



AP/ATM/5
WP/20
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**International Civil Aviation Organization
UNDP/ICAO Regional Project RLA/98/003
Transition to the CNS/ATM Systems in the CAR and SAM Regions**

**Fifth Meeting/workshop of Air Traffic Management (ATM) Authorities and
Planners for RVSM, RNAV routes and RNP implementation in the CAR and SAM Regions
(AP/ATM/5 RVSM-RNAV-RNP)**

(Panama, Panama, 18 to 20 June 2003)

Agenda Item 1: Review of the RNAV routes Implementation Programme

National Programme of RNAV Routes Implementation in Brazil

(Presented by Brazil)

Summary

This working paper presents the actions submitted by Brazil for implementation of a group of routes and its National Programme of RNAV Implementation, connecting the main capitals and cities of Brazil and others used for flights that cross the Brazilian airspace towards the airports in Europe and the United States and other States in CAR/SAM Region.

References:

- UNPD/ICAO RLA/98/003 Regional Project
Transition to the CNS/ATM Systems in the CAR and SAM Regions
- Report of the AP/ATM3 Third Meeting (Lima, Peru, May 20 to 24, 2002).
- Report of the AP/ATM4 Fourth Meeting (Sta. Cruz, Bolivia January 27 to 31, 2003)
- Report of the Tenth and Eleventh GREPECAS Meeting
- Doc. 9574, RVSM Manual
- Doc. 9613, RNP Manual
- Doc. 9689, Manual on Separation Minima

1. Introduction

1.1 The Regional Project of UNPD/ICAO RLA/98/003 (Transition to the CNS/ATM Systems in the CAR and SAM Regions), points out the different needs of the RNAV routes implementation in the

CAR/SAM Regions so as to connect a couple of cities whose flights flow is significant on the point of justifying those routes. From among those routes, some of them that use the Brazilian airspace have been included, so connecting domestic airports to airports in CAR/SAM Region, North America and Europe.

1.2 The Third Working Meeting (AP/ATM/3) has established the continuity of rehearsal and tests pre-operational of the group of RNAV routes proposed in GREPECAS 10. The works carried out for approval of the routes proposed for rehearsals had success and some of those routes have been implemented definitively commencing from March 2003.

1.3 The Brazilian airspace supports most of the crossing international flights in the Region, therefore it receives the major impact in terms of air traffic control and its co-ordination. Thus it is necessary that an RNAV implementation programme be commenced, so contemplating shorter path routes and with the integration of RNAV routes network and the Brazilian national ATS and neighboring states.

1.4 In that sense, in accordance with the established by GREPECAS 11 (conclusion 11/12), the Brazilian Aeronautical Administration has commenced studies to implement a group of RNAV routes to connect the main capitals of the States in SAM Region and the main capitals of the Brazilian states and also for flights to use the Brazilian airspace towards airports in Europe and United States of America, based on the needs defined in Regional Project of UNPD/ICAO RLA/98/003 (Transition to the CNS/ATM Systems in the CAR and SAM Regions) and subsequent analysis of the air traffic evolution.

2. Analysis

2.1 From the viewpoint of the air traffic control and management, the new air traffic flow of Brazil involving Brasilia, Curitiba, Recife, Manaus, Porto Velho and Atlantico FIRs as well as SID and STAR of the main terminal control areas guarantee the transition between flights on route and TMAs and connect appropriately the airports to national and international airways through specific sectors of arrival and departure in TMAs.

2.2 This air traffic flow model is mainly based on the use of the national routes network and is supported by upper and lower ATS routes. The current international RNAV routes are even in reduced number.

2.3 A studies programme for the Brazilian RNAV routes implementation (GREPECAS 11 conclusion 11/12) aims at a harmonization between the domestic network and international RNAV routes, besides contemplating the realignment of the current airways and the transformation of some of these airways in RNAV airways to allow the common use and optimized by the national and international air traffic and still to allow the users to have the possibility to plan their flights so reducing the flight time, even during the departure and arrival phases at Brazilian airports. It also gets the scenario ready for the RVSM implementation scheduled for January of the year 2005.

