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

WORKING PAPER

GREPECAS/23 — WP/3.2
09/01/26

Fifth GREPECAS–RASG-PA Joint Meeting (GREPECAS-RASG-PA/5) and Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/23)

Virtual Phase (Asynchronous, 19 January to 17 February 2026)
In-Person Phase (Mexico City, Mexico, 4 to 6 March 2026)

Agenda Item 3: Updates on GREPECAS-RASG-PA Joint activities

REPORT ON THE RESULTS OF THE RVSM AIRSPACE MONITORING PROGRAMME IN THE CAR/SAM REGIONS FOR 2024 AND GTE ACTIVITY REPORT FOR 2024–2025

(Presented by the Scrutiny group - GTE Rapporteur)

EXECUTIVE SUMMARY

This Working Paper provides a summary of the activities carried out by the GREPECAS Scrutiny Working Group (GTE) since its last report, with the participation of the States' Points of Contact (POCs), CARSAMMA, the Rapporteur, and the ICAO Regional Offices. During the period under review, the GTE continued to monitor and analyse the operational safety performance of Reduced Vertical Separation Minima (RVSM) airspace in the CAR and SAM Regions, in order to verify that safety levels remained within the established acceptable criteria. Furthermore, through coordination between the States and CARSAMMA, the GTE strengthened its role as a regional mechanism for the generation, consolidation, and analysis of operational safety data, which constitute an essential input for decision-making by States and air navigation service providers.

Action:	The suggested actions are included in Section 4.
Strategic Objectives 2026-2050:	• Every flight is safe and secure • Aviation is environmentally sustainable • Aviation delivers seamless, accessible, and reliable mobility for all • No country left behind • The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges • The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All
References:	• Final Report of the Twenty-Fifth Meeting of the Scrutiny Working Group (GTE/25) of the CAR/SAM Regional Planning and Implementation Group (GREPECAS), Rio de Janeiro, Brazil, 18–22 August 2025

1. Introduction

1.1 Since the implementation of Reduced Vertical Separation Minima (RVSM), applicable between Flight Levels 290 and 410 inclusive (RVSM airspace), the GREPECAS Scrutiny Working Group (GTE), together with the Monitoring Agency for the Caribbean and South American Regions (CARSAMMA), have carried out an important task in the continuous monitoring of the performance of the air navigation system in RVSM airspace, as well as in operational safety assessments, in compliance with the provisions of ICAO Documents 9937 and 9574.

1.2 This Working Paper provides a summary of the activities carried out by the GTE during the 2024–2025 period, including the results of the operational safety performance analysis of RVSM airspace for 2024 in the CAR/SAM Regions. The **Appendix** to this note shows tables with the results of the TLS calculation and a classification of LHD events.

2. Discussion

2.1 From 18 to 22 August 2025, the Twenty-Fifth Meeting of the Scrutiny Working Group (GTE/25) was held in Rio de Janeiro, Brazil, at the facilities of the Instituto Histórico-Cultural da Aeronáutica (INCAER), with the participation of 14 States/Territories from the CAR and SAM Regions and one International Organization, with a total of 40 delegates.

2.2 All the documentation of the meeting is available at the following web link:

https://www2023.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2025-GTE25

2.3 During the period 2024–2025, the GTE conducted quarterly teleconferences that provided feedback on Large Height Deviation (LHD) events, with the objective of verifying their validity and identifying trends or operational safety situations requiring immediate action.

2.4 GTE/25 included an asynchronous working phase conducted through the Microsoft Teams platform and available until 29 August 2025, with the purpose of collecting comments on the Working Papers and Information Papers from the States' Points of Contact (POCs) and other stakeholders. This approach recognized the importance of incorporating inputs from States that were unable to participate in the in-person meeting.

2.5 The LHD reports accumulated over a 12-month period, between January and December 2024, were used for the operational safety assessment. The result of the vertical collision risk evaluation – CRM (Collision Risk Model) for the 2024 period was 1.255×10^{-9}; therefore, the risk remained within the acceptable level of operational safety of 5×10^{-9} fatal accidents per flight hour or per loss of the standard vertical separation of 1,000 ft. (See Appendix Fig. I).

