International Civil Aviation Organization
North American, Central American and Caribbean Office

SUMMARY OF DISCUSSIONS

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Twenty-Sixth Scrutiny Working Group Meeting (GTE/26)
of the CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Asynchronous (virtual): 9 to 25 September 2026
In person: Mexico City, Mexico, 12 to 16 October 2026

SUMMARY OF DISCUSSIONS

ii.1 Place and Date of the Meeting

The Twenty-Sixth Scrutiny Working Group Meeting (GTE/26) of the CAR/SAM Regional Planning and Implementation Group (GREPECAS) was conducted as follows: asynchronously (virtual) from 9 to 25 September 2026 and in-person at the ICAO NACC Regional Office in México City, México, from 12 to 16 October 2026.

ii.2 Opening Ceremony

Mr. Christopher Barks, Regional Director of the North American, Central American and Caribbean (NACC) Office of the International Civil Aviation Organization (ICAO) provided opening remarks and officially opened the meeting.

ii.3 Officers of the Meeting

The GTE/26 Meeting was held with the participation of the GTE Rapporteur, Diana María Luque Salcedo, Colombia. Ms. Luque Salcedo chaired the meeting plenary. Mr. Eddian Méndez, Regional Officer, Air Traffic Management and Search and Rescue, served as Secretary of the Meeting supported by Mr. Ángel Luna, Regional Officer, Flight Safety, both of the ICAO NACC Regional Office of the NACC Regional O.

ii.4 Working Languages

The working languages of the Meeting were English and Spanish. The working papers, information papers and presentations of the meeting were available to participants in both languages.

ii.5 Schedule and Working Arrangements

It was agreed that the working hours for the in-person sessions of the meeting would be from 08:30 to 15:30 hours daily with adequate breaks. Ad hoc Groups were created during the Meeting to do further work on specific items of the Agenda.

ii.6 Agenda

Agenda Item 1: Draft Agenda and Schedule Approval

Agenda Item 2: Review of the valid conclusions and recommendations of previous Caribbean and South American Monitoring Agency (CARSAMMA) and Scrutiny Group meetings

2.1 Review of previous conclusions

2.2 Review of previous recommendations

Agenda Item 3: Review of the Results of the Analysis of Large Height Deviations (LHDs) and of the Collision Risk Model (CRM)

3.1 Indicator data on points of highest occurrence of LHD events
3.2 Actions taken to improve data capture of LHD events and to improve RVSM status capture by States of Registry or the Operator
3.3 Results of the safety assessment project in RVSM airspace for the CAR and SAM Regions
3.4 Trend identification
3.5 LHD Event Management and Progress for LHD Reduction by CAR/SAM States
3.6 Flight plan audit report
3.7 Presentation of CRM 2025 and an analysis of the causes that contributed to these risks in Flight Information Regions (FIRs) that had a value above the Collision Risk Assessment (CRA) Desired Level of Safety (TLS)
3.8 Follow-up collaboration between GREPECAS GTE and RASG-PA PA/RAST

Agenda Item 4: Activities and Tasks to be Reported to GREPECAS

4.1 Review of tasks to be reported to GREPECAS
4.2 Cooperation GTE/Regional Aviation Safety Team-Pan America (PA-RAST)
4.3 CARSAMMA/AWG and the North American Approvals Registry and Monitoring Organization (NAARMO) cooperation

Agenda Item 5: Other Business

Agenda Item 6: Preliminary results of the virtual phase GTE/26

Agenda Item 7: **Review of the GTE Work Programme**

Agenda Item 8: **Any other business**

Agenda Item 9: **Draft Conclusions and Decisions GTE/26**

ii.7 Attendance

The Meeting was attended by 13 States/Territories from the CAR/SAM Regions, 1 International Organizations, totalling 44 delegates as indicated in the list of participants contained in **Appendix A.**

ii.8 Draft Conclusions and Decisions

The Meeting recorded its activities as Draft Conclusions and Decisions as follows:

DRAFT CONCLUSIONS: Activities requiring endorsement by the GREPECAS.

DECISIONS: Internal activities of the GTE.

ii.9 List of Draft Conclusions and Decisions

Number	Title	Page
C/1	***IMPROVING COORDINATION PROCEDURES AT FIR INTERFACES***	10
D/1	***SUPPORT TO THE REGIONAL MONITORING AGENCIES DATA COLLECTION***	14
C/2	***UPDATE TO THE GUIDANCE MANUAL POC ACCREDITED TO THE CARSAMMA***	17
C/3	***ENHANCE DATA SHARING BETWEEN THE GTE AND PA-RAST***	18
D/2	***ADHOC GROUP FOR THE REVIEW OF THE GTE WORK PROGRAMME***	20

ii.9 List of Working and Information Papers and Presentations

Refer to the Meeting web page:
NACC - Meetings | International Civil Aviation Organization

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01	1	Agenda, Working Method, Schedule, and Work Plan	09/10/2026	Secretariat
WP/02	2	Review of Previous Scrutiny Group Meeting Conclusions and Recommendations	09/14/2026	Secretariat
WP/03		*CANCELLED*		
WP/04	3	Mitigating LHD Risk Associated with Transfer of Communication Before Transfer of Control	09/17/2026	Jamaica
WP/05	3	CAR/SAM RVSM Audit Process	09/21/2026	CARSAMMA
WP/06	3	Estimated Vertical Collision Risk in CAR/SAM Regions in 2025	09/21/2026	CARSAMMA
WP/07	4	Status of the Joint Work of the GREPECAS Scrutiny Working Group and the Pan America Regional Aviation Safety Team on Mid-Air Collision Risk in RVSM Airspace	09/23/2026	RASGPA
WP/08	4	Update to the GTE Points of Contact Manual	09/23/2026	Rapporteur
WP/09	3	Vertical Safety Analysis for Mexico Airspace – 2025	10/6/2026	NAARMO
WP/10	3	Vertical Safety Analysis for Caribbean Airspace Designated to the NAARMO RMA – 2025	10/6/2026	NAARMO
WP/11	3	NAARMO Traffic Compliance Monitoring	10/6/2026	NAARMO

