International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

WORKING PAPER

GREPECAS/21 — WP/23
26/09/23

Twenty-first Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/21)
Santo Domingo, Dominican Republic, 15 to 17 November 2023

Agenda Item 4: GREPECAS Work Programme

REPORT OF THE RESULTS OF THE RVSM AIRSPACE MONITORING PROGRAMME OF THE CAR/SAM REGIONS IN 2022

(Presented by the Rapporteur of the GREPECAS GTE)

EXECUTIVE SUMMARY

This Working Paper presents a summary of the activities of the GREPECAS Scrutiny Working Group (GTE) since its previous report. The GTE has continued to carry out an important task to ensure that the level of operational safety of the RVSM airspace of the CAR/SAM Regions remains within the acceptable level. The GTE, in coordination with CARSAMMA, evolved to be generators of operational safety data for decision-making by States and service providers in the CAR/SAM Regions.

Action:	Suggested actions are included in Section 5.
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency
References:	• Preliminary report of the CAR/SAM Planning and Implementation Regional Group (GREPECAS) Twenty Third Scrutiny Working Group Meeting (GTE/23) Lima, Peru, 11 – 15 September 2023

1. Introduction

1.1 Since the implementation of the Reduced Vertical Separation Minimum (RVSM), between Flight Levels 290 and 410 inclusive (RVSM airspace), the GREPECAS GTE jointly with the Monitoring Agency for the Caribbean and South America Regions (CARSAMMA), has developed an important task in the continuous monitoring of the performance of the air navigation system in Reduced Vertical Separation Minimum (RVSM) airspace, as well as in Operational Safety evaluations, in compliance with the provisions of the ICAO Documents 9937 and 9574.

2. Scope

2.1 This working paper includes a summary of the activities carried out by the GTE in the period 2022-2023, as well as the result of the RVSM airspace safety performance analysis for 2022.

3. Discussion

3.1 During the opening of the GTE/23 meeting, the Director of the ICAO South American Regional Office recognized the important role that women play in the objectives of the GTE, which has a representative number of women as Focal Points and the Rapporteur is also a woman.

3.2 In the period between **2022-2023**, the GTE held an in-person meeting and quarterly teleconferences that provided feedback on large height deviation (LHD) events with the objective of verifying their validity, as well as to identify trends or operational safety situations that guarantee immediate action; An instructional seminar was also held to calculate the Safety Management System (SMS) risk value for LHD events at the Points of Contact (PoC) accredited to CARSAMMA.

3.3 From September 11 to 15 of this year, the twenty-third meeting of the GTE was held in Lima, Peru, which was attended by representatives of 16 States/Territories and International Organizations of the CAR/SAM and NAM Regions, with a total of 23 delegates.

3.4 LHD reports accumulated over a 12-month period, between January and December 2022, were used for the safety assessment. The result of the vertical collision risk assessment - CRM (Collision Risk Model) for the period 2022 was **$\underline{\mathbf{1{,}255 \times 10^{-9}}}$**, so the risk has remained within the acceptable operational safety level of 5×10^{-9} fatal accidents per flight or loss of standard vertical separation of 1,000 ft. (See Appendix Fig. I).

3.5 The FIRs La Paz (Bolivia), Piarco (Trinidad and Tobago), Asunción (Paraguay), Guayaquil (Ecuador) and Port-au-Prince (Haiti) reflect in 2022 their risk above the Target Level of Safety (TLS). Although the CAR/SAM Regions have remained within the acceptable level of operational safety (5×10^{-9}), it is necessary for the GTE to work together to ensure that all FIRs achieve this objective. In this sense, the GTE requested from CARSAMMA an analysis of the quantitative factors that influenced the CRM calculations of the FIRs mentioned above to be mitigated. (See Appendix Fig II)

3.6 Regarding the occurrence of LHDs reported in the CAR/SAM Regions, CARSAMMA received a total of 1,280 LHDs in 2022. After the analysis and validation carried out through teleconferences with the points of contact, the North American Approvals Registry and Monitoring Organization (NAARMO) and the CARSAMMA, 711 of these LHDs were considered valid in the CAR/SAM Regions.

