



RVSM/TF/3
WP/08
07/08/02

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ATM COMMITTEE OF THE GREPECAS ATM/CNS/ SUBGROUP**

**THIRD MEETING OF THE RVSM TASK FORCE
(Lima, Perú, 8 to 9 August 2002)**

Agenda Item 2: ATC Operations (ATC/WG)

(Presented by Brazil)

SUMMARY

The aim of this working paper is to provide information about the Brazilian fleet preparation for RVSM operations in CAR/SAM Regions, in order to help in the development of the CAR/SAM RVSM Operational Concept.

References:

- AP/ATM/3 Meeting Report
- RVSM/TF2 Report

1. Introduction

1.1 One of the main issues that must be taken into consideration during the RVSM planning phase is the necessity to conduct a conclusive cost benefit analysis, taken into account, among others, the fleet preparation and flight level occupancy.

1.2 In accordance with conclusion AP/ATM/3/16 of the Third Meeting/workshop of the Air Traffic Management Authorities and Planners and conclusion 2/4 of the RVSM/TF2 meeting, Brazil has continued the cost benefit analysis, initiated in June 2002, with the objectives of achieving the impact caused by RVSM implementation for Brazilian Airspace users and to help in the development of the CAR/SAM RVSM Operational Concept.

2. Flight Type distribution on Brasilia/Curitiba/Recife FIR's

2.1 After RVSM TF2 meeting, Brazil has performed a more complete survey about flight type in Brazilian Airspace This survey included Brasilia, Curitiba and Recife FIR that represent about 90% of flights in the Brazilian Airspace.

2.2 The main users of the Brasilia/Curitiba/Recife FIR's upper airspace are Domestic Airlines, responsible for 88.73% of total flights (see table1).

2.3 Following the domestic airlines, we have International Airlines responsible for 9.17 % of total flights.

2.4 Other users of Brasilia/Curitiba/Recife FIR's upper airspace are Domestic General Aviation, International General Aviation and Military flights, that represents 2.1% of total flights.

2.5 Taking into consideration that flights of Domestic Airlines use Repetitive Flight Plan and that most of the international flights go to or come from Europe or United States (must be RVSM approved independent of CAR/SAM RVSM program), a survey that takes into account just Repetitive Flight Plans is very representative of the flight level occupancy and aircraft type in the Brazilian Airspace.

FIR SBBS/SBCW/SBRE - UPPER AIRSPACE		
FLIGHT TYPE	Number of operations	%
DOMESTIC AIRLINE	51578	88.73
INTERNATIONAL AIRLINE	5329	9.17
NATIONAL GENERAL AVIATION	586	1.01
INTERNATIONAL GENERAL AVIATION	281	0.48
MILITARY FLIGHTS	354	0.61
TOTAL	58128	100.00

Table 1 – Flight Type Distribution in Upper Airspace of SBBS/SBCW/SBRE

3. Aircraft Type per Flight Operation in the Brazilian Upper Airspace, based on Repetitive Flight Plans.

3.1 The distribution of aircraft type in the Brazilian Upper Airspace indicates that 30,83% of flights are made by category 3 aircraft (B707, B732 and F100), in accordance with CAR/SAM RVSM Minimum Monitoring Requirements, approved during the RVSM/TF2 meeting (see table 2). This fact indicates that a significant part of the flight operations in the Brazilian Airspace will need to comply with the more stringent monitoring requirements foreseen for category 3 aircraft. Some more information regarding the decision of airlines about equipping these aircraft must be taken in the near future. Meetings between Brazilian operators and Department of Airspace Control still continue, in order to achieve the fleet renovation plan of each airline that can lead to a better scenario.

AIRLINE	ACFT TYPE	Number of operations	Percentage
BSI	B703	75	0.40
FLB	B722	70	0.38
GLO	B737	1564	8.40
NES	B735	1022	5.49
	E145	417	2.24
SKC	B707	10	0.05
RSL	B733	80	0.43
	B735	1391	7.47
	E145	1194	6.41
TAM	F100	3835	20.59
	A320	2145	11.52
	A319	523	2.81
VBR	B722	66	0.35
VRG	B733	3021	16.22
	MD11	251	1.35
	B734	336	1.80
	B762	74	0.40
	B772	14	0.07
	B763	82	0.44
	B738	168	0.90
VSP	B733	333	1.79
	A30B	28	0.15
	B722	98	0.53
	B732	1828	9.81
TOTAL	0	18625	100.00

Table 2 – Aircraft Type Distribution in Upper Airspace of SBBS/SBCW/SBRE

4. Flight Level distribution in the Brazilian Airspace based on Repetitive Flight Plan

4.1 The Flight Level distribution in the Brazilian Upper Airspace, based on Repetitive Flight Plan is shown on table 3. This flight level distribution indicates that the use of FL 290, 310 and 330 is 52.09% of the total flights. The use of flight levels 350, 370 and 390 is about 24.9 % of the total flights.

The distribution provided on the table 3 indicates the following consequences:

- a) the implementation of RVSM between FL 350 and 390 will include 24.9% of the flight operations in the RVSM stratum;
- b) the implementation of RVSM between FL 290 and 410 will include 76.99% of the flight operations in the RVSM stratum;

- c) The implementation of RVSM as an exclusive airspace from FL 350 to FL 390 will probably increase the occupancy of FL 310 and FL 330 with non-RVSM approved aircraft. These Flight Levels (310 and 330) are already significantly occupied.
- d) The implementation of RVSM as an exclusive airspace from FL 290 to FL 410 will probably increase the occupancy of FL 270 and FL 280 with non-RVSM approved aircraft. So far, these flight levels are not significantly occupied.

BRAZILIAN UPPER AIRSPACE		
REPETITIVE FLIGHT PLAN		
FLIGHT LEVEL	NUMBER OF OPERATIONS	PERCENTAGE
250	266	1.43
260	1145	6.15
270	1313	7.05
280	1481	7.95
290	1876	10.07
310	3706	19.90
330	4120	22.12
350	2857	15.34
370	1114	5.98
390	667	3.58
410	80	0.43
TOTAL	18625	100.00

Table 3 – Flight Level Distribution in the Brazilian Upper Airspace

5. Action proposed

The meeting is invited to:

- a) Take note of the information provided in this working paper.
- b) Discuss the impact caused by a significant number of category 3 aircraft flight operations in the CAR/SAM RVSM monitoring program; and
- c) Discuss the feasibility and requirements for RVSM tactical application in some areas of CAR/SAM Regions, to be applied in the case of a significant part of airlines, that uses some aircraft type (B732, B707, F100...etc) decide not change and not equip the actual fleet.