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01		List of Working Papers and Information Papers	09/10/2026	Secretariat
IP/02	3	LHD Mitigation Measures Implementation – Progress by Trinidad and Tobago	9/18/2026	Trinidad and Tobago
IP/03	3	LHD Reporting and Validation in the CAR/SAM Regions: 2025 Data Quality and PoC Filtering	10/5/2026	CARSAMMA
IP/04	3	Safety Evaluation of the RVSM Airspace of the CAR/SAM FIR — 2025	10/5/2026	CARSAMMA
IP/05	3	Trends and Recurrence of Coordination Failures Identified in LHD Reports from 2023 to 2025	10/5/2026	CARSAMMA

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/06	5	NAARMO Altimetry System Error Report (ASE-R) Statistics and Examples	10/6/2026	NAARMO
IP/07	5	NAARMO RVSM Long Term Height Monitoring Burden	10/6/2026	NAARMO
IP/08	3	Development of a Standard Operating Procedure for the Reporting of LHDs for US FAA ATC Units	10/6/2026	United States
IP/09	3	Report on LHD Mitigation Within the Georgetown FIR from 2024 to Date	10/6/2026	Guyana

PRESENTATIONS

Number	Agenda Item	Title	Presented by
1	3	Mitigating LHD Risk Associated with Transfer of Communication Before Transfer Control	Jamaica
2	3	LHD Mitigation Measures Implementation – Progress by Trinidad and Tobago	Trinidad and Tobago
3	3	NAARMO Mexico Vertical Safety Monitoring Report 2025	NAARMO
4	3	NAARMO 2025 Vertical Safety Analysis for Caribbean FIRs	NAARMO
5	3	Report on LHD Mitigation Within the Georgetown FIR from 2024 to Date	Guyana

Agenda Item 1 Draft Agenda and Schedule Approval

1.1 Under this Agenda Item the Secretariat presented WP/01 with a draft agenda, the working method and the schedule for the GTE/26 Meeting.

1.2 Due to technical difficulties accessing the meeting's virtual Teams platform, the Secretariat proposed an extension of one week to the asynchronous phase.

1.3 The CAR/SAM Regional Monitoring Agency (CARSAMMA) requested clarification regarding the proposed slot for the Points of Contact Manual Workshop. The Secretariat explained that this was a proposal for consideration of the Meeting.

1.4 CARSAMMA and the North American Approvals Registry and Monitoring Organization (NAARMO) requested that documentation from the virtual phase that could not be reviewed on time be discussed during the in-person phase.

1.5 The Agenda was approved, with an extension to the asynchronous phase and the flexibility to consider during the in-person phase any documentation not discussed virtually. Consequently, the schedule of the Meeting was also adjusted.

1.6 For future GTE Meetings, the Meeting suggested retaining the asynchronous phase and considering extending it to three weeks. It also requested that the Secretariat establish a permanent Microsoft Teams channel for the GTE.

Agenda Item 2 Review of the valid conclusions and recommendations of previous CARSAMMA and Scrutiny Group meetings

2.1 The Secretariat presented WP/02 for review of previous GTE meetings Conclusions/Decisions and recommendations. The Meeting reviewed each of the Conclusions and Decisions. The results of the review were as follows:

a. Conclusion GTE/18/2 was considered completed and integrated into the current procedures of the Points of Contact accredited to the CARSAMMA.
b. Conclusion GTE/22/03 was superseded by Conclusion GTE/24/05, which remains valid pending implementation of LHD events validation procedures by United States.
c. Decision GTE/25/01, for item a) the Rapporteur will present a working Paper to the GREPECAS/RASG-PA joint Meeting to update the results of the work into the risk associated with aircraft experiencing communication delays when entering a FIR, items b) and c) were considered completed and integrated to the Manual of Points of Contact accredited to the CARSAMMA.

d.

e. Conclusion GTE/25/02 was considered completed and reported to GREPECAS.

Agenda Item 3 Review of the Results of the Analysis of Large Height Deviations (LHDs) and of the Collision Risk Model (CRM)

Actions taken to improve data capture of LHD events and to improve Reduced Vertical Separation Minimum (RVSM) status capture by States of Registry or the Operator

3.1 Under this Agenda Item CARSAMMA presented IP/03 to examine the treatment of 439 reports submitted to CARSAMMA as potential LHD occurrences in 2025. The paper explains the supplementary administrative classifications applied to 182 reports, the resulting dataset of 257 validated occurrences, and the 69 additional code L records generated by CARSAMMA through RVSM approval-status checks. It also identifies issues concerning reporting timeliness, Points of Contact (PoC) filtering and the consistent treatment of reports during validation.

3.2 The primary factor explaining the discrepancy between the reports received and the validated occurrences was their submission beyond the established deadline: 115 reports were late. Also identified were reports that did not meet LHD criteria, events occurring outside RVSM airspace, and self-reports concerning occurrences already notified via another source. Consequently, the document highlights the importance of improving the timeliness, completeness, and quality of reports submitted by PoC, as well as maintaining consistent procedures for the validation and consolidation of data.

3.2.1 CARSAMMA will conduct an additional review of the 115 reports that were submitted late to verify the impact to the overall of the CAR/SAM RVSM safety assessment.

