

**International Civil Aviation Organization  
PNUD/ICAO RLA/98/003 Regional Project  
Transition to the CNS/ATM Systems in the CAR/SAM Region**

**Third Meeting/Workshop of Air Traffic Management (ATM) Authorities and Planners.**  
(Lima, Perú, 20 to 24 May 2002)

**Agenda Item 4: Analysis of the Action Plan for RVSM Implementation in the CAR/SAM Regions, for its approval.** – Analysis of the flights in the CAR/SAM Region

(Presented by IATA)

**SUMMARY**

The purpose of this working paper is to analyze the international and domestic flights in the CAR/SAM Region in order to establish an action plan for the implementation of RVSM in the CAR/SAM Region by the last quarter of 2004.

## **1. Introduction**

The GREPECAS 10 meeting held in Las Palmas, Spain last October determined under conclusion 10/11 the implementation of RVSM in the CAR/SAM Region by the year 2004. The conclusion established that the implementation would take place in two phases; the first phase starting 01 April 2004, will cover FL350 to FL390. The second phase, at a date to be determined in accordance with the operational needs, will cover FL290 to FL350 and FL390 to FL410.

The information provided in this working paper forecast RVSM readiness of the States by the year 2004. This forecast will give direction so that the group may establish a date for the second phase, or to consider if necessary, the implementation of RVSM in one single phase, instead of two.

## **2. Explanation of the information presented**

The information is presented in three attachments. Attachment A shows the current number of RVSM and non-RVSM flights per week during the year 2002. Attachment B tells us how and why those non-RVSM flights will evolve into RVSM flights during the next two years. And finally, Attachment C presents the forecast of RVSM and non-RVSM flights per week for the last quarter of the year 2004. Classification of the future flights was made, based in part, on the information provided in a previous working paper regarding the fleet status.

The flights noted are the flights with origin and/or destination to the State, and those overlying the State territory or FIR. International and domestic flights have been taken into account. Flights of less than 50 minutes and/or 250 nautical miles have not been inventoried since they do not reach FL290, or reached it for a very brief period of time. In the same manner, those flights between Bahamas and United States of America have not been computed since they will be operated within an RVSM environment irrespective of the decision of the CAR/SAM Region.

The information has been collected from the Official Airlines Guide and includes passenger and cargo flights. In order to have a factual timetable as to when the airlines will modernize their fleets, all major IATA and non-IATA airlines based in the Region have been contacted directly and have been asked to specify this time-frame. The flights have been categorized as international and domestic, and entered in numeric form noting as well the percentage of RVSM flight per State or FIR.

States under a common FIR have been presented under the name of the FIR. States with several FIRs have been presented under the name of the State. The result is presented for every State, FIR, sub-region, and the CAR/SAM Region as a whole.

In order to forecast the quantity of RVSM flights in the year 2004, the flights proceeding from other regions with non-RVSM aircraft, have been noted in 2004 as RVSM flights. In the same manner, non-RVSM flights to other regions with non-RVSM aircraft based in the CAR/SAM region, are speculated to be RVSM flights in the future.

### **3. Results of the analysis.**

The term “Percentage of RVSM Readiness”, used in this working paper, is the estimated percentage of international and domestic flights that are or that will be operated with RVSM aircraft in a State or FIR. In summarizing the appendixes of this working paper, the estimated RVSM readiness by the last quarter of 2004 is:

Caribbean sub-region :  
98% percent of the flights will be RVSM

Central America, Mexico and Panama:  
91% percent of the flights will be RVSM.

South America sub-region  
81% percent of the flights will be RVSM.

CAR/SAM Region as a whole  
87.7 percent of the flights will be RVSM.

### **4. Discussion**

The low percentage of non-RVSM flights estimated in the CAR/SAM region by the year 2004 will not be, for the most part, operated by flag carriers. Most of these flights will be operated by domestic airlines operating within a specific State. Generally these flights are of short range less than 250 nautical miles.

IATA members encourage the implementation of RVSM in the CAR/SAM region in one single phase covering all the flight levels and coinciding with the USA's domestic RVSM implementation.

