN

1.1 La presente Circular de Información Aeronáutica AIC, describe el procedimiento de presentación del plan de vuelo vía AMHS o AFTN.

1.2 Las disposiciones presentadas en esta AIC se aplican a todas las compañías aéreas que operan vuelos regulares, que posean una terminal de mensajería AMHS o AFTN o hayan contratado un servicio de transmisión de planes de vuelo vía AMHS o AFTN.

1.3 En caso la compañía aérea no transmita directamente el FPL vía AMHS o AFTN, procederá a presentar el formato de FPL en el Equipo AIS/ARO correspondientes.

1.4 El usuario será responsable por cualquier demora que pueda ocasionar el rechazo y reenvío de Planes de Vuelo remitido con errores o por falla en su sistema.

2. GENERALIDADES.

Este nuevo procedimiento deberá cumplir con:

2.1 Lo especificado en el documento 4444 PANS/ATM de la OACI, Capítulo 11, el Apéndice 2 y los formatos correspondientes explicados en el Apéndice 3;

2.2 Condiciones adicionales, especificadas en la AIP del Perú parte ENR.1.10 Planificación de vuelos y;

2.3 Regulación Aeronáutica del Perú- RAP 91.

3. DEFINICIONES

Gestión del tránsito aéreo (ATM). Administración dinámica e integrada-segura, económica y eficiente del tránsito aéreo y del espacio aéreo, que incluye los servicios de tránsito aéreo, la gestión del espacio aéreo y la gestión de la afluencia del tránsito aéreo, mediante el suministro de instalaciones y servicios sin discontinuidades en colaboración con todos los interesados y funciones de a bordo y basadas en tierra.

Hora prevista de fuera calzos (EOBT). Hora estimada en la cual la aeronave iniciará el desplazamiento asociado con la salida.

Mensajes de demora (DLA). Se transmitirá un mensaje DLA cuando la salida de la aeronave para la cual se hayan enviado datos básicos de plan de vuelo (FPL o RPL) se demora más de 30 minutos después de la hora prevista de fuera calzos indicada en los datos básicos de plan de vuelo.

Mensajes de Modificación (CHG). Cuando haya de efectuarse un cambio de los datos básicos de plan de vuelo de los FPL o RPL transmitidos anteriormente, se transmitirá un mensaje CHG. El mensaje CHG se enviará a todos los destinatarios de datos básicos de plan de vuelo que estén afectados por el cambio.

Mensajes de cancelación de Plan de Vuelo (CNL).

Se enviará un mensaje de cancelación de plan de vuelo (CNL) cuando se haya cancelado un vuelo con respecto al cual se hayan distribuido anteriormente datos básicos de plan de vuelo. La dependencia ATS que sirve al aeródromo de salida transmitirá el mensaje CNL a las dependencias ATS que hayan recibido los datos básicos de plan de vuelo.

Oficina de Notificación de los Servicios de Tránsito Aéreo (ARO). Oficina creada con objeto de recibir los informes referentes a los servicios de tránsito aéreo y los planes de vuelo que se presentan antes de la salida.

Plan de vuelo (FPL). Información especificada que, respecto a un vuelo proyectado o a parte de un vuelo de una aeronave, se somete a las dependencias de los servicios de tránsito aéreo.
Nota. Las especificaciones relativas a los planes de vuelo aparecen en el anexo 2. El Apéndice 2 del documento 4444 Gestión de tránsito Aéreo PANS/ATM de la OACI, contiene un modelo de plan de vuelo.

Publicación de información aeronáutica (AIP).
Publicación expedida por cualquier Estado, o con su autorización, que contiene información aeronáutica, de carácter duradero, indispensable para la navegación aérea.

Red de telecomunicaciones fijas aeronáuticas (AFTN). Sistema completo y mundial de circuitos Fijos aeronáuticos, dispuestos como parte de Servicio Fijo Aeronáutico, para el intercambio de mensajes o de datos numéricos entre estaciones fijas, que posean características de comunicaciones idénticas o compatibles.

Región de información de vuelo (FIR). Espacio aéreo de dimensiones definidas, dentro del cual se facilitan los servicios de información de vuelo y de alerta.

Servicio de Tránsito Aéreo (ATS). Expresión genérica que se aplica, según el caso, a los servicios de información de vuelo, alerta, asesoramiento de tránsito aéreo, control de tránsito aéreo (servicios de control de área, control de aproximación o control de aeródromo).

Sistema de tratamiento o manejo de mensajes aeronáuticos (AMHS) Conjunto de diversos componentes de software o hardware integrados, con el propósito de gestionar un sistema de enrutamiento de mensajería aeronáutica general, que maximiza las ventajas de las técnicas modernas en gestión de redes.

Usuario. Para fines de esta AIC, el término usuario se refiere a la línea aérea que presenta su Plan de vuelo cumpliendo con los requisitos exigidos en esta AIC.

4. Directrices.
4.1 Los usuarios que harán uso del procedimiento de presentación de plan de vuelo vía AMHS o AFTN, deberán contar con una terminal de mensajería propia o contratada.
Sus direcciones de transmisión, deberán ser notificadas previamente a CORPAC, en calidad de administrador de la red de mensajería AMHS o AFTN, a las siguientes direcciones:
ccam@corpac.gob.pe
ccamo@corpac.gob.pe
ranastacio@corpac.gob.pe

4.2 Se recepcionará el plan de vuelo vía AMHS o AFTN de todas las compañías Aéreas que cuenten con vuelos regulares aprobados por la DGAC PERÚ.

4.3 Las compañías aéreas que cumplan con los requisitos especificados en los numerales 4.1 y 4.2 de esta AIC, continuarán el proceso con el siguiente período de validación.

4.4 Periodo de validación.
4.4.1 Se requiere que la compañía aérea comunique a las direcciones de correo de CORPAC, mostradas en el numeral 4.1 de esta AIC, la siguiente información:

a) Nombre de su punto focal, que debe ser su representante operativo o quien lo reemplace,
b) Teléfono y dirección AMHS o AFTN y email del CCO o centro de despacho que opere H24 o en las operaciones del vuelo, para contactar en caso de alguna observación en el FPL.
4.4.2 Por un periodo de 7 días las compañías aéreas deberán presentar simultáneamente el FPL en las respectivas oficinas ARO de la FIR Lima y el FPL directamente por el sistema AMHS o AFTN, para el control y verificación simultánea de información por CORPAC S.A. Transcurrido este periodo de manera satisfactoria, el Equipo AIS/ARO del Área de Información Aeronáutica de CORPAC se contactará con el punto focal designado, para confirmar que la aceptación de los FPL´s se efectuarán a partir de la fecha únicamente vía AMHS o AFTN.

5. Procedimiento.

5.1 El usuario presentará el plan de vuelo vía AMHS o AFTN a la dirección SPIMZQZX (ACCLIMA) y a las direcciones del aeródromo de destino, alternos y a los ACC correspondientes. En caso que la aeronave no despegue del aeródromo de Lima (SPJC), se consignarán en las direcciones del aeródromo de salida ZTZX y YOYX. En el caso de un vuelo desde/hacia el Cuzco se deberá agregar SPZOZAZX.

5.2 Los usuarios serán responsables de enviar sus programaciones diarias de manera física o vía email a la siguiente dirección: aislima@corpac.gob.pe; debiendo esperar la confirmación de recepción del Equipo AIS/ARO para asegurar el monitoreo y control de los Planes de Vuelo. Solo se aceptarán correos corporativos.

5.3 Los mensajes ATS aplicables a esta AIC son: ***FPL, CNL, CHG y DLA***.

5.4 El mensaje FPL, permite enviar un plan de vuelo a las dependencias ATS. En ningún caso se debe reenviar un FPL a una dependencia a la cual ya haya sido transmitido a menos que sea expresamente solicitada. De ser así, este FPL se debe enviar únicamente a la dirección que lo requiera. El tiempo mínimo para la transmisión de un FPL será de 1 hora previa al EOBT.

5.5 El usuario transmitirá mensajes normalizados ATS de ***CNL, CHG o DLA*** antes de los 30 minutos de su EOBT. Al cancelar un plan de vuelo se retornará al punto anterior (5.4)

5.6 El plan de vuelo que exceda 1 hora después de su EOBT será cancelado en forma automática por el sistema.

5.7 Las compañías aéreas serán responsables del correcto envío de los mensajes e itinerarios remitidos vía AMHS o AFTN, los cuales deben estar autorizados por la DGAC.

5.8 En caso la aeronave no pueda salir a tiempo por problemas técnicos, operacionales o de otra índole, el plan de vuelo se considerará cancelado y no podrá presentar plan de vuelo hasta cumplir con el procedimiento establecido por la DGAC según oficio N° 0673 – 2007 MTC/ 12.

5.9 Los medios de comunicación, disponibles en el Equipo AIS/ARO de Lima, para el suministro, intercambio y coordinaciones entre las dependencias y usuarios serán los siguientes:

a) Dirección AFTN : SPJCYOYX

b) Números telefónicos: (511) 2301171,
(511) 2301172

c) Email: aislima@corpac.gob.pe

APPENDIX H

GUIA DE ORIENTACION CON CONSIDERACIONES TECNICAS PARA EL APOYO A LA IMPLANTACION DEL ATFM

SPANISH ONLY

GUIA DE ORIENTACION CON

CONSIDERACIONES TECNICAS PARA EL APOYO A LA IMPLANTACION DEL ATFM

Lima, Perú

Version 0.1

Mayo 2016

INDICE

APENDICE 1 -

1 INTRODUCCION

1.1 Objetivo de la Guía

1.1.1 En base al Concepto Operacional ATM, el Plan Mundial de Navegación Aérea, la Metodología de Mejoras por Bloques del Sistema de Aviación ASBU, el *Concepto Operacional de la Gestión de la Afluencia* (ATFM) *en las Regiones del Caribe/Sudamérica (CONOPS ATFM* CAR/SAM*)* y el *Manual ATFM para el Caribe y Sudamérica (CAR/SAM)* se tiene previsto avanzar con la implantación del servicio ATFM y sistema de apoyo correspondiente en los Estados/ANSP de la región SAM.

1.1.2 Asimismo, siguiendo los lineamientos de la Metodología ASBU en sus bloques "B0" y "B1" aplicables a la ATFM, se consideró como una de las actividades requeridas el desarrollo de esta guía, la cual tiene por objetivo servir como una referencia para los Estados de la Región SAM que requieran iniciar la operación de un sistema de apoyo a la ATFM, dándose las consideraciones que se deben tener para el diseño y especificación técnica del sistema, antes de la decisión de usar el sistema a modo de prueba y posteriormente en modo operacional.

1.1.3 Aunque los Estados tengan necesidades específicas con respeto a los ASBU, en la implantación de la ATFM deberían de considerarse especialmente los siguientes bloques:

- B0-NOPS Mayor eficiencia para manejar la afluencia mediante la planificación basada en una visión a escala de la red;
- B0-FRTO Mejores operaciones mediante trayectorias en ruta mejoradas;
- B0- RSEQ Mejoramiento de la afluencia de tránsito mediante secuenciación en las pistas; y
- B0-ACDM Operaciones aeroportuarias mejoradas mediante CDM a nivel aeropuerto; y bien sus actualizaciones correspondientes al bloque "B1".

1.1.4 La metodología ASBU tiene flexibilidad que le permite a los Estados implantar los módulos de acuerdo con sus requisitos operacionales específicos. Sin embargo, en el caso de ATFM el progreso no uniforme podría obstaculizar el paso eficiente de aeronaves de una FIR a otra del espacio aéreo.

1.2 Alcance de la Guía

1.2.1 La presente guía esta dirigida a los proveedores de servicios de navegación aérea, autoridades de aeronáutica civil, operadores de aeropuertos y operadores de aeronaves, de la región sudamericana de la OACI (SAM), que requieran información introductoria sobre consideraciones técnicas alineadas con los conceptos operacionales ATFM, que se deberían tener en cuenta, antes de la planificación e implementación del ATFM, con el fin de proporcionar seguridad operacional, eficacia y garantizar una afluencia óptima del tránsito aéreo hacia determinadas áreas o a través de ellas durante períodos en que la demanda excede

o se prevé que excederá la capacidad disponible del sistema ATC.

1.2.2 Esta guía no reemplaza ni suplementa los estándares y recomendaciones internacionales especificados por OACI o por otros desarrolladores de estándares para la ATFM. Sin embargo, sí proporciona un punto de partida en común para que los Estados dentro de la región, que vayan a implantar instalaciones y/o servicios ATFM, cuenten con una descripción de arquitectura armonizada y flexible, y bien las consideraciones técnicas que permitan la interoperabilidad de los sistemas ATFM involucrados.

1.2.3 El aumento de la capacidad debería siempre ser una prioridad y objeto del foco en curso por los ANSP y aeropuertos. Los ANSP deberían llevar a cabo un análisis rutinario de sus operaciones para establecer el grado de sofisticación del ATFM, y proceso CDM, que se requiere en su área de responsabilidad y decidir qué concepto tal como se describe en este documento debería ser implementado. En caso de que un Estado o ANSP no tiene todavía requisitos ATFM sofisticados, asimismo se espera que va apoyar a otros Estados que sí requieren aplicación ATFM/CDM, mediante la adhesión a los procedimientos acordados de la región. La cooperación y la colaboración entre todas las partes interesadas en la región asegurará la implementación exitosa de la ATFM/CDM, lo que beneficiará a todos los usuarios mediante la reducción de esperas en vuelo, aumento de la previsibilidad, y proporcionando una mayor flexibilidad operativa.

1.3 Lista de Acrónimos

AAC Autoridad de Aviación Civil
AC Circular de asesoramiento
ACC Centro de Control de Área
ACID Identificación de la aeronave
ADEXP ATS Data Exchange Presentation
ADP ATFM Daily Plan
AIP Publicación de Información Aeronáutica
AIS/AIM Servicio de Información Aeronáutica/Gestión de Información Aeronáutica
ANSP Proveedor de Servicios de Navegación Aerea
ASBU Aviation System Block Upgrades - Mejoras por bloques del sistema de aviación
ASD Presentación de Situación Aerea
ASTERIX Intercambio estructurado de información de vigilancia multipropósito de Eurocontrol
ATC Control de tránsito aéreo
ATCO Controlador de tránsito aéreo
ATCSCC Air Traffic Control System Command Center
ATM Gestion del transito aéreo
ATN Red de telecomunicaciones aeronáuticas
ATS Servicios de transito aéreo
AUs Airspace Users
CDTI Presentación de información de transito en el puesto de pilotaje

CNS Comunicaciones, navegación, vigilancia
CTA Calculated Time of Arrival
CTOT Calculated Takeoff Time
DMZ Zona Demilitarizada
Eurocontrol Agencia Europea para la Seguridad de la Navegación Aérea
FAA Federal Aviation Agency
FCA Flow Constrained Area
FDP Procesamiento de Datos de Vuelo
FEA Flow Evaluation Area
FIR Región de Información de Vuelo
FMC Computadora de Gestión de Vuelo
FMP Flow Management Position
FMU Flow Management Unit
FMS Sistema de gestión de vuelo
FPL Plan de Vuelo Presentado
GDP Ground Delay Program
GNSS Sistema mundial de navegación por satélite
GPI Indicador de Performance Global
GPS Sistema de Posicionamiento Global
GS Ground Stop
GUI Interface Grafica de Usuario
IFR Reglas de vuelo por instrumentos
IMC Condiciones meteorológicas de vuelo por instrumentos
ISO Organización Internacional de Normalización
LAN Red de Área Local
MINIT Minutes in Trail
MIT Miles in Trail
MSSR SSR monoimpulso
MTBF Tiempo promedio entre fallas
MTTR Medium Time to Repair
NM Network Manager (ex – CFMU)
NTP Network Time Protocol
OACI Organización de Aviación Civil Internacional
PSR Radar primario de vigilancia
SAM Región sudamericana de la OACI
SARPs Normas y Métodos Recomendados por OACI
SDP Procesamiento de datos de vigilancia
SSR Radar secundario de vigilancia
TIS Servicio de información de transito
TIS-B Servicio de información de transito — radiodifusión
TMI Iniciativas de gestión de tránsito
UPS Uninterruptible Power Supply

UTC Tiempo universal coordinado
VFR Reglas de Vuelo Visual
VPN Virtual Private Network

1.4 Definiciones

1.4.1 **Partes involucradas en la ATFM –** La comunidad de las partes involucradas en la ATFM incluye a las organizaciones, organismos o entidades que podrían participar, colaborar y cooperar en la planificación, desarrollo, utilización, regulación, operación y mantenimiento del sistema ATFM. Entre éstas, figuran:

El conjunto de aeródromos – Las autoridades de control de tránsito aéreo, la jefatura del aeródromo, los explotadores comerciales, militares y de la aviación general, y otras partes involucradas en la provisión y operación de la infraestructura física necesaria para apoyar el despegue, aterrizaje y servicios de escala de las aeronaves.

Los proveedores del espacio aéreo – Se refiere, en términos generales, a los Estados/Territorios Contratantes, en su calidad de dueños del espacio aéreo legalmente facultados para permitir o negar el acceso a su espacio aéreo soberano. También se puede aplicar el término a organizaciones del Estado a las cuales se les ha asignado la responsabilidad de establecer las normas y lineamientos para el uso del espacio aéreo.

Usuarios del espacio aéreo – Se refiere a los explotadores comerciales, militares y de la aviación general que utilizan el espacio aéreo soberano de los Estados/Territorios/Organizaciones.

Proveedores de servicios ATM – Todas las organizaciones y el personal (por ejemplo, controladores, ingenieros, técnicos) involucrados en el suministro de servicios ATFM a los usuarios del espacio aéreo.

Aviación militar – Se refiere al personal, aeronaves y equipos de las organizaciones militares que desempeñan un papel primordial en la seguridad de los Estados/Territorios.

Organización de Aviación Civil Internacional (OACI) – Considerada la única organización internacional capaz de coordinar eficientemente las actividades de implantación de la ATM mundial.

1.5 Documentos de Referencia

OACI. Documento 4444: Gestión del tránsito Aéreo (PANS-ATM)
OACI. Documento 9971: Manual de gestión colaborativa de la afluencia del tránsito aéreo

OACI. Plan de implantación de navegación aérea basado en el rendimiento para la Región SAM (SAM **PBANIP)**

OACI. Documento 9750: Plan Mundial de Navegación Aérea, 5ª Edición.

