



Agenda

Item 5: Other Business

RESULT OF THE SAFETY ASSESSMENT OF SAM RVSM AIRSPACE

(Presented by the Secretariat)

SUMMARY

This working paper presents the result of the safety assessment of RVSM airspace in the SAM region, as part of the RVSM airspace-monitoring task; likewise, the working paper introduces for analysis of the working groups, some situations identified as causing or precursors of significant altitude deviations (LHD) in the RVSM SAM airspace.

References:

- ICAO Doc 9574
- ICAO Doc 9937
- SAMIG/24 meeting report
- GTE/21 Meeting Report

1. Introduction

1.1 As part of the responsibilities of the member States, the safety monitoring of RVSM airspace is identified. Section 3.3.5.1 of Annex 11 establishes that “For all airspace where a reduced vertical separation minimum of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the continued application of this vertical separation minimum meets the safety objectives. The scope of regional monitoring programmes shall be adequate to conduct analyses of aircraft group performance and evaluate the stability of altimetry system error.”

1.2 In compliance with the aforementioned, in the CAR/SAM regions, the RVSM space of the 34 FIRs included is monitored. This activity is carried out in close coordination with the CARSAMMA regional monitoring agency and the focal points of the States or organizations that participate in this process.

1.3 As part of the monitoring mechanism, the focal points of the 34 FIRs collect important altitude deviations (LHD) during the twelve months of the year. Following the process established in the terms of reference of the focal points, these LHDs are reported to CARSAMMA, who, after a filtering process, includes the data for the corresponding period for analysis and presentation to the GTE.

1.4 The data prepared by CARSAMMA are analyzed at the GTE meeting, which validates the results presented, thus ending the analysis process corresponding to the relevant year, initiating a new analysis cycle.

1.5 The Twenty First Meeting of the GREPECAS Scrutiny Working Group (GTE/21) was held in August 2021. In this meeting the results of the monitoring from January to December 2020 were analyzed. The report of the aforementioned meeting is available in the following link;

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2021-RLA06901-IIGTINTEROP&t=1

2. Analysis

2.1 During GTE/21, CARSAMMA presented the data from the analysis of the LHDs of the CAR/SAM regions. These data include the events reported by the focal points of the FIRs. The Table I below, presents the vertical risk calculation for each of the FIRs included in the analysis.

Table I – Vertical Risk

STATE	FIR	Vertical Risk
ARGENTINA	CORDOBA - SACF	1.38E-09
	EZEIZA - SAEF	0.26E-09
	MENDOZA - SAMF	4.51E-09
	RESISTENCIA - SARR	1.71E-09
	COMODORO - SAVF	0.24E-09
BOLIVIA	LAPAZ - SLLF	6.04E-09
BRAZIL	ATLANTICO - SBAO	0.19E-09
	AMAZONICA - SBAZ	1.02E-09
	BRASILIA - SBBS	1.10E-09
	CURITIBA - SBCW	1.86E-09
	RECIFE - SBRE	0.20E-09
CHILE	PUNTA ARENAS - SCCZ	0.12E-09
	SANTIAGO - SCEZ	4.33E-09
	ANTOFAGASTA - SCFZ	2.71E-09
	PASCUA - SCIZ	0.16E-09
	PUERTO MONTT - SCTZ	0.14E-09
COLOMBIA	BARRANQUILLA - SKEC	0.46E-09
	BOGOTA - SKED	5.82E-09
ECUADOR	GUAYAQUIL - SEFG	5.12E-09
GUYANA	GEORGETOWN - SYGC	0.11E-09
FRENCH GUIANA	CAYENA - SOOO	4.41E-09
PANAMA	PANAMA - MPZL	2.62E-09
PARAGUAY	ASUNCION - SGFA	1.05E-09
PERU	LIMA - SPIM	6.05E-09
SURINAME	PARAMARIBO - SMPM	0.34E-09
URUGUAY	MONTEVIDEO - SUEO	1.14E-09
VENEZUELA	MAIQUETIA - SVZM	2.17E-09
NETHERLANDS ANTILLES	CURACAO - TNCF	5.49E-09
CENTRAL AMERICA	CENAMER - MHTG	0.35E-09
CUBA	HABANA - MUFH	0.45E-09
HAITI	PORT AU PRINCE - MTEG	1.02E-09

STATE	FIR	Vertical Risk
JAMAICA	KINGSTON - MKJK	0.54E-09
DOMINICAN REPUBLIC	SANTO DOMINGO - MDCS	1.49E-09
TRINIDAD & TOBAGO	PIARCO - TTZP	4.05E-09
TOTAL CAR/SAM		1,78E-09

2.2 After the analysis using the collision risk model, it was determined that **the technical risk of the CAR/SAM FIRs complies with the TLS value, not exceeding 2.5×10^{-9} fatal accidents per flight hour caused by the loss of the standard vertical separation of 1000 ft.**

2.3 **In the total value of the risk analysis, it was determined that the total estimated risk for the evaluated FIRs is 1.78×10^{-9} , below the TLS (5.0×10^{-9})**

2.4 Regarding the FIRs of the SAM region, a vertical risk of 2.04667×10^{-09} was obtained and although this risk value is below the TLS of 5.0×10^{-09} , is higher than the average value of the calculation of the risk of the CAR/SAM Regions

2.5 When the risk value for each FIR was analyzed, four regions of flight information of the SAM region were identified with risk level above the TLS, being SLLF, SKED, SEFG, SPIM, these results are unacceptable and require immediate actions to reduce LHD.