2.6 The FIRs of La Paz, Panama, Curaçao, Port-au-Prince, and Santo Domingo presented risk levels above the Target Level of Safety (TLS). Although the CAR and SAM Regions, as a whole, remained within the acceptable level of operational safety (5×10^{-9}), the GTE worked in a coordinated manner to identify the factors negatively affecting the calculation of the Collision Risk Model (CRM), with the objective of supporting the FIRs in achieving compliance with this target. In this context, the GTE requested CARSAMMA to conduct an analysis of the quantitative factors that influenced the CRM calculations for the aforementioned FIRs, to facilitate the definition and implementation of mitigation actions (See Appendix, Fig. I).

2.7 CARSAMMA presented a summary of the LHD reports for the year 2024, in which 694 LHD reports were received, of which 575 were validated and, among these, 43 reports had a risk value between 39 and 51 points (requiring monitoring).

2.8 It was identified that LHDs coded as “E” (error/failure/lack of coordination between ATC units) were the most frequent in 2024, with 477 occurrences, followed by code “F” with 50 reports (the operator uses the equipment for the transfer but makes an error), and code “L” with 14 reports (aircraft without RVSM approval). (See **Appendix** Fig. III).

2.9 During the analysis of this report, several suggestions were made to CARSAMMA, requesting that future analyses for States with more than one FIR allow for the identification of the risk value for each FIR individually.

2.10 CARSAMMA emphasized that the analyses of Large Height Deviations (LHD) and the Collision Risk Model (CRM) depend on the accuracy and reliability of the surveillance and approval records maintained by the Regional Monitoring Agencies (RMAs), which are fundamental for conducting safety risk assessments in RVSM airspace. In this regard, the States’ Points of Contact (POCs) responsible for aircraft airworthiness certification should ensure effective operational safety communication with CARSAMMA, as well as a full understanding of the safety assurance implications associated with their coordination responsibilities with the RMA.

2.11 CARSAMMA presented an analysis of the main errors identified in the RVSM Traffic Movement Data Form (Form F0), submitted annually by States based on samples collected between 1 and 31 December. The analysis was conducted using data corresponding to the year 2024, which directly affect the calculation of vertical collision risk in the CAR/SAM Regions. In this context, States and International Organizations are encouraged to duly complete and submit Form F0 and ensure its delivery no later than 15 February of each year, in accordance with the guidance provided in items 2.2.1 and 2.2.2 of the Guidance Manual for POCs accredited with CARSAMMA.

2.12 In 2024, the following States did not submit Form F0: Colombia (FIRs: SKEC and SKED), French Guiana (FIR: SOOO), and Suriname (FIR: SMPM). Therefore, aircraft movements in these airspaces were not included in the vertical collision risk assessment for the CAR/SAM Region in 2024.

2.13 CARSAMMA presented an evaluation of operators that used RVSM airspace in the CAR and SAM Regions without having current approval information in its database. The evaluation was based on traffic samples corresponding to December 2024 and used approval records updated through April 2025. It was noted that, in some cases, the absence of the aircraft registration number in the traffic samples limits the full verification of approval status, a situation that occurs mainly in operations by operators outside the CAR/SAM Regions.

2.14 Additionally, NAARMO presented a paper in which civil operators using RVSM in the airspace under its monitoring responsibility (Mexico, Canada, the United States, and the adjacent oceanic airspace) were evaluated, using traffic samples from December 2024 and approval records valid as of May 2025.