2. VISION GENERAL DE LA ATFM

La visión de la Gestión de afluencia del tránsito aéreo (ATFM) debería de estar conforme a la definición ofrecida en el documento 4444-ATM/501 de OACI: *Servicio establecido con el objetivo de contribuir a una circulación segura, ordenada y expedita del tránsito aéreo asegurando que se utiliza al máximo posible la capacidad ATC, y que el volumen de tránsito es compatible con las capacidades declaradas por la autoridad ATS competente.*

El GREPECAS, tras analizar el escenario aeronáutico regional, desde luego consideró que la implantación temprana de la ATFM deberá "*garantizar una afluencia óptima de tránsito aéreo hacia ciertas áreas o a través de las mismas, durante períodos en los cuales la demanda excede o se espera exceda la capacidad disponible del sistema ATC"*.

En síntesis, se requiere de la ATFM para implementación de iniciativas que ajusten la demanda a la capacidad declarada, sin que eso introduzca o aumente el retraso de los vuelos.

2.1 Consideraciones generales

Los servicios ATFM pioneros se han implementado de forma centralizada en Europa (CFMU, actualmente el NM) y EEUU (ATCSCC). De hecho, el *Concepto Operacional de la Gestión de la Afluencia* (ATFM) *en las Regiones del Caribe/Sudamérica (CONOPS ATFM* CAR/SAM*)* también considera que *la gestión de flujo de tránsito aéreo debería implantarse dentro de una región o dentro de otras áreas definidas como una organización ATFM centralizada, con el apoyo de unidades de gestión de flujo (FMU) establecidas en cada ACC dentro de la región o área de aplicación.*

Actualmente, se ha observado que todavía no es factible implementar la Unidad ATFM centralizada en la Región SAM (o mismo CAR/SAM). Sin embargo, aunque la implantación del servicio ocurre a nivel subregional o unilateral de cada Estado, resulta imprescindible que en dicha implantación sean observados apropiadamente los requisitos de armonización e interoperabilidad regional y global, ya que el intercambio de datos ATFM es un requisito global. También se requiere la armonización de normas y procedimientos a nivel regional, que facilitara un ambiente colaborativo entre los Estados garantizando el incremento de los niveles de seguridad de las operaciones aéreas en la región y el logro de metas conjuntas en el área ATFM.

2.2 Beneficios de la utilización de la ATFM

A través de la ATFM se logrará una afluencia óptima de tránsito aéreo en todo el espacio aéreo, incluyendo rutas, sectores o áreas en las cuales podrían ocurrir congestiones de tránsito aéreo y un exceso de la demanda en relación a la capacidad disponible del sistema ATC.

El sistema ATFM debería reducir las demoras de las aeronaves, tanto en vuelo como en tierra, y evitar la sobrecarga del sistema. El sistema ATFM también ayudará al ATC a alcanzar sus objetivos y lograr una utilización más efectiva del espacio aéreo y de la capacidad aeroportuaria disponible.

La ATFM también contribuye para garantizar que la seguridad de las operaciones aéreas no se vea comprometida en caso de existir niveles inaceptables de congestión de tránsito aéreo y, al

mismo tiempo, garantizar una gestión efectiva del tránsito aéreo sin necesidad de imponer restricciones innecesarias a la afluencia.

2.3 Deficiencias causadas por la la falta de la ATFM

La ATFM es una iniciativa sistémica en apoyo al crecimiento continuado del transporte aéreo, el cual impone retos adicionales para la infraestructura tanto de aeropuertos como de navegación aérea. Por lo tanto, la ATFM se incluye entre las acciones concretas para el sostenimiento de los logros hasta ahora alcanzados en la seguridad operacional.
La falta de la ATFM involucraría dificultades y riesgos que incluyen lo siguiente:

- Sobrecarga de trabajo en los puestos operacionales de control de tránsito aéreo;
- Control de flujo *ad hoc, i. e.,* sin planificación estratégica o pre táctica de los movimientos de aeronaves;
- Demoras de las aeronaves, sin adecuada sincronización del flujo y desequilibrio en la cuestión “demanda X capacidad”;
- Imposición de restricciones unilaterales y mal distribuidas entre los operadores de aeronaves;
- Pérdida de capacidad del espacio aéreo y de los aeropuertos;
- Niveles inaceptables de congestión en sectores de espacio aéreo;
- Poca o ninguna toma de decisión en colaboración (CDM) con los actores de aeropuertos, líneas aéreas, etc.;
- Sobretodo y en general, una Gestión del tránsito aéreo ineficaz.

2.4 Requisitos ATFM

Los requisitos para implantación del servicio ATFM abarcan aspectos de reglamentación, procedimientos, arreglos institucionales, recursos humanos, instalaciones, herramientas, etc. En esta Guía de consideraciones técnicas presiéntanse únicamente requisitos básicos relacionados con los siguientes aspectos técnicos – funciones o capacidades mínimas del sistema:

2.4.1 Demanda

Predecir la demanda de tránsito aéreo, basado en planes e intención de vuelo de todos los usuarios del espacio aéreo, o bien complementado con datos estadísticos de los operadores de la aviación general y militar.

2.4.2 Capacidad

Monitoreo de la capacidad declarada de todos los recursos de infraestructura lado aire y lado tierra (pistas, rutas, sectores de espacio aéreo, FIR, puntos de recorrido, etc.)
Nota: Esa función requiere el más pronto acceso a los datos AIS/AIM, de meteorología, de mantenimiento (MTBF/MTTR), etc.

2.4.3 Demanda X Capacidad

Indicación comparativa de la situación “Demanda X Capacidad” en las fases estratégica y pre-táctica de ATFM; y monitoreo en tiempo real del volumen de tránsito aéreo en los diferentes aeropuertos y los sectores de control en la operación ATFM táctica.

2.4.4 Iniciativas de gestión de flujo (TMI)

Aplicación de las diversas iniciativas de gestión de transito, incluyendo evaluación previa de su impacto.
Nota: Una herramienta ATFM debería ser capaz, como mínimo, de proveer indicación de CTOT – Calculated Take-Off Time (y eventualmente también de CTA – Calculated Time of Arrival)

2.4.5 Toma de decisión en colaboración (CDM)

Función para el intercambio de información con los “stakeholders” (socios?) en las diferentes fases de la ATFM. Interfaz estandarizada con sistema A-CDM (basada en formato ADEXP)

2.4.6 Análisis post operacional

Registro de datos operacionales (estadísticos), que permita análisis post operacional sobre la eficiencia de las iniciativas de gestión tomadas.

3. CONSIDERACIONES GENERALES EN LA REGION SAM PARA LA PLANIFICACION DE IMPLANTACION DEL ATFM

En la CONOPS ATFM CAR/SAM presiéntanse requisitos que se debería considerar en la implantación de la ATFM Centralizada en la región.

Asimismo, en la misma CONOPS también se establece que se podría aplicar procedimientos ATFM básicos sin tener la inmediata necesidad de contar con una dependencia ATFM centralizada, en base a la experiencia adquirida en otras Regiones y por algunos Estados de las Regiones CAR/SAM.

En consecuencia, se recomendaría que los Estados/Territorios y Organismos Internacionales, al definir su requisito de dependencia ATFM, e.g. una Unidad de Gestión de Flujo de Tránsito Aéreo y los Puestos de Gestión de Afluencia asociado, tomen en cuenta también el concepto de ATFM multi-nodal tal como se ha definido en la región APAC (Asia-Pacífico).

3.1 Situación actual de la ATFM en la Región SAM

Según las metas regionales fijadas en la Declaración de Bogotá, como resultado de la décimo tercera Reunión de Autoridades de Aviación Civil de la Región Sudamericana (RAAC/13), se debería ya tener un *100% de centros de control de área (ACCs) proporcionando el servicio de gestión de la afluencia del tránsito aéreo (ATFM).* El requisito de implantación del ATFM se basa en el contenido de la Sección 3.7.5 del Anexo 11 al Convenio sobre Aviación Civil Internacional.

Sin embargo, aunque significativos avances se ha obtenido, todavía se identifican distintos grados de implantación de la ATFM en los Estados de la región SAM. La situación actual se describe en el apéndice X.

3.2 Aplicación inicial de la ATFM

En ese sentido, se debería tomar nota que el Doc 9971 establece que *en su aplicación inicial, la ATFM no requiere de involucrar procesos, procedimientos o herramientas complejas. El objetivo es de colaborar con todos los stakeholders y de comunicar información operacional a los usuarios del espacio aéreo, proveedores de servicios de navegación aérea y otros actores interesados en una manera tempestiva*.

Asimismo, la implantación de herramientas complejas de ATFM debería basarse en los requisitos operacionales específicos y análisis de costo-beneficio.

4. CONSIDERACIONES TECNICAS PARA EL APOYO A LA IMPLANTACION DEL ATFM

4.1 Generalidades

El Doc 9971 - Manual de gestión colaborativa de la afluencia del tránsito aéreo, preconiza en el capítulo 3, que "… existiran distintos niveles de vigilancia ATFM. Sin embargo, el concepto principal se basa en el hecho de que los Estados asignan responsabilidades por la vigilancia y ejecución de servicios ATFM.

4.1.1 Control y vigilancia de las actividades ATFM

En consecuencia, cada Estado asignara la responsabilidad de reunir y dar a conocer información relacionada con la ATFM, y de controlar y vigilar las actividades ATFM dentro de sus FIR respectivas. Eso garantizara que todas las partes interesadas tengan acceso oportuno y eficiente a la información ATFM pertinente". Dicho documento aún define que, como mínimo, esta estructura permitirá la gestión y vigilancia de:

a) el servicio ATFM; y
b) la coordinación e intercambio de información, tanto interna como externa; y también

debe garantizar:

c) la existencia de una estructura jerárquica para la implantación de decisiones; y
d) el cumplimiento de los requisitos de la misión que se hayan asignado a los servicios ATFM.

4.1.2 Estructura de respalde a servicio ATFM

Para cumplir las actividades listadas en el párrafo anterior, es necesaria la implantación de una estructura jerárquica que respalde el servicio ATFM, que puede incluir:

a) un administrador del servicio ATFM;
b) la dependencia de gestión de afluencia (FMU) que presta servicio ATFM a un conjunto especifico de dependencias ATS; y
c) puestos de gestión de la afluencia (FMP) en dependencias ATS especificas responsables de las actividades ATFM cotidianas.

4.1.3 Maneras de implantar el servicio ATFM

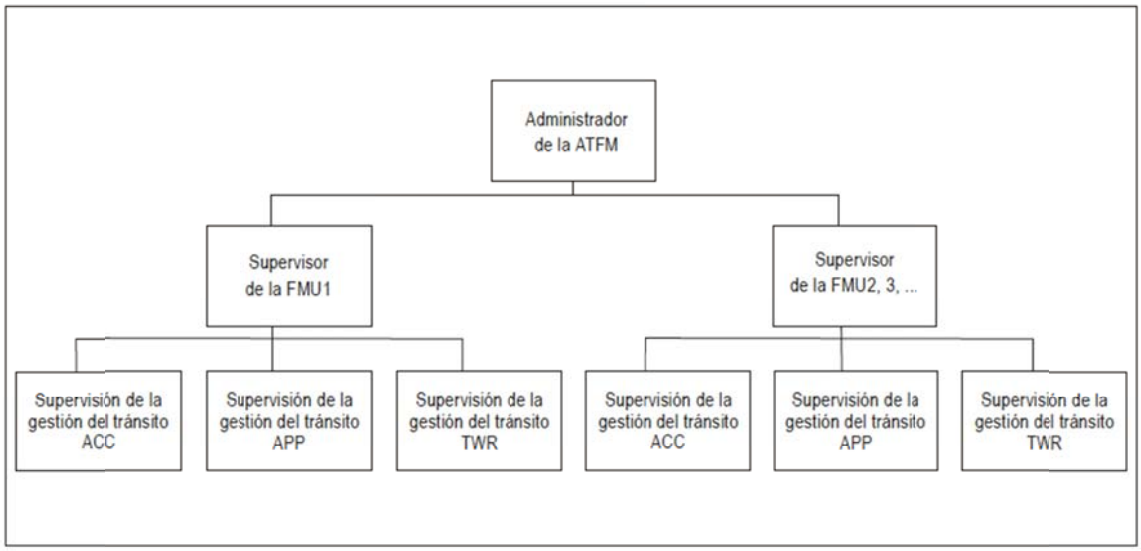
Un servicio ATFM pude ser implantado de diversas maneras, levando en cuenta lo siguiente:

a) Utilización de una o más FMP: en este caso se puede trabajar con los siguientes escenarios:
   (1) un FMP puede prestar servicio a una torre de control de aeródromo (TWR). Se puede asignar esta tarea a un puesto existente o tal vez sea necesario un puesto dedicado. El FMP de la torre de control coordina con el FMP en la dependencia de control de aproximación;
   (2) un FMP puede prestar servicio a una dependencia de control de aproximación. Se puede asignar esta tarea a un puesto existente en la unidad de control de aproximación o tal vez sea necesario uno o más puestos dedicados, según el volumen de trabajo. El FMP de la dependencia de control de aproximación coordina con el FMP en un centro de control de area (ACC).
b) Utilización de una FMU. En este caso se puede trabajar con los siguientes escenarios:

(1) una FMU puede prestar servicio a un ACC. Esta estructura ATFM en un ACC es más compleja puede constar de una serie de puestos de coordinador de tránsito para satisfacer las necesidades del ACC y sus dependencias subordinadas. Las actividades serian:

- la coordinación de control de aproximación;
- la coordinación de control de salida;
- la coordinación en ruta;
- la coordinación de información/pronósticos meteorológicos;
- el enlace AU;
- el enlace militar;
- la coordinación del aeropuerto;
- el análisis posterior a las operaciones; y
- otras funciones de apoyo que tal vez sean necesarias, como la coordinación administrativa y de tecnología de la información. También tal vez se necesiten las funciones adicionales de coordinador de gestión de crisis, si corresponde.

Un ejemplo de estructura jerárquica es descrito en el diagrama siguiente:



(2) un centro nacional o internacional ATFM puede prestar servicio a un grupo de ACC. Esta es una de las estructuras ATFM más complejas e incluye múltiples funciones, que pueden incluir:

- la coordinación de la gestión del tránsito;
- la planificación del tránsito;
- la coordinación de información/pronósticos meteorológicos;
- la coordinación NOTAM/mensajes;
- la coordinación de calibración de vuelo/verificación en vuelo;
- el enlace con AU;
- el enlace militar;

- la coordinación de la tecnología de la información y la gestión de datos operacionales;
- la coordinación de operaciones técnicas (relativas a infraestructura y sistemas como NAVAID, radares, sitios de comunicaciones VHF); la coordinación de gestión de crisis; y
- el análisis operacional;

a. Un centro ATFM nacional o internacional, responsable de la difusión de la información y la coordinación entre las instalaciones ubicadas en su área de responsabilidad, es decir, coordinación nacional, intrarregional e interregional.

4.1.4 Tipos de estructuras ATFM en la región SAM

Bajo el concepto de implantación de la ATFM en la Región SAM, se observa la existencia de dos tipos de estructuras ATFM. La primera es basada en la implantación de uno o más FMP, para tratar de forma local las necesidades de gestión de afluencia en determinados aeródromos y o dependencias de control de aproximación. La segunda es basada en la implantación de una o más FMU, que es responsable por tratar la gestión de la afluencia de tránsito aéreo en todo el espacio aéreo bajo responsabilidad de un ANSP.

4.1.5 Visión Prospectiva

Una visión prospectiva apunta para un escenario más complejo, en lo cual se tendrá varias FMU y pocas FMP, como forma de atender a las necesidades de mejor gestión del crecente flujo de aeronaves en la Región. En este escenario será muy importante establecer mecanismos de coordinación entre las FMU, a ejemplo del considerado en la arquitectura “Multi-Nodal Cross Border”.

4.2 Funciones de una FMU/FMP

4.2.1 Según el Doc 9971, se incluyen, entre otras, las siguientes funciones de una FMU/FMP:

1) Crear y distribuir el ADP sobre la base de la consulta previa y la colaboración con las instalaciones y partes interesadas designadas;

2) reunir toda la información pertinente, como las condiciones meteorológicas, limitaciones de capacidad, fallas en la infraestructura, cierres de pistas, interrupciones automatizadas del sistema y cambios en los procedimientos que afecten a las dependencias ATS. Esto se puede lograr a través de los medios disponibles, como teleconferencias, correo electrónico, internet y recopilación automatizada de datos;

3) analizar y distribuir toda la información pertinente;

4) documentar una descripción completa de todas las medidas ATFM (p. ej., programas de demora en tierra (GDP), MIT) en un registro designado. Entre otros datos, se debería incluir, para cada medida, las horas de inicio y fin, los vuelos y partes interesadas pertinentes y su justificación;

5) coordinar los procedimientos con las partes interesadas pertinentes;

6) crear una estructura para la difusión de información (como un sitio web);

7) hacer conferencias telefónicas y/o conferencias web a diario, según sea necesario; y

8) controlar continuamente el sistema ATM, haciendo ajustes en la prestación de los servicios cuando sea necesario, gestionando las medidas ATFM y cancelándolas cuando ya no sean necesarias.

4.3 Consideraciones Técnicas

El área técnica tiene la misión de proveer los medios para que sea implementada la ATFM tomando en cuenta los requerimientos operacionales y los recursos financieros disponibles. Por lo tanto, el apoyo a la implantación del ATFM en la Región SAM debe tener en cuenta la posibilidad de que algunos Estados implanten FMP en determinados sitios y otros implanten una FMU.

Lo que cambia son las necesidades de acceso a la información, las cuales implican en necesidades diferentes de infraestructura técnica para soportar la ejecución de las actividades. Las FMP son más sencillas y demandan menos recursos técnicos y humanos, en cuanto que las FMU comprenden un ambiente complejo y requieren mucho más infraestructura técnica y recursos humanos altamente especializados.

Para mejor describir el papel de l área técnica, serán hechas consideraciones específicas para las FMU y para las FMP.

4.3.1 – Consideraciones Técnicas – FMU

Por su relevancia, amplitud y estructura organizacional, una FMU requiere un gran aporte de recursos técnicos para soportar su operación y administración. Sin embargo, es fundamental que se tenga un sistema automatizado que posibilite a los operadores tener acceso a la información necesaria actualizada y íntegra. Dicho sistema automatizado debe reflejar el modelo operacional de la FMU, contemplando herramientas para las funciones y actividades relacionadas a la gestión de la afluencia de tránsito aéreo.

Sin embargo, un sistema automatizado presupone la existencia de toda una infraestructura técnica basada en sistemas de fornecimiento de energía, climatización, comunicaciones y logística, entre otros.