2.4 For the reasons shown, in advance to the presentation of the entire Brazilian RNAV programme, it is presented in this working paper a list of the main RNAV routes in compliance with conclusions AP/ATM/4/1, 4/2, 4/3/ 4/4, 4/5 and 4/6 of the fourth meeting of ATM authorities and

planners, Sta. Cruz de La Sierra, besides others that will be included in the Brazilian RNAV programme, described in the attached “A” of this working paper.

3. **Conclusion**

3.1 The implementation programme of the Brazilian RNAV routes aims at integrating the national and international air traffic flow keeping in mind the main flights flow that uses the Brazilian airspace towards Europe, the United States and all the CAR/SAM Region.

3.2 Considering the great extension and location of the Brazilian airspace in CAR/SAM scenario, the participation of all States involved is necessary for analysis and proposition of suitable adjusts in order that the RNAV routes network can really assist the users of that region, so integrating and optimizing the airspace use.

4. **Suggested action**

4.1 The meeting is invited:

- a) to stimulate the involved States to analyze each of the proposed routes so that they can be implemented in definitive nature and in accordance with the air traffic flow of each State and integrated in the Region; and,
- b) that being concluded the preliminary analysis on the impacts in each airspace, a joint-work programme to be defined with the involved states with the propose of implementing the established routes.

ATTACHMENT A

AP/ATM/5-WP/20

RNAV ROUTES PROGRAMME OF BRAZIL - LIST OF ROUTES

REFERENCE: PROJECT RLA/98/003 AND GREPECAS 11						
LIST OF RNAV ROUTES FOR IMPLEMENTATION						
RUTA	DESIGNA- DOR DE LA RUTA	CIUDADES		PUNTOS DE LIGACIÓN	OBSERVACIONES	
		ORIGEN	DESTINO			
a	01	UL 660	ASUNCIÓN	CAMPO GRANDE	VAS VOR (ASUNCIÓN)/CGR VOR (CAMPO GRANDE)	DOBLE SENTIDO DESIGNATIVO INFORMADO POR OACI
b	02	UL 301	ASUNCIÓN	SÃO PAULO	VAS VOR/CTB VOR (CURITIBA)	SENTIDO ÚNICO. ES LA UL 301 DESPLAZADA DE SU TRAMO CPN/VAS
c	03	UL XXX	SÃO PAULO	ASUNCIÓN	CGO VOR (CONGONHAS)/VAS VOR	SENTIDO ÚNICO VAS/ CTB. APÓS CURITIBA SIGUE POR LA UW47.
d	04	UL XXX	CAMPO GRANDE	STA CRUZ DE LA SIERRA	CGR VOR/VIR VOR (VIRU-VIRU)	DOBLE SENTIDO
e	05	UL XXX	SANTIAGO	SÃO PAULO	JUA VOR (SAN JUAN)/ERE VOR (CERES)/ IREKA/RTA VOR (RECONQUISTA)/PNG NDB (PARANAGUA)/SAT NDB (SANTOS)	SENTIDO ÚNICO
f	06	UL 310	SÃO PAULO	SANTIAGO	CGO VOR/POS VOR (POSADAS)/JUA VOR	SENTIDO ÚNICO. ES LA UL 310 DESPLAZADA DE SU TRAMO SCB/POS
g	07	UL XXX	SANTIAGO	SÃO PAULO	ESITO/PNG NDB/SAT NDB	SENTIDO ÚNICO HAY CRUZE COM ESPACIO AÉREO RESTRINGIDO
h	08	UL 310	SÃO PAULO	SANTIAGO	CGO VOR/CBA VOR (CORDOBA)/ALDEX/ KALEN/SOLER/SALBO/NIRTA/DOZ VOR (MENDOZA)	SENTIDO ÚNICO. ES LA UL 310 DESPLAZADA DE SU TRAMO SCB/POS HAY CRUZE COM ESPACIO AÉREO RESTRINGIDO
i	09	UL XXX	SANTIAGO	MADRID	JUA VOR/SLI VOR (SÃO LUIZ)	DOBLE SENTIDO.
j	10	UL XXX	SANTIAGO	MADRID	JUA VOR/GOI VOR (GOIÂNIA)/FLZ VOR	DOBLE SENTIDO.

