International Civil Aviation Organization
South American Regional Office
Twelfth Workshop/Meeting of the SAM Implementation Group (SAM/IG/12) - Regional Project RLA/06/901
(Lima, Peru, 14 to 18 October 2013)

SAM/IG/12-WP/04
23/09/13

Agenda Item 2: SAM airspace optimisation
a) En-route PBN

UPDATING OF LETTERS OF OPERATIONAL AGREEMENT

(Presented by the Secretariat)

SUMMARY

This working paper sets forth the need to update the letters of operational agreement (LOAs) as a result of the last amendments to the SAM ATS route network and the transfer procedures used between adjacent ATC units, which have resulted in various LHD incidents in RVSM airspace.

REFERENCES

- SAM/IG workshop/meeting reports
- ATSRO workshop/meeting reports
- GTE/13 meeting report

ICAO Strategic Objectives:	*A - Safety* *C - Environmental protection and sustainable development of air transport*

1. Background

1.1 As a result of the SAM/IG and ATSRO meetings, amendments have been introduced to the SAM ATS route network. Since 17 October 2013, route UM662 from Guayaquil to position DAREK has been implemented; 2 RNAV routes (UM411 and UM549) have been implemented, and routes UA317, UA321, UL201, UL216, UL304, UL550, UL795, UM417, UM530, UM548, and UM782 have been aligned, effective 12 December 2013. This information is contained in **Appendix A** to this working paper as a reference.

1.2 The CAR/SAM Regional Planning and Implementation Group (GREPECAS) delegated the implementation of the SMS methodology for the analysis of LHDs to the Caribbean and South American Monitoring Agency (CARSAMMA). CARSAMMA is an administrative agency under the *Departamento de Controle do Espaço Aéreo* (Airspace Control Department - DECEA), which is part of the Brazilian Airspace Control System (SISCEAB).

1.3 The Thirteenth Meeting of the Scrutiny Group (GTE/13), held in Lima on 9-13 September 2013, made a safety assessment of RVSM airspace in CAR/SAM FIRs. The meeting took note of the evolution of large height deviations (LHDs) in CAR/SAM FIRs, mainly in categories M and N.

2. **Discussion**

2.1 ATS route network implementations or modifications require the updating of the letters of operational agreement to make sure that the information concerning transfer points and related procedures is updated according to the new ATS route structure, thus avoiding omissions or obsolete information that might mislead ATC units when coordinating and transferring traffic.

2.2 Likewise, at the GTE/13 meeting, CARSAMMA presented a summary of the evolution of safety in RVSM airspace in the CAR/SAM FIRs, which was based on a series of LHD reports covering a period of 3 years between 2010 and 2012.

2.3 Table 1 shows LHDs reported at the points of highest occurrence of risk in CAR and SAM FIRs for the 2010-2012 period.

Position	M	N
VESKA	113	42
VAKUD	33	26
PALAS	44	14
UGUPI	35	20
IREMI	46	8
OROSA	30	17
BEROX	52	5
PIGBI	32	17
POKAK	24	6
REPAM	22	4
SBAO-SUEO	54	25
PLG	21	8
SBAO-DIII	27	29
TERAS	20	8
AVELO	3	3

Table 1: LHD reports at the points of highest occurrence, in categories M and N

2.4 The GTE/13 meeting noted that M-coded LHDs (error in the ATC transfer message) were the most frequent during the 2010-2012 period, with 486 events, followed by Code N (lack of coordination), with 232 events.

2.5 It was also noted that Code M was the most frequent in almost all positions, except at the SBAO/SUEO and SBAO/DIII boundaries, where Code N prevailed due to the impact of traffic management between the Falkland Islands and the Ascension Island in the South Atlantic.

Safety analysis (SMS) of LHDs in the SAM Region

2.6 Table 2 lists LHD or operational errors that were considered by the GTE as having the highest risk (VR> 46) during the 12 months of 2012.

2.7 LHD 1158, which occurred in December 2012, accounted for 2.592% of the risk assessment for that month, with a VR = 60, the highest of the sample.

2.8 The Lima FIR appears 11 times with LHD reports for adjacent FIRs, since they contributed to the generation of risk in its RVSM airspace.