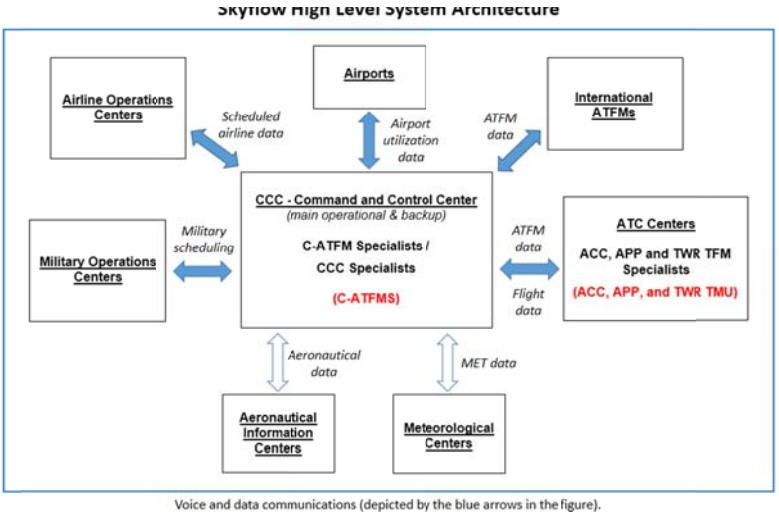
Para manejar y mantener toda esta infraestructura es necesario se tener un equipo de técnicos especializados en tecnología y seguridad de la información, así como para los demás sistemas y subsistemas.

4.3.1.1 Arquitectura del Sistema Automatizado FMU

Al se considerar la adopción de una FMU bajo el concepto de un centro ATFM que haga la gestión de uno o más ACC, es importante se tener en cuenta la arquitectura del sistema automatizado a ser utilizado, lo cual debe considerar los siguientes actores;

1. las aerolíneas, con sus centros de operación;
2. los aeródromos involucrados;

3. los centros ATC involucrados;
4. los sistemas de vigilancia;
5. los parceros internacionales;
6. los sistemas de comunicación por voz y datos;
7. los órganos reguladores;
8. los centros militares;



Arquitectura del sistema ATFM – Ejemplo del sistema SKYFLOW by Atech

Además, la arquitectura debe se basar en las siguientes directrices:

- Atendimiento a los requerimientos operacionales
- Flexibilidad para procesar nuevas fuentes de información, lo que implica en se tener un sistema automatizado diseñado para ser adaptable a nuevas reglas y necesidades.

Para atender a dichas directrices es necesario que la arquitectura sea basada en el concepto "*open system of systems*", con el propósito de se tener más flexibilidad para posibilitar su evolución y añadir funcionalidades para atender a futuras demandas operacionales.

4.3.1.2 Componentes de la arquitectura

La arquitectura es compuesta de los siguientes componentes:

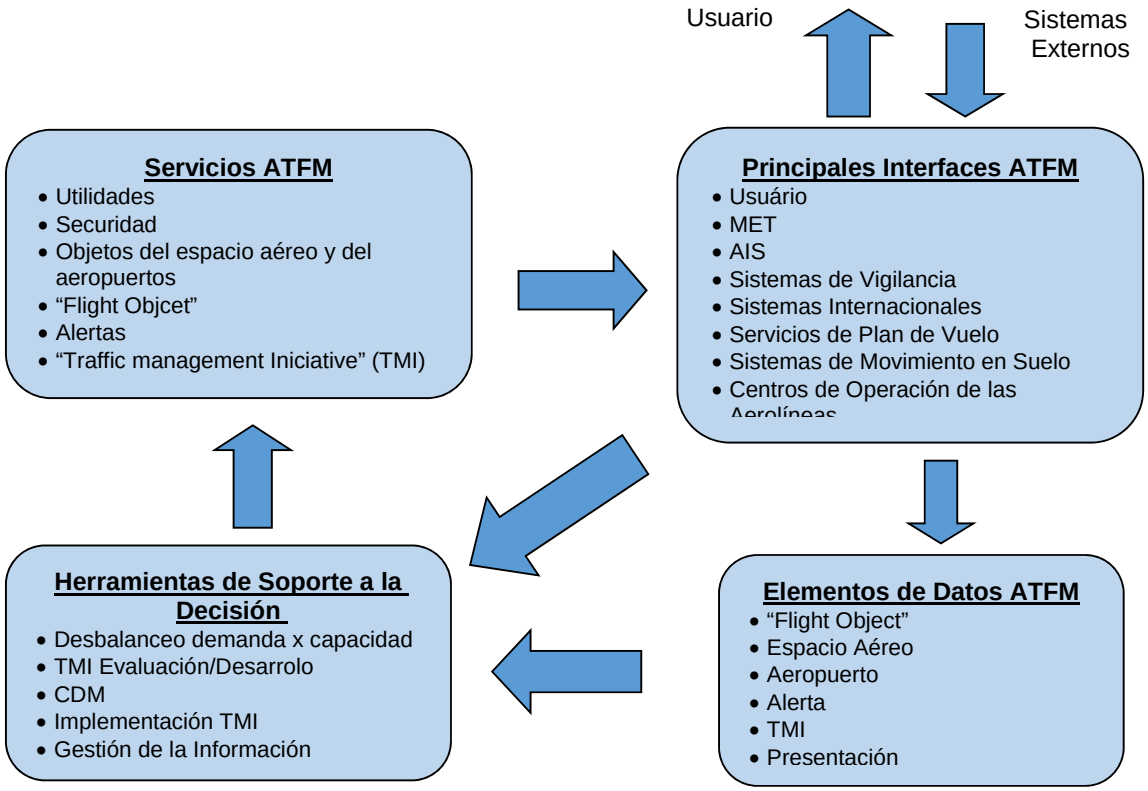
1. Servicios
2. Interfaces
3. Elementos de datos

4. Herramientas de soporte a la toma de decisión.

Dicha arquitectura posibilita agregar con facilidad nuevos servicios, elementos de datos, interfaces o herramientas de soporte a la toma de decisión sin cambiar su abordaje principal, bastando solamente mantener las consistencias entre los cuatro componentes.

4.3.1.3 Componentes y interacciones del sistema

La figura siguiente es una presentación gráfica de los componentes y sus interacciones.



Arquitectura del Sistema ATFM – Interacción entre componentes

4.4 Servicios ATFM

4.4.1 Funcionalidades de los servicios ATFM

Los servicios ATFM son compuestos de las siguientes funcionalidades:

a) Servicios de utilidad. Presta servicios como presentación de informaciones en las pantallas, logging de datos operacionales y de inserción de datos por el usuario;
b) Servicios de Seguridad. Presta servicios de seguridad para garantizar la integridad de todo el sistema, comprendiendo los servicios de controle de acceso al sistema, de control acceso a los datos y de distribución de los datos;
c) Servicio de objetos del espacio aéreo y de aeropuertos. Provee información acerca de los objetos espacio aéreo y aeropuertos, posibilitando la creación de espacios aéreos específicos y proveyendo informaciones geográficas sobre los espacios aéreos y aeropuertos;

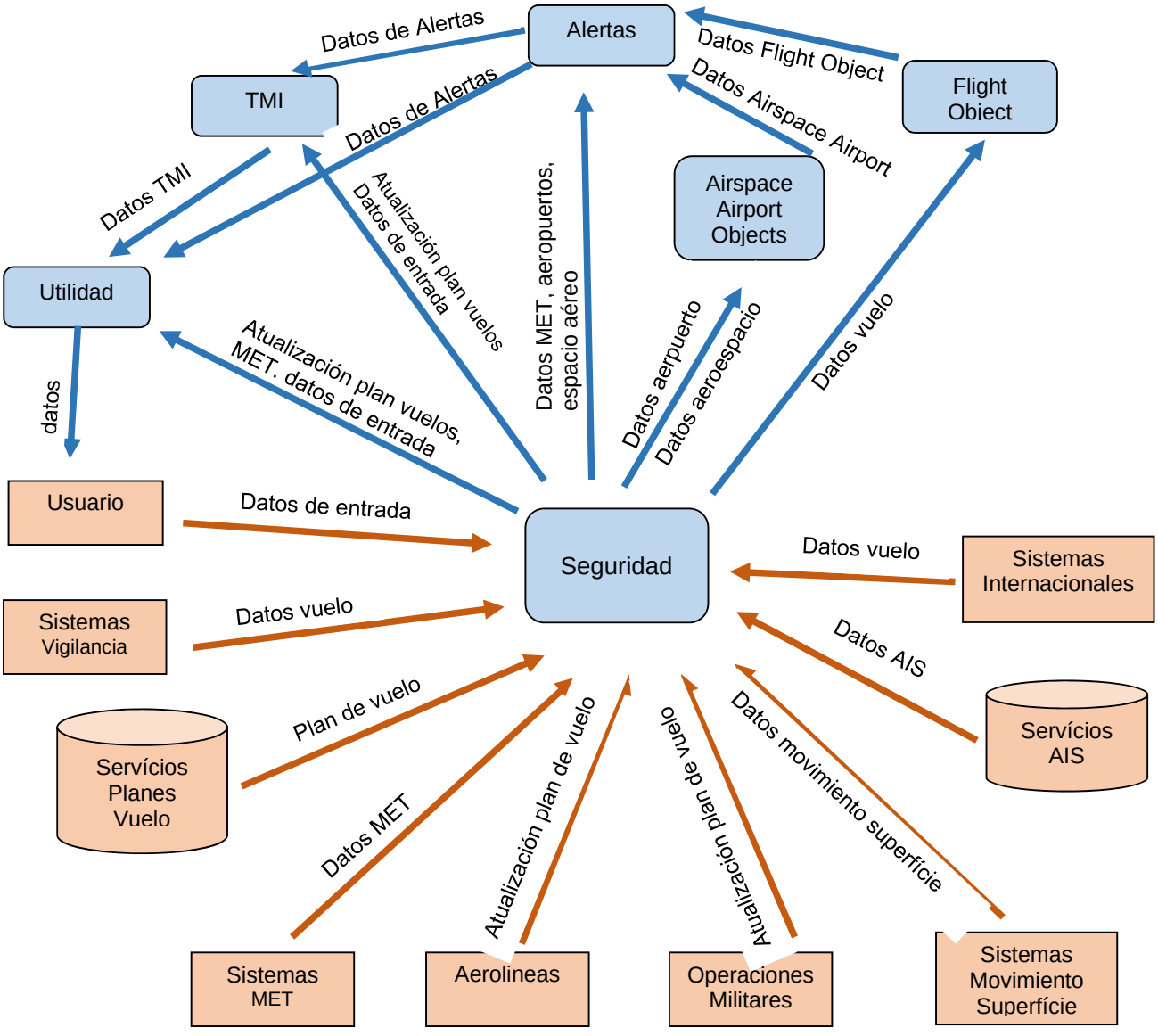
d) Servicio de “flight object”. Provee informaciones sobre los “flight objects”, siendo compuesto de los servicios de posición en una determinada hora, de ruta, de eventos (ETA, EDCT, off block time, etc) y de la predicción de la hora en que un vuelo va cruzar un componente del espacio aéreo;

e) Servicio de alertas. Proporciona alertas sobre desbalanceas entre capacidad y demanda., considerando la demanda calculada, la capacidad del espacio aéreo, las restricciones de capacidad debidas a problemas con “navaids”, sensores de vigilancia y factores meteorológicos; y

f) Servicio de “Traffic Management Iniciative”. Proporciona herramientas para implementar y gestionar las iniciativas TMI. Es compuesto de los servicios de ajuste del nivel de vuelo; “reroute / fix balancing”; “airborne holding”; “metering sequencing / spacing”; y “ground stop (GS) / ground delay program (GDP)”.

4.4.2 Servicios ATFM y interfaces con los sistemas ATM

El diagrama siguiente es una representación esquemática de los servicios y sus relaciones con las interfaces de los sistemas ATM que proveen informaciones críticas para el sistema ATFM. También es posible observar los flujos de datos entre los servicios. Se nota que todas las interfaces de sistemas ATM se comunican solamente con el servicio de seguridad.



4.4.3 Principales Interfaces ATFM

Las interfaces son el elemento de la arquitectura responsable de la integración y el intercambio de datos con diversos sistemas externos y heredados. De acuerdo con los diferentes tipos de sistemas externos, este elemento debe contener varios adaptadores o componentes que pueden implementar las funciones de ingesta y intercambio de datos. Varios vendedores desarrollaron los sistemas heredados actualmente utilizados por las diferentes instalaciones ATC. Cada uno de estos sistemas contiene sus propias complejidades y las mejores prácticas de la industria recomiendan un tipo de enfoque de "caja negra" en el que cada uno de estos sistemas produce un flujo de datos basado en una especificación. Por lo tanto, el sistema ATFM no necesita entender las complejidades de los datos en cada uno de los sistemas ATC. Para implementar la integración de datos, se requiere un “middleware” de mensajería, que es un software de computadora que conecta componentes de software y sus aplicaciones. El software consiste en un conjunto de servicios que permite que múltiples procesos se ejecuten en una o más máquinas para interactuar. Esta tecnología evolucionó para proporcionar interoperabilidad en apoyo de la migración a arquitecturas distribuidas coherentes, que se utilizan con mayor frecuencia para apoyar y simplificar aplicaciones distribuidas complejas. Incluye servidores web, servidores de aplicaciones y herramientas similares que soportan el desarrollo y la entrega de aplicaciones. El “Middleware” es parte integral de la moderna tecnología de la información basada en XML, Simple Object Access Protocol (SOAP), Servicios Web y SOA (Service Oriented Architecture), que sirve de base para la implementación de los conceptos del SWIM.

4.4.3.1 AIS

Esta interfaz importa los datos que son producidos por el Sistema de Información Aeronáutica (AIS). Los datos incluyen la estructura del espacio aéreo, rutas, beacons, aeropuertos, NAVAIDS, restricciones, etc. Este componente construye un modelo digital de espacio aéreo, que se utiliza directamente para hacer una predicción de tránsito con las trayectorias de vuelo.

4.4.3.2 MET

Esta interfaz posibilita que el sistema ATFM procese informaciones provenientes de radares meteorológicos, de imágenes satelitales, de estaciones meteorológicas y de otras informaciones, disponibles en las bases de datos OPMET.

4.4.3.3 VIGILANCIA

Esta interfaz proporcionará un Mosaico Nacional de todos los datos del sistema de vigilancia, con una imagen integrada de todas las aeronaves. La interfaz del sistema de vigilancia acepta los datos de vuelo y el informe de posición de las aeronaves provenientes de los radares, ADS-B, ADS-C y MLAT.

4.4.3.4 Centros de Operaciones de las Aerolíneas

Esta interfaz es responsable por el intercambio de datos con las aerolíneas y sus agentes operativos. El sistema ATFM puede recibir planes de vuelo directamente de las aerolíneas. Habrá un sistema de gestión del plan de vuelo operativo independiente para examinar y aprobar los planes de vuelo y mantener una base de datos completa del plan de vuelo.

4.4.3.5 Movimiento en Superficie

Esta interfaz recibe informaciones de utilización de los patios y el tiempo "off-block" de los sistemas de automatización de control de operación del aeropuerto. El principal beneficio de la interfaz con el sistema ATFM es una mejor estimación del Tiempo de Despeje de Salida Estimado que, a su vez, conduce a una mejor estimación del tiempo de llegada y todos los tiempos posteriores del viaje para un vuelo.

4.4.3.6 Sistemas Internacionales

Esta es una capacidad que es necesaria para la integración con el sistema de aviación mundial.

4.4.3.7 Operaciones Militares

Esta interfaz es responsable por el intercambio de datos con las Fuerzas Armadas. El sistema ATFM recibirá planes de vuelo directamente de los militares para vuelos que atravesarán el espacio aéreo civil.

4.5 Elementos de Datos ATFM

4.5.1 "Flight Object"

Hay un "flight object" para cada vuelo, que puede estar volando efectivamente, esté previsto su despeje o ha llegado. "Flight Objects" hacen uso de los "airspace objects" y de los "airport objects" y es compuesto de los siguientes datos:

- Información de la aeronave: describe completamente la aeronave. Es compuesto por su identificación (ID) y tipo de la equipaje.
- Plan de vuelo: describe completamente el plan de vuelo, según el Doc. 4444.
- Trayectoria futura del vuelo: describe la posición proyectada de la aeronave con el tiempo.
- Trayectoria actual del vuelo: describe la trayectoria actual de la aeronave.
- Latitud
- Longitud
- Característica del espacio aéreo: Tipo de característica del espacio aéreo para describir la trayectoria; Será uno de los siguientes: Waypoint, center, fix, airway, sector, airport.
- Altitud

- Velocidad del suelo
- Proa: la dirección actual de la aeronave en vuelo.

4.5.2 “Espacio Aéreo”

Estos objetos son utilizados cómo puntos de referencia para los vuelos y son compuestos por los siguientes datos: nombre, latitud, longitud y frecuencia.

4.5.3 Alertas

Los alertas son compuestos de los siguientes datos:

- Demanda actual y futura
- Capacidad actual y futura
- Alertas de impactos debidos a la capacidad
- Alertas de impactos debidos a meteorología.

Estos alertas se proporcionan al servicio TMI para permitir el sistema ATFM a emitir TMI apropiados que proporcionen un equilibrio entre la demanda y la capacidad.

4.5.4 TMI

Hay un elemento de datos por TMI que se ha iniciado. Si no hay TMI en el sistema, entonces no hay objetos TMI. Los diferentes tipos de TMI incluyen:

- Flight Level Adjustment TMI
- Reroute/Fix Balance TMI
- Airborne Holding TMI
- Metering Sequencing Spacing TMI
- Ground Stop (GS)/Ground Delay Program (GDP) TMI
- Flow Constrained Areas (FCA)
- Flow Evaluation Area (FEA)

4.5.5 Presentación de la situación de demanda/capacidad

Es compuesto de las siguientes informaciones, tanto para la situación actual cuanto para la proyectada:

- Demanda del Aeropuerto/Espacio aéreo
- Capacidad del Aeropuerto/Espacio aéreo
- Retraso en Aeropuerto/Espacio aéreo
- Restricciones de capacidad
- Meteorología

- Estructura del espacio aéreo
- TMIs activos y proyectados
- Métricas de performance de TMI.