Results of the safety assessment project in RVSM airspace for the CAR and SAM Regions

3.3 IP/04 presents the operational safety assessment of the LHD occurrences validated by CARSAMMA for 2025, focusing on risk value, level of safety, occurrence categories and geographical distribution.

3.4 It is important to note that the risk value serves as an indicator for prioritizing analysis and should not be interpreted in isolation as a comprehensive assessment of operational risk. For this reason, CARSAMMA proposes examining the FIRs, occurrence categories, and positions associated with the highest individual values, while also encouraging the States involved to analyse recurring contributing factors and communicate the corresponding mitigation measures.

3.5 The Meeting requested that CARSAMMA provide a table containing the L-codes and the affected FIRs, for inclusion in the GTE's report to GREPECAS.

Trend identification

3.6 CARSAMMA presented IP/05 to review coordination-related LHD occurrences from 2023 to 2025, identifying persistent, increasing and emerging concentrations by FIR interface and transfer point. CARSAMMA also organized common indications identified in the 2025 reports into a taxonomy, to support targeted State investigation and mitigation.

3.7 The priority is to address recurring and increasing concentrations—specifically those involving Guayaquil–Bogotá, Curaçao–Barranquilla, La Paz–Córdoba, PUBUM, and OROSA.

3.8 Mitigation measures must be specific and verifiable. A generic recommendation to "provide training to personnel" is insufficient. States must provide evidence—such as AIDC/AMHS logs, transfer procedures, letters of agreement, contingency test results, and indicators of recurrence—as relevant to the specific mechanism under investigation.

3.9 The investigation should focus on operational barriers, procedures, and systems, rather than assigning individual responsibility based on regional data. The objective is not merely to identify where coordination failures recur, but to determine—through investigations conducted by the States—which barriers require correction and how the effectiveness of the implemented mitigation measures will be verified.

3.9.1 During the discussions, attention was also drawn to the significant decrease in LHD occurrences related to coordination failures from 528 in 2024 to 236 in 2025. The Secretariat and CARSAMMA noted that this decline should not necessarily be interpreted as an improvement in operational safety, as it may also reflect limitations in LHD occurrence reporting. In this connection, it was recalled that IP/03 identified 115 reports submitted after the established deadline, which were not included in the validated dataset. The importance of strengthening awareness campaigns and promoting compliance with reporting deadlines was therefore emphasized in order to improve the completeness and reliability of regional trend analyses.

LHD Event Management and Progress for LHD Reduction by CAR/SAM States

3.10 Jamaica presented WP/04, supported by P/01, to provide information about two LHD occurrences during 2025 with significant safety implications. In each occurrence, an arriving aircraft had been transferred to the Kingston ACC frequency while still within the Habana FIR. A trainee Area Controller subsequently issued descent before responsibility for control had transferred. In both cases, the descent created conflict with overflying traffic operating within Habana controlled airspace.

3.11 The principal safety lesson is that transfer of communication and transfer of control are separate processes. An aircraft may be on the receiving controller's frequency, displayed on surveillance and incorporated into the traffic plan while remaining under the control responsibility of the transferring unit. An aircraft being on the frequency of an ATC unit does not, by itself, mean that responsibility for control of the aircraft has transferred to that unit.

3.12 Recommended regional safety enhancements:

- States and ANSPs should consider incorporating the distinction between transfer of communication and transfer of control into competency-based training and assessment frameworks consistent with ICAO Doc 10056.
- Where early communication transfer forms part of normal operations, FIR-boundary scenarios should be incorporated into controller training and assessment using defined observable behaviours and performance criteria.
- ANSPs should consider appropriate OJTI safeguards for trainee operations near transfer of control points, including positive confirmation of aircraft control status before significant tactical intervention.
- Adjacent ATS units should review applicable Letters of Agreement to ensure that transfer of control and transfer-of-communication provisions, predetermined routing or level arrangements, restrictions on tactical changes and coordination requirements are clearly defined.
- States and ANSPs should identify similar FIR interfaces where communication routinely transfers before control and determine whether comparable vulnerabilities exist.
- Where technically feasible, ANSPs should consider system or HMI functionality that provides additional awareness of aircraft control status.
- LHD information should continue to be used proactively to identify recurrent event mechanisms and assess the effectiveness of corrective actions.
- These measures are intended for interfaces where communication routinely transfers before control or where recurring tactical requirements arise before transfer of control and should be adapted to the operational context concerned.

3.13 The Rapporteur commended Jamaica for this Paper and emphasized that the analysis provides and important lesson regarding the distinction between transfer of communications and transfer of control, particularly during FIR boundary transitions. The Rapporteur also recognized Jamaica for the timely corrective actions implemented, including the combination of strengthened training and revision of operational letters of agreement.

3.14 Based on the results of the discussion for this Working Paper, the following Draft Conclusion was approved:

<table>
<tr><td colspan="4">DRAFT CONCLUSION
GTE/26/01 IMPROVING COORDINATION PROCEDURES AT FIR INTERFACES</td></tr>
<tr><td colspan="3">What:

That, recognizing operational vulnerability associated with transfer of communication before transfer of control at FIR interfaces; States and ANSPs

a) analyse FIR interfaces and enhance operational procedures, including training and transfer arrangements, to emphasize the distinction between transfer of communication and transfer of controls and report it to GREPECAS/24; and

b) identify safety-related events involving the transfer of communications before the transfer of control; share related occurrences, lessons learned and safeguards; and continue using LHD information as a proactive safety management tool.</td><td>Expected impact:

☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:

To mitigate the LHD risk associated with transfer of communication before transfer of control</td></tr>
<tr><td>When:</td><td>Report to GREPECAS/24</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☐ ICAO ☒ Other:</td><td colspan="2">ANSPs</td></tr>
</table>

3.15 IP02, supported by P/02, presented Trinidad and Tobago's analysis of LHDs attributable to Piarco ACC from January 2009 to July 2026 and outlined strategic measures implemented to reduce such occurrences. The analysis of the data collected by the Air Traffic Service Provider (ATSP) showed a long-term downward trend in LHD events despite a temporary increase between 2023 and 2025. Notably, attributable LHD occurrences reported by Piarco ACC decreased from five during January to July 2025, to one during the corresponding period in 2026.