2.9 The Guayaquil FIR, in turn, appears 8 times in terms of risk generation.

Sequence	FIR subject to the risk	FIR generating the risk	GTE code	Risk value
7	ATLANTICO	MONTEVIDEO	N	46
59	ATLANTICO	ABIDJAN	N	46
150	ATLANTICO	MONTEVIDEO	N	46
408	ATLANTICO	MONTEVIDEO	N	46
592	ATLANTICO	DAKAR	N	46
657	ATLANTICO	MONTEVIDEO	N	46
839	ATLANTICO	ABIDJAN	N	46
884	ATLANTICO	MONTEVIDEO	N	46
1054	ATLANTICO	DAKAR	N	46
933	BOGOTA	GUAYAQUIL	N	46
1125	BOGOTA	AMAZONICA	N	51
1158	BOGOTA	GUAYAQUIL	N	60
3	LIMA	GUAYAQUIL	N	46
27	LIMA	GUAYAQUIL	N	55
64	LIMA	GUAYAQUIL	N	46
91	LIMA	LA PAZ	N	46
232	LIMA	LA PAZ	N	46
275	LIMA	AMAZONICA	N	46
281	LIMA	GUAYAQUIL	N	55
419	LIMA	AMAZONICA	N	46
534	LIMA	BOGOTA	N	46
694	LIMA	GUAYAQUIL	N	46
714	LIMA	GUAYAQUIL	N	55
188	MAIQUETIA	AMAZONICA	N	46

Table 2: LHDs with the highest risk value in 2012

2.10 The analysis includes a detailed review of certain operational errors in order to identify contributing factors and make sure that safety authorities of SAM FIRs implement procedures and processes to reduce the probability of recurrence of errors.

2.11 Likewise, there has been a significant increase in lack of transfer, resulting in serious loss of situational awareness of traffic, thus significantly affecting safety. N-coded LHDs are amongst the worst air traffic incidents, since the aircraft involved is not expected in a given position, at that level, or at the time of occurrence.

2.12 The high number of M- and N-coded LHDs shows the need for better coordination between adjacent air traffic control units, which could be achieved by sensitising and training controllers in coordination matters, and by better describing the procedures in the letters of operational agreement.

2.13 The points of transfer identified in Table 1 for the SAM Region shall be taken into account both specifically and generally in the letters of agreement, which shall indicate the mitigation measure to prevent that type of errors that must have been already identified by States, thus ensuring better safety management.

2.14 Some FIRs have decided to automate transfer, with the cost that involves. However, there is still a coordination issue that is not reflected in the letters of operational agreement between adjacent FIRs, especially regarding the reception of flight plans, the duplication of flight plans, the lack of transfer specifications concerning aircraft attitude (climb/descent) or the delivery of a flight at the level at which traffic will be delivered.

3. **Suggested action:**

3.1 The Meeting is invited to:

a) identify the positions in Table 1 that belong to the SAM States listed therein where most M- and N-coded LHDs occur; and

b) modify the letters of operational agreement (LOAs), establishing procedures to reduce the risk of LHD.

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APPENDIX A

Proposal for amendment to the CAR/SAM ANP - Volume I - Basic
Serial N° SAM 13/03 - ATM

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

b) **Proposal for amendment:**

Editorial note: The amendment has been prepared so that the text to be deleted appears with strike out (~~text to be deleted~~) and new text appears with grey shading (text to be inserted)

1. Add, as described below, the following route: **UM662.**
(Cf – Doc. 8733, Volume I, Basic, Part V - Appendix A – Table ATS-1).

UM 662		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
GUAYAQUIL	02° 07’ 42’’S	079° 52’ 01’’ W
BIVAN	01° 34’ 08’’S	079° 30’ 13’’ W
BOLOM	00° 16’ 56’’ N	076° 41’ 41’’ W
ILVIR	03° 50’ 32’’ N	071° 17’ 35’’ W
AMAYA	06° 09’ 48’’N	068° 09’ 30’’ W
EGOSU	07° 57’ 57’’N	066° 08’ 44’’ W
DAREK	11° 29’ 39’’ N	062° 48’ 14’’ W

c) **Originated by**: Colombia, Ecuador, Venezuela and IATA.

d) **Reasons of the originator for the amendment**:

As a result of the Third Workshop/Meeting of SAM ATS Routes Network Optimization (SAM ATSRO/3 and in view of the further revision made by SAM/IG/11 Meeting, States originating this proposal for amendment, in coordination with users, represented by IATA, have agreed that this RNAV-5 route be included within the SAM ATS routes structure optimisation programme, and therefore, are ready for its implementation, as appropriate.

