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Agenda Item 6: Creation of an additional Monitoring Agency in the CAR/SAM Regions

CREATION OF AN ADDITIONAL MONITORING AGENCY IN THE CAR/SAM REGIONS – CARSAMMA BEST PRACTICES

(Presented by CARSAMMA)

EXECUTIVE SUMMARY	
This paper presents a summary of the work carried out by CARSAMMA and the analysis of the creation of another monitoring agency in the Caribbean Region.	
Strategic Objectives:	• Safety
References:	• ICAO Doc 9574 and Doc 9937

1. Introduction

1.1 CARSAMMA was established in 2002 at the GREPECAS/10 meeting, in order to provide support for the safe and seamless use of the Reduced Vertical Separation Minima in the RVSM airspace of the CAR/SAM Regions. This decision was confirmed in 2003, and the headquarters was established in Brazil.

2. CARSAMMA Operation Scope

2.1 The duties and responsibilities of CARSAMMA include:

a) Monitor all the aspects of horizontal and vertical navigation operation, including the performance of "height maintenance";

b) Monitor the aircraft approval condition in order to maintain the non-authorized aircraft in the RVSM/RNP airspace operations rate within the acceptable limits;

c) Assess security before and after CAR/SAM Regions RVSM implementation and disseminate the results as appropriate;

d) Establish and maintain an RVSM and PBN approval database;

e) Facilitate RVSM/PBN approval data transfer with other regional monitoring entities.

3. CARSAMMA Achievements

3.1 Despite the challenges faced, CARSAMMA has been successful and has delivered products made with impeccable quality from the beginning. Workload has increased as air traffic in the Region grows, although quality was not reduced.

3.1.1 Error calculation in the altimetry system of aircraft wishing to fly in our Region RVSM airspace is based on digital files sent by the equipment operators firms EGMU (ARINC, CSSI, AEROPEARL). The result of this calculation reported by CARSAMMA is an essential part in the RVSM certification process of the CAAs. CARSAMMA must maintain and update a database, exchange correspondence among the different actors (CAA, EGMU operators and other RMA) until the final certification presented through a RVSM certification form (F2) by the CAA, when this information is entered in the database and located in the CARSAMMA website for consultation purposes. From a total of 2.260 RVSM CAR/SAM Regions certified aircraft, 910 aircraft altimetry errors have been calculated since 2011 by the CARSAMMA Altimetry Lab, and before, these calculation were performed by the FAA William J. Hughes technical Centre, as presented in Table 1.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Error calculation	FAA	FAA	FAA	FAA	FAA	FAA	122	178	265	345
Bank update	187	252	415	501	458	353	300	262	323	424

Table 1 – calculation of errors and update of data base of RVSM approval.
FAA – calculations made by the Federal Aviation Administration.
Source: CARSAMMA

3.1.2 Another product is the RVSM Global Airspace Use Audit performed annually since 2010 with high quality to confirm that aircraft using this airspace are certified to do it. Input data are sent by the CAR/SAM FIRs, and in this case CARSAMMA invests approximately 30 working days with 2 experts to purge aircraft movement data, that are numerous and with imperfections (197.607 movements in 2013), giving 65.535 movements after purge, ready to remove the needed parameters for the audit and the system risk calculation.

Year	2010	2011	2012	2013
Number of uncertified aircraft	1.897	586	274	700
Air movement	59.310	220.833	151.117	263.142

Table 2 – Effort through the performance of the global audit
Source: CARSAMMA

3.1.3 CARSAMMA performs the Vertical Collision Risk (CRM) calculation, which values are irrefutable, using the Reich Model. In this process, several input are involved such as the reported LHD validated during the year plus the already purged air movement within the RVSM. There are many steps involved in this process and many *software* that will be used to obtain a reliable and updated result. Of the results of this calculation presented by CARSAMMA to GREPECAS and GTE, CAA may mitigate the possible faults encountered, providing a safer airspace. All work requires time from the Consultants, while products are always verified accurately.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Risk calculation (CRM)	OK	OK	OK	OK	OK	OK	Not performed	Not performed	OK	OK

Table 3 – Workload with risk calculation in the CARSAM Regions RVSM (E-09).
Source: CARSAMMA

3.1.4 Another methodology applied by CARSAMMA is the one of Safety Management Systems (qualitative) which was adapted by CARSAMMA experts for its use with reported and validated LHDs. As a result, CARSAMMA can highlight (through graphs and maps) the "hot points" in our regions with a high risk value, the most relevant reports, the time of the year and the time at which they occur, and describe the categories of the most common failures and even suggest mitigating actions.

	Region	2011	2012	2013
Risk calculation (SMS/SGSO)	CAR	OK	OK	OK
	SAM	OK	OK	OK
	CARSAM	OK	OK	OK

Table 4 –CARSAMMA efforts with RVSM risk calculation in the CARSAM Regions
Source: CARSAMMA

3.1.5 Since 2011, at the request of the ICAO SAM Office, CARSAMMA developed and kept a PBN databank, currently with 2.155 aircraft, driven by information sent by the SAM CAAs through PBN certification or annulation forms (F5 o F6), which relationship is placed in the CARSAMMA website for consultation by the stakeholders. Table 5 designates the growing effort in order to keep updated data.