The data used to provide the information presented in this working paper is available to any State or organization that wishes to explore it further and to use it as an aid in the development of the Safety Assessment required by ICAO.

#### **5. Action suggested**

The Group is invited to analyze the information presented and consider this information in the development of an Action Plan for implementation of RVSM in the CAR/SAM Region in a single phase that will cover from FL290 to FL410.

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Appendix A

<b>2002 CAR/SAM JET WEEKLY FLIGHTS OF MORE THAN 50 MINUTES OR 250 NM</b>							
	International Flights		Domestic Flights		Total		Readiness in percentage
COUNTRY/FIR	RVSM ready	Non-RVSM	RVSM ready	Non-RVSM	RVSM ready	Non-RVSM	RVSM ready
<b>Caribbean</b>							
Cuba	2101	406	2	26	2103	432	83%
Curacao FIR	581	334	0	0	581	334	63%
Dominican Rep.	986	349	0	0	986	349	74%
Haiti	629	222	0	0	629	222	74%
Kingston FIR	1313	283	0	0	1313	283	82%
Piarco FIR	913	72	0	0	913	72	93%
San Juan FIR	2073	176	0	0	2073	176	92%
subtotal ----->	8596	1842	2	26	8598	1868	82%
<b>Central America and Mexico</b>							
Cenamex FIR	1435	302	0	0	1435	302	83%
Mexico	3553	483	2146	2198	5699	2681	68%
subtotal ----->	4988	785	2146	2198	7134	2983	71%
<b>South America</b>							
Argentina	779	272	346	1059	1125	1331	46%
Bolivia	224	149	0	107	224	256	47%
Brasil	1388	208	6569	862	7957	1070	88%
Chile	452	144	392	181	844	325	72%
Colombia	1176	379	208	149	1384	528	72%
Ecuador	501	136	0	0	501	136	79%
French Guyana	31	6	0	0	31	6	84%
Guyana	172	27	0	0	172	27	86%
Panama	833	277	0	0	833	277	75%
Paraguay	298	79	0	0	298	79	79%
Peru	561	168	134	260	695	428	62%
Surinam	31	13	0	0	31	13	70%
Uruguay	512	143	0	0	512	143	78%
Venezuela	992	435	0	324	992	759	57%
subtotal ----->	7950	2436	7649	2942	15599	5378	74%
grand total---->	21534	5063	9797	5166	31331	10229	75%

## **Explanation by States/FIR of the evolution of the non-RVSM flights into RVSM flights**

### **Cuba**

International: At the present time, 221 weekly flights operated over Cuba FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 132 flights per week over Cuba FIR with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 14 flights with B737-200 that will be B737NG.

Domestic: There is traffic with Yak-42 that can be operated under FL290 with a low penalty in fuel.

### **Curaçao**

International: At the present time, 48 weekly flights operated over Curaçao FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 160 flights per week over Curaçao FIR with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 67 flights with B737-200 that will be B737NG.

Domestic: No traffic.

### **Dominican Republic**

International: At the present time, 75 weekly flights operated over Dominican Republic FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 163 flights per week over Dominican Republic FIR with destination USA, therefore if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 67 flights with B737-200 that will be B737NG.

Domestic: No traffic.

### **Haiti**

International: At the present time, 68 weekly flights operated over Haiti FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 144 flights per week over Haiti FIR with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 4 flights with B737-200 that will be B737NG.

Domestic: No traffic.

### **Kingston FIR**

International: At the present time, 113 weekly flights operated over Kingston FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 118 flights per week over Kingston FIR with destination USA, therefore, if these flights are to continue to operate into USA they must be made RVSM ready by 2004. COPA is operating 29 flights with B737-200 that will be B737NG.

Domestic: No traffic

### **Piarco FIR**

International: At the present time, 25 weekly flights operated over Piarco FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 16 flights per week over Piarco FIR with destination USA, therefore if these flights are to continue to operate into USA they must be made RVSM ready by 2004.

Domestic: No traffic. The flights of more than 250nm operated within the Piarco FIR have been considered as international flights.