This route UM662 is wholly in the SAM Region and it will be part of the CAR/SAM ANP routes network, Volume I, Basic. The implementation of the new route shall enable a reduction in distance (25NM) and time flight with the consequent fuel savings, operational costs and environmental protection reducing annually 341 Tons of CO2.

e) **Proposed date of implementation**:

Two AIRAC cycles, after the proposal for amendment has been approved by ICAO Council.

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

Anguilla (United Kingdom)
Antigua & Barbuda
Argentina
Barbados
Bolivia
Brazil
Chile
Colombia*
Dominica
Ecuador*
France
French Antilles (France)
French Guyana (France)
Grenada
Guyana
Montserrat (United Kingdom)
Panamá
Paraguay
Peru
San Kitts & Nevis
Saint Vincent & the Grenadines
Saint Lucia
Suriname
Trinidad & Tobago
United Kingdom
Uruguay
Venezuela*
Virgin Islands (United Kingdom)

International Organizations:

CARSAMMA*
IATA*
IFALPA HQ*

***** for information

g) **Secretariat comments**:

1) ATS Routes Network restructuring contained in the Basic CAR/SAM Air Navigation Plan is framed within the ATM evolution process in the CAR and SAM Regions, as approved through CAR/SAM/3 RAN Recommendations 5/14, 5/15 and 5/16.

2) The trajectory has been configured keeping in mind PBN implementation in the SAM Region, fuel saving, economy of air operations and environmental protection, which shall enable a wider use of this route benefitting a greater number of users of the concerned airspace.

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Proposal for amendment to the CAR/SAM ANP - Volume I - Basic
(Serial N° SAM 13/04 – ATM)

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

b) **Proposal for amendment:**

Editorial note: The amendment has been prepared so that the text to be deleted appears with strike out (~~text to be deleted~~) and new text appears with grey shading (text to be inserted)

2. Add, as described below, the following routes: **UM411; UM549.**
(Cf – Doc. 8733, Volume I, Basic, Part V - Appendix A – Table ATS-1).

UM 411		
PUNTO SIGNIFICATIVO SIGNIFICANT POINT	*LATITUD LATITUDE*	*LONGITUD LONGITUDE*
VIR VOR	17°37’34’’S	063°08’52’’W
GAVOS	17°58’14’’S	061°47’56’’W
EVLOL	19°04’48’’S	057°48’21’’W
POXET	20°37’21’’S	052°37’07’’W
MORPI	21°18’20’’S	049°53’25’’W
PIR VOR	21°59’04’’S	047°20’40’’W

UM 549		
PUNTO SIGNIFICATIVO SIGNIFICANT POINT	*LATITUD LATITUDE*	*LONGITUD LONGITUDE*
TABOGA	08°47’18’’N	079°33’42’’W
DAKMO	07°27’42’’N	077°48’36’’W
MARIQUITA	05°12’24’’N	074°25’30’’W
BOGOTA	04°50’48’’N	074°19’24’’W
MITU	01°14’30’’N	070°14’12’’W
ABIDE	00°40’42’’N	069°41’16’’W
OTRAR	02°02’57’’S	063°48’37’’W
SALSA	05°03’45’’S	063°48’37’’W
PAKEN	07°47’46’’S	061°13’27’’W
SIPAK	09°45’19’’S	059°23’09’’W
DADEL	12°31’58’’S	056°13’46’’W
MANSI	15°09’27’’S	053°28’39’’W
EGONI	18°00’03’’S	050°01’46’’W
URB (NDB)	19°45’55’’S	047°57’33’’W

3. Realign, as described, the following routes: **UA317; UA321; UL201; UL216; UL304; UL550; UL795; UM417, UM530, UM548; UM782.**
(Cf – Doc. 8733, Volume I, Basic, Part V – Appendix A - Table ATS-1)

