Agenda Item 2: Optimisation of SAM airspace

a) Progress made in regional PBN implementation
b) Actions to standardise longitudinal separation of aircraft en-route
c) Coordination of the SAM route network – Version 4
d) Progress made in ATS contingency plans

FOLLOW-UP TO PBN IMPLEMENTATION

(Presented by the Secretariat)

SUMMARY

This working paper presents a report on PBN implementation activities and other implementations related to SAM airspace optimisation, so that States may identify those activities on which they must focus their efforts to meet the established goals.

References:

- SAM/IG meetings
- ATSRO meetings
- PANS-OPS workshops
- GREPECAS/18 meeting

ICAO strategic objectives:	*A - Safety* *E – Environmental protection*

1. Background

1.1 The SAM/IG/20 meeting reviewed, *inter alia,* the status of implementation of PBN with respect to the optimisation of SID/STAR routes, terminal areas, PBN approach procedures, pursuant to the goals of the Declaration of Bogota, which were to be attained in December 2016.

2. Discussion

PBN en route

1.2 The implementation of PBN en-route is discussed at ATS/RO meetings, based on route network versions, to ensure that the best possible airspace structure is always available, applying an integrated development concept. A separate working paper addresses the progress made in the en-route segment through the corresponding action plan, and the development of version 4 of the optimised route network.

PBN in TMAs

2.1 The process of PBN redesign of the main SAM TMAs was promoted through implementation workshops under the sponsorship of Regional Project RLA/06/901. Workshop PANS-OPS/2 was delivered in September 2017, and its results are summarised later in this document.

2.2 A relevant aspect is the investment made in PANS-OPS training for personnel of aviation administrations and ANSPs. The Region now has a significant number of PANS-OPS designers, which reflects the fact that the capacity and knowledge required for PBN implementation have been obtained.

2.3 During the second half of 2017, PBN airspace became effective at the Asunción FIR and TMA and at the International Airport Silvio Pettirossi. Likewise, Aerocivil of Colombia implemented the new Bogota TMA with RNAV/RNP approach procedures and standard routes for El Dorado airport. Under the PBN SUR project, Brazil has made significant improvements in the Curitiba FIR, with emphasis on the optimisation of several main TMAs (Curitiba, Florianópolis, Santa Maria, Porto Alegre, etc.) and main airports.

2.4 SAM States continue working on meeting the implementation deadlines defined in their action plans. To date, 93% of States have submitted their action plans for PBN redesign of their selected airspaces, as shown in the following table:

May 2018 93%	ARG	BOL	BRA	CHI	COL	FGY	ECU	GUY	PAN	PAR	PER	SUR	URU	VEN
	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES

2.5 The tentative implementation dates in the aforementioned action plans were defined at the SAMIG/20 meeting. At this Meeting, States must report on progress made and activities carried out. Current planning is shown in the following table:

Redesign of selected TMA airspaces based on PBN plans		
State		**Implementation**
Argentina	BAIRES	Phase 1.- October 2017. Optimisation of available resources. Phase 2.- 2017-2020. Introduction of the PBN concept. (See SAM/IG/20-IP/04)
Bolivia	Cochabamba	Phase 1.- July 2018. PBN design, but also taking into account conventional procedures. Phase 2.- August 2019. Final PBN design, taking into account airspace with ATS surveillance.
	La Paz	
	Santa Cruz	
Brazil	Brasilia	12 Nov 2015 (implemented)
	Belo Horizonte	12 Nov 2015 (implemented)
	Sao Paulo (partial modifications)	12 Nov 2015 (implemented)