3.16 This positive trend suggests that the mitigation measures implemented have been effective in reducing the occurrence of attributable LHD events. These measures include ANSP certification, strengthened collaboration among ATS, AIM and CNS departments, enhanced coordination with airlines and neighbouring ATSPs, reinforcement of Standard Operating Procedures (SOPs), continued implementation of voluntary reporting systems, safety bulletins, staff support programmes, and lessons-learned debriefings and, increased operational staffing through competency-based programmes.

3.17 The IP also highlighted the implementation of ATS Interfacility Data Communication (AIDC) between Piarco ACC and New York Air Route Traffic Control Centre (ARTCC), with further AIDC integration planned with San Juan Combined Control Facility (CCF), and other interested neighbouring ATSPs, which is expected to improve coordination accuracy and reduce future LHDs. Trinidad and Tobago's ANSP reaffirms its commitment to continuous safety improvement, strict procedural compliance, effective communication, and comprehensive reporting to further reduce LHD occurrences and maintain safe and efficient ATS."

3.18 United States presented IP/08 to inform the Meeting about the development of a standard operating procedure (SOP) for the reporting of LHDs for its FAA ATC units.

3.19 In response to Conclusions GTE/24-05 and GTE/22-03, United States is developing a SOP for all US ATC units with international boundaries. The objective of this SOP is to support mitigation efforts to reduce the number of ATC coordination events involving adjacent non-US ATC Units. The SOP strategy is to ensure awareness, validation, and monitoring of occurrences from all impacted ATC Units, including those within the ICAO CAR Region. When ATC coordination events occur, information collected from all ATC Units will help to identify causal factors and trends for the individual ATC units as well as the region, to support development of effective mitigations and prevention of future occurrences.

3.20 The development of the SOP is being modelled from best practices utilized by the San Juan Combined Control Facility (CCF). The objectives are to enhance standardization of procedures for reporting LHDs and applicable occurrences to other ATC units and RMAs, and, to promote coordination, information exchange, and timely investigation of LHDs and applicable occurrences with the goal of identifying mitigations, reducing the number of occurrences and increasing safety.

3.21 Some key features of the planned SOP are:

- Each US FAA ATC Unit will have a designated point of contact (POC) for reporting and receiving LHD occurrence reports from adjacent international ATS Units.

- The SOP will specify that the POC collect information to support a thorough event investigation and will be shared with the adjacent ATC unit when a coordination error occurs.

3.22 It was further noted that an initial draft of the SOP had been developed and distributed for internal FAA review; however, progress had been affected by organizational restructuring and competing priorities. United States indicated that coordination regarding the review and implementation of the SOP would continue and that further progress updates would be provided to the GTE.

3.23 The Meeting also acknowledged the valuable contributions provided by the San Juan CCF/ZSU member and presenter of IP/08, particularly the technical expertise, operational experience, and insights shared regarding ATC coordination, LHD reporting, and the development of mitigation measures. The Meeting recognized that such contributions are important in supporting meaningful discussions, strengthening regional coordination, and advancing ongoing efforts to improve operational safety. In this regard, the Meeting recognized the value of continued technical contributions of this nature in future GTE

meetings, particularly in supporting the Group's discussions, facilitating regional coordination, and advancing ongoing aviation safety initiatives.

3.24 Guyana presented IP/09, supported by P/05 to report on LHD mitigation within the Georgetown FIR from 2024 to date. Guyana has provided Area Control – Surveillance service in the Georgetown FIR using Automatic Dependent Surveillance–Broadcast (ADS-B) since 2015. Coordination with the adjacent FIRs (Piarco, Maiquetía, Amazónica, and Paramaribo) remains procedural. Only two isolated LHD occurrences were recorded from 2024 onward — one each in 2024 and one in 2025 — indicating a sustained downward trend and performance below the regional Target Level of Safety.

3.25 Georgetown ACC has introduced two key mitigation measures. First, trials and continued development of an electronic coordination log to replace paper record, improve situational awareness, reduce transcription errors and delays, and identify potential conflicts earlier. Second, an automated surveillance-label alert compares actual, cleared, and coordinated flight levels. Where values differ, the display highlights the discrepancy in amber, prompting controllers to reconcile the aircraft profile or update coordination before transfer. These measures provide layered protection against transfer of control errors and reinforce the Georgetown FIR's low-risk profile.

Flight plan audit report

3.26 CARSAMMA presented WP/05 to provide an overview of the non-approved operators that have used RVSM airspace monitored by CARSAMMA in the Caribbean and South America, based on traffic samples from March to December 2025. RVSM approval records up to August 2026 were used for the evaluation.

3.27 The primary objective of WP/05 is to improve the verification of RVSM approvals and prevent these operations from being excluded from the regional safety assessment. In 2025, a preliminary analysis of 584,757 operations was conducted, identifying 249 registrations listed as unapproved in the CARSAMMA database—primarily from Argentina and Brazil. It is important to clarify that this does not necessarily mean these aircraft lack valid State approval. Therefore, we request that States verify the status of the identified registrations.

3.28 The Paper identifies the lack of communication from Civil Aviation Authorities (CAAs) following the initial analysis phase as the main issue in the verification process. Furthermore, since the Altimetry System Error (ASE) value for these aircraft is unknown, it is impossible to calculate their technical risk using available data. Consequently, the document highlights the importance of considering operational risk through Category L LHD records.