UA317		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
TAPACHULA	14°47’30’’N	092°22’30’’W
SAN JOSE	13°56’06’’N	090°51’06’’W
EL SALVADOR	13°26’30’’N	089°02’54’’W
MANAGUA	12°08’24’’N	086°10’30’’W
LIMON	09°57’48’’N	083°01’36’’W
BUFEO	09°49’00’’N	082°34’12’’W
TABOGA	08°47’18’’N	079°33’42’’W
~~DAKMO~~	~~07°27’42’’N~~	~~077°48’36’’W~~
~~MARIQUITA~~	~~05°12’24’’N~~	~~074°25’30’’W~~
~~BOGOTA~~	~~04°50’48’’N~~	~~074°19’24’’W~~
~~MITU~~	~~01°14’30’’N~~	~~070°14’12’’W~~
~~TEFE~~	~~03°23’18’’S~~	~~064°43’42’’W~~
~~REMIL~~	~~————————~~	~~————————~~
~~XINGU~~	~~11°27’36’’S~~	~~054°01’45’’W~~
~~BRASILIA~~	~~15°52’18’’S~~	~~048°01’18’’W~~
~~PIRAI~~	~~————————~~	~~————————~~

UA321		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
ASUNCIÓN VOR	25°14’39’’S	057°31’19’’W
UKELA	24°37’18’’S	058°08’30’’W
KIMAL	21°04’46’’S	060°42’28’’W
MOMDI	19°37’40’’S	061°42’55’’W
~~GERNI~~	~~19°55’06’’S~~	~~061°51’00’’W~~
VIRU VIRU VOR	17°37’34’’S	063°08’52’’W
TRINIDAD VOR	14°47’57’’S	064°56’17’’W
VILUX	10°28’32’’S	067°32’22’’W
RIO BRANCO VOR	09°52’19’’S	067°53’43’’W
LIMPO	04°53’06’’S	072°22’00’’W
PUERTO LEGUIZAMO VOR	00°10’42’’S	074°46’30’’W
CALI VOR	03°24’06’’N	076°24’24’’W
BUSMO	06°42’48’’N	078°19’48’’W
TABOGA VOR	08°47’18’’N	079°33’42’’W
SAN ANDRES VOR	12°35’00’’N	081°42’18’’W
PELRA	14°15’00’’N	082°27’00’’W
~~IS. DEL~~ CISNE	17°24’00’’N	083°57’00’’W
DANUL	20°11’12’’N	085°18’54’’W
~~REMIL~~	----------	----------
~~IVONE~~	----------	----------
~~(HARVEY)~~	----------	----------

UL201		
PUNTO SIGNIFICATIVO SIGNIFICANT POINT	*LATITUD LATITUDE*	*LONGITUD LONGITUDE*
CPN VOR	23°00’31’’S	047°07’44’W
~~PIRACUNUNGA~~	~~21°59’42’’S~~	~~047°20’40’’W~~
RCL NDB	22°25’48’’S	047°33’44’’W
ASTOB	20°40’48’’S	048°49’23’’W
MABMA	16°42’33’’S	053°06’03’’W
EQUAL	13°45’24’’S	056°06’34’’W
ARPAR	10°30’54’’S	059°17’10’’W
OBEBA	06°56’28’’S	062°42’49’’W
~~EGLER~~	~~05°18’19’’S~~	~~064°15’19’’W~~
BUMBA	03°33’04’’S	065°46’11’’W
CLOTI	02°07’25’’S	067°10’05’’W
ABIDE	00°40’42’’N	069°41’16’’W
MITU	01°14’30’’N	070°14’12’’W

UL 216		
PUNTO SIGNIFICATIVO SIGNIFICANT POINT	*LATITUD LATITUDE*	*LONGITUD LONGITUDE*
POR VOR	29°59’45’’S	051°09’54’’W
GEBUN	26°34’40’’S	053°46’46’’W
FOZ	25°35’00’’S	054°30’12’’W
ARVOP	22°16’00’’S	056°37’00’’W
SIDAK	19°38’24’’S	058°12’30’’W
UGUPA	15°37’34’’S	060°23’30’’W
~~GELTU~~	~~16° 42’ 27’’S~~	~~059° 48’ 13’’W~~
ARMUK	13°28’54’’S	061°33’30’’W
UBSIM	12°56’30’’S	061°50’36’’W
PORTOVELHO	08°42’48’’S	063°54’12’’W
MEDLE	04°49’00’’S	065°18’30’’W
SAO GABRIEL	00°09’00’’S	066°59’06’’W
ZORRO	01°51’47’’N	067°12’07’’W
PUERTO AYACUCHO	05°36’58’’N	067°36’37’’W
ALTOS	10°23’35’’N	067°02’31’’W