Year	2010	2011	2012	2013	2014
No of aircraft	92	525	283	614	641

Table 5 – Load with updated PBN approved aircraft table
Source: CARSAMMA

3.1.6 When an unexpected event occurs in the RVSM airspace, FIRs shall complete and present to CARSAMMA a format called "Large Height Deviation" (LHD), describing precisely such events, in order to be analyzed and validated by CARSAMMA and the members of the GTE in bi-monthly conferences sponsored by the ICAO NACC and SAM Offices. In this regard, CARSAMMA has made 5.300 validated LHDs chosen from the 6.443 received, as in Table 6:

	2004	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Received	22	29	74	116	420	650	762	879	824	1.204	1.463
Validated	22	29	68	113	287	449	629	645	687	1.065	1.306

Table 6 – Efforts to carry out validation of LHDs in CARSAMMA.
Source: CARSAMMA

3.1.7 CARSAMMA engages in conferences on elevation and updating of professionals involved in RVSM, in order to accurately fill the air movement data in the RVSM airspace and from LHDs reported by involved FIRs.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Involved ATCO	-	-	-	30	250	200	-	-	150	200
Brazil ACC + APP	-	-	-	5 + 2	5 + 2	5	-	-	5	5 + 1

Table 7 – Effort with conferences on height and update
Source: CARSAMMA

3.1.8 At the GTE/11 meeting, it was planned to hold a seminar for LHD focal points on the new calculation methodology for the assessment of LHD reports, with a view to an elevation and leveling of knowledge. The meeting was held from 11 to 13 August 2014.

3.1.9 It should be also noted the various enhancements made by CARSAMMA with Brazil, that have been successful by providing basic means and improvement of quality of the provided services (course on altimetry system errors course in USA, development of software for automated identification of LHDs in the Brazilian ACC, and furniture and computers for the perfect running of the Agency).

4. Analysis

4.1 During GREPECAS/17 meeting, held from 21 to 25 July 2014, the possibility of creating an agency to operate in the Caribbean was analyzed. In this regard, the following operational limitations are observed, to be assessed:

The agency is the result of an agreement between the States of the CAR/SAM Regions (GREPECAS) which objective is to develop an integrated and harmonious air navigation plan between the States. The action of creating another entity is against this reasoning and may generate difficulties, mainly in the boundaries between the jurisdiction areas of the entities, bearing in mind the data of the entities as indicators, for the reasons explained below, taking into account that:

a) A greater quantity of LHDs as indicators provides greater accuracy in the statistical analysis performed to then indicate with certainty a trend or a deficiency/demand against which the corrective measures may be taken of the provision of resources may be applied;

b) The largest number of aerial movements, provides a greater certainty on the CRM computed calculations as a single region;

c) LHDs involving both regions (CAR/SAM) could be duplicated distorting reality;

d) States share similarities in terms of air navigation support infrastructure as well as RVSM space monitoring, which confirms the need to be treated as a whole.

4.2 From the beginning, CARSAMMA plays its role as a RVSM monitoring agency for the CAR/SAM regions with productive efficiency as it is summarized in point 3as shown above. In the meantime, Air traffic growth in the region is increasing to a rate of 8% y. (IATA statistical yearbook), while the number of advisors has remained steady, as shown in table 8.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chief	1	1	1	1	1	1	1	1	1	1	1	1
Advisors	2	3	2	2	4	4	4	3	3	3	3	3

Table 8 *- Evolution of the number of human resources at CARSAMMA.*
Source: *CARSAMMA*

4.3 According to the data presented above, it is noted an increasing work overload on the CARSAMMA Advisors, nevertheless, the executed Works by CARSAMMA continue to be of irrefutable quality.

4.4 In the Previous scenario is designated that the CARSAMMA has not still reach its greater potential yet, and needs to grow in production improving quality as in the number of “experts” to fight with the increasing demand of labour and to cope with the increasing demand of better quality Air traffic.

4.5 The complexity of the work of CARSAMMA restricts the assignment of personnel from the qualitative and/or quantitative point of view. Must have a deep understanding of traffic regulations and know the limitations of the aid and surveillance teams to arrange each LHD or to obtain the vertical risk calculations and make the calculation of the aircraft altimetry systems errors.

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4.6 To achieve this growth at CARSAMMA. It is necessary that the experts or focal points of other countries make a trade in the agency with the aim to provide knowledge of the ATC structures, rules and mode of operation in their countries as well as its restrictions in order to improve CARSAMMA current advisors knowledge.

4.7 As mentioned before, CARSAMMA has been maintained through the efforts of Brazil. Thus, CARSAMMA invites and requests analysis on the possibility of each state of our regions to offer experts from their countries, with the cost of the state of origin, in order to reinforce CARSAMMA activities and knowledge exchange to continue its growth before thinking on creating another organization.

5. **Suggested Actions:**

5.1. The meeting is invited to:

a) Recognize that CARSAMMA is an Agency that still has growth potential and that should have support and contribution from the CAR/SAM regions experts, in order to achieve higher service quality; and

b) Analyse the possibility of, in addition to the experts maintained by Brazil, provide CARSAMMA with additional human resources, elected and paid by the State of origin, with a view to exchange information with consultants and improve service quality of the agency.

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