4.5.6 Herramientas de Soporte a la Decisión

Se definen como aquellos elementos de hardware y software que ayudan al especialista ATFM en el desempeño de las tareas asignadas. Estas herramientas incluyen el desarrollo de la información necesaria para la tomada de decisión y las pantallas son utilizadas para proporcionar esta información al especialista. Se han categorizado de la siguiente manera:

4.5.6.1 Desbalanceo Demanda x Capacidad

Estas herramientas presentarán las siguientes informaciones:

- Visualización del aeropuerto, instalaciones, espacio aéreo, sector, demanda de rutas y capacidad;
- Datos meteorológicos incluyendo la situación actual, la planificación con la evaluación del riesgo, y otras herramientas de apoyo a la decisión;
- Información de la situación del espacio aéreo para visualización de uso condicional, militar y no militar.
- Sistema de información operacional que deberá proporcionar retrasos en el sistema de tránsito aéreo, demanda, planificación del sistema y limitaciones de capacidad, así como controlar el intercambio de información en función de la autorización de las autoridades competentes.
- Información de la situación del aeropuerto, que deberá proporcionar: estado y disponibilidad de la puerta de la aeronave; información meteorológica relativa a las condiciones locales y regionales; retrasos que afectan las partes interesadas y al proveedor de servicios de tránsito aéreo; información sobre el impacto de la capacidad (deshielo, clima convectivo, niebla, etc.); información sobre colas de taxis de aviones y presentación de líneas; impactos en la construcción del aeropuerto (pista, taxi y otras áreas de movimiento) y configuración de la pista en uso.
- La visualización futura del tránsito incluirá: visualización de información de tránsito aéreo proyectada, basada en información actual y trayectorias esperadas; información de llegada y salida del aeropuerto basada en información meteorológica, eólica y otra información predictiva; la demanda específica del aeropuerto y la herramienta de balanceo de capacidad.
- Herramienta de identificación y alerta de restricciones de demanda / capacidad (todos los niveles de instalaciones de tránsito aéreo).

4.5.6.2 Herramientas para la Evaluación/Desarrollo de las "TMI"

Son compuestas por las herramientas que procesan informaciones específicas de tránsito aéreo, que incluyen:

a) La demanda y capacidad de tránsito aéreo en los aeropuertos, las instalaciones de tránsito aéreo y los volúmenes identificados de espacio aéreo, sectores y rutas.
b) Datos meteorológicos incluyendo la situación actual, pronóstico, planificación con evaluación de riesgos y otras decisiones
c) Herramientas de soporte.
d) Información de estado del espacio aéreo para uso condicional, militar y no militar.
e) Capacidades actuales y futuras para la demanda nacional, regional y local.
f) Identificación de la demanda / capacidad con intercambio de información, que deben incluir:

• Demanda de los recursos del sistema de tránsito aéreo (rutas, sectores, aeropuertos, etc.).

• Capacidad de los recursos del sistema de tránsito aéreo reflejados por métricas acordadas y otros impactos (clima, recursos de personal, sectorización, etc.)

• Información de retardo, automatizada y/o reportada.

• Herramientas compartidas comunes que permiten a todos los proveedores de servicios de tránsito aéreo la capacidad de identificar y compartir los retrasos del sistema y mostrar información sobre las restricciones del sistema a las partes interesadas.

• Herramientas de comunicación e información de las partes interesadas que permitan el intercambio directo de cuestiones, preocupaciones, necesidades y expectativas mediante:

• Sistemas de información y asesoramiento

• Intranet / Internet incluyendo correo electrónico y sitios web

• Herramientas de voz (teleconferencias) y chat para el tránsito aéreo intra / inter instalaciones y comunicación de partes interesadas del sistema, intercambio de información, planificación y toma de decisiones.

• Reorientar la asignación, la disponibilidad, la evaluación de la demanda / capacidad de información que es coordinada y compartida a través de herramientas automatizadas comunes ya mencionadas.

• Base de datos de gestión e información de rutas con capacidades de análisis. Incluyen las rutas preferidas y opcionales disponibles para las instalaciones de tránsito aéreo y el uso de las partes interesadas del sistema.

• “Replay” de tránsito para la revisión de sistemas, instalaciones, sectores o torres y evaluación de eventos pasados

• Proporcionar una evaluación en tiempo real y posterior del desempeño de las operaciones ATM.

• La evaluación incluirá la información meteorológica, la demanda / capacidad y los

datos relativos a los retrasos y el uso y las modificaciones de la ruta.

4.5.7 CDM

La toma de decisión en colaboración es un proceso, que también implicará compartir información común usando sistemas dedicados, conectividad de Internet y sistemas telefónicos para apoyar:

- Información y difusión de TMI.
- Visualización de la situación del estado del aeropuerto.
- Visualización de la situación del tránsito en ruta.
- Herramientas de estado de información de tránsito aéreo.
- Las acciones tácticas basadas en automatización solicitan herramientas para abordar los retrasos, recuperación de desvíos, vuelos especiales y otras necesidades del sistema o solicitudes de los usuarios.
- Información de estado del sistema basada en la automatización, incluyendo información sobre la demanda del sistema, retrasos, restricciones de tiempo y otras limitaciones de capacidad, información de uso especial del espacio aéreo. El acceso puede estar basado en información y basado en privilegios.
- Información de ruta que permite conocer el estado del uso actual de la ruta y las posibles opciones o cambios.

4.5.8 Implementación del “TMI”

Para la implementación de las herramientas de apoyo a la decisión relacionadas al TMI, deben ser considerados los siguientes aspectos:

- Comunicación y coordinación para identificar, describir, modificar y ejecutar acciones concernientes a propuestas y acciones ATFM. Este proceso utilizará herramientas informativas comunes que utilizan sistemas dedicados, conectividad de Internet y sistemas telefónicos para proporcionar apoyo a todos los niveles del equipo.
- Sistema de asesoramiento automatizado que proporcionará información sobre las acciones ATFM, estado del sistema, planes futuros y otra información según sea necesario.
- Sistema basado en Web capaz de proporcionar información de estado para reflejar iniciativas actuales. El sistema proporcionará información a todos los niveles de las partes interesadas según sea necesario y designado.
- Utilizar procedimientos automatizados para actualizar informaciones de monitoreo que reflejen las iniciativas y sus impactos.
- Sistema de alarma o alerta diseñado para monitorear iniciativas en tiempo real. El sistema notificará la demanda y la capacidad y alertará al personal para modificar dinámicamente, cancelar o extender las acciones ATFM según sea necesario. El sistema responderá cuando la demanda, la capacidad, los impactos del sistema o los comentarios de los usuarios justifiquen la acción.

4.5.9 Gestión de la Información

Estas herramientas incluyen:

- Sistema de re visualización y análisis de tráfico aéreo con datos de instalaciones de torre, radar y no radar.
- Herramienta de análisis de demanda y de retraso, basada en aeropuertos.
- Herramienta automatizada de análisis del retardo del transporte aéreo (mantenimiento, vectorización, reroutes).
- Sistema de notificación de retrasos por causa y efecto del tráfico aéreo que identifica la correlación entre:
  - ¿Quién se retrasa, por cuánto tiempo, y cuántos?
  - ¿Cuál es el impacto, la causa, las acciones que se toman para mitigar los retrasos?
  - ¿Cuándo comenzaron los retrasos y cuál es su duración esperada?
  - ¿Dónde se producen los retrasos?
  - ¿Por qué se han producido los retrasos?
- Herramientas de análisis de eficiencia (Tráfico Aéreo y Partes Interesadas). Estos analizarán los retrasos en el sistema, no sólo aquellos identificados como tráfico aéreo (por ejemplo, construcción, mantenimiento, manejo de equipaje).
- Intercambio de datos centralizado y herramientas de gestión de bases de datos de información.
- Herramientas militares / especiales de seguimiento del uso del espacio aéreo
- Herramienta de análisis y asignación de rutas (qué rutas fueron requeridas, archivadas, enmendadas).
- Herramienta de análisis de rendimiento y de eficiencia aeroportuaria.
- herramienta de análisis de demanda y de retraso, basado en aeropuertos.

4.5.10 Presentación de la Información (displays)

Un conjunto de visualizaciones incorpora los datos y funciones que el sistema presenta a un especialista para permitir la interacción humana y el control sobre el sistema ATFM. Las directrices de alto nivel para las pantallas identificadas en esta sección incluyen:

- Conocimiento común de la situación: una de las metas fundamentales de la toma de decisiones colaborativa es proporcionar una conciencia de situación común entre todos los tomadores de decisiones. Dado que la ATFM tiene tantas partes interesadas, es absolutamente necesario proporcionar a cada una de ellas una parte de la información del sistema, dentro de los límites de seguridad y política, para asegurar objetivos comunes y decisiones inteligentes.
- Facilidad de accesibilidad, mantenimiento y soporte: este sistema debe estar disponible para los

especialistas de ATFM en una amplia área geográfica. Por lo tanto, muchas de estas pantallas se diseñarán utilizando tecnologías distribuidas que permitan el nivel apropiado de interacción, pero con relativa facilidad de despliegue y mantenimiento a través de las diversas instalaciones.

4.5.10.1 Pantallas de presentación de información

Las siguientes son las principales pantallas para el sistema:

a) Planificación estratégica de "slots" y de planes de vuelo

Se proporcionan servicios de información previa a las compañías aéreas y pilotos para facilitarles información actualizada sobre las instalaciones aeroportuarias y otras instalaciones aeronáuticas conexas para una planificación eficaz del vuelo y la conducción segura del vuelo.

b) Visualización de la situación del tráfico

La Visualización de la Situación del Tráfico debe ser el punto de partida para cualquier interacción del con el sistema. Es una visualización del estado actual de la situación, la demanda futura prevista y la congestión, los TMI actuales, el estado del espacio aéreo y la visualización del tiempo. Contiene tanta información, que puede ser apropiado que los especialistas con diferentes responsabilidades tengan diferentes presentaciones. Toda la información recopilada a través de las interfaces del sistema, toda la subestructura de datos y todos los servicios deberían estar disponibles a través de la interfaz de los especialistas de ATFM.

Dicha visualización puede ser presentada para los especialistas, por ejemplo de un Centro de Mando y Control (CCC), o para un acceso remoto utilizando Web browsers o para acceso a ficheros texto.

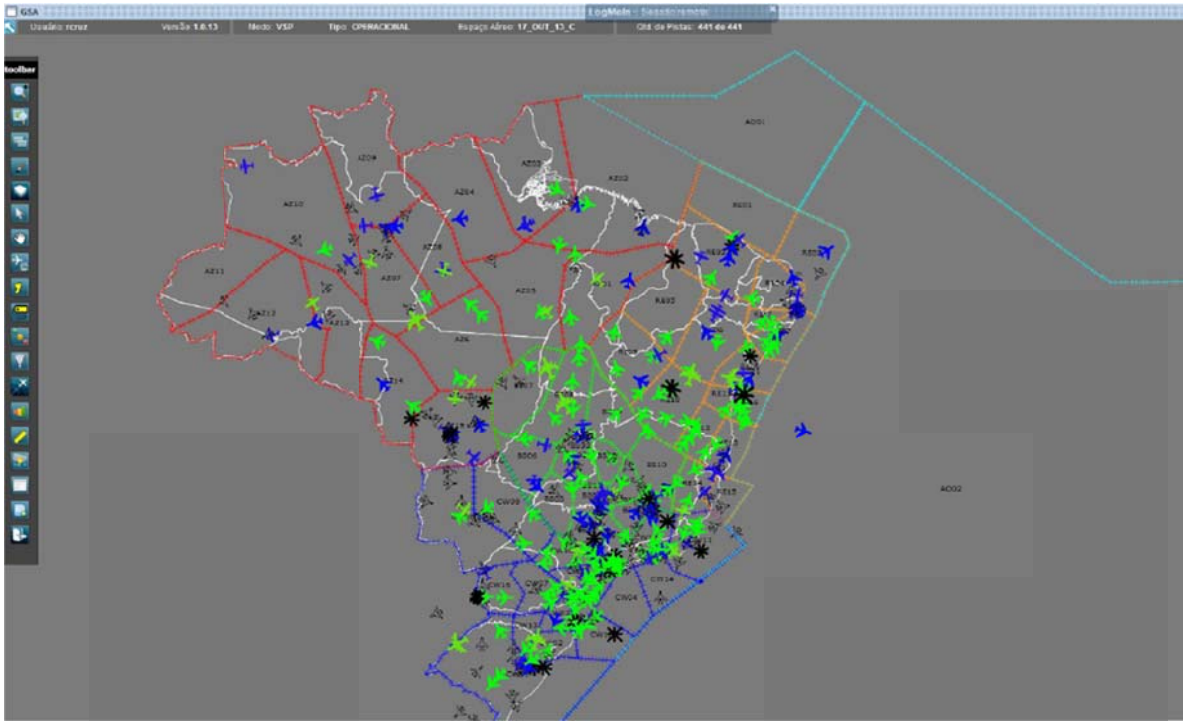
Los datos pueden ser presentados en la forma de gráficos asociados a mapas, relatórios texto y gráficos/tablas basadas en "timelines".

4.5.10.2 Actualización de la información

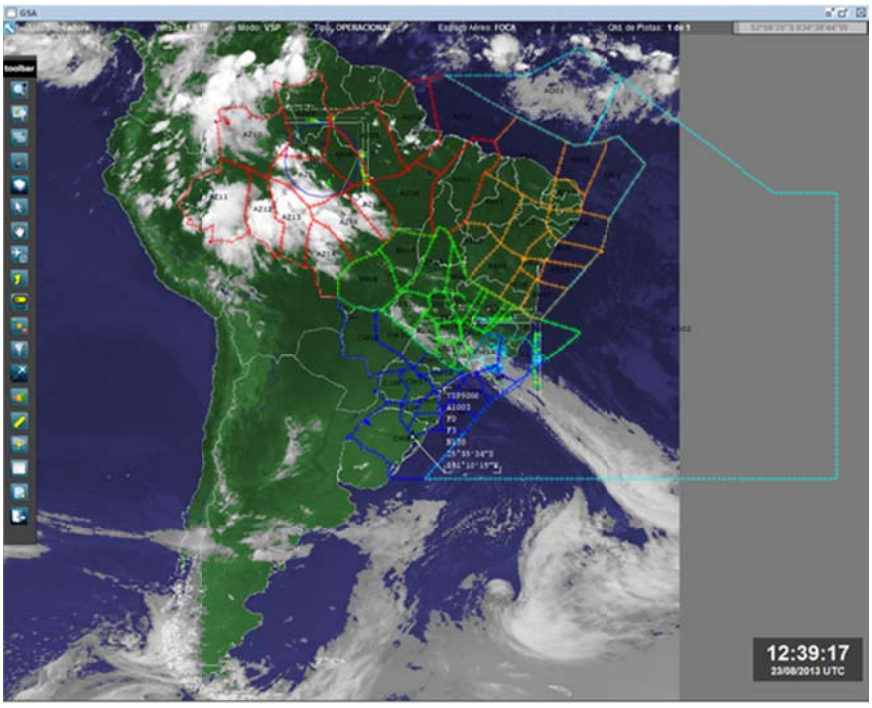
La situación del tráfico será presentada, a cada minuto, conjuntamente con los datos geográficos y meteorológicos, con los alertas, los cambios en ruta, las áreas de evaluación de flujo (FEA) y las áreas de restricción de flujo (FCA).

4.5.10.3 Información meteorológica

La meteorología será presentada con base en distintas fuentes, con los radares meteorológicos, las informaciones satelitales, METAR/TAF y las informaciones transmitidas por las aeronaves. La figura en siguiente contiene la visualización de la situación del tráfico disponible en espacio aéreo de Brasil, disponible en el Sistema SIGMA, del CGNA. Los datos de posición de cada aeronave son obtenidos de sensores radar, ADS-B, ADS-C Y MLAT. El sistema procesa los datos y genera una síntesis nacional, o mismo regional.



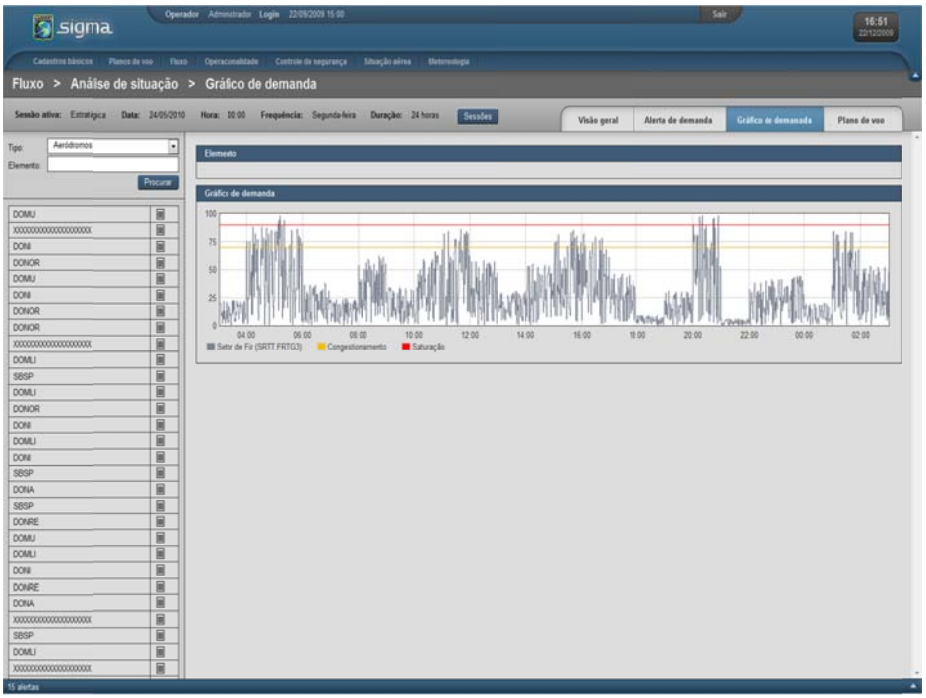
Sistema SIGMA - Visualización del Tráfico Aéreo



Sistema SIGMA – Visualización integrada

La imagen anterior muestra la visualización de datos meteorológicos y de aeronaves integrada con la jurisdicción de la unidad de gestión de flujo.

Sistema SIGMA – Análisis de la Situación -Visualización General



Sistema SIGMA – Análisis de la Situación –Demanda

4.5.11 Modelización de TMI, evaluación de impacto y ejecución

La modelización, la evaluación de impacto y la ejecución de TMI pueden considerarse el elemento más

crítico de todo el sistema, ya que es el método en el cual el especialista ATFM puede cambiar el estado operacional. Realmente hay dos partes para trabajar con TMI: el modelado y evaluación; y la ejecución. El modelado y la evaluación deben proporcionar al especialista ATFM la capacidad de modelar diferentes escenarios y sus impactos sobre el sistema. Por ejemplo, durante un "Ground Delay Program" (GDP), es esencial visualizar el efecto antes y después del GDP. Esto permite al especialista ATFM discernir rápidamente si el programa tendrá el efecto deseado y alcanzará la velocidad adecuada.