Obs.: La implantación de las rutas "g" y "h" son alternativas de las rutas "e" y "f", caso estas no puedan ser activadas en razón de los espacios aéreos restringidos.

CONTINUATION OF THE LIST OF RNAV ROUTES OF RNAV ROUTES PROGRAMME OF BRAZIL

WP/20-A2

k	11	UN 741	EUROPA	BUENOS AIRES	FLZ VOR(FORTALEZA)/TRM VOR(TRÊS MARIAS)/PSN VOR(PIRAÇUNUNGA)/DUR VOR(DURAZNO)	SENTIDO ÚNICO. ES LA CONTINUACIÓN DESDE FLZ VOR. HAY CRUZE CON EAC
l	12	UN 857	BUENOS AIRES	EUROPA	PTA VOR(LA PLATA)/MLO VOR(MELO)/POR VOR(PORTO ALEGRE)/MRC VOR(MARICÁ)/NOR VOR(NORONHA)	SENTIDO ÚNICO: PTA/MLO /POT: DOBLE SENTIDO: POR/MRC; SENTIDO ÚNICO: MRC/NOR es desplazamiento y extensión de UN 857
m	13	UL XXX	EUROPA	BUENOS AIRES	FLZ VOR/EDOLA/BRU NDB(BAURU)KADUS/EZE VOR(EZEIZA)	DOBLE SENTIDO HAY CRUZE COM ESPACIO AÉREO RESTRINGIDO
n	14	UL XXX	BUENOS AIRES	SÃO PAULO	PTA VOR/CXS VOR(CAXIAS DO SUL)/SAT NDB	SENTIDO ÚNICO
o	15	UL XXX	SÃO PAULO	BUENOS AIRES	CGO VOR/PNG NDB/DUR VOR	SENTIDO ÚNICO
p	16	UL XXX	SÃO PAULO	MOTEVIDEO	CGO VOR/PNG VOR/PT XXXXX/MLO VOR	SENTIDO ÚNICO; EL PUNTO XXXXX ES LA INTERCECCIÓN CON LA RUTA UA 310 DESPLAZADA.)CGO/DUR)
q	17	UL XXX	MOTEVIDEO	SÃO PAULO	CRR VOR(CARRASCO)/POR VOR/SAT NDB	SENTIDO ÚNICO
r	18	UL XXX	SÃO PAULO	LIMA	SCB VOR(SOROCABA)/CBA VOR(COCHABAMBA/LPZ VOR(LA PAZ)/ASI VOR(ASIA)	SCB/CBA: SENTIDO ÚNICO CBA/ASI: DOBLE SENTIDO
s	19	UL XXX	SÃO PAULO	LIMA	SCB VOR/PRR VOR(PRESIDENTE PRUDENTE)/TIRKU/LIM VOR(LIMA)	SCB/TIRKU: SENTIDO ÚNICO TIRKU/LIM: DOBLE SENTIDO
t	20	UL XXX	LIMA	SÃO PAULO	CBA VOR/CGR VOR/AAQ NDB(ARARAQUARA)/PSN VOR	SENTIDO ÚNICO
u	21	UN 873	EUROPA	RIO DE JANEIRO	NTL VOR(NATAL)/BBC NDB(BARBACENA)	SENTIDO ÚNICO. ES EL DESPLAZAMIENTO DE LA RNAV UN 873 DE EUROPA.
v	22	UN 866	SÃO PAULO	EUROPA	BCO VOR(BONSUCESSO)/MSS VOR(MOSSORÓ)	SENTIDO ÚNICO. ES EL DESPLAZAMIENTO DE LA RNAV UN 866 DE EUROPA.
x	23	UL XXX	BUENOS AIRES	NEW YORK	SIS VOR(RESISTENCIA)/MAN VOR(MANAUS)	DOBLE SENTIDO. ES UNA ALTERNATIVA DE LA RNAV UL 793 y UA 300
Obs.: Las rutas "k"(UN 741), tramo PSN VOR/DUR VOR, y "m"(UL XXX), tramo FLZ VOR/EZE VOR, solamente serán implantadas después de las coordinaciones a cerca de los espacios aéreos restringidos						