Redesign of selected TMA airspaces based on PBN plans			
State			**Implementation**
	Salvador		27 Apr 2017 (implemented)
	Manaus		17 Aug 2017 (implemented)
	(PBN SUR)	Curitiba	12 Oct 2017 (implemented)
		Florianópolis	
		Joinville	
		Navegantes	
		Porto Alegre	
		São Paulo (modifications)	
		CW FIR route network	
	Fortaleza, Natal and Maceió		September 2019
	Vitória		October 2018
	Belém, Campo Grande and Sao Luis		October 2021
	Cuiabá, Boa Vista, Porto Velho and Rio Branco		October 2023
	Sao Paulo		TBD
Chile	Santiago (South)		8 Dec 2016 (implemented)
	Santiago FIR route network		
Colombia	Bogota		12 Oct 2017 (implemented)
Ecuador	Guayaquil		21 Jul 2016 (implemented)
Panama	Panama		Project start date: 2018. (See SAM/IG/20-IP/10)
Paraguay	Asunción		17 Aug 2017 (implemented)
Peru	Arequipa		December 2018
	Cusco		December 2018
	Juliaca		December 2018
	Puerto Maldonado		December 2018
Uruguay	Carrasco and Laguna del Sauce		First semester of 2018 * The Carrasco TMA will be optimised concurrently with Phase 2 of the Baires TMA.
Venezuela	Maiquetía		December 2017
	Isla Margarita		Second semester of 2018

Implementation of PBN SIDs, STARs and approach procedures

2.6 Through the *Declaration of Bogota,* States undertook to implement PBN SIDs and STARs at the main aerodromes by December 2016, using CDO and CCO methods. The aforementioned Declaration also urged States to implement APV approach procedures to comply with ICAO Assembly Resolution A37-11.

2.7 To date, PBN SIDs/STARs have reached 72.9% implementation. The goal of the *Declaration of Bogota* was 60% by 2016, so the goal has been exceeded. The design of arrival and departure procedures is related to the application of CDO and CCO methods, which have reached an implementation percentage of 34% and 26%, respectively.

2.8 Regarding Resolution A37-11 on the implementation of PBN approaches, SAM States are still striving to reach the 100% goal. To date, the implementation rate is 78.6%.

2.9 The GREPECAS/18 meeting held last April noted that the commitments set forth in the Declarations of Bogota and Port-of-Spain have been an effective component of integration, and have contributed to the progress made in air navigation implementation in the two Regions, without forgetting that these Declarations should be seen as a policy guide that States adopted by consensus.

2.10 GREPECAS/18 urged States to keep on working on the harmonised implementation objectives within a new project management scheme, emphasising the identification of State and regional requirements, and clearly defining relations with users and all stakeholders, and a new accountability approach.

2.11 Consequently, the Secretariat is presenting a separate paper that addresses the updating of the PBN project.

PBN focal points of the regulator and the air navigation service provider

2.12 Some changes have been made in the responsible parties within the States. Therefore, the list of PBN focal points of the regulator and the air navigation service provider (ANSP), shown in **Appendix A** to this working paper, must be updated for coordination and teleconferencing purposes.

PANS-OPS workshops

2.13 The Second workshop on PANS-OPS design in the SAM Region (PANS-OPS/2) was held in Lima, Peru, on 18-22 September 2017. The PBN and PANS-OPS workshops are part of the PBN implementation strategy in the Region, since they strengthen collaboration with experts and airline pilots, obtaining valuable feedback on user requirements.

2.14 The Third PANS OPS workshop has been scheduled for 27 August 2018, and is expected to address mainly the transition of RNAV to RNP mapping, as discussed in a separated working paper.

2.15 The participants of the PANS OPS/2 workshop ratified the validity of the recommendations of the PANS-OPS/1, and agreed that efforts should continue to be made for the implementation of these recommendations. Accordingly, **Appendix B** contains the table of recommendations to be updated by the States based on the progress made.

Actions to standardise longitudinal separation of aircraft en route

2.16 At present, a number of letters of agreement and memoranda of understanding have been established to consolidate the commitments assumed at the SAM/IG/17 meeting for the reduction of longitudinal separation minima from 80 NM to 40 NM. **Appendix C** shows the agreements reached between adjacent FIRs of the SAM Region, as well as with adjacent FIRs of the CAR Region, which serve to monitor the second optimisation stage based on a 20 NM separation minimum.

2.17 The level of implementation with the ACCs of adjacent States has increased to 92%, with the implementation in the Santiago ACC of 40 NM for the continental area of the Antofagasta FIR and the Santiago FIR, as follows:

May 2018 **92%**	**ARG**	**BOL**	**BRA**	**CHI**	**COL**	**FGY**	**ECU**	**GUY**	**PAN**	**PAR**	**PER**	**SUR**	**URU**	**VEN**
	YES	YES	YES	YES	YES	NO*	YES	YES	YES	YES	YES	YES	YES	YES

* French Guiana applies oceanic separations with neighbouring States.