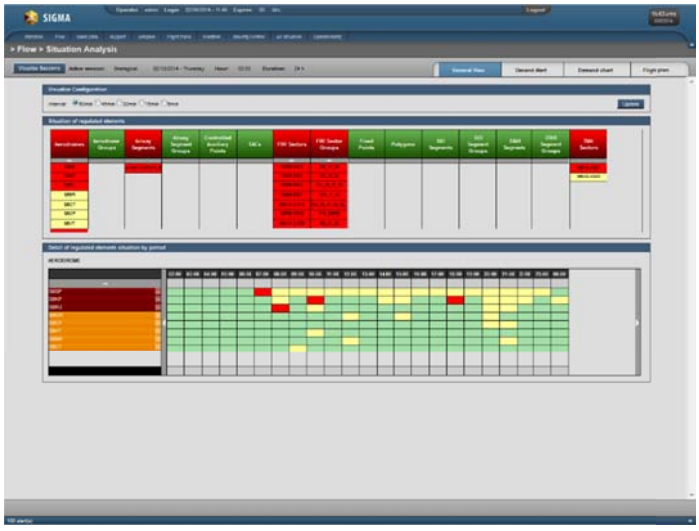
Si el especialista ATFM no ve los resultados deseados, el especialista puede remodelar el programa con diferentes parámetros antes de enviar el programa a través del sistema operativo. Esta técnica reduce en gran medida el error operacional.

La ejecución es crítica, porque un TMI no tendrá éxito sin la distribución adecuada y la notificación de toda la comunidad ATFM. Desde los controladores aéreos hasta los despachadores aéreos, los administradores de flujo de tráfico aéreo y los especialistas en ATFM del aeropuerto, hay muchas partes involucradas en la ejecución de un TMI. Por lo tanto, la notificación apropiada es absolutamente obligatoria.

4.5.11.1 Tipos de visualización TMI

Utilizando gráficos de barras o gráfico de líneas, el sistema ATFM puede presentar alertas de desequilibrio que pueden ocurrir en los elementos del espacio aéreo que se evaluarán. Estas alertas se muestran automáticamente a través de la diferenciación de color, tal como se define, por ejemplo, en el sistema SIGMA:

- Verde - demanda adecuada la capacidad configurada;
- Amarillo - demanda hasta el 80% de la capacidad configurada;
- Rojo - demanda por encima del 100% de la capacidad configurada.



Sistema SIGMA - Análisis de la situación

En la figura anterior, el color rojo representa que la demanda del elemento de espacio aéreo regulado está por encima de la capacidad operativa máxima (100%) y una medida de la gestión del flujo debe ser aplicada por el equipo operativo. El color amarillo indica que la demanda es superior al 80% de la capacidad máxima de funcionamiento del elemento de espacio aéreo. Esto gráfico prevé la demanda para los próximos siete días para fijo, ayuda, sectores y aeródromos. Gráficos de la demanda x capacidad

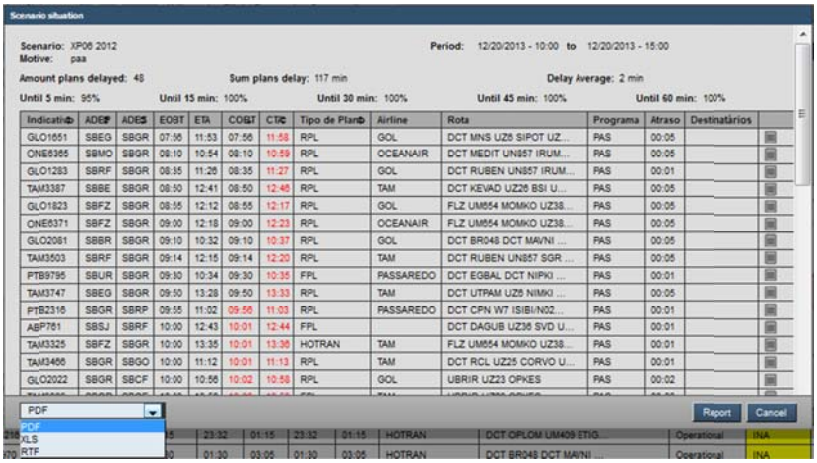
son capaces de mostrar los atrasos a intervalos de 15, 30, 45 o 60 minutos. Los esquemas de color se utilizan para diferenciar los tipos de planes (EFI, FPL y RPL), aerolíneas, estados de los planes (inactivos, preactivos, activos, cancelados, cancelados o terminados). Proporcionan una visión general de la demanda que el sistema está siendo sometido, ya través de su análisis se puede buscar soluciones con el objetivo de aplicar la iniciativa de gestión de tráfico (TMI).

4.5.11.2 Visualizaciones

Para atender a las necesidades de gestión, el sistema ATFM pude presentar las siguientes visualizaciones:

a) Ground Stops y Ground Delay Program

Para solucionar los problemas de demanda en los aeropuertos el sistema ATFM puede hacer uso de la herramienta GDP, que después de la aplicación y la decisión en colaboración con los usuarios (AO, ATC, etc) se pueden producir brechas sin el uso de las franjas horarias disponibles. Con el fin de mantener la flexibilidad de las operaciones de los aviones, el sistema permite que el gestor de flujo haga nuevas aplicaciones PIB que buscan optimizar la capacidad operativa del aeródromo. Concluidas estas acciones, el sistema envía mensajes a los usuarios involucrados para ajustar sus vuelos.



Sistema SIGMA – Aplicación de GDP - Lista de FPL afectados

En la captura de pantalla anterior las celdas marcadas en rojo representan los Planes de Vuelo que fueron afectados por la medida ATFM.

b) Flight Level/Altitude Adjustment

Las medidas de gestión del tráfico (TMI) relacionadas con la altitud o el ajuste del nivel de vuelo se obtendrán mediante la aplicación de programas de gestión de flujo. Como resultado de este análisis, los cambios que se deben realizar serán enviados a los usuarios involucrados.

Para implementar este ajuste, el sistema ATFM puede proporcionar la funcionalidad de simulación, por lo que el gestor de flujo puede probar la eficiencia de aplicar una medida de cambio de nivel. Después de la validación, se enviará un mensaje de cambio para actualizar la base de datos (planes inactivos o preactivos) y una instrucción de control de vuelo se pasará a la unidad ATC.

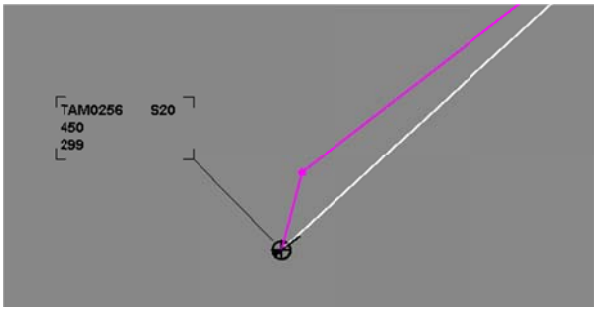
c) In-Trail Spacing

Estas medidas son aplicadas cuando se necesita incrementar la separación para ajustar el flujo de tráfico aéreo en situaciones específicas. Puede ser aplicada en distancia – Miles In Trail (MIT), o en tiempo –

Minutes in Trail (MINIT).

d) Reroutes

El sistema ATFM tiene una biblioteca de rutas que son utilizadas para implementar el programa de re direccionamiento. Esta función tiene como objetivo generar una base de datos de rutas, que ayudan a los usuarios en la definición de la ruta de vuelo que se especificará en el plan de vuelo. La figura siguiente presenta la aplicación del redireccionamiento en el sistema SIGMA.



Sistema SIGMA – Re direccionamiento de Rutas

e) Fix balancing

Una de las medidas de gestión del tráfico (TMI) se asocia con el análisis de la demanda en puntos específicos del espacio aéreo (fix) y la implementación de medidas que buscan equilibrar la demanda en ese punto. El sistema ATFM tiene una función que permite definir el área de interés y aplicar reglas de separación de flujo que deben ser consideradas por el sistema. Después de elegir una solución que cumpla los criterios para equilibrar el punto considerado, el sistema proporciona un informe de los cambios que se aplicarán. Se enviará un mensaje de cambio a la aplicación de las medidas de gestión del tráfico a las dependencias ATC para que se cumpla.

f) Airborne Holding

Para la definición de las medidas de gestión de flujo (TMI) asociadas con la espera, el sistema ATFM pude permitir la creación de un escenario simulado donde se probará la opción de hacer esperar el vuelo. Un valor de tiempo se inserta en el FPL a través del designador DLE. El sistema analiza la eficiencia del cambio y permite al gestor de flujo aplicar dicha medida. Las medidas de gestión del flujo (TMI) se difundirán a los usuarios implicados (unidad ATC, AO) para su aplicación inmediata. La figura siguiente presenta la visualización de las esperas en el sistema SIGMA:

Sistema SIGMA – Lista de Esperas

g) Sequencing and spacing

El sistema ATFM puede permitir la aplicación de técnicas operacionales para el establecimiento de ciertos intervalos entre las aeronaves que operan en el espacio aéreo o aeropuertos (DEP / ARR).Para los aeródromos el sistema considera los valores de espaciamiento entre las operaciones de despegue y aterrizaje, teniendo como base la capacidad máxima que puede absorber el aeródromo en un intervalo de 60 minutos.

Para el tráfico en ruta, el sistema considera el espaciamiento que debe considerarse entre las operaciones secuenciadas, teniendo en cuenta los diferentes escenarios operativos gestionados por el sistema ATFM. Después de establecer los parámetros para la secuenciación y el espaciado, el gestor revela las medidas de gestión de flujo (TMI) a los usuarios implicados (unidad ATC, PDB) para su aplicación inmediata.

4.5.12 Monitoreo y evaluación del desempeño operacional

La supervisión y evaluación del desempeño operacional debe responder a la simple pregunta "¿Cómo lo hicimos?" Una organización que puede responder a esa pregunta es una organización centrada en la mejora operativa. Una dependencia clave para la medición del desempeño operacional es la captura y almacenamiento de datos operacionales. Lo mejor es construir la capacidad de capturar datos operacionales para su análisis y evaluación en el diseño original.

En esta arquitectura del sistema, los servicios de gestión de datos pertinentes son responsables de capturar y almacenar los datos del sistema operativo. Una vez que el sistema captura los datos operativos, las pantallas pueden proporcionar la vista al funcionamiento operativo. Se pueden construir muchos tipos diferentes de pantallas y los analistas pueden consultar directamente las bases de datos relacionales para calcular las estadísticas operativas.

CGNA – Sala de Operaciones

CGNA – Sala de Operaciones

4.5.13 Otras Visualizaciones

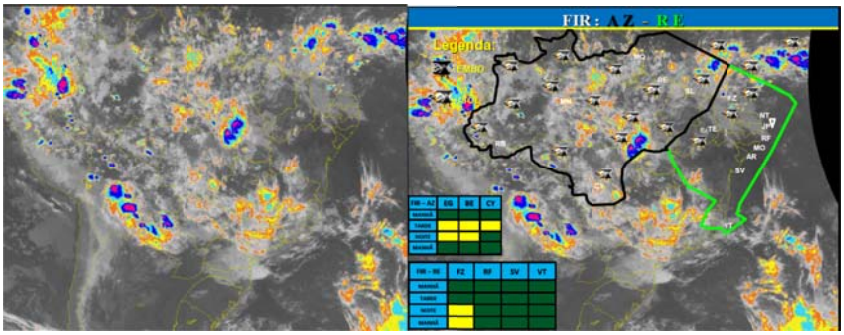
El sistema ATFM puede fornecer varias informaciones de interés para los usuarios, las cuales estarán disponibles en un “portal web’ disponible en la Internet, para los usuarios externos, o en la red interna de la organización, para los usuarios internos. El ejemplo en siguiente representa el portal de CGNA – Brasil, que puede ser visitado en “portal.cgna.gov.br”. Dicho sitio contiene informaciones estratégicas, pré-tacticas y tácticas, así como recursos tales como boletines meteorológicos, medias atfm en curso, capacidad de los aeródromos, sectorización, etc.

CGNA – Portal “Web”

Las figuras siguientes contienen informaciones sobre las capacidades de los aeródromos y los briefings meteorológicos disponibles en el Portal.

Portal CGNA –Capacidad de aeródromo”

Portal CGNA –Briefing Meteorológico

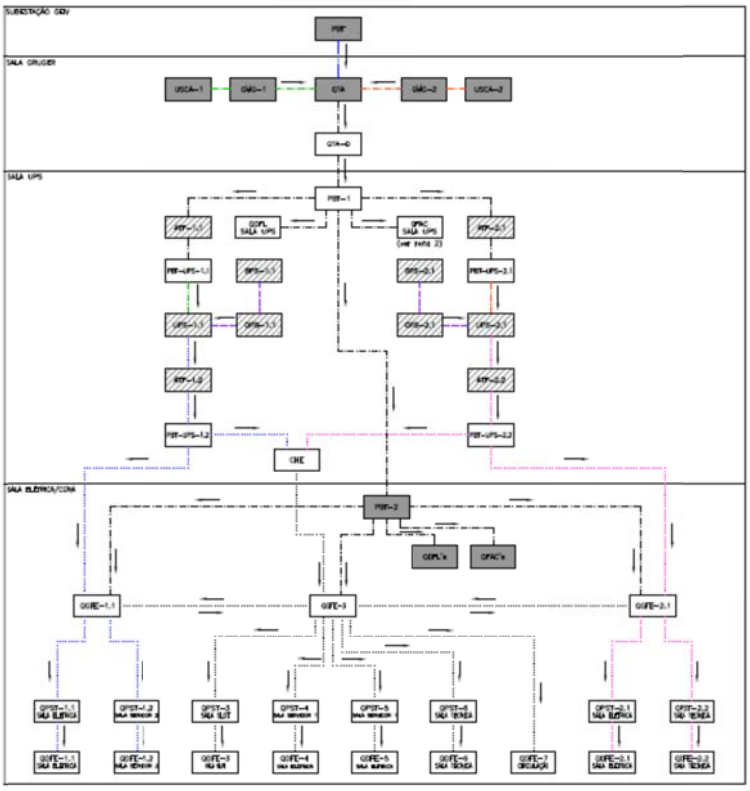


Portal CGNA – Informaciones Meteorológicas Satelitales

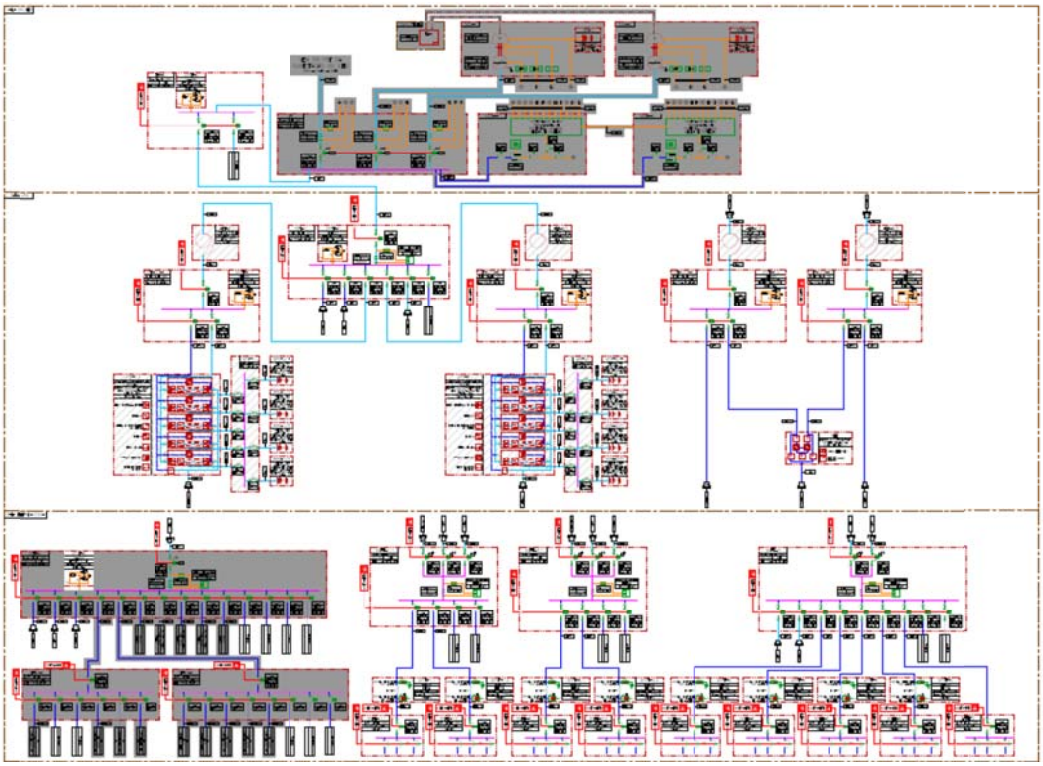
4.5.14 Energía

El sistema ATFM requiere atención especial por parte de las áreas técnicas responsables por el fornecimiento de energía, de forma a garantizar su operación continuada. El proyecto debe levar en consideración criterios de redundancia, apoyados por fuentes alternativas como generadores de energía (a diésel o gasolina), sistemas UPS, etc.

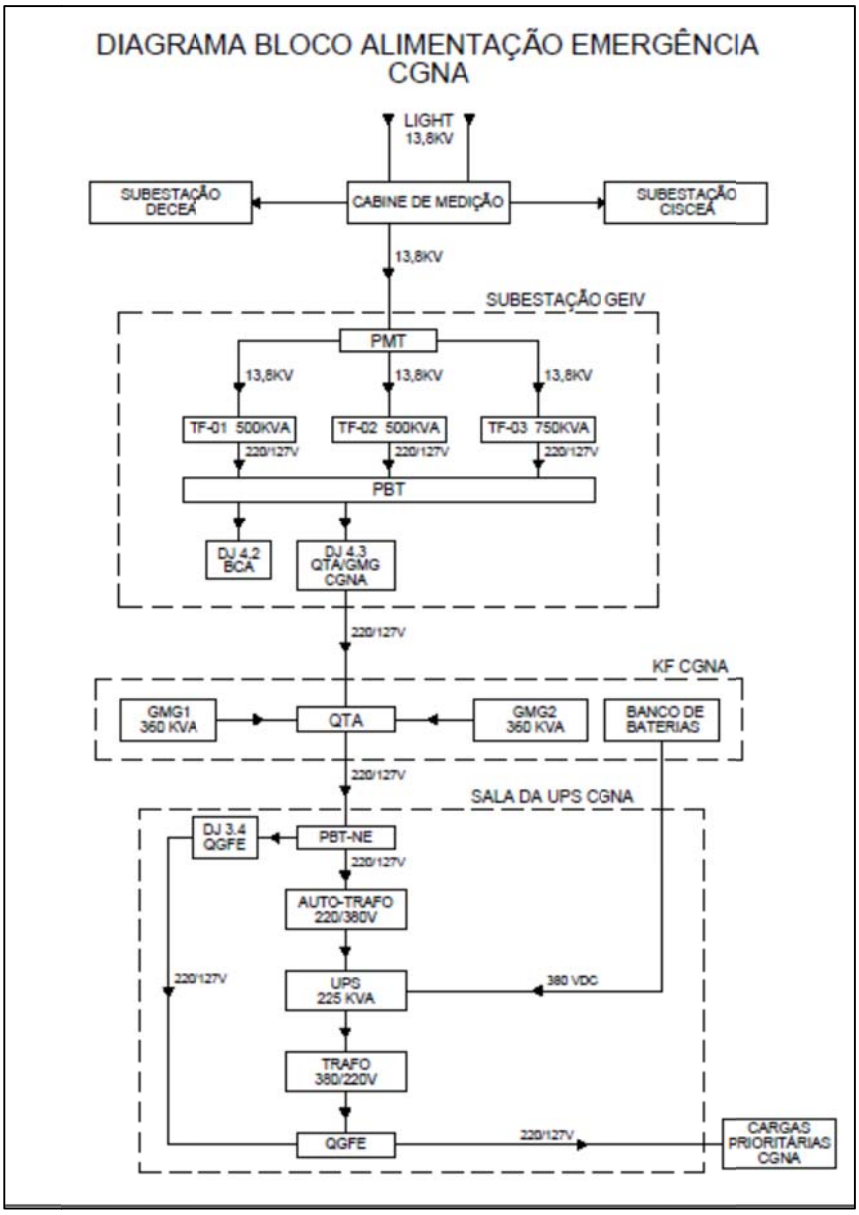
Las figuras siguientes presentan algunas características del sistema de fornecimiento de energía proyectado para el CGNA – Brasil, donde se destaca la preocupación en garantizar la disponibilidad de los sistemas críticos, con uso de generadores duplicados e sistema UPS.