UL 304		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
EGONI	18°00’03’’S	050°01’46’’W
MOSNA	15°04’39’’S	051°34’24’’W
MALMI	12°11’01’’S	053°03’03’’W
TAROP	09°01’55’’S	054°37’57’’W
ESMAR	05°44’52’’S	056°52’03’’W
MAVBA	03°05’43’’S	058°21’44’’W
NILBU	00°38’42’’S	060°27’24’’W
POVLA	04°10’37’’S	062°26’12’’W
~~BONSUCESSO~~	~~23°24’23’’S~~	~~046°36’05’’W~~
~~POCOS DE CALDAS~~	~~21°50’09’’S~~	~~046°33’65’’W~~
~~CORVO~~	~~18°54’21’’S~~	~~048°04’50’’W~~
~~GOIANIA VOR~~	~~16°37’57’’S~~	~~049°12’55’’W~~
~~TERES~~	~~12°28’32’’S~~	~~051°22’05’’W~~
~~DADOT~~	~~09°51’59’’S~~	~~052°48’55’’W~~
~~DARLO~~	~~05°12’31’’S~~	~~055°22’07’’W~~
~~PUERA~~	~~01°01’17”S~~	~~058°08’09’’W~~
~~BOA VISTA VOR~~	~~02°51’08’’N~~	~~060°41’12’’W~~
~~ISANI~~	~~04°14’59’’N~~	~~061°35’32’’W~~
~~CANAIMA~~	~~06°15’00’’N~~	~~062°51’27’’W~~
TEPER	09°00’57’’N	065°09’53’’W
CABO CODERA	10°34’25’’N	066°03’00’’W
ILKIT	12°52’40’’N	067°39’43’’W
IRGUT	16°00’00’N	069°54’53’’W
~~VISDA~~	----------	----------
JOSES	20°08’42’’N	073°13’05’’W
GREAT INAGUA	20°57’35’’N	073°40’42’’W

UL 550		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
LIMA	12°00’31’’S	077°07’22’’W
~~ILMAR~~	----------	----------
~~GELIS~~	----------	----------
PISCO VOR	13°44’20’’S	076°12’47’’W
EVLEP	16°33'55"S	073°56'51"W
ALDAX	18°21'00"S	072°28'20"W
CALAMA	22°30’01’’S	068°52’37’’W
KONRI	24°07’00’’S	067°32’00’’W
TUCUMAN VOR	26°50’45’’S	065°06’30’’W
ROKER	31°53’11’’S	061°33’37’’W
ROSARIO	32°54’18’’S	060°46’53’’W

UL 795		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
~~CAMPINAS VOR~~	~~23°00’31’’S~~	~~047°07’44’W~~
CXI VOR	22°49’01’’S	043°15’36’’W
~~PIRACUNUNGA~~	~~21° 59’ 04’’S~~	~~047° 20’ 39’’W~~
OGMUK	21°34’23’’S	044°04’25’’W
IVSOB	21°16’21’’S	044°37’32’’W
RAXUS	20°22’10’’S	046°37’55’’W
URB NDB	19°45’55’’S	047°57’33’’W
EGONI	18°00’03’’S	050°01’46’’W
NEFAR	17°23’53’’S	050°45’31’’W
~~GARCAS~~	~~15°51’12’’S~~	~~052°23’42’’W~~
ISOPA	14°54’13’’S	052°19’00’’W
~~OBLIR~~	~~14° 08' 42" S~~	~~068° 51' 18" W~~
SIGAX	12°57’36’’S	053°30’04’’W
~~RONIL~~	~~12°10’42’’S~~	~~054°41’54’’W~~
TELOS	09°15’30’’S	056°23’03’’W
~~ALTA FLORESTA (ATF) VOR/DME~~	~~09°52’06’’S~~	~~056°06’18’’W~~
MOLKO	08°13’08’’S	057°05’18’’W
~~UGEMU~~	~~06°35’24’’S~~	~~058°18’24’’W~~
MASMA	04°35’03’’S	059°25’51’’W