3.29 The Rapporteur thanked CARSAMMA for the work presented in this Paper, as a key input for the work of the GTE and the Regional safety monitoring, and suggested to analyse the FIRs that exceeded the TLS in 2025 and which of them were affected by registration with no RVSM approvals.

3.30 NAARMO raised comments on the approach presented in WP/05 and WP/06 about the Non-Approved RVSM aircraft. NAARMO explained the difference between Operational and technical risk, the unapproved aircraft scenario (if an aircraft without RVSM approval falsely files a "W" in item 10 of the flight plan) and provided guidance on how collision mode should handle this situation. NAARMO offered additional information to be brought during the GTE week.

3.31 With WP/11 the Meeting was informed of the results of the RVSM traffic compliance monitoring conducted by NAARMO using December 2025 Traffic Sample Data (TSD) and the September 2026 Combined Approvals snapshot to identify aircraft potentially operating without valid RVSM approvals.

3.32 The analysis covered 918,132 operations within the Contiguous United States (CONUS), 21,077 operations within New York West oceanic airspace, and 121,308 operations within Canadian airspace, identifying 70 civilian aircraft, 13 civilian aircraft, and 6 civilian aircraft, respectively, for which valid RVSM approvals could not be verified following the initial assessment.

3.33 The Meeting noted that Mexico did not provide the requested TSD, limiting the assessment of RVSM compliance within its airspace. It was further highlighted that delays in State notification of RVSM approval information to the appropriate Regional Monitoring Agencies (RMAs) remain a primary contributing factor to discrepancies identified during the verification process. NAARMO indicated that the responsible States and RMAs had been notified of the identified aircraft and that feedback received had been incorporated into the assessment.

3.34 The Meeting was invited to recognize the importance of the consistent and timely provision of TSD and updated RVSM approval records by States to support effective traffic scrutiny, identification of potentially non-approved operations, and continued safety oversight of RVSM airspace.

3.35 Following the presentation of this working paper, the following Mexican-registered aircraft may be removed from the list of aircraft identified as not having RVSM approval: XA-AAL, XA-IZA, XA-MRX, XB-VIP, and XA-JOC.

Presentation of CRM 2025 and an analysis of the causes that contribute to these risks in FIRs that had a value above the Collision Risk Assessment (CRA) TLS

3.36 With WP/06rev CARSAMMA presented the quantitative assessment of the Estimated Collision Risk (CRE) for the year 2025. Similarly, contributing factors in FIRs whose values exceeded the TLS in the Estimated CRE are analysed.

3.37 CARSAMMA systematically monitors 34 FIRsin the CAR/SAM regions. For statistical modelling purposes, each FIR is treated individually as an independent stochastic subsystem. The determination of the frequency of passage and the representative dynamic and physical parameters was based on sampling the air traffic data collected between 1 to 31 December 2025, covering 31 active FIRs.

3.38 The processed volume totalled 10,184,412 flight hours and 354,030 trajectory records (flight lines). The spatial distribution of the recorded sample was:

- CAR Region: 2,275,672 flight hours (22.34% of total volume).
- SAM Region: 7,908,739 flight hours (77.66% of total volume).

3.39 It is important to highlight that CARSAMMA did not receive traffic movement data for December 2025 from the Cayenne (SOOO), Paramaribo (SMPM), and Lima (SPIM) FIRs. Consequently, these movements were excluded from the vertical collision risk assessment. The lack of data extends

beyond December 2025. The most recent data received for each FIR dates back significantly: Lima (SPIM) December 2024, Paramaribo (SMPM) December 2022, Cayenne (SOOO) December 2020.

Conclusions on the Estimation of the risk of vertical collision (CRE)

3.40 Although the CAR/SAM Regions had an estimated risk of 0.7834 E-09 below the global threshold value of 5.0 E-09, the FIRs of Port-au-Prince, Asunción, La Paz, Curaçao and Guayaquil recorded individual risk indices above the TLS. The main factors identified are aircraft without RVSM approval, tactical proximity between aircraft and severity and duration of LHD events.

3.41 Dominican Republic suggested that the variables for the CRM calculation should be presented for each FIR above the TLS, to target identified weaknesses and integrate risk mitigation measures.

3.42 The Rapporteur reminded that since GTE/23 it's been recognized the importance of the identification and sharing of factors that negatively affect the CRM calculation, particularly for FIRs exceeding the TLS. This information must serve as basis to define mitigating measures and follow-up. The Rapporteur kindly asked for the information on the factors that contributed to the 5 FIRs that lead to exceed the TLS in 2025 and that this information allow to guide corresponding mitigation actions.

3.43 NAARMO reminded their comments for WP/05 were applicable to WP/06.

3.44 Based on the comments and actions required for WPs 05 and 06, the following Draft Decision was approved:

<table>
<tr><td colspan="2">DRAFT DECISION
GTE/26/ 01 SUPPORT TO THE REGIONAL MONITORING AGENCIES DATA COLLECTION</td></tr>
<tr><td>What:

That, to allow compliance with the activities of the Regional Monitoring Agencies, the GTE Rapporteur report to GREPECAS/24:

i. the status of States' compliance with the requirement to report the RVSM approval of aircraft registered under their authority to the Regional Monitoring Agencies.
ii. The Flight Information Regions (FIR) that do not provide traffic movement data to the Regional Monitoring Agencies.
iii. The Flight Information Regions that exceeded the TLS in 2025, requesting to implement mitigation measures addressing their primary safety issues.</td><td>Expected impact:

☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="2">Why:

To support the RVSM monitoring in the CAR/SAM Regions</td></tr>
</table>

When:	Report to GREPECAS/24	**Status:**	☒ Valid / ☐ Superseded / ☐ Completed
Who:	☐ States ☐ ICAO ☒ Other:	GTE Rapporteur	

3.45 WP/09, supported by P/03, presents NAARMO's 2025 vertical safety assessment of Mexico RVSM airspace, using traffic data and LHD reports. Of the 34 reported LHDs, nine were identified as risk-bearing. ATC coordination errors and communication failures both decreased compared to 2024.