CGNA – Energía – Diagrama de Blocos



CGNA – Energía - Diagrama Unifilar General



CGNA – Energía – Alimentación de Emergencia

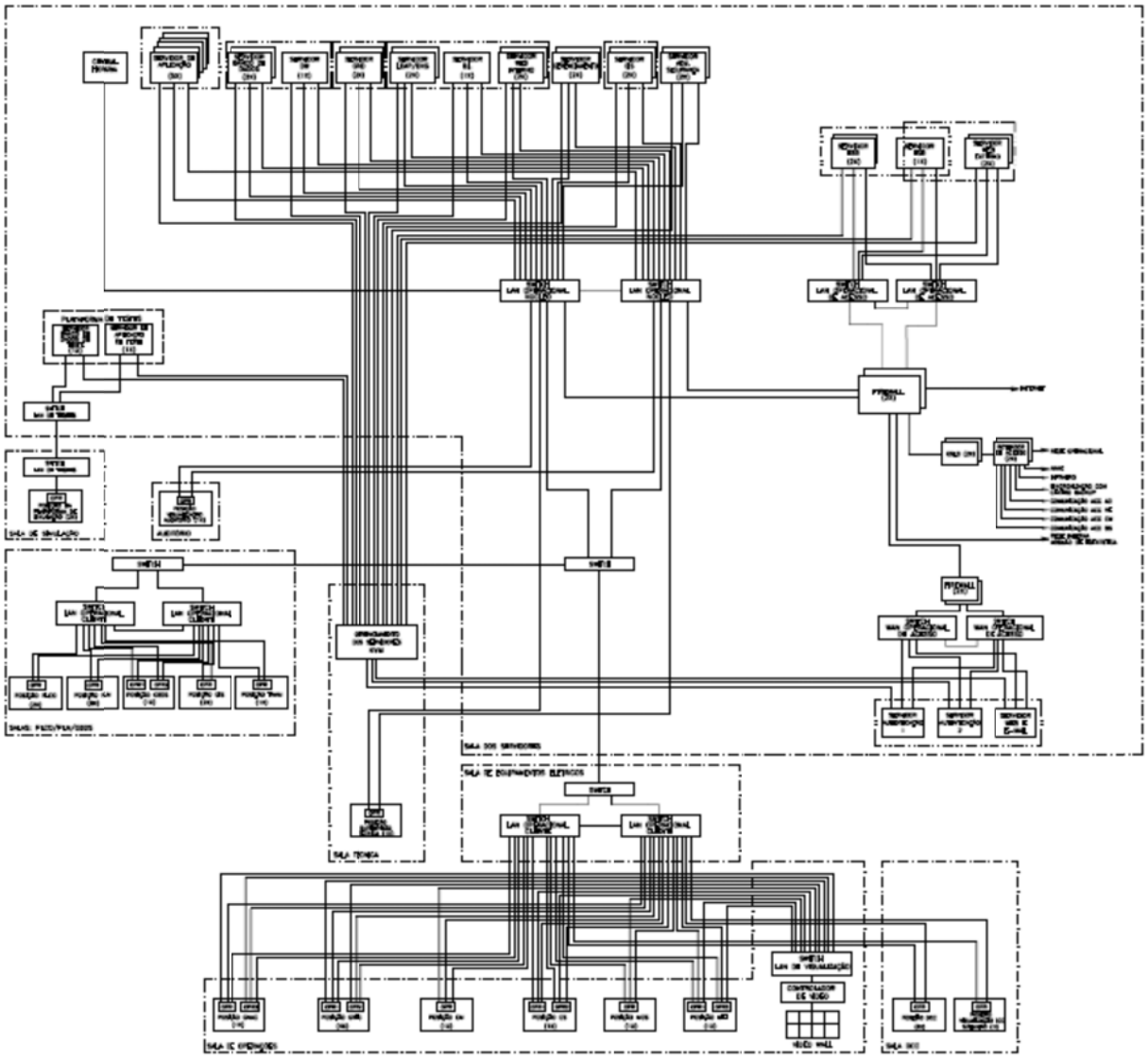
4.5.15 Comunicaciones

El sistema ATFM es fuertemente basado en la necesidad de comunicación entre los diversos actores involucrados, lo que requiere una estructura de comunicaciones que sea eficaz y eficiente, garantizando el desempeño, la integridad y la disponibilidad del sistema. Dicha estructura comprende las comunicaciones de datos y de voz, descritas en siguiente.

4.5.15.1 Red de Datos

La red de comunicación de datos debe ser proyectada para atender a los requerimientos operacionales del sistema ATFM, lo cual puede ser considerado como un sistema de misión crítica. Asimismo, las siguientes características deben ser observadas:

a) Disponibilidad: la topología de la red debe proporcionar altísima disponibilidad para garantizar la operación ininterrumpida del sistema ATFM. Por lo tanto, es necesario que la red tenga redundancia física y lógica. Así mismo, los activos de red necesitan tener dispositivos que garanticen la disponibilidad requerida, con fuentes de energía redundantes. El diagrama siguiente presenta la topología de la red interna del sistema SIGMA, utilizado por el CGNA – Brasil. Se puede observar que los servidores y estaciones de trabajo están conectados a dos redes, una principal y otra backup. Otro punto importante es la existencia de una central horaria, que es responsable por el sincronismo y actualización de todos los equipamientos.

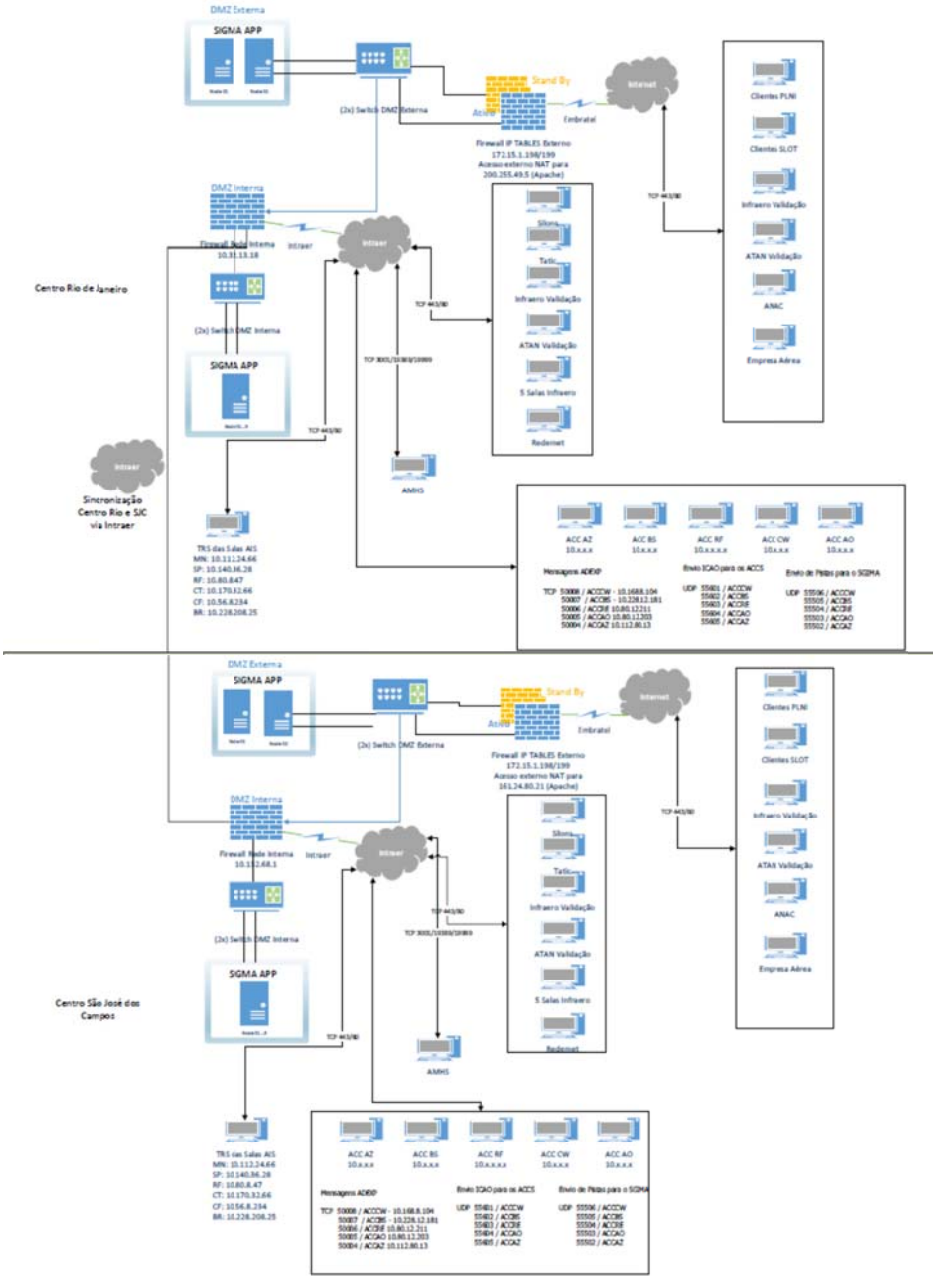


CGNA – Topología de la Red Operacional

b) Desempeño: Las conexiones de la red interna al sistema ATFM deben garantizar que la información sea presentada de forma actualizada para los operadores, con desempeño típico de las redes locales de alto desempeño, con la utilización de bandas Gb por medio de fibras ópticas, por ejemplo.

c) Flexibilidad: Cómo el sistema ATFM recibe y transmite informaciones para varios usuarios, internos y externos, la red de comunicación de datos debe ser capaz de se conectar a distintas redes por medio de interfaces de comunicación previamente definidas en un documento de interfaz (ICD). Así mismo, el protocolo estándar debe ser basado en la suite de protocolos TCP/IP. Así mismo, debe se tener en cuenta que el trámite de mensajes ATS preconizado por la OACI es el AMHS.
d) Capilaridad: Un sistema ATFM tiene interfaces con los usuarios que están distribuidos en el territorio nacional o internacional, lo que requiere del proyecto de la red de comunicación de datos una gran capilaridad., la cual puede utilizar distintos medios de comunicación, como las redes satelitales y infraestructuras de proveedores de comunicación privados. En la Región SAM los Estados pueden utilizar las facilidades de comunicación disponibles en la REDDIG, que es basado en una red satelital y un backbone terrestre.

El diagrama en siguiente es un ejemplo de las conexiones externas que soportan el sistema SIGMA, del CGNA – Brasil. Se puede observar las interfaces con distintos proveedores por medio del internet y el acceso por los usuarios internos por medio de la intranet (INTRAER). También es posible observar la conexión del centro principal, en CGNA - Rio de Janeiro, con el centro backup, ubicado en São José dos Campos, en las dependencias del Instituto de Controle do Espaço Aéreo (ICEA).



CGNA – Red Operacional – Conexiones Externas

4.5.15.2 Comunicación por Voz

Las actividades de un Centro ATFM, bajo el concepto del "Collaborative Decision Making" (CDM), requieren estrecha coordinación con las diversas partes involucradas, la cual es posible a través de recursos de comunicación oral.

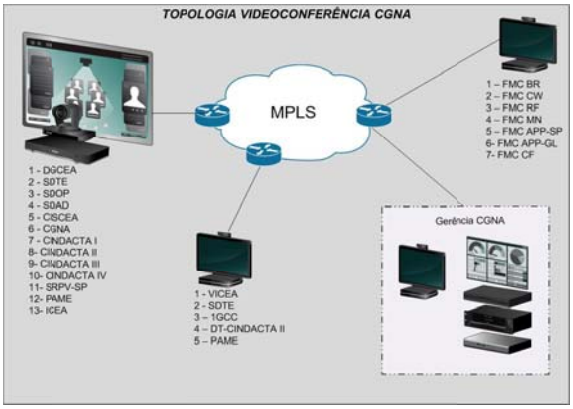
Por lo tanto es necesario fornecer líneas telefónicas en cantidad suficiente para los diversos sectores involucrados con dichas coordinaciones, con facilidades para llamadas locales, nacionales e internacionales.

Otro recurso de gran relevancia se refiere a la utilización de teleconferencias entre los centros de control, las aerolíneas, los explotadores de los aeropuertos, los demás FMP/FMU y otras organizaciones

involucradas con un determinado tema. En la Región SAM, los Estados tienen la posibilidad de realizar hasta 2 teleconferencias simultáneas por medio de la REDDIG, las cuales son utilizadas según sus necesidades operacionales. Dichas conferencias pueden ser programadas, donde se define los momentos en que las dependencias ATFM celebrarán conferencias operacionales para intercambiar informaciones de interés, o tácticas, en que se establece un procedimiento para reunirse en tiempo real y a nivel táctico, a fin de efectuar ajustes operacionales.

4.5.15.3 Vídeo-Conferencias

Adicionalmente, el Centro ATFM puede hacer uso de recursos de vídeo-conferencia para las discusiones y coordinaciones, las cuales pueden utilizar conexiones de Internet. Todavía, dichos recursos requieren largo ancho de banda y deben ser analizados y proyectados para que non hagan retrasos y falta de sincronismo. Recomendase que sea diseñada una topología específica y dedicada para mejor atender a esta facilidad.



CGNA – Vídeo-Conferencia

4.5.16 Seguridad de la Información

En los escenarios en los que el sistema ATFM necesita requisitos de seguridad de red restringidos y fuertes, se adoptará una combinación entre solución de diseño de hardware, software y red capaz de crear una especie de "célula de seguridad" para las situaciones que necesitan cambiar la información con otros sistemas utilizando redes no protegidas o poco fiables como Internet, por ejemplo.

La solución de seguridad puede tener un diseño basado en las redes DMZ (zonas desmilitarizadas). En este caso, los servidores y dispositivos de red más críticos están conectados en diferentes segmentos de red de acuerdo con las necesidades del cliente y del sistema. El objetivo principal de este enfoque técnico es reducir el impacto de un eventual ataque de seguridad a la red y al sistema ATFM. Cada una de las redes está conectada a las otras a través de firewalls redundantes configurados con el abordaje que todo se deniega y se autoriza explícitamente el tráfico de red autorizado. En esta también solución es posible tener una VPN (Virtual Private Network) para conectar el sistema ATFM con otros sistemas.

Es importante tener herramientas de monitoreo de los ataques y amenazas, lo que puede ser hecho utilizándose un IDS (Intrusion Detection System).

Otra característica importante es tener un servicio de “loghost” instalado en un equipo físico o virtual que es capaz de recibir los mensajes de registro de los servidores críticos y dispositivos de red. Es un

recurso muy útil para ayudar a los administradores de sistemas de clientes y analistas de seguridad de la información a investigar posibles problemas de seguridad. Este enfoque evita que los servidores y otros dispositivos de red puedan ser explotados por hackers que usan funciones predeterminadas y comunes no seguras de los sistemas operativos y firmwares, por ejemplo.

Es recomendable que las interfaces web del sistema ATFM sean basadas en protocolos seguros, como HTTPS (Hypertext Transfer Protocol Secure). En este caso, todos los paquetes de red transmitidos entre el ordenador del usuario y el servidor de aplicaciones están cifrados, incluyendo las contraseñas y otras informaciones sensibles.

4.6 Consideraciones Técnicas - FMP

Un FMP puede prestar servicio a un APP o a una TWR, con la finalidad de atender a las necesidades específicas de gestión de flujo, que son de alcance más restricto, cuando comparadas a las actividades de un centro ATFM completo. Por lo tanto, las necesidades de recursos técnicos también son más sencillas.

4.6.1 Activación de un FMP

La activación de un FMP puede ser hecha por medio de una posición operacional de control de un APP o por medio de una estación de trabajo aislada del sistema automatizado, poseendo herramientas o aplicaciones desarrolladas para el calculo de la capacidad de un o más aeródromos, teniendo en cuenta las demandas de vuelos de salida y llegada y las informaciones relativas a disponibilidad de los equipamientos y sistemas. Las herramientas también pueden ser basadas en hojas de cálculo disponibles en software como MS-Excel o similar,a ejemplo da utilizada por la dependencia ATFM del Perú.

Es importante que se tenga recursos de comunicación oral, para hacer las coordinaciones necesarias entre los diversos sectores involucrados así como con otras dependencias ATFM, las cuales pueden hacer uso de las facilidades de comunicación de la REDDIG, que disponibiliza 2 canales para teleconferencias entre deendencias ATFM de la región SAM.

Asimismo, las informaciones referentes a las medidas ATFM y a la situación operacional pueden estar disponibles en un sitio “web”, acesado por medio de la internet. También estarán disponibles os teléfonos y personas de contacto para esclarecimientos y otras necesidades.