3.7 LHDs with Code "E" (error/coordination failure between ATC units) were the most frequent in 2022, with 685 events, followed by Codes "B" The flight crew ascended/descended without ATC authorization (8), "I" Deviation due to turbulence or other meteorological phenomenon (5), "H" Deviation due to failure of onboard equipment that led to an unintentional or undetected change in flight level (3), "J" Deviation due to RA TCAS (3), "M" Other cases (3). The high number of "E" codes demonstrates the need for better coordination between adjacent air traffic organizations. (See Appendix Fig III)

3.8 The FIRs that reported the most in 2022 were: FIR PANAMÁ (Panama), GUAYAQUIL (Ecuador), BOGOTÁ (Colombia), AMAZÓNICA (Brazil), LIMA (Peru) and SANTO DOMINGO (Dominican Republic). Only those six (6) FIRs add up to 414 reports or 58.2% of the general total. (See Appendix Fig IV)

3.9 The increase in traffic volume between 2021 and 2022, the constant growth of the reporting culture in the region's FIRs and the implementation of new coordination technologies (AIDC) influenced the increase in LHD events during 2022. Likewise, shows the lack of implementation of surveillance systems in some FIRs in the CAR/SAM Regions. The trend analysis showed significant increases in the number of events suffered by the FIRs of Amazónica (Brazil) 54 reports, Bogotá (Colombia) 80 reports, Guayaquil (Ecuador) 88 reports and Panama (Panama) 116 reports. (See Appendix Fig. V)

3.10 Considering the significant number of events involving the Bogotá (Colombia), Barranquilla (Colombia), Lima (Peru) and Guayaquil (Ecuador) FIRs during the periods between 2019 and 2021, the ICAO SAM office organized an in-person meeting on 13 as of March 16, 2023 between the focal points of the States involved as part of the strategy implemented to reduce LHDs on their border, in follow-up to the conclusion GTE 22/01. Colombia presented its Action Plan as part of conclusion 22/1 of the GTE and took note of the information presented regarding the reduction of LHDs in the FIRs of Barranquilla and Bogotá, highlighting the actions that are being carried out as good practices. carried out to reduce risk in RVSM airspace.

3.11 In the analysis of the 2022 events, some related to the failure of coordination due to technical issues of the equipment used for the transfer, specifically the AMHS or the AIDC, were also identified. One of these failures refers to aircraft with flight plans with direct routing, which do not contain entry and exit points of all the FIRs that they fly over, which causes errors in automated coordination, increasing their operational risk. The GTE echoes on the challenges faced by operational safety in the implementation of direct flights between States.

3.13 The effectiveness of the airspace monitoring programme depends on the quality and quantity of data received by CARSAMMA (RMA). These data are mainly used for the calculation of the collision risk model (CRM). Although support for the RVSM airspace monitoring programme is an obligation for States, the sending of data is not always carried out in accordance with the provisions of the CARSAMMA Points of Contact Manual. In the 2022 period, 5 FIRs were identified that did not submit the required data in a timely manner: Cayenne (France), Montevideo (Uruguay), Central America (COCESNA), and Kingston (Jamaica).

3.14 The GTE 23 Meeting created an Ad-hoc group made up of Colombia, Cuba, Ecuador, Dominican Republic, Peru and Trinidad and Tobago that must amend the manual of points of contact accredited to CARSAMMA. This proposed amendment should specify the CAR Region FIRs reporting to CARSAMMA and NAARMO, the expansion of CARSAMMA responsibilities with respect to PBCS, specify the validation period with adjacent control centres (ACC) for LHDs before being sent to CARSAMMA, functions of the Rapporteur and impact of contingency plans.

3.15 As part of the GTE 23 agreements, CARSAMMA must organize, with the support of the Secretariat, a seminar aimed at the States of the CAR/SAM Regions to inform on the actions they must take to report communication approvals. and performance-based surveillance (PBCS).

3.16 The Meeting took note of the results of the long-standing audit where aircraft that use RVSM airspace are identified without being included in the RMA RVSM capabilities database. During the presentation, the lack of response to CARSAMMA communications by some States of the CAR/SAM regions was identified. Following up on this information, GTE 23 asked the Secretariat to establish a coordination mechanism between the States and CARSAMMA to keep the information in the database on the RVSM capabilities of aircraft registered in the CAR/SAM States updated.

3.17 GTE 23 recognized the good work of coordination and harmonization of procedures that CARSAMMA and NAARMO have been carrying out, which results in an improvement in data sharing, as well as in the analysis of performance in the RVSM airspace of the CAR Region, comprehensively. One of the points discussed during GTE 23 refers to the validation and coordination of events on the border between the Caribbean FIRs in charge of CARSAMMA and NARMMO, emphasizing that the Points of Contact (POC) must exchange information on said events complying with the provisions of the Points of Contact (POC) Manual. Mexico and the United States were urged to implement procedures to ensure the exchange of LHD events that occurred with FIRs from other States.

3.18 It is important to recognize the excellent work carried out by CARSAMMA, which in recent years has reinforced the agency's team of experts and improved internal procedures to continue supporting the CAR/SAM RVSM airspace monitoring process.

4. Conclusions and Recommendations

4.1 Urge States/Territories and International Organizations to promote female participation in the different groups and activities of ICAO.