3.46 The estimated vertical collision risk was 2.48×10^{-9} fatal accidents per flight hour, down from 3.05×10^{-9} in 2024 and below ICAO's TLS of 5.0×10^{-9}. Overall, Mexico RVSM airspace continues to meet established vertical safety requirements.

3.47 WP/10, supported by P/04, presents NAARMO's 2025 vertical safety assessment for Caribbean airspace, including Mexico, Miami Oceanic, San Juan, New York West, and Houston Oceanic FIRs. Of the 180 reported occurrences, 57 were validated as Large Height Deviations (LHDs), accounting for 29 minutes at incorrect flight levels.

3.48 The estimated overall vertical collision risk was 3.957×10^{-9} fatal accidents per flight hour, below the ICAO TLS of 5.0×10^{-9}. This represents an improvement over previous years. The results demonstrate that RVSM operations within the monitored Caribbean airspace continue to meet the established safety target. Coordination errors remain the largest contributor to operational vertical risk, highlighting the importance of continued monitoring, sharing and collaboration among ATC facilities.

Agenda Item 4 Activities and Tasks to be Reported to GREPECAS

Review of tasks to be reported to GREPECAS

4.1 The GTE Rapporteur presented WP/08 to update the status of the GTE Points of Contact Manual.

4.2 In 2023, an Ad hoc Group of the GTE began the process of updating the Points of Contact Guide Manual. The developed version was approved by GTE/24 and subsequently presented to GREPECAS/22. During GTE/25, the Secretariat presented IP/11, in which the conclusions related to the process of updating the Manual were presented, including the conclusions of the ADHOC Group and the recommendations of GREPECAS/22.

4.3 Based on this information, the GTE/25 considered it convenient to return to the version of the Manual approved at the GTE/24, as it contained the changes agreed upon by the GTE and maintained the traceability of the process, and to request its presentation again to GREPECAS/23 for its consideration and approval, reporting the modifications subsequently incorporated to GREPECAS/22.

4.4 The Meeting noted the status of the POC Manual and agreed to discuss and resolve any issues to reach consensus on the necessary updates.

4.5 The manual provides procedural guidance for CAR/SAM State POCs accredited to CARSAMMA, including the completion and submission of required forms and the analysis and validation of LHDs. The manual also included the Terms of Reference (TORs) for the GTE and CARSAMMA. The Meeting determined that their status and content were inappropriate for the manual because the TORs were already included in the GREPECAS Procedural Handbook. It therefore agreed to remove them and replace them with a reference to the Handbook.

4.6 To accurately reflect the activities currently conducted by the GTE and the RMAs, the Meeting agreed to the following recommendations to update the GREPECAS Procedural Handbook:

- For Appendix B:
-
    - Reflect the role and contribution of NAARMO to the CAR Region Monitoring Process.
    - Specify functions conducted by CARSAMMA and NAARMO.
    - Reflect CAR/SAM Territories and NAARMO in the composition of the GTE.

- For Section 4, to clarify the Rapporteur election process:
-
    - Nomination and Election of the GTE Rapporteur
        A. The GTE Rapporteur shall be elected for a term of three years and may be re-elected only once.
        B. Candidates shall be nominated prior to the GTE meeting at which the election is scheduled to take place. Candidates shall be active participants in the GTE and possess the experience and qualifications necessary to fulfil the responsibilities of the position.
        C. The election shall be conducted during a regular GTE meeting, in accordance with the applicable GREPECAS procedures and in coordination with the ICAO Secretariat.
        D. The elected Rapporteur shall assume duties at the conclusion of the meeting at which the election takes place. The election outcome shall be recorded in the meeting report.

4.7 Following a comprehensive review, the Meeting agreed on the changes needed to proceed with the amendment of the Manual's Second Edition. The revised Manual is included in **Appendix B** to this Summary of Discussions.

4.8 Based on the comments and discussions on this Agenda Item, the Meeting agreed the following Draft Conclusion:

<table>
<tr><td colspan="2">DRAFT CONCLUSION GTE/26/02</td><td colspan="2">UPDATE TO THE GUIDANCE MANUAL POC ACCREDITED TO THE CARSAMMA</td></tr>
<tr><td colspan="3">What:

That, to strengthen contributions of CARSAMMA Points of Contact and to ensure compliance with GREPECAS requirements.
a) the Third Edition of the GUIDANCE MANUAL POC ACCREDITED TO THE CARSAMMA included in Appendix B is approved; and

b) the Rapporteur submit GREPECAS/24 the recommendations included under Section 4.6 to update to the GREPECAS Procedural Handbook.</td><td>Expected impact:

☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:

To accurately reflect the functions and responsibilities to comply with the RVSM Monitoring Function in the CAR/SAM Regions</td></tr>
<tr><td>When:</td><td colspan="2">A) Immediate
B) Report to GREPECAS/24</td><td>Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td colspan="2">☐ States ☐ ICAO ☒ Other:</td><td>GTE and GTE Rapporteur</td></tr>
</table>

Cooperation GTE/Regional Aviation Safety Team-Pan America (PA-RAST)

4.9 RASG-PA Secretariat presented WP/07 to report the status of the collaborative work between the GTE and the Pan America Regional Aviation Safety Team (PA-RAST) of the Regional Aviation Safety Group – Pan America (RASG-PA). Both groups work jointly, under agreed ToRs, on the monitoring and mitigation of occurrences in RVSM airspace. It also sets out the importance of the joint work for developing safety risk mitigation measures for mid-air collision, and the contribution of the RMAs on which the work depends.