APPENDIX I

C2 SAM PROJECT DESCRIPTION

SAM Region	PROJECT DESCRIPTION (PD)	PD N° C2	
Programme	**Project Title**	**Starting Date**	**Ending Date**
ATM Automation and Situational Awareness *(Programme Coordinator: Onofrio Smarrelli*)	Improve ATM Situational Awareness in the SAM Region *Project Coordinator: Paulo Vila (Peru)* *Contributing experts: Murilo Loureiro (Brasil); José Rubira, Marcos Vidal and Jorge Otiniano (Peru); Javier Vittor (Argentina), Ivan Salas (Ecuador)*	October 2011	November 2016
Objective	Develop guidelines supporting the implementation of improvements in the situational awareness of ATS units in the South American Region and follow-up to ADB-B implementation		
Scope	Guidelines supporting the implementation of various applications, such as common traffic visualization, common meteorological conditions visualization and communications in general • Analysis of the current surveillance infrastructure and identification of necessary improvements to support en route and terminal airspaces, airspace classification, PBN and ATFM • Implementation of ADS-B, ADS-c and/or MLAT surveillance systems at selected airspaces • Minimum common electronic information and data bases required in support of decision-making process and alert systems towards an interoperable situational awareness among centralized ATFM units • Implement flight plan data process systems (new FPL format) and data communications tools among ACC´s • Implement advanced automation support tools to contribute towards the sharing of aeronautical information • Follow-up to ADB-B implementation		
Metrics	Drafting of following documents: • Regional surveillance strategy for the implementation of systems in support of improvement of situational awareness – revised • Evaluation of the surveillance systems coverage in the SAM Region - completed • Guideline on technical/operational considerations for ADS-B implementation – completed • Guideline on technical/operational considerations for MLAT implementation - completed • Guideline on technical considerations in support of ATFM implementation – completed • Guideline for the presentation of MET products in graphic format – completed • Action plan for ADS-B implementation in the SAM Region • Number of ADS-B stations installed		

Strategy	• All tasks will be conducted by experts nominated by States and organizations of the SAM Region members of the Project *Improve ATM situational awareness in the SAM Region*, under management of the project coordinator. Communications among project members, as well as between the project coordinator and programme coordinator, shall be carried out through teleconferences and the Internet. • Once studies are completed, the results will be submitted to the ICAO programme coordinator as a final consolidated document for its analysis, review, approval and presentation at the GREPECAS PPRC
Goals	• Regional surveillance strategy for the implementation of systems in support to situational awareness improvement for July 2012 (completed) • Guideline on technical/operational considerations for ADS-B implementation for October 2012 (completed) • Guideline for the drafting of SIGMET in graphic format (December 2013) (completed) • Guideline for technical/operational considerations for MLAT implementation for March 2015 (completed) • Guideline for technical considerations in support of ATFM implementation (By May 2017) • Action plan for ADS-B implementation in the SAM Region (November 2014) (completed) • 60% of continental regional air space superior FLP 245 covered with ADS-B by end 2020
Justification	• Improve situational awareness has been identified as a great support for ATM, contributing in the increase of safety and in flight efficiency • In addition, a close relationship with the other programmes and their respective projects is necessary, with the aim of collecting the operational requirements demanded by the mentioned applications and their respective tentative implementation dates • This project contributes to the implementation of modules B0 ASUR, B0 SURV, B0 NOPS and B0 AMET of the *Air Navigation System Performance-Based Implementation Plan for the SAM Region (SAM PBIP)*
Related Projects	• Air Navigation Systems in Support of PBN • Automation • ATFM • ATN Ground-ground and Air-ground Applications

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation[1]	Delivery Date	Remarks
Evaluation of surveillance infrastructure and identification of surveillance systems improvements					
Evaluation of surveillance systems coverage in the SAM Region	PFF SAM CNS 04 ANRF B0 ASUR	Paulo Vila (Peru)		Completed October 2012	The evaluation of coverage was carried out in connected to the drafting activities of the Guideline on technical/operational considerations for ADS-B implementation. The results are presented as Appendix A to the Guideline and can be downloaded from site http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS
Drafting of regional plan for ADS-B and MLAT implementation					
Guideline on technical/ operational considerations for ADS-B implementation	PFF SAM CNS 04 ANRF B0 ASUR	José Rubira (Peru) Marco Vidal (Peru)		Completed October 2012	The Guideline was approved for use in the interested States of the SAM Region, by the Eleventh Workshop/Meeting of the SAM Implementation group (SAM/IG/11) held in Lima from 13 to 17 May 2013 and can be downloaded from the following website http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS
Guideline on technical/ operational considerations for MLAT implementation	PFF SAM CNS 04 ANRF B0 ASUR	Ivan Salas (Ecuador)		Completed October 2015	The Guideline was presented in the Fifteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/15) held in Lima from 11 to 15 May 2015 for initial review and was circulated to all SAM Region States. The final approval is foreseen for the Sixteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/16) to be held in Lima from 19 to 23 October 2015.

[1] ***Gray**: Activity has not started*
***Green**: Activity has or will deliver planned milestone as scheduled*
***Yellow**: Activity is behind schedule on milestone, but still within acceptable parameters to deliver milestone on time*
***Red**: Activity has failed to deliver milestone on time, mitigation measures need to be identified and implemented*

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation[1]	Delivery Date	Remarks
Guideline on technical considerations in support of ATFM implementation	PFF SAM ATM 05 B0 NOPS	Murilo Loureiro		May 2017	The preliminary guideline was prepared on early 2016 and is presented for Meeting review.
Guideline for the presentation of MET products in graphical format	PFF SAM MET 03 ANRF B0 AMET	Jorge Otiniano (Peru)		Completed October 2014	The document guideline was delivered to the Secretariat (MET) of SAM Region for its review by the corresponding meteorology specialists. The Guideline was review by the OPMET information exchange Meeting of SAM Region (27 – 29 October 2014) and will be used as guideline for the implementation of SIGMET graphic in Argentina, Chile, Ecuador, Paraguay and Peru by the second half of 2015 sponsored by the technical cooperation regional project RLA/06/901.
Action plan for ADS-B implementation in SAM Region	ANRF B0 ASUR	Paulo Vila (Peru)		Completed November 2014	The action plan for the regional implementation of the ADS B was presented an approved in the Fourteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/14) Lima, Peru, from 10 to 14 November 2014. The document can be downloaded from the following website as part of the final report of the SAM/IG/14 (Appendix C, Agenda Item 7) http://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2014-SAMIG14
Follow-up to ADS-B implementation in SAM Region States	ANRF B0 ASUR	Paulo Vila (Peru)		December 2020	Status of implementation of ADS-B stations are presented in WP/11 of SAM/9G/19 meeting

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation[1]	Delivery Date	Remarks
Monitoring activities for the implementation of improvement to the ATM Situational Awareness in the SAM Region		Programme Coordinator and Project Coordinator		October 2011 December 2016	
Resources necessary	Experts in the carrying out of the deliverables				

- END-

APPENDIX J

TABLE CNS II-CARSAM-5- SURVEILLANCE SYSTEMS PLAN

EXPLANATION OF THE TABLE

Column

1	Name of State/Territory and location of the radar station
2	Air traffic services unit served by the facility
3	PSR/Function - Primary surveillance radar/Function E - En-route area control centres T - Terminal
4	Coverage of primary surveillance radar in nautical miles
5	SSR/MSSR/Function - Secondary surveillance radar/ Monopulse secondary surveillance radar/Function E - En-route area control centres T - Terminal
6	SSR/MSSR/Modes - Modes A, C or S
7	Coverage of secondary surveillance radar in nautical miles
8	ADS-B/Function — Automatic dependent surveillance-Broadcast/ Function E — En-route area control centres T — Terminal
9	ADS-C/Function — Automatic dependent surveillance-Contract/ Function C — Continental Airspace O — Oceanic Airspace
10	MLAT/Function — Multilateration /Function E — En-route area control centres T — Terminal
11	Remarks

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
ANGUILLA (UK)										
ANTIGUA & BARBUDA										
	V.C. Bird APP			T	A/C	180				*MSSR
ARGENTINA										
Bahía Blanca, Airport	Ezeiza ACC Bahía Blanca TMA/APP			E/T	A/C	200				*MSSR
Córdoba, Airport	Córdoba ACC Córdoba TMA/APP			E/T	A/C	200				
Corriente Airport	Resistencia ACC Resistencia TMA/APP			E/T	A/C	200				*MSSR
Comodoro Rivadavia Airport	Com. Rivadav. ACC Com.Rivad. ACC			E/T	A/C	200				*MSSR
Esquel Airport	Com. Rivad.ACC Esquel TMA			E/T	A/C	200				*MSSR
Ezeiza, Airport	Ezeiza ACC Buenos Aires TMA/APP	T	90	E	A/C	220				

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Ezeiza ACC Buenos Aires TMA/APP			E/T	A/C	200				*MSSR
La Rioja, Airport	La Rioja, Airport La Rioja TMA			E/T	A/C	200				*MSSR
Malargue Airport	Mendoza ACC Cordoba ACC Ezeiza ACC Malargue TMA/APP			E/T	A/C	200				*MSSR
Mendoza, Airport	Mendoza TMA Cordoba ACC	T	60	E	A/C	180	E/T			
Morteros	Cordoba ACC Ezeiza ACC Resistencia ACC			E/T	A/C	200				*MSSR
Neuquen	Ezeiza ACC Neuquen TMA			E/T	A/C/S	200				*MSSR
Paraná, Airport	Ezeiza ACC Córdoba ACC			E/T	A/C	200				*MSSR
Pehajó Airport	Ezeiza ACC			E/T	A/C	200				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Posadas Airport	Pehuajó Airport Resistencia ACC Posadas TMA/APP			E/T	A/C	200				*MSSR
Presidente Roque Saenz Paña Airport	Resistencia ACC Cordoba ACC P. Roque Saenz TWR			E/T	A/C	200				*MSSR
Puerto Madryn, Airport	Com. Rivad. ACC Ezeiza ACC			E/T	A/C	200				*MSSR
Quilmes	Ezeiza ACC Buenos Aires APP			E/T	A/C	200				*MSSR
Rio Gallegos, Airport	Com. Rivad. ACC Rio Gallego,TMA			E/T	A/C	200				*MSSR
San Carlos de Bariloche, Airport	Ezeiza ACC Bariloche TMA/APP			E/T	A/C	200				*MSSR
Salta	Cordoba ACC Salta TMA/APP			E/T	A/C	200				*MSSR
San Luis, Airport	Córdoba ACC Ezeiza ACC			E/T	A/C	200				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
San Julian , Airport	Com. Rivad. ACC			E/T	A/C	200				*MSSR
Santa Rosa, Airport	Santa Rosa TMA/APP			E/T	A/C	200				*MSSR
	Cordoba ACC									
	Ezeiza ACC									
Tucumán, Airport	Córdoba ACC									
	Tucuman TMA/APP			E/T	A/C	200				*MSSR
Ushuaia, Airport										
	Com. Rivad. ACC			E/T	A/C	200				*MSSR
	Ushuaia TMA/APP									
ARUBA										
	Reina Beatrix APP	T	80	T	A/C	256				*MSSR
BAHAMAS										
Nassau	Miami ACC									
	Nassau APP	E/T		E/T	A/C	200				
BARBADOS										
Aiport	Adams APP			T	A/C	250				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
BELIZE										
Belize	Belize APP			E/T	A/C	250				*MSSR
BERMUDA										
	Bermuda TWR			T	A/C	250				
BOLIVIA										
Cochabamba	Cochabamba APP			E/T	A/C					
	La Paz ACC									
La Paz	La Paz ACC			E	A/C					
	La Paz APP			T	A/C					
BRASIL										
Barcelos	Manaus ACC	E	180	E	A/C	220				*MSSR
Barra do Carcas	Brasilia ACC	E	180	E	A/C	220				*MSSR
Belém	Manaos ACC	T	60	E	A/C	220				*MSSR
Belém	Belem APP	E	180	T	A/C	220				*MSSR
Boa Vista	Manaus ACC			E	A/C	220				*MSSR
Bom Jesus da Lapa	Recife ACC	T	60	E	A/C	220				*MSSR
Brasilia	Brasilia APP			T	A/C	220				*MSSR
Cachimbo	Manaus ACC	T	60	E	A/C	220				*MSSR
Campinas	Campinas APP	T	60	T	A/C	220				*MSSR
Campo Grande	Campo Grande APP	E	180	T	A/C	220				*MSSR
Cangucu	Curitiba ACC	E	180	E	A/C	220				*MSSR
Catanduvas	Curitiba ACC	E	180	E	A/C	220				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Chapada Dos Guimaraes	Brasilia ACC	E	180	E	A/C	220				*MSSR
Conceição do Araguaia	Manaus ACC	T	60	E	A/C	220				*MSSR
Confins	Confins APP	T	60	T	A/C	220				*MSSR
Congonhas	São Paulo APP	E	180	T	A/C	220				*MSSR
Cruzeiro do Sul	Manaus ACC	T	60	E	A/C	220				*MSSR
Cuiabá	Cuiabá APP	T	60	T	A/C	220				*MSSR
Curitiba	Curitiba APP	T	60	T	A/C	220				*MSSR
Eduardo Gomes	Manaus APP	E	180	T	A/C	220				*MSSR
Eirunepé	Manaus ACC			E	A/C	220				*MSSR
Fernando Noronha	Recife ACC	T	60	E	A/C	220				*MSSR
Florianópolis	Florianópolis APP	E	180	T	A/C	220				*MSSR
Fortaleza	Recife ACC	T	60	E	A/C	220				*MSSR
Fortaleza	Fortaleza APP	T	60	T	A/C	220				*MSSR
Foz do Iguazu	Foz do Iguacu APP	T	60	T	A/C	220				*MSSR
Galeão	Galeão APP	E	180	T	A/C	220				*MSSR
Gama	Brasília ACC	E	180	E	A/C	220				*MSSR
Guajaramirim	Manaus ACC	T	60	E	A/C	220				*MSSR
Guarulhos	Sao Paulo APP			T	A/C	220				*MSSR
Imperatriz	Manaus ACC			E	A/C	220				*MSSR
Jacarcacanga	Manaus ACC			E	A/C	220				*MSSR
Jaraguari	Curitiba ACC	E	180	E	A/C	220				*MSSR
Macapa	Manaus ACC	E	180	E	A/C	220				*MSSR
Maceió	Recife ACC	E	180	E	A/C	220				*MSSR
Manaus	Manaus ACC	E	180	E	A/C	220				*MSSR
Manaus	Manaus APP	T	60	T	A/C	220				*MSSR
Manicoré	Manaus ACC			E	A/C	220				*MSSR
Mombaça	São Paulo APP	T		T	A/C	220				*MSSR
Morro da Igreja	Curitiba ACC	E	60	E	A/C	220				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Natal	Recife ACC		180	E	A/C	220				*MSSR
Natal	Natal APP	E	180	T	A/C	220				*MSSR
Palmas	Brasília ACC	T	60	E	A/C	220				*MSSR
Petrolina	Recife ACC	E	180	E	A/C	220				*MSSR
Pico do Couto	Brasilia ACC			E	A/C	220				*MSSR
Porto Alegre	Porto Alegre APP	E	180	T	A/C	220				*MSSR
Porto Espiridiao	Manaus ACC	T	60	E	A/C	220				*MSSR
Porto Seguro	Recife ACC	E	180	E	A/C	220				*MSSR
Porto Velho	Manaus ACC	E	180	E	A/C	220				*MSSR
Recife	Recife APP	E	180	T	A/C	220				*MSSR
Río Branco	Manaus ACC	T	60	E	A/C	220				*MSSR
Río de Janeiro	Galeão APP	E	180	T	A/C	220				*MSSR
Salvador	Recife ACC	T	60	E	A/C	220				*MSSR
Salvador	Salvador APP	E	180	T	A/C	220				*MSSR
Santa Teresa	Brasília ACC	T	60	E	A/C	220				*MSSR
Santarém	Manaus ACC	E	180	E	A/C	220				*MSSR
Santiago	Curitiba ACC	E	180	E	A/C	220				*MSSR
Sao Felix do Aragunia		E	180	E	A/C	220				*MSSR
S. Feliz do Xingu				E	A/C	220				*MSSR
Sao Gabriel Cachoeira	Manaus ACC	E	180	E	A/C	220				*MSSR
Sao Luiz	Manaus ACC	E	180	E	A/C	220				*MSSR
Sao Roque	Brasilia ACC	E	180	E	A/C	220				*MSSR
Sinop	Brasilia ACC	E	180	E	A/C	220				*MSSR
Tabatinga	Manaus ACC	E	180	E	A/C	220				*MSSR
Tanabi	Brasilia ACC	E	180	E	A/C	220				*MSSR
Tefé	Manaus ACC	E	180	E	A/C	220				*MSSR
Tirios	Manaus ACC			E	A/C	220				*MSSR
Tres Marias	Brasilia ACC	E	180	E	A/C	220				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Vilhena	Manaus ACC	E	180	E	A/C	220				*MSSR
CHILE										
Antofagasta	Santiago ACC			E	A/C	250				MSSR
	Antofagasta APP			E/T						
	Iquique ACC			E						
Carahue	Santiago ACC			E	A/C	250				MSSR
	Puerto Montt ACC			E						
	Concepcion APP			E/T						
Chañaral	Santiago ACC			E	A/C	250				MSSR
	Antofagasta TMA/APP			E						
	Iquique ACC			E						
Concepción	Santiago ACC			E	A/C/S	250				
	Puerto Montt ACC			E						
	Concepción APP			E/T						
Coyhaique	Puerto Montt ACC			E	A/C	250				MSSR
	Punta Arena ACC			E						
	Santiago ACC			E						
Iquique	Antofagasta TMA/APP			E/T	A/C	250				MSSR
	Iquique ACC			E/T						

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Santiago ACC			E						
Puerto Montt	Puerto Montt ACC	E/T	80	E/T	A/C	220				MSSR
	Punta Arenas ACC			E						
	Santiago ACC			E						
Punta Arenas	Punta Arenas ACC	E/T	80	E/T	A/C/S	220				
	Santiago ACC	E		E						
Santiago	Santiago ACC	E/T	80	E/T	A/C/S					
	Oceánico ACC									
	Santiago TWR									
Talagante	Santiago ACC			E/T	A/C	250				MSSR
	Concepción APP			E						
Vallenar	Antofagasta APP			E/T	A/C	250				MSSR
	Santiago ACC			E						
	Iquique ACC			E						
COLOMBIA										
Araracuara	Bogotá ACC			E/T	A/C	250				*MSSR
	Villavicencio APP									
Bucaramanga	Barranquilla ACC			E/T	A/C	250				* <2005
	Bogotá ACC									
	Bucaramanga APP									