The Paramaribo FIR and Atlántico FIR – Brazil maintain oceanic separation due to their characteristics. Nevertheless, the SAM Region has consolidated the implementation of the 40NM minimum, pending coordination with adjacent States of the CAR Region.

2.18 Likewise, a workshop was conducted on 6-10 November 2017 at the SAM Regional Office, where an action plan was proposed to foster the reduction from 40 to 20 NM, and the signing and effective implementation of letters of agreement between States was coordinated to consolidate the 40NM separation. **Appendix D** contains the aforementioned plan, which lists several tasks for discussion at this Meeting.

2.19 A highlight of the aforementioned workshop was coordination between States, and the efforts made by Bolivia to consolidate, since last February, the implementation of agreements involving the La Paz FIR.

2.20 Within this context, Brazil has started standard implementation of the 20NM separation for aircraft entering its FIRs, with effective implementation of this initiative between Colombia and Brazil. A summary of the results of this workshop are posted on the following link:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2017-OPTSEPLONG

Activities and resources required for the execution of the Action Plan for SAM Airspace Optimisation, with the support of Project RLA/06/901

Activities and resources approved for 2018 with the support of Project RLA/06/901

2.21 The Eleventh meeting of the Coordination Committee of Project RLA/06/901 (RCC/11) approved activities to support SAM airspace optimisation in 2018, which have been scheduled/executed as follows:

- Meeting on ATS contingency plans and letters of operational agreement, held on 19-23 March 2018 – Updating and harmonisation of contingency plans, in accordance with ICAO Annex 11, and signing of ATS letters of agreement. This is discussed in WP/18.
- ATSRO/9 – Follow-up to the implementation of Version 4 of the SAM Route Network (final version).
- Third workshop on PANS-OPS implementation – To continue with the harmonisation and coordination of PBN instrument procedures in the SAM Region, advanced RNP and CDO /CCO. This will have an impact on the transition from RNAV to RNP mapping.

- Development of draft Version 5 of the SAM route network – Deliverable: SAM Route Network document – Version 5.
- SAM/IG/21 and SAM/IG/22 – All air navigation implementation priorities to proceed with the implementation of action plans.

Strategy for PBN implementation in the SAM Region

2.22 SAM/IG meetings promote a strategy for PBN implementation in en-route and TMA airspace, by approving various activities. These activities, as well as aircraft separation workshops and the PANS-OPS workshop, were incorporated into the work plan for airspace optimisation.

2.23 Taking into account that SAM/IG meetings would not be enough for said follow-up, it is advisable to participate in monthly teleconferences. In summary, PBN implementation would be based on the following activities/events.

a) ATSRO/9 meeting, with activities for follow-up and adjustment to the implementation of Version 4 of the ATS route network.

b) Development of a draft Version 5 of the ATS route network.

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

d) Transition from RNAV to RNP mapping, and harmonisation and coordination of PBN instrument procedures in the SAM Region - PANS-OPS workshops.

e) Optimisation of longitudinal separation – multilateral and bilateral meetings.

f) Meetings to update ATS contingency plans and letters of agreement to ensure safety and consolidation of PBN implementations and improvements, and make sure benefits are obtained.

g) Coordination and harmonisation of route networks and longitudinal separation between the CAR/SAM Regions – NAM/CAR/SAM interregional implementation meetings and teleconferences.

3. Suggested actions

3.1 The Meeting is invited to:

a) take note of the information provided in this working paper;

b) update tentative dates of implementation of the PBN redesign of selected airspaces and delivery of updated PBN action plans to the Secretariat;

c) review the information provided in **Appendix A,** and advise the Secretariat in case there is a need to make any changes;

d) review, propose changes or improvements, and approve the SAM PBN implementation strategy;

e) review the information provided in **Appendix B,** and update the implementation process as required;

f) update the information contained in **Appendix C** on the status of implementation of the optimisation of longitudinal separation in the SAM Region;

g) coordinate with the Secretariat whenever States need to update or sign LOAs or MOUs on longitudinal separation;

h) review the information provided in **Appendix D** on the action plan for the optimisation of the longitudinal separation to 20NM, and define the corresponding tasks; and

i) send to the Secretariat all information related to fuel saving calculations related to route optimisation or redesign of selected airspaces.