4.10 RASG-PA Safety Advisory RSA-13, Large Height Deviations in RVSM Airspace, was issued in February 2026 as a product of this collaboration. The advisory draws on the finding at GTE/25 of an increase, compared with the previous year, in FIRs nearing or exceeding the ICAO TLS. Its recommendations to oversight bodies include the use of ICAO platforms, among them GREPECAS and the RASG-PA, to share lessons learned and harmonize mitigation strategies.

4.11 The LHD information is analysed together with aggregate, de-identified TCAS RA information, consistent with the ToR, to identify patterns and hotspots. For the purposes of the joint work, initial results indicate that LHD information alone is not exhaustive; LHD and TCAS RA information are complementary components of the analysis. Where TCAS-RA hotspots coincide with LHD hotspots, they aid in further characterization of the risk from the perspective of the flight crew. Where they do not coincide, the analysis seeks to determine whether this reflects an unreported LHD, a resolution advisory not notified to the FIR concerned, or a TCAS RA without an associated LHD, as the basis for subsequent mitigation.

4.12 A further RASG-PA Safety Advisory, addressing unauthorized RVSM operations and the strengthening of equipage compliance and reporting, is under development.

4.13 Events in which aircraft operating in RVSM airspace transit FIRs without establishing contact with the air traffic services unit concerned fall within the scope of the joint work. GTE and PA-RAST are working to further validate and characterize this issue.

4.14 The Rapporteur highlighted the positive results of the collaboration between the PA-RAST and the GTE, allowing the advance in the analysis of LHD and TCAS-RA information, as well as the identification of contributing factors and the development of mitigation measures to reduce risk of mid-air collision in RVSM airspace. The Rapporteur thanked CARSAMMA and NAARMO for their collaboration in providing LHD information to support this joint work.

4.15 To support the continuation of the joint work between the GTE and PA-RAST, the following Draft Conclusion was approved:

DRAFT CONCLUSION GTE/26/03	**ENHANCE DATA SHARING BETWEEN THE GTE AND PA-RAST**
What: That to improve the analysis of LHD and TCAS-RA events, the GTE: a) continue supporting joint efforts between the GREPECAS/GTE and the RASG-PA/PA-RAST; b) request GREPECAS endorsement of LHD data sharing between the Regional Monitoring Agencies (CARSAMMA and NAARMO) and PA-RAST, with multiyear data provided in an agreed format and updated annually to GREPECAS-RASG-PA/6; and c) Invite CARSAMMA and NAARMO to attend regular meetings of the GTE/PA-RAST Midair Collision (MAC) Team.	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Operational/Technical

Why:			
To support the implementation of regional safety enhancements to reduce identified risks			
When:	Report to GREPECAS–RASG-PA/6	**Status:**	☒ Valid / ☐ Superseded / ☐ Completed
Who:	☒ States ☐ ICAO ☒ Other:	CARSAMMA and NAARMO	

Agenda Item 5 Other Business

5.1 NAARMO presented IP/06 to inform the results of the Altimetry System Error (ASE) monitoring activities conducted during the period from 1 August 2025 to 31 July 2026. The analysis identified 31 aircraft exhibiting large ASE values, of which 15 remained under evaluation.

5.2 NAARMO explained that daily monitoring of aircraft using ADS-B data enables the identification of abnormal height-keeping performance and the detection of potential safety concerns within RVSM airspace. Aircraft exhibiting ASE values of ±245 feet or greater are subject to additional surveillance and evaluation, with Altimetry System Error Reports (ASE-Rs) issued when further action is warranted to notify the responsible States, operators, and RMAs.

5.3 The Meeting was further informed of NAARMO's procedures for coordinating with State authorities and aircraft operators to investigate significant ASE events, implement corrective actions, and verify satisfactory height-keeping performance through subsequent monitoring. The results indicated that 30 of the 31 cases involved general aviation aircraft, including seven events with ASE values of 500 feet or greater. Examples presented demonstrated that significant ASE events were frequently associated with defects in pitot-static systems, air-data sensors, and other aircraft components affecting altitude measurement. The importance of continued ADS-B monitoring, timely corrective action, and effective coordination between RMAs, States, and operators was highlighted as essential to identifying and addressing large ASE events and maintaining the safety of RVSM operations.

5.4 With IP/07 the Meeting was informed of the results of the Long-Term Height Monitoring (LTHM) burden assessment conducted by the NAARMO, using RVSM approval records as of March 2026 and monitoring data covering the preceding two years.

5.5 The assessment identified 25,158 aircraft with valid RVSM approvals, resulting in a monitoring burden of 13,461 aircraft, of which 660 aircraft (approximately 5% of the monitoring burden) had not been successfully monitored within the previous two years. Of these, 612 aircraft were registered in United States and 48 in Canada, with the outstanding monitoring population concentrated primarily within the International General Aviation (IGA) category, particularly among U.S.-registered aircraft.

5.6 The Meeting was further informed that Mexico was excluded from the assessment due to incomplete RVSM approval information and the limited number of approval records received from the Federal Civil Aviation Agency (AFAC). NAARMO indicated that the responsible States had been notified of the aircraft requiring monitoring. The information presented highlighted the importance of maintaining accurate and complete RVSM approval records, ensuring compliance with ICAO Annex 6 LTHM requirements, and strengthening coordination between States, operators, and RMAs to address outstanding monitoring requirements and support continued RVSM safety oversight.

Agenda Item 6 Preliminary results of the virtual phase GTE/26

6.1 The Meeting reviewed the preliminary results of the virtual phase, which are reflected in this Summary of Discussions.