2.15 The Rapporteur presented, on behalf of the GTE24/07 Ad hoc Group, the results of the proposed revision of the existing methodology for the analysis and evaluation of type E events involving delays in communication between flight crews and Air Traffic Services (ATS). The Ad hoc Group conducted an analysis of the methodology for the classification and evaluation of class E LHD events in accordance with its agreed terms of reference. The GTE classifies events as code E (E1: coordination error; E2: lack of coordination), without considering the impact of operational errors by flight crews, such as failure to contact the adjacent FIR upon receiving and readback of the transfer of communication, as well as failure to establish communication when entering an FIR or crossing compulsory reporting points. The duration of the LHD event has an adverse effect on the TLS; therefore, non-compliance by flight crews with call procedures prior to entering an FIR and with mandatory reporting point notification negatively increases the vertical collision risk calculation for the FIR under study.

2.16 The results of the Ad hoc Group GTE/24/09 on the mitigation of human error in LHD events were presented, highlighting the importance of the human factor. Likewise, the Manual of Contact Points was presented with the changes required by GREPECAS/22, agreeing to return to the version approved in the AWG/24 and to submit a Study Note in the face-to-face phase of GREPECAS/23 with the proposed changes.

2.17 The Rapporteur, in coordination with CARSAMMA, held a workshop on chapters 3 and 5 of the Manual of Points of Contact accredited to CARSAMMA, addressing the procedures and parameters contained therein. As a result, and in view of the need to revise Chapter 3, in particular the SMS assessment process, it was agreed to conduct further analysis and submit a proposal to AWG/26.

2.19 In attention to Decision GREPECAS/22/1 "AD-HOC GROUP TO EVALUATE THE COORDINATION OF SAFETY MATTERS PA-RAST/MAC-GTE", the aforementioned bodies are collaborating to develop a Regional Safety Advisory (RSA) with recommendations to address an initial list of contributing factors related to LHD in RVSM airspace. The publication of this RSA is scheduled for January 2026. As the matter is analyzed, other RSAs will be published. The deliverable will be presented at the RASG-PA ESC/41 meeting.

3. Conclusions and recommendations

3.1 The effectiveness of RVSM airspace monitoring in the CAR and SAM Regions continues to depend largely on the quality, consistency, and timeliness of the data provided to CARSAMMA. The active collaboration of States is essential to ensure that the information used in operational safety analyses is complete and reliable, allowing for adequate risk assessments and the timely adoption of corrective measures.

3.2 The analyses conducted indicate that certain operational events, particularly those associated with deficiencies in coordination between ATS units and the use of RVSM airspace by operators without current approval information, continue to represent a relevant risk factor for operational safety. It is essential to continue strengthening mitigation and prevention actions in order to reduce their impact on the safety level.

3.3 The work carried out by the GTE in the identification and analysis of Large Height Deviations (LHD) has contributed to a better understanding of the factors influencing vertical collision risk. The review of the classification methodology, as well as the improvement proposals related to coordination events and human factors, constitute a significant advancement in strengthening the RVSM monitoring process.

3.4 The active participation of States, through their Points of Contact, in the processes of validation, updating, and provision of technical information is a key element in maintaining an adequate level of operational safety in RVSM airspace. The training and coordination activities promoted within the framework of the GTE support the continuous improvement of the system.

3.5 Finally, the importance of maintaining effective and timely communication among States, CARSAMMA, and the GTE is emphasized, in order to ensure the updating of RVSM approval databases and the implementation of the recommendations formulated. This joint effort is essential to ensure that operations in RVSM airspace are conducted within the established acceptable risk levels.

4. Suggested actions

4.1 The Meeting is invited to:

a) Take note of the information provided in this Working Paper.

b) Implement appropriate measures to reduce LHDs as exposed in section 3, including those related to ATS coordination errors.

c) Support the RVSM airspace monitoring process by providing the data and information requested by CARSAMMA.

d) Take note of the joint PA-RAST/MAC– GTE activities.

e) Suggest any additional actions deemed necessary.

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APPENDIX

Fig I: The table shows the FIRs that experienced TLS values above the acceptable safety level of 5×10^{-9} fatal accidents per flight hour or per loss of the standard vertical separation of 1,000 ft.