KOKPA	03°42’21’’S	059°59’31’’W
~~MUGAS~~	----------	----------
EGBAX	00°37’59’’S	061°58’10’’W
VUMPI	01°59’24’’N	063°56’54’’W
LOGON	06°33’24’’N	066°58’18’’W
~~EKUNA~~	~~07°19’06’’N~~	~~067°28’48’’W~~
ESIPO	12°29’54’’N	071°00’54’’W
DIBOK	16°21’42’’N	073°38’30’’W
GELOG	18°33’42’’N	075°10’42’’W
URSUS	24°00’00’’N	079°04’12’’W

UM 417		
PUNTO SIGNIFICATIVO SIGNIFICANT POINT	*LATITUD LATITUDE*	*LONGITUD LONGITUDE*
MAIQUETIA VOR	10°36’34.1’’N	066°59’22.8’’W
TUY VOR	10°17’42.1’’N	066°47’50.3’’W
VAGAN	03°49’09’’N	063°05’02’’W
~~BUVNI~~	~~00°49’42’’S~~	~~060°22’37’’W~~
~~DADEG~~	~~02°09’13’’S~~	~~059°14’95’’W~~
~~DAGDU~~	~~06°34’34’’S~~	~~055°58’59’’W~~
~~TAROP~~	~~09°01’5.5’’S~~	~~054° 37’5.7’’W~~
~~DAKIS~~	~~11°44’38’’S~~	~~053°11’08’’W~~
ARVOT	02°12’40’’S	062°22’48’’W
ILSUB	02°01’48’’S	060°09’54’’W
JAC VOR	06°14’08’’S	057°46’13’’W
UBVIL	11°45’02’’S	055°12’57’’W
POPTI	13°59’38’’S	053°34’16’’W
BAG VOR	15°51’12’’S	052°23’44’’W
ATONI	18°28’32’’S	050°29’09’’W
ASTOB	20°40’48’’S	048°49’23’'W
~~DIMUB~~	~~13°40’0.4’’S~~	~~052° 17’0.2’’ W~~
~~PASTE~~	~~20° 19’2.6’’S~~	~~048°45’4.4’’W~~
~~PIRACUNUNGA~~	~~21° 59’ 04’’S~~	~~047° 20’ 39’’W~~
CAMPINAS VOR	23°00’31’’S	047°07’44’W

UM 530		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
AKNOG	02°47’54’’S	079°46’54’’W
EVLIM	03°50’46’’S	078°19’31’’W
VUKOK	05°20’36’’S	076°13’57’’W
EGLAD	06°17’13’’S	074°31’39’’W
KUDKU	06°46’46’’S	073°37’53’’W
DOKVA	08°33’58’’S	070°20’55’W
ESGAD	09°32’33’S	068°31’14’’W
RIO BRANCO VOR	09°52’19’’S	067°53’43’’W
DADED	10°09’00’’S	066°53’35’’W
BUVKI	10°34’35’’S	065°24’46’’W
EQUAL	13°45’24’’S	056°06’35’’W
ILSOT	14°11’27’’S	054°45’34’’W
SAMAR	14°42’47’’S	053°07’10’’W
MOSNA	15°04’40’’S	051°34’25’’W
OPLIK	15°28’38’’S	049°49’22’’W
BRASILIA VOR	15°52’19’’S	048°01’19’’W