2.6 Since 2016 the trend of LHD types has been maintained, being those of code "E" - Coordination errors between ATC transfer units or control responsibility, as a result of human factors", 95% of the total safety events in the CAR/SAM Regions.

2.7 In the analysis carried out, it was detected that some of these code "E" events are rooted in flight plans. At the last GTE meeting, some SAM FIRs stated that they still have difficulties in processing some flight plans, mainly for aircraft that fly direct from point to point. Since the entry point to the FIR is not included in the flight plan, the system does not process it correctly, starting the chain of events until it finally manifests itself in an error in the coordination between the FIRs.

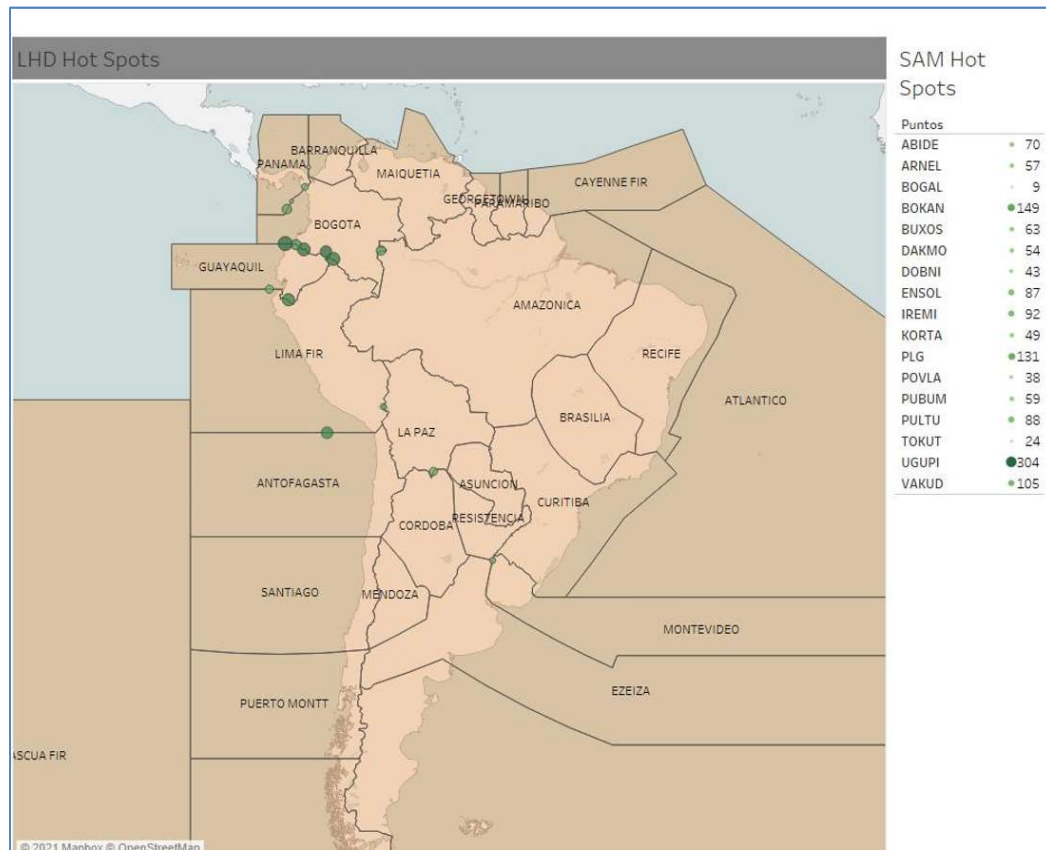
2.8 In second place in the classification of LHDs, although with a very low percentage, only 2%, those related to the code "F - Coordination errors between ATC transfer units or control responsibility are also identified, as a result of equipment failure or technical problems ", these are generally related to problems with the AIDC.

2.9 In the geographical analysis of the events, it can observed that approximately 98% of the LHDs are located on the borders between the FIRs. Some of the areas where LHDs are commonly identified are areas with reduced surveillance.

2.10 The data shows that certain points maintain a strong LHD trend; these data are available to the working groups to support decision-making regarding implementation. In Graph I the history of the last five years as regards the LHD report can be observed.

2.11 Experience in the analysis of RVSM airspace monitoring data has shown that the implementation of technology for the exchange of information such as AMHS and AIDC, or the exchange of radar surveillance signals to improve coverage, have a significant impact on the reduction of LHDs, mainly those related to the “E” code, thus improving the operational safety of the airspace through the reduction of coordination errors.

Graph I- SAM Hot Spots



2.12 The work of the implementation groups has an impact not only on the improvement of infrastructure and interoperability, but also directly influences the security of RVSM airspace in the region, SAM.

3. Suggested actions

3.1 The Meeting is invited to:

- a) Take note of the information presented in this working paper;
- b) support the work of the implementation groups to improve the safety of RVSM airspace in the SAM region; and

- c) improve coordination between implementation groups with other working groups and the GTE to increase results.

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