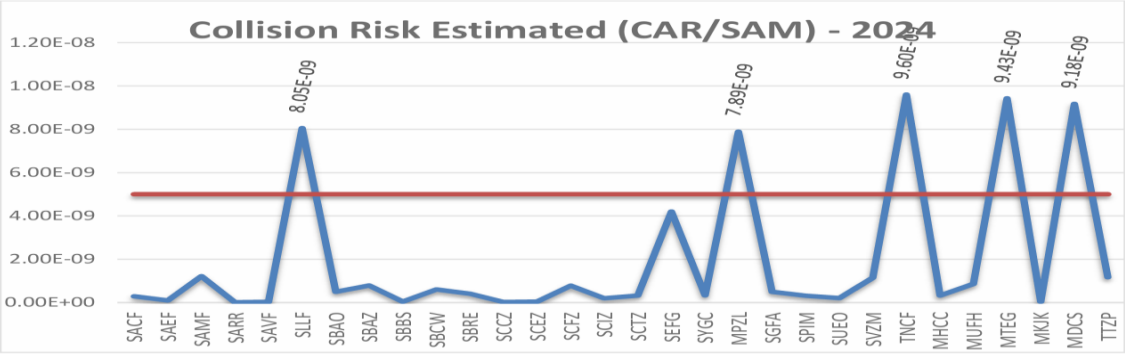
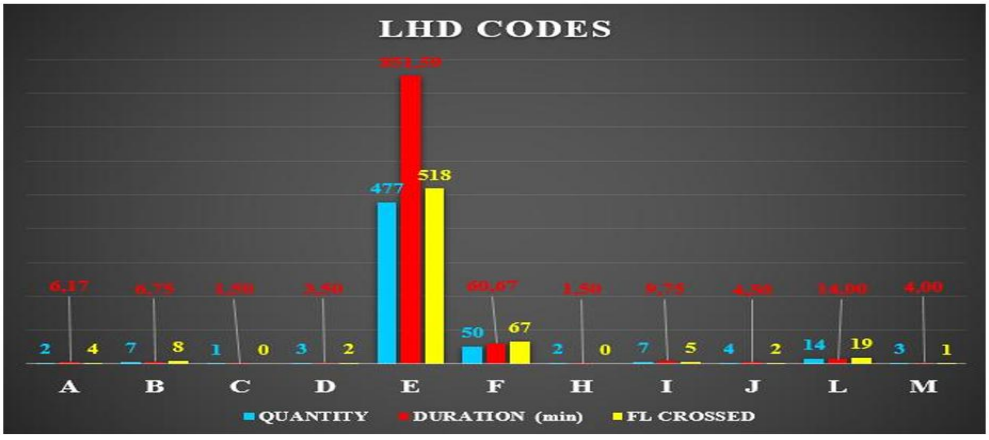


Figure 1 - Collision Risk Estimated

Fig II: The Table shows the FIRs that during the last five years had a risk above the TLS of 5 x 10^{-9} fatal accidents per flight or loss of the standard vertical separation of 1,000 ft.

CRM	2019	2020	2021	2022	2023	2024
FIRs ABOVE THE ACCEPTABLE TARGET LEVEL OF SAFETY (TLS) (5X10-9)	LA PAZ BOGOTA GUAYAQUIL ASUNCION MONTEVIDEO MAIQUETIA	CORDOBA BRASILIA CURITIVA RECIFE SANTIAGO PANAMA LIMA HABANA	MENDOZA LA PAZ BARRANQUILLA BOGOTA PANAMA MAIQUETIA	LA PAZ GUAYAQUIL ASUNCION PORT AU PRINCE PIARCO	PORT AU PRINCE LA PAZ GUAYAQUIL CURAZAO PANAMA SANTO DOMINGO	LA PAZ PANAMA PORT AU PRINCE CURAZAO SANTO DOMINGO
TOTAL FIR ABOVE TLS	6	8	6	5	6	5

Fig III: The table shows the number of LHD events broken down by class, duration, and levels.



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