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Cúcuta APP									
Cali	Bogotá ACC Cali APP	T	80	T	A/C	250				*MSSR
Carepa	Barranquilla ACC Bogotá ACC Rio Negro APP	E/T	80	E/T	A/C/S	250				*MSSR
Carimagua	Bogotá ACC Villavicencio APP	E/T	200	E/T	A/C	200				*MSSR
Cerro Maco	Barranquilla ACC Barranquilla APP Bogotá ACC Cartagena TWR Rio Negro APP	E/T	165	E/T	A/C	250				
Cerro Verde (Rio negro)	Barranquilla ACC Barranquilla APP Bogotá ACC Cali APP Pereira APP Rio Negro APP	E/T	60	E	A/C	200				*MSSR
El Dorado	Bogotá ACC Bogotá APP Villacencio APP	E/T	60	E/T	A/C	200				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Espinal	Bogotá ACC Bogotá APP			E/T	A/C	250				
Leticia	Bogotá ACC Leticia APP Villavicencio APP	E/T	200	E/T	A/C	250				*MSSR
Leticia (MIL)	Villavicencio APP	T	240	T	A/C	240				
Marandúa	Bogotá ACC Villavicencio APP	E/T	240	E/T	A/C	240				
Pereira	Bogotá ACC Bogotá APP Cali APP Pereira APP Rio Negro APP			E/T	A/C	250				*MSSR
Ríohacha	Barranquilla ACC	E	240	E	A/C	240				
S. J. Guaviare	Bogotá ACC Villavicencio APP	E/T	240	E/T	A/C	240				
San Andrés	Barranquilla ACC San Andrés APP			E/T	A/C	250				*MSSR
San Andrés (MIL)	Barranquilla ACC	E/T	240	E/T	A/C	240				

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	San Andrés APP									
Santa Ana	Bogotá ACC Cali ACC/APP Pereira APP	E/T	165	E/T	A/C	250				*MSSR
Tablazo	Bogotá ACC Bogotá APP Cali APP Pereira APP Rio Negro APP Villavicencio APP	ET	80	E/T	A/C	250				*MSSR
Tubará (Barranquilla)	Barranquilla ACC Barranquilla APP San Andrés APP	E/T	80	E	A/C	250				*MSSR
Villavicencio	Villavicencio APP	T	80	E/T	A/C	150				
COSTA RICA										
El Coco	El Coco APP	E/T	60	E/T	A/C	250				*MSSR
Volcan Poas	El Coco APP CENAMER ACC			E/T	A/C/S	250				*MSSR Mode S
CUBA										
Camagüey	Habana ACC	T	60	T	A/C	200	E/T			*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Camagüey APP									
Habana	Habana TMA			T	A/C	200	T			*MSSR
	Habana APP									
Holguín	Habana ACC			E/T	A/C	200	E/T			*MSSR
	Santiago de Cuba TMA									
	Holguín APP									
Menocal	Habana ACC			E/T	A/C	200	E/T			*MSSR
	Habana TMA									
	Habana APP									
	Varadero APP									
Varadero	Varadero APP			E	A/C	200			T	*MSSR
San Julián	Habana ACC			E	A/C	200	E			*MSSR
Sta. Clara	Habana ACC			E	A/C	200	E			*MSSR
Gran Piedra	Santiago de Cuba TMA			E/T	A/C	200	T			
DOMINICA										
DOMINICAN REPUBLIC										
Puerto Plata	Puerto Plata APP	T	70							
Punta Cana	Santo Domingo ACC	T	70	E/T	A/C	250				*MSSR
	Punta Cana APP									

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Santo Domingo	Santo Domingo ACC	E/T	70	E/T	A/C	250				*MSSR
	Santo Domingo APP									
ECUADOR										
Guayaquil	Guayaquil ACC			E	A/C					*MSSR
	Guayaquil APP	T	50	T	A/C	250				*MSSR
Quito APP	Guayaquil ACC			E	A/C	250				*MSSR
	Quito APP	T	50	T	A/C	250				*MSSR
San Cristobal	Guayaquil ACC			E	A/C	250				*MSSR
EL SALVADOR										
El Salvador	El Salvador APP	T	80	T	A/C	200				*MSSR
Ojo de Agua	El Salvador APP			E/T	A/C	250				*MSSR
FRENCH ANTILLES										
Fort-de-France	Fort-de-France APP			T	A/C	200				*MSSR
Point-à-Pitre	Point-à-Pitre APP			T	A/C	250				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
GRENADA										
	Point Salines APP									
GUATEMALA										
C. Guatemala	La Aurora APP	T	80	T	A/C	250				*MSSR
San José Escuintla	San José APP			T	A/C	250				*MSSR
Santa Elena	Tikal APP			T	A/C	250				*MSSR
GUYANA										
	Georgetown ACC									
HAITI										
	Port-au-Prince ACC			E/T	A/C	250				*MSSR
	Port-au-Prince APP			T	A/C	250				*MSSR
HONDURAS										
San Pedro Sula	La Mesa APP			T	A/C	250				*MSSR
JAMAICA										
Kingston	Kingston APP	T	60	E/T	A/C	250				*MSSR
Montego Bay	Montego Bay APP	T	60	T	A/C	250				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Mount Denham	Kingston ACC	E	120	E	A/C	250				*MSSR
MEXICO										
Acapulco	Acapulco APP			T	A/C	240				*MSSR
Bajio Gto	México ACC			E/T	A/C/S	240				*MSSR
	Bajio APP									
Cancún Cerro	Mérida ACC	E/T	60	E/T	A/C	240				*MSSR
	Cancún APP									
Cerro Gordo	México ACC			E/E	A/C	240				*MSSR
	Monterrey ACC									
Potosi Cerro	Monterrey ACC			E	A/C	240				*MSSR
	México ACC									
Rusias	Mazatlán ACC			E	A/C	240				*MSSR
	México ACC									
	Monterrey ACC									

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Cerro Los Gallos	Mazatlán ACC			E	A/C	240				*MSSR
	México ACC									
	Monterrey ACC									
Cerro Santa Eulalia	Monterrey ACC			E/T	A/C	240				*MSSR
	Chihuahua APP									
Guadalajara	Guadalajara APP	T	80	E/T	A/C	240				*MSSR
Hermosillo	Mazatlán ACC			E/T	A/C	240				*MSSR
	Hermosillo APP									
	Tijuana APP									
La Paz	Mazatlan ACC			E/T	A/C	240				*MSSR
	San Jose del Cabo									
Los Mochis	Mazatlán ACC			E	A/C	240				*MSSR
Mazatlán	Mazatlán ACC			E	A/C	240				*MSSR
Mérida	Mérida ACC	E/T	80	E/T	A/C	240				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Mérida APP									
Monterrey	Monterrey ACC	E/T	80	E/T	A/C	240				*MSSR
	Monterrey APP									
Peñón	México APP	E/T	80	E	A/C	240				*MSSR
Puerto Peñasco	Mazatlán ACC			E	A/C	240				*MSSR
Puerto Vallarta	Puerto Vallarta APP			T	A/C	240				*MSSR
San José del Cabo	Mazatlán ACC			E	A/C/S	240				*MSSR
Tampico	México ACC			E	A/C/S	240				*MSSR
	Mérida ACC									
	Monterrey ACC									
Tijuana	Tijuana APP			T	A/C	240				*MSSR
Toluca	México ACC	E/T	80	E/T	A/C	240				*MSSR
	Toluca APP									
Veracruz	México ACC			E	A/C	240				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Mérida ACC									
Villahermosa	México ACC			E	A/C/S	240				*MSSR
	Merida ACC									
MONTSERRAT (United Kingdom										
CURACAO										
Willemstad	Curaçao ACC	E/T	120	E/T	A/C	256				
	Curaçao APP									
SINT MAARTEN										
Saint Maarten	Juliana APP	T	60	T	A/C	256				
NICARAGUA										
Managua	Managua APP			T	A/C/S	250				*MSSR Mode S
Bluefields	Bluefields TWR			T	A/C	250				
PANAMA										
Panamá	Panamá ACC	T	60	E/T	A/C	200				

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Panamá APP									
PARAGUAY										
Asunción	Asunción ACC	T	60	E/T	A/C/S	250				*MSSR Mode S
Roque Alonso	Roque Alonso Aeródromo						E/T			
Mcal Estigarribia	Mcal Estigarribia						E/T			
Bahía Negra	Bahía Negra						E/T			
Concepción	Concepción						E/T			
Minga Guazú	Guaraní						E/T			
San Juan Bautista	San Juan Bautista						E/T			
Ciudad del Este	Ciudad del Este APP	T	60	E/T						
PERU										
Ayacucho	Lima ACC			E	A/C/S	250				

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Arequipa	Lima ACC			E/T	A/C/S	250				
	Lima APP			E/T	A/C/S	250				
Cajamarca	Lima ACC			E	A/C/S	250				
Cusco	Lima ACC			E	A/C/S	250				
Iquitos	Lima ACC			E/T	A/C/S	250				
	Iquitos APP			E/T	A/C/S	250				
Lima	Lima ACC	E	60	E	AC/S	250				
Pucallpa	Lima APP	T	60	T	AC/S	250				
	Lima ACC			E/T	A/C/S	250				
Talara	Pucallpa APP			E/T	A/C/S	250				
	Lima ACC			E	A/C/S	250				
PUERTO RICO (United States)										
Pico del Este	San Juan ACC	E/T	200	E/T	A/C	200				*MSSR
San Juan	San Juan APP	E/T	60	E/T	A/C	180				

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
SAINT KITTS AND NEVIS										
SAINT LUCIA	Santa Lucia APP									
SAINT VINCENT & THE GRENADINES	E.T.Joshua APP									
SURINAME										
TRINIDAD & TOBAGO										
Piarco (15 NM north)	Piarco ACC Piarco APP	E/T	60	E/T	A/C	250				*MSSR
TURKS & CAICOS IS. (United Kingdom)										
Grand Turks	Miami ACC San Juan ACC			E	A/C	250				*MSSR
URUGUAY										
Carrasco	Montevideo ACC Carrasco APP	E/T	80	E/T	A/C	180				
Durazno	Montevideo ACC			E/T	A/C	256				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Carrasco APP									
VENEZUELA										
Barcelona	Barcelona APP	E/T	60	E/T	A/C	250				*MSSR
	Maiquetia ACC									
Barquisimeto	Barquisimeto APP	E/T	60	E/T	A/C	250				*MSSR
	Maiquetia ACC									
San Carlos de Rio Negro	Maiquetia ACC			E	A/C	250				*MSSR
Isla Margarita	Margarita APP	E/T	60	E/T	A/C	250				*MSSR9
	Maiquetia ACC									
Las Coloradas	Maiquetia ACC			E	A/C	250				*MSSR
Maiquetía	Maiquetia ACC	E/T	80	E/T	A/C	250				
	Maiquetia APP									
Maracaibo	Maracaibo APP	E/T	60	E/T	A/C	250				*MSSR
	Maiquetia ACC									
Puerto Ayacucho	Maiquetia ACC	E/T	200	E/T	A/C	250				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Puerto Ordaz	Puerto Ordaz APP	E/T	200	E/T	A/C	250				*MSSR
	Maiquetia ACC									
Santa Elena de Uairen	Maiquetia ACC			E/T	A/C	250				*MSSR
VIRGIN IS. **(United Kingdom)**										
VIRGIN IS. (United States)										
Saint Thomas	San Juan ACC	E/T	60	E/T	A/C	180				
	San Juan APP									
COCESNA										
Cerro Santiago, Guatemala	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Grand Cayman, Cayman I.	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
	Owen Roberts TWR									
Mata de Caña, Costa Rica	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Puerto Cabezas, Nicaragua	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Dixon Hill, Honduras	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C& S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Monte Crudo, Honduras	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S

APPENDIX K

Argentina

There are short-term plans to install three ADS-B stations to support surveillance in the Buenos Aires-Santiago route. In the medium term, it is expected that 7 additional ADS-B receivers will be available to cover routes toward the North of the country. Likewise, with the installation of these ADS-B stations Argentina also intends to ensure, in connection with the planned installation of radars, the non-existence of "blind area".

Bolivia

No information is available on ADS-B implementation.

Brazil

Brazil has installed ADS-B stations in Cuenca De Campos. In this regard, Aeronautical Information Circular AIC-N 22/2011 was issued, specifying the technical and operational requirements of the ADS-B at Cuenca de Campos. For the period 2018-2020, there are plans to implement ADS-B all over Brazil in support of en-route operations over FL245. In this regard, a draft of the AIC that will be circulated shortly is already available.

Chile

No information is available on ADS-B implementation.

Colombia

There are plans to maintain radar systems, while the use of ADS-B concurrently with radar systems is being considered, taking into account the extended use of ADS-B. This clearly constitutes a safe but expensive plan.

The deployment of ADS-B started with 11 systems installed at national level in San Andrés, Barranquilla, Montería, Cerro Kennedy, Santa Elena, Tasajero, Mitú, Carimagua, San José, Tumaco, and Santana. Likewise, an MLAT/WAM system is being installed in Bogota and two WAM systems are planned for SKMD and SKCC, with ADS-B functionalities.

Mandatory use of ADS-B out on board aircraft is contemplated as of 1 January 2020 through the installation of a Mode S 1090 Mhz Extented Squitter transponder, as established in aeronautical information circular (AIC) "*Proceso de implementación de vigilancia dependiente automática – radiodifusión ADS B*" CO4/16, dated 15 February 2016.

For this mandate to be effective, it is important for the Aviation Administration of Colombia to inform the aviation community of the need to start the process of installation of the Mode S 1090Mhz Extender Squitter transponder, rather than waiting until it gets close to the operational start-up date, mainly due to the fact that installation firms have queuing considerations.

Ecuador

There is no information available about the implementation of ADS-B stations. There are two WAM systems in Loja and Latacunga.

French Guiana

The installation of 5 ADS-B stations at the airports of Rochambeau, en Mont Matoury, Maripasoula, Mana, and Saint Georges is scheduled for 2018.

Guyana

At present, an ADS-B station operates in Timehry and 4 additional ADS-B stations are being installed (SYAN, SYKA, SYKM and SYPK), which are expected to come on line by late July 2017. An AIP supplement has been published (26 May 2016) *Commencement of Testing and Operational Trials for Aeronautical Surveillance Service using Automatic Dependent Surveillance Broadcast (ADS-B) out Operations within Georgetown Flight Information Region (SYGC CTA).* This SUP supersedes AIPSUP 02/16. Operational use of ADS-B for flights above FPL245 is in effect since 12 November 2015. By 26 July 2017 at 00:00 UTC, all aircraft that wish to operate in the Georgetown FIR below FPL245 must be equipped with ADS-B. It is expected that surveillance control will be provided as of October 2017.

Panama

There is an ADS-B system installed in Cerro Jefe. Three additional stations are scheduled to be installed by the end of 2017.

Paraguay

Regarding the implementation of advanced surveillance systems, there are 6 ADS-B stations installed to meet radar coverage requirements in support of the main Mode S radar surveillance system. At present, the ADS system has not been fully implemented. The existing AIRCON 2100 version does not support the ADS-B asterix 21 radar data protocol, and thus cannot be integrated into the automated system. The solution being considered is the updating of the AIRCON 2100 system to the latest version that supports asterix 21 processing.

Peru

There are two ADS-B stations installed, one at the airport of Pisco and the other in Lima integrated with the secondary radar information in the Lima ACC. The Meeting took note that in March, the reception of signal in Pisco A-DSB had to be disconnected due to a compatibility problem which was generating false emergency alarms when aircraft changed SSR codes at ATS request. This problem will be solved with the start-up of the updated automated system in the Lima ACC, expected to be accomplished by October 2017.

Suriname, Uruguay, and Venezuela

There is no information available on the implementation of ADS-B stations.

Agenda Item 6: Other business

6.1 Under this agenda item the Meeting analysed the following papers:

a) WP/18 - No *FIR airspace in the Pacific Ocean* (prepared by LATAM, presented by IATA); and
b) IP/04 - *Security culture* (presented by Uruguay – Spanish only).

No FIR airspace in the Pacific Ocean

6.2 LATAM representative stated that in the recent years, SAM Region has been outstanding at a global level for making decisive progress in the implementation of PBN and improving the infrastructure of communications, surveillance and air traffic management, thus providing users with a homogeneous, seamless airspace which allows increasing the sustainable development of aviation. This progress requires SAM States and operators to continue exploring new opportunities for improvement, in order to increase the efficiency of certain routes which, considering their flow, have not been analyzed nor need to be published.

6.3 LATAM Airlines has been evaluating the advantages of applying between the aforementioned city pairs the model of "Random Routes" (or RNAV User Preferred Routes) in the South Pacific. During this analysis, while carrying out simulations for more efficient flight plans according to the winds, there was found that these routes would cross the airspace included in the area described as "NO FIR", which prevents even from initiating co-ordinations on these routes with the States involved, due to the lack of Flight Information and Alert services.

6.4 The benefit of the implementation of such routes in the Region would imply savings that could reach close to 800 Tons. CO_2 per year, only for LATAM flights. The Meeting agreed on the need to define responsibility over the "NO FIR" area with the aim of improving the quality of that air space and to allow beginning coordination to implement Random Routes. The following actions were suggested:

a) That, the representatives of Ecuador and Peru make the corresponding consultations in their countries to evaluate the possibility that these States take responsibility for the mentioned area[1].

b) That, the Secretariat inquires the ICAO Air Navigation Bureau (ANB) and presents if required, a Working Paper to GREPECAS regarding this opportunity of improvement.

The results of this arrangement will be assessed in the SAM/IG/20 Meeting.

Security culture

6.5 The Meeting was informed on the Information Paper sent by Uruguay and presented by the Secretariat where the security culture issue was encountered, as well as the efforts made by this State to increase the security. The note recognizes that the success of the SSP and SMS depends mainly, on the development of a positive and proactive safety culture. Staff involved in the provision of air traffic services, including regulation and surveillance, should appreciate the Security Culture, including its principles, commitment and assertiveness to put it into practice.

[1] Corrigendum to paragraph 6.4 a) requested by the Peruvian Administration

6.6 The Secretariat will share this Information Paper with other SAM Regional Office forums where activities related to Annex 19 are discussed.

Coordination tasks for ATS Letters of Agreements of Argentina, Brazil and Paraguay

6.7 Delegations from Argentina, Brazil and Paraguay, take the opportunity offered by the meeting, to carry out tasks related to the drafting of ATS letters of agreement for air spaces and airdromes in boundary areas, such as TMA FOZ, Paso de los Libres and Encarnación - Posadas. The Secretariat will be informed on the progress made on this issue until the subscription of the documentation by the corresponding Authorities.

Possible case of Cyber-Attack in Paraguay

6.8 Paraguay presented to the group of analysis of Agenda Items 4 and 5 an experience of possible cyber-attack in the system that enable the presentation of flight plans to all users registered, accessing through internet from any remote location (IFIS System). As a consequence of the cyber-attack the system experienced erratic performance initiating claims by users who had difficulties in entering into IFIS. Additionally, changes in the data base of IFIS were detected. On this respect some recommendations were made and taken into consideration by the *ad hoc* group of the REDDIG II for security analysis.