4.2 The GTE must continue working with all FIRs of the CAR/SAM Regions, to ensure that they obtain their expected safety performance, prioritizing those that reflect a risk level above the TLS in 2022.

4.3 Continue with strategies for the mitigation of LHDs with E code, implementing the automation of transfer communications between control centres, along with awareness activities and coordination training between controllers.

4.4 Urge the States/Territories and International Organizations of the CAR/SAM Regions to implement multilateral action plans for the reduction of LHDs, addressing the root causes of the events reported jointly.

4.5 Take note of the failures that have occurred due to the presentation of flight plans with direct routing; Likewise, reiterate to the States/Territories and International Organizations their commitments regarding the submission of the data required by the monitoring agencies.

4.6 Urge Mexico and the United States to implement procedures to ensure the exchange of LHD events that occur with FIRs from other States.

4.7 Based on the information provided in this paper, included the Conclusions and Recommendations, the following draft Conclusion is proposed:

<table>
<tr><td colspan="3">CONCLUSION
GREPECAS/21/XX SUPPORT THE WORK OF THE GREPECAS GTE</td></tr>
<tr><td colspan="2">What:

That, to improve the work of the GREPECAS GTE:
a) States/Territories and International Organizations to promote female participation in the different groups and activities of ICAO;
b) States/Territories and International Organizations continue current strategies for the mitigation of Code E (error/coordination failure between Air Traffic Control (ATC) units) Large Height Deviations (LHDs), including the implementation of Air Traffic Services Inter-facility Data Communication (AIDC) and RADAR data sharing;
c) the States/Territories and International Organizations of the CAR/SAM Regions implement multilateral action plans for the reduction of LHDs, jointly addressing the root causes of the events reported;
d) States/Territories and International Organizations take into consideration the failures that have occurred due to the presentation of flight plans with direct routing;
e) States/Territories and International Organizations be reiterated of their responsibilities related to the submission of the data required by the monitoring agencies; and
f) Mexico and the United States be urged to implement procedures to ensure the exchange of LHD events that occur with Flight Information regions (FIRs) from other States.</td><td>Expected impact:

☒ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:

To enhance safe operations in RVSM airspace of the CAR/SAM Regions</td></tr>
<tr><td>When:</td><td>By GREPECAS 21</td><td>Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☐ Other:</td><td></td></tr>
</table>

5. Suggested actions

5.1 The Meeting is invited to:

a) take note of the information provided in this Working Paper;

b) approve the draft conclusion presented in section 4.7.; and

c) suggest any additional action that is considered necessary.

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APPENDIX

Figure I

Figure I shows a table with the results of the CRM evaluations in the period 2018-2022, indicating that operations in RVSM airspace have remained within the acceptable safety level of 5 x 10^{-9} fatal accidents per flight or due to loss of standard 1,000 ft vertical separation

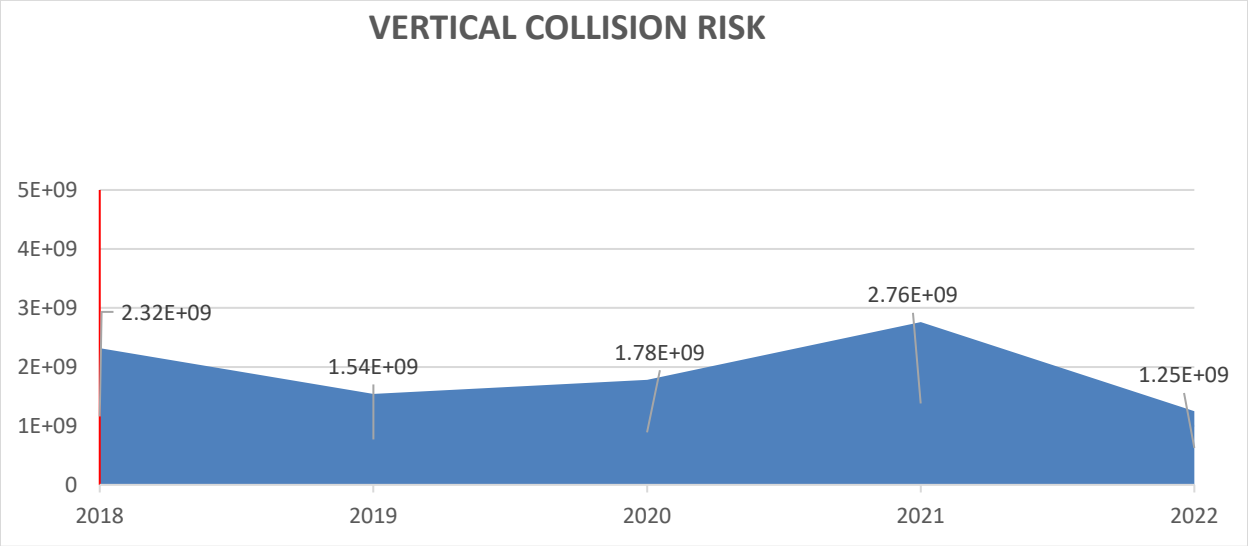

Figure II

The Table shows the FIRs that suffered a TLS above the acceptable safety level of 5 x 10^{-9} fatal accidents per flight or loss of standard vertical separation of 1,000 ft