APPENDIX A / APÉNDICE A

LIST OF CONTACTS FOR OPERATIONAL PBN FOCAL POINTS

LISTA DE CONTACTOS PARA PUNTOS FOCALES PBN

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
ARGENTINA*	Mariana Fernandez Administración Nacional de Aeronáutica Civil (ANAC) A/C Departamento Programaciòn Tècnica Tel: +54 11 5941 3000, Ext. 69193 E-mail: mafernandez@anac.gob.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
BRAZIL / BRASIL*	Luiz Antonio dos Santos Jefe ATM Departamento de Control del Espacio Aéreo (DECEA) Av. General Justo, 160 – Centro Rio de Janeiro 20.021-130, Brasil Tel: +55 21 2101 6088 E-mail: luizantoniolas@decea.gov.br Rochelly de Miranda Corrêa Auxiliar ATM Departamento de Control del Espacio Aéreo (DECEA) Av. General Justo, 160 – Centro Rio de Janeiro 20.021-130, Brasil Tel: +55 21 2101 6197 E-mail: rochellyrmc@decea.gov.br
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
PANAMÁ	Alberto De Icaza Diseño de Procedimiento y Espacio Aéreo Autoridad Aeronática Civil Edif. N° 646 Av. Demetrio Korsi Calle Héctor Conte Bermúdez Albrook, Panamá Tel: +507 315 9834 E-mail: adeicaza@aeronautica.gob.pa

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
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
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

State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
SURINAME	Kalawatie Radha Atwaroe Air Traffic Controller / Controlador de Tráfico Aéreo Suriname Civil Aviation Department Tel: +597 855 5025 Email: radha_atwaroe@hotmail.com Quincy Cyrus Air Traffic Controller / Controlador de Tráfico Aéreo Suriname Civil Aviation Department Tel: +597 724 8980 Email: qcyrus83@gmail.com
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State/ Estado	PBN FOCAL POINTS PUNTOS FOCALES PBN
VENEZUELA (Bolivarian Republic of) / **VENEZUELA (República Bolivariana de)***	Omar Enrique Linares Coordinador Nacional ATS Jefe de Área de Planificación 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 3034513 E-mail: o.linares@inac.gob.ve ollinaresomar2@gmail.com

** Updated SAM/IG/20 / Actualizados en la SAM/IG/20*

APPENDIX B

PANS-OPS/1 WORKSHOP RECOMMENDATIONS (Updated: 20 October, 2017)

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
1. 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			YES	OG	OG		NO	YES	Argentina: Applies Resolution 457 of year 2016, which included the use of TERPS-FAA Concepts for IFP designs.
2.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	OG	NO			OG					NO		YES	NO	Argentina: Yes Rest of States: Pending recommendation is assumed as indicated in ICAO bulletin suspending Circular 336
3. 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		OG			YES	NO	YES		OG	YES	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
4. 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	OG		YES			YES	YES	OG		OG	YES	
5. 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	OG		YES			YES	YES	OG		OG	NO	
6. 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		NO			OG	OG	OG		NO	YES	
7. 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	YES	NO	OG YES		OG NO			OG	OG	NO		NO NO	YES NO	

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
enhance situational awareness of controllers and pilots.															
8. 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	YES	YES	OG OG		OG NO			OG	YES N/A	OG OG		YES NO	YES NO	
9. 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	YES	OG	OG YES		YES YES			OG	YES	YES YES		YES YES	YES YES	

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
10. 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	OG OG		YES YES			OG	YES	YES YES		NO NO	YES YES	
11. 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	O/G	OG		YES			OG	OG	NO		OG	YES	

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGI	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
12. 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	OG	OG		OG			YES	YES	YES		YES	YES	
13. 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	OG	YES	NO YES		YES YES			OG	YES	NO YES		NO NO	YES	

APPENDIX C

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			Not applied
	ASUNCION	YES	01/01/17			Not applied
	CURITIBA	YES	01/01/17			Not applied
	CORDOBA	YES	01/01/17			Not applied
	LIMA	OG				No agreement
	IQUIQUE	OG				Agreement in process
	RESISTENCIA	YES	01/01/17			Not applied

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			
	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	---	---	---	---	
NOTA: Before SAM/IG/21 20 NM will be applied to receive traffic into FIR Brazil						

CHILE						
ACC	ACC ADJ	Longitudinal separation				Comments
		40 NM GNSS/ DME	Date of Implementation	20 NM GNSS/ DME	Date of implementation	
SANTIAGO	IQUIQUE	N/A				5NM
	LIMA	OG				
	MENDOZA	OG				
	PUERTO MONTT	N/A				5NM
IQUIQUE	CORDOBA	OG				
	LA PAZ	OG				Agreement in process
	LIMA	OG				Agreement in process
	SANTIAGO	N/A				5NM

PUERTO MONTT	PUNTA ARENAS	N/A				5NM
	EZEIZA	OG				
	COMODORO RIVADAVIA	OG				
PUNTA ARENAS	PUERTO MONTT	N/A				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				No MoU prepared because efficient communications could not be pledge in the border area
	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	21/03/17			
	PANAMÁ	YES	13/10/16			
	BARRANQUILLA	YES	05/10/16			
BARRANQUILLA	MAIQUETIA	YES	21/03/17			
	PANAMÁ	YES	13/10/16			
	BOGOTÁ	YES	05/10/16			
	KINGSTON	YES	15/06/13			
	CURAÇAO	NO				No MoU prepared because efficient communications could not be pledge in the border area

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			
	KINGSTON	YES	10/12/16			

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			Not being applied. Coordination with Argentina required

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			During OSL workshop full application was agreed
	BOGOTÁ	YES	31/03/16			Implemented
	OCEANICO	NA				Oceanic separation
	IQUIQUE	OG				Agreement in process
	GUAYAQUIL	YES	10/11/16			implemented
	LA PAZ	OG				Pending agreement

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	21/03/17			Informed on 23/3/2017
	BARRANQUILLA	YES	21/03/17			Informed on 23/3/2017
	PIARCO	OG				Negotiating
	CURAZAO	NO				Curazao does not accept.
	SAN JUAN	NO				San Juan has no conditions to implement
	GEORGETOWN	OG				

APPENDIX D

Draft Action Plan 2018 – 2019

"Enhancement and standardisation of en-route longitudinal separation minima"

Phase 1: Consolidation of 40NM LSM and initial actions for the application of a 20NM LSM

- Define agreement to apply 40NM LSM with CAR States (April 2018)
- Define application of 40NM LSM at the La Paz FIR (SAMIG/21)
- Feedback of Brazil on application of 20NM LSM (SAMIG/21)
- Feedback of COL, PER, ECU, VEN, PAN on application of 20NM LSM (SAMIG/21)
- Full implementation of 40NM LSP in SAM continental airspace (SAMIG/21)

Phase 2: Implementation of 20NM LSM

- Analysis following implementation of 40NM LSM (SAMIG/22)
- Analysis of results of unilateral application of 20NM in Brazil (SAMIG/22)
- Analysis of results of 20NM LSM trials in the States (SAMIG/22)
- Analysis of limitations and gaps (SAMIG/22)
    a. ATS sectorisation, ATS capacity measurement
    b. Flow management, implementation of initiatives
    c. Direct VHF communications
    d. ATS route network
    e. Implementation of AIDC, FPL management
- Risk assessment
- Define agreements for implementation of 20NM LSM with CAR States (SAMIG/22)
    a. Stage 1, aircraft landing in the FIR
    b. Stage 2, all aircraft entering the FIR
- Define agreements and date of implementation of 20NM LSM among SAM States (SAMIG/22)
    a. Stage 1, aircraft landing in the FIR
    b. Stage 2, all aircraft entering the FIR
- Full implementation of 20NM LSM in SAM continental airspace (SAMIG/23 - 2019)
- Analysis following implementation of 20NM LSM (SAMIG/23 - 2019)

Phase 3: Implementation of 10NM LSM with ATS surveilance (TBD)