### **San Juan FIR**

International: At the present time, 84 weekly flights operated over San Juan FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region operate 66 flights per week over San Juan FIR with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 24 flights with B737-200 that will be B737NG.

Domestic: No traffic.

Observations: San Juan FIR is under FAA jurisdiction, therefore will be RVSM. Beside of this fact, is reported the RVSM and non RVSM for general knowledge.

### **Cenamer FIR**

International: At the present time, 96 weekly flights operated over Cenamer FIR are USA carriers, therefore they will be RVSM by 2004. COPA is operating 148 flights with B737-200 that will be B737NG.

Domestic: No traffic.

### **Mexico**

International: At the present time, 170 weekly flights operated over Mexico are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region operate 248 flights per week over Mexico's FIRs with destination USA, therefore if these flights are to continue to operate to USA they must be made RVSM ready by 2004. Aeromexico and Mexicana are operating 20 flights with be made with newer generation aircraft.

Domestic: Sixty percent of the non RVSM domestic flights are operated by Aeromexico and Mexicana which will have their fleet renewed by 2004.

Observations: In 2004 the Mexican Civil Aviation Authority is implementing restrictions to aircraft with high noise levels. This will prohibit aircraft from early generations to operate in the Mexican territory.

### **Argentina**

International: At the present time, 10 weekly flights operated over Argentina's FIRs are USA carriers, therefore, they will be RVSM by 2004. LAPA and LanChile are operating 89 flights non-RVSM flights per week; both airlines are in the process of renewing their fleet.

Domestic: LAPA operates 199 flights with B737-200 that will be operated with B737-700 in the near future.

Observations: Aerolineas Argentina/Austral own 39 B737-200, and the future renovation plans for these two airlines remain uncertain. Therefore, it is speculated that the RVSM readiness percentage of Argentina in the year 2004 will be only 58%. Perhaps the geographic location of Argentina will allow

for the possibility that the southern portion of the Argentinean airspace can be utilized as a non-RVSM airspace.

### **Bolivia**

International: No comments

Domestic: No comments

Observations: Lloyd Aereo Boliviano and Aerosur operate B727-200. These aircraft are used for domestic flights and medium range international flights. Lloyd Aereo Boliviano is renewing its B727-200 fleet for B737-300 on a long-range plan.

### **Brazil**

International: At the present time, 5 weekly flights operated over Brazil FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 22 flights per week over Brazil's FIRs with destination USA, therefore if these flights are to continue to operate to USA they must be made RVSM ready by 2004.

Domestic: The domestic traffic in Brazil is the eighty- percent of the total traffic. In general the airlines operating the domestic flight are equipped with a modern aircraft fleet.

### **Chile**

International: At the present time, 10 weekly flights operated over Chile's FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 5 flights per week over Chile's FIRs with destination USA, therefore if these flights are to continue to operate into USA they must be made RVSM ready by 2004. LanChile operates 88 flights with B737-200 that will be operated by A320.

Domestic: LanChile operates 98 percent of the domestic flights. LanChile is replacing its B737-200 fleet for A320.

### **Colombia**

International: At the present time, 46 weekly flights operated over Colombian FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 35 flights per week over Colombian FIRs with destination USA, therefore if these flights are to continue to operate into USA they must be made RVSM ready by 2004. COPA operates 147 flights over Colombian FIRs that will be performed by B737-700.

Domestic: ACES is in the process of replacing its B727-200 for A320. Aerorepublic is replacing their DC9 for MD80, but this was not taken into account since they do not have a schedule planned.

### **Ecuador**

International: At the present time, 14 weekly flights operated over Guayaquil FIR are USA carriers, therefore they will be RVSM by 2004. LanChile operates 14 flights with B737-200 that will be operated by A320.

Domestic: No traffic.

### **French Guyana**

International: No comments

Domestic: No traffic

### **Guyana**

International: At the present time, 6 weekly flights operated over Georgetown FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 35 flights per week over Georgetown FIRs with destination USA, therefore, if these flights are to continue to operate into USA they must be made RVSM ready by 2004.

Domestic: No traffic.

### **Panama**

International: At the present time, 44 weekly flights operated over Panama FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 32 flights per week over Panama FIR with destination USA, therefore if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 175 flights with B737-200 that will be B737NG.