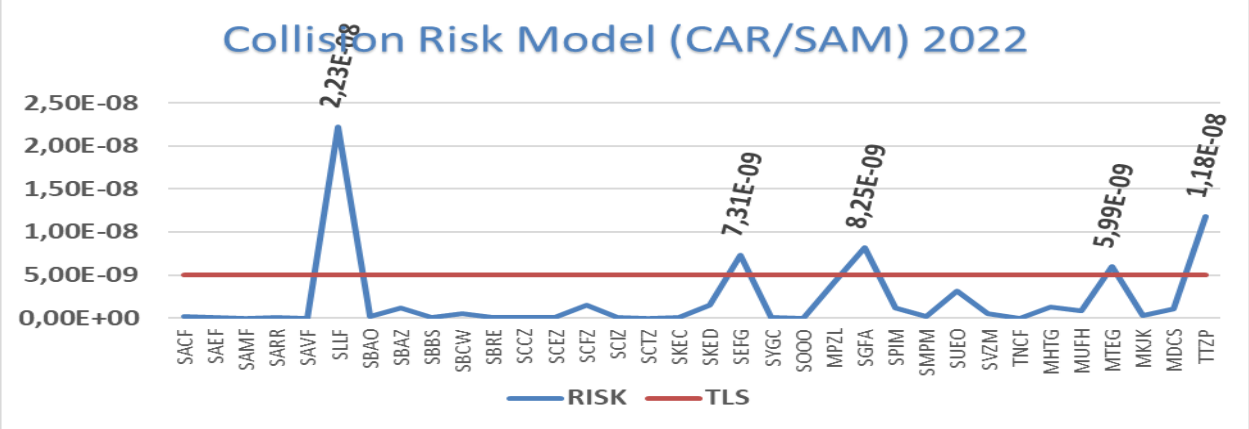

Figure III

The figure shows the total failures 2022, detailing each type of failure.

-	A	B	C	D	E1	E2	F	G	H	I	J	K	L	M	Total
#LHD	1	8	0	2	401	284	0	0	3	5	3	0	1	3	711

Figure IV

The figure shows the FIRs that submitted the most reports

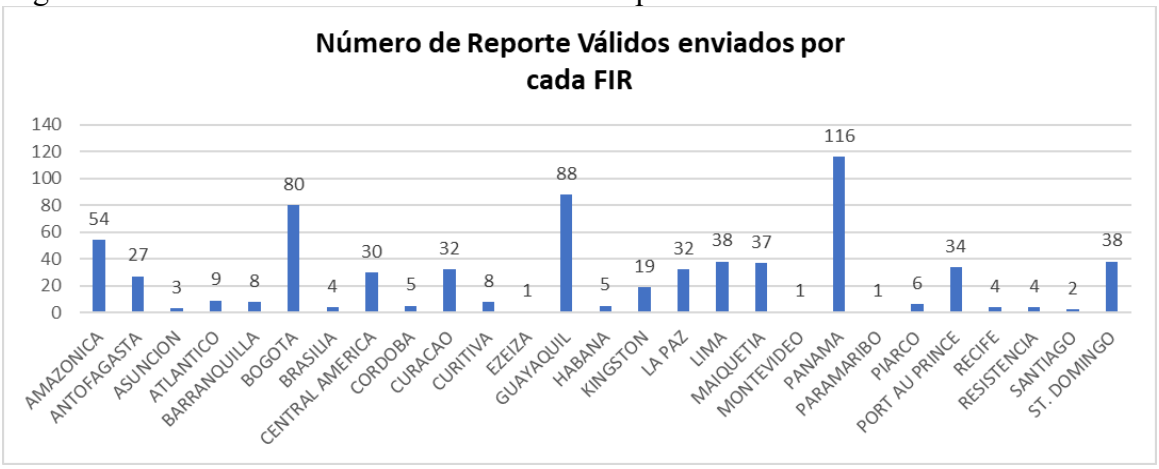

Figure V

The Figure shows a comparison of the total events suffered by FIR from the years 2021 – 2022