Agenda Item 7 Review of the GTE Work Programme

7.1 The Meeting established a working group comprising Argentina, the Dominican Republic, CARSAMMA, NAARMO and the Rapporteur to update the GTE work programme. Coordinated by the Secretariat, the group will work virtually and submit its results by 30 March 2027.

<table>
<tr><td colspan="2">DECISION GTE/26/02</td><td colspan="2">AD HOC GROUP FOR THE REVIEW OF THE GTE WORK PROGRAMME</td></tr>
<tr><td colspan="2">What:

That, to ensure that GTE activities meet expectations arising from the GREPECAS work programme and the latter be promptly updated to address emerging needs,anAd hoc Group comprising Argentina, Dominican Republic, CARSAMMA, NAARMO and the Rapporteur is established to update the GTE work programme, thatwill work virtually under the Secretariat coordination and submit its results by 30 March 2027.</td><td colspan="2">Expected impact:

☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:

To review and update the GTE Work Programme</td></tr>
<tr><td>When:</td><td>by 30 March 2027</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☐ ICAO ☒ Other:</td><td colspan="2">Adhoc group</td></tr>
</table>

Agenda Item 8 Any other business Ya existe el Agenda Item 5, es repetido

8.1 No other business was discussed.

Agenda Item 9 Draft Conclusions and Decisions GTE/26

9.1 The Draft Conclusions and Decisions of the GTE/26 are included under Section ii.9.

— — — — — —— —— ——

Twenty-Sixth Scrutiny Working Group Meeting (GTE/26)
of the CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Vigésimo Sexta Reunión del Grupo de Trabajo de Escrutinio (GTE/26)
del Grupo Regional de Planificación y Ejecución CAR/SAM (GREPECAS)
(GTE/26)

Mexico City, Mexico, 12 to 16 October 2026 / Ciudad de México, México, 12 al 16 de octubre de 2026

APPENDIX/APÉNDICE A

LIST OF PARTICIPANTS / LISTA DE PARTICIPANTES

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2. Hernan Burguener

BOLIVIA

3. Franklin Rosas Carvajal (v)

BRAZIL / BRASIL

4. Renata Aguiar de Souza Gonçalves (v)
5. Ingrid Fontoura Brandão (v)
6. Charlene Roberta da Silva Moreira Aieta
7. Luiz Henrique Barreto De Moura Costa Freitas (v)
8. Reinaldo Taveira (v)
9. Ricardo D. Rocha (v)
10. Virginia Mignoni (v)

COLOMBIA

11. Diana María Luque Salcedo
12. Nelson Armando Higuera Nieto

CUBA

13. Roxana Bernal Carbonell (v)
14. Arian Florencio Noda Jiménez

CURACAO/CURAZAO

15. Danny-Dean Marten

DOMINICAN REPUBLIC / REPÚBLICA DOMINICANA

16. Luis Emilio Cabral Rivera
17. Francis Pavel Vásquez del Pozo

GUYANA

18. David Javed Low
19. Romel Leonardo Hiralal

HAITI / HAITÍ

20. Abdon Frantz Junior (v)

HONDURAS

21. Consuelo Yalena Bonilla Mejia

JAMAICA

22. Yannick Francis
23. Omar Edwards

MEXICO / MÉXICO

24. Luis Fernando Sosa Mariz
25. Andrés Román Araujo
26. Leobardo David Alvarez
27. Ulises Reyes Zamora
28. Fernando González Millán
29. Francisco Javier Yañez León
30. Oswaldo Alexis Ceja Zepeda

31. Miriam Edith Hernández Pérez
32. Juan Carlos Ramos Soto
33. Sofia Manzo (v)

PARAGUAY

34. Delia Cristina Gimenez Aranda
35. Débora Ferreira Cañete
36. Aníbal Andrés González Diaz

TRINIDAD AND TOBAGO / TRINIDAD Y TABAGO

37. Anton Ramdass (v)
38. Ian Gómez (v)

UNITED STATES / ESTADOS UNIDOS

39. José Pérez
40. Jennifer LeBlanc
41. Christine Falk (v)

VENEZUELA

42. Daniel Mazzei

COCESNA

43. Henry Reyes Alfaro
44. Pablo Luna

ICAO / OACI

45. Eddian Méndez
46. Fernando Hermoza (v)
47. Angel Luna

GUIDANCE MANUAL FOR POINTS OF CONTACT (PoCs) ACCREDITED TO THE CARSAMMA

~~Second~~ Third Edition - ~~2021~~2026

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AMENDMENTS

The new amendments to this manual are regularly announced by the Monitoring Agency for the CAR/SAM Regions (CARSAMMA) and the Scrutiny Working Group (GTE) and are available on the CARSAMMA electronic portal so that users can perform the necessary consultations. The space below has been established to keep a record of such amendments.

Record of Amendments and Corrections

Amendments				Corrections			
No.	**Applicability Date**	**Input date**	**Introduced by**	**No.**	**Date of Emmision**	**Input Date**	**Introduced by**
1	**29/10/2021**	**29/10/2021**	**Secretariat**				
	16/10/2026	**Pending**	**Secretariat**				

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Chapter 1

INTRODUCTION

1.1 Background

1.1.1 In 1982, coordinated by ICAO's Review of the General Concept of Separation Panel (RGCSP), some countries initiated programs to comprehensively study the issue of vertical separation minimum (VSM) reduction above FL290. In December 1988, the results of these studies were considered by the RGCSP at its sixth meeting (RGCSP/6). After exhaustive studies using quantitative risk assessment methods to support operational decisions regarding the feasibility of reducing the VSM, the level of risk considered acceptable was named the Target