Domestic: No traffic

### **Paraguay**

International: At the present time, 5 weekly flights operated over Paraguay are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region operate 12 flights per week over Paraguay with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004.

Domestic: No traffic.

### **Peru**

International: At the present time, 7 weekly flights operated over Lima FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region operate 17 flights per week over Lima FIR with destination USA, therefore, if these flights are to continue to operate to USA they must be made RVSM ready by 2004.

Domestic: Aviandina, TANS and Aerocontinente share 60 percent of the domestic flights with B737-200 and B727-200. Plans for renewal of the fleet are unknown.

### **Surinam**

International: No comments:

Domestic: No traffic

### **Uruguay**

International: At the present time, 12 weekly flights operated over Montevideo FIR are USA carriers, therefore they will be RVSM by 2004. LanChile is operating 12 flights with B737-200 that will be A320 by 2004.

12 flights made by airlines from the CAR/SAM to USA. 14 flights made by LanChile that will be operated in 2004 with A320. 12 flights made by LAPA that will use B737-700.

Domestic: No traffic

### **Venezuela**

International: At the present time, 43 weekly flights operated over Maiquetia FIR are USA carriers, therefore they will be RVSM by 2004. The airlines based in CAR/SAM Region are operating 162 flights per week over Maiquetia FIR with destination USA, therefore if these flights are to continue to operate to USA they must be made RVSM ready by 2004. COPA is operating 12 flights with B737-200 that will be B737NG.

Domestic: The local airlines have 324 flights operated with non-RVSM capable aircraft, but these flights are no more than 60 minutes long and can be operated under FL290 with non or very little fuel penalty.

Observations: Four major airlines are based in Venezuela: Aeropostal, Aserca, Avensa and Servivensa. These airlines operated a total of 26 DC9, 13 B727-200 and 3 B737-200. They cover most of the domestic and international flights. The intention of fleet replacement is unknown, but it is important to note that the main market of these airlines is into United States destinations, with 190 of 349 international flights operated to USA. This fact will force these airlines to replace their fleet if they want to continue to fly into the USA.

Appendix C

<b>2004 CAR/SAM JET WEEKLY FLIGHT OF MORE THAN 50 MINUTES OR 250 NM</b>							
	International Flights		Domestic Flights		Total		Readiness in percentage
COUNTRY/FIR	RVSM ready	Non-RVSM	RVSM ready	Non-RVSM	RVSM ready	Non-RVSM	RVSM ready
Caribbean							
Cuba	2457	50	2	26	2459	76	97%
Curacao FIR	856	59	0	0	856	59	94%
Dominican Rep.	1291	44	0	0	1291	44	97%
Haiti	845	6	0	0	845	6	99%
Kingston FIR	1573	23	0	0	1573	23	99%
Piarco FIR	954	31	0	0	954	31	97%
San Juan FIR	2247	2	0	0	2247	2	100%
Subtotal ----->	10223	215	2	26	10225	241	98%
Central America and Mexico							
Cenamex FIR	1679	58	0	0	1679	58	97%
Mexico	3991	45	3520	824	7511	869	90%
Subtotal ----->	5670	103	3520	824	9190	927	91%
South America							
Argentina	878	173	545	860	1423	1033	58%
Bolivia	224	149	0	107	224	256	47%
Brazil	1415	181	6576	854	7991	1035	89%
Chile	555	41	531	42	1086	83	93%
Colombia	1404	151	278	79	1682	230	88%
Ecuador	530	107	0	0	530	107	83%
French Guyana	31	6	0	0	31	6	84%
Guyana	184	15	0	0	184	15	92%
Panama	1084	26	0	0	1084	26	98%
Paraguay	315	62	0	0	315	62	84%
Peru	585	144	134	260	719	404	64%
Surinam	31	13	0	0	31	13	70%
Uruguay	550	105	0	0	550	105	84%
Venezuela	1209	218	0	324	1209	542	69%
subtotal ----->	8995	1391	8064	2526	17059	3917	81%
grand total--->	24888	1709	11586	3376	36474	5085	87.76%