UM 548		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
LIM VOR	12°00’31’’W	077°07’22’’W
ASIA VOR	12°45’38’’S	076°36’23’’W
LAKUN	14°39’19’’S	073°59’36’’W
EQU VOR	16°20’20’’S	071°35’51’’W
ORALO	17°17’46’’S	069°37’30’’W
ARUBO	20°01’59’’S	065°46’16’’W
MARIA	22°00’00’’S	063°00’00’’W
PILCO	22°24’16’’S	062°25’05’’W
PAKIS	23°50’16’’S	060°00’26’’W
~~ASUNCION~~ VAS VOR	25°14’39’’S	057°31’19’’W
FOZ VOR	25°35’00’S	054°30’12’’W
~~ILBEK~~	~~25°40’36’’S~~	~~051°27’30’’W~~
CURITIBA VOR	25°31’55’’S	049°10’03’’W
KAMIL	25°35’14’’S	053°45’58’’W
PARANAGUA NDB	25°32’04’’S	048°31’51’’W
RONUT	25°12’34’’S	047°15’03’’W
ANISE	24°36’07’’S	046°37’31’’W

UM 782		
PUNTO SIGNIFICATIVO *SIGNIFICANT POINT*	*LATITUD* *LATITUDE*	*LONGITUD* *LONGITUDE*
SCB VOR	23°30'25''S	047°22'41''W
PARSE	22°47'15''S	048°14'14''W
~~BAURU~~	~~22°18'50''S~~	~~049°06'26''W~~
~~ANPOS~~	~~----------~~	~~----------~~
~~VUDER~~	~~----------~~	~~----------~~
MUGOT	20°52'25''S	050°42'18''W
TOMBO	17°25'26''S	054°05'06''W
EVNAK	13°35'55''S	057°37'43''W
ISOKI	09°53'32''S	060°54'44''W
PARDO	11°55'40''S	059°07'26''W
SIMON	09°10'18''S	061°32'15''W
GLINT	06°27'25''S	063°58'12''W
ROUSE	03°37'51''S	066°16'55''W
MULIP	02°29'53''S	067°12'10''W
ABIDE	00°40'42''N	069°41'16''W
MITU	01°14'30''N	070°14'12''W
LONAX	03°56'01''N	073°56'53''W
BARRANCABERMEJA	07°01'42''N	073°48'18''W
XOGEN	07°47'38''N	074°30'01'W
AGUJA	10°57'31''N	077°25'00''W
ARNAL	15°00'00''N	080°36'54''W
DELVI	16°27'06''N	082°11'24''W
OMIRO	18°31'30''N	084°29'42''W
TAKUX	20°01'36''N	085°53'48''W
CANCUN	21°01'30''N	086°51'30''W
OTELO	22°41'06''N	088°29'36''W
KEHLI	24°29'12''N	089°50'24''W

c) **Originated by**: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Panama, Paraguay, Peru, Venezuela and IATA.

f) **Reasons of the originator for the amendment**:

As a result of the Fourth and Fifth Workshops/Meetings of SAM ATS Routes Network Optimization (SAM ATSRO/4 and SAM ATSRO/5) and in view of the further revision made by SAM/IG/11 Meeting, States originating this proposal for amendment, in coordination with users, represented by IATA, have agreed that these RNAV5 routes be included within the SAM ATS

routes structure optimisation programme, and therefore, are ready for its implementation, and realignment, as appropriate.

All of them will be part of the CAR/SAM ANP routes network, Volume I, Basic. The implementation of the new routes and changes made to the aforementioned trajectories shall enable a reduction in distance and time flight with the consequent fuel savings, operational costs and environmental protection.

g) **Proposed date of implementation**:

At least two AIRAC cycles, after the proposal for amendment has been approved by ICAO Council, en accordance with specific implementation programme which, to this end establish particularly and in coordination by States/Territories/International Organizations.

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

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

International Organizations:
CARSAMMA*
COCESNA*
IATA*

***** for information

g) **Secretariat comments**:

1) ATS Routes Network restructuring contained in the Basic CAR/SAM Air Navigation Plan is framed within the ATM evolution process in the CAR and SAM Regions, as approved through CAR/SAM/3 RAN Recommendations 5/14, 5/15 and 5/16.

2) The trajectories have been configured keeping in mind PBN implementation in the SAM Region, fuel saving, economy of air operations and environmental protection, which shall enable a wider use of such routes benefitting a greater number of the concerned airspace.

3) The implementation, and re-alignment of ATS routes presented in this proposal of amendment shall optimise the CAR/SAM ATS routes network structuring and will keep SAM Region prepared to continue with the airspace structure optimisation programme, and the introduction of additional improvements, in order to respond to current and future users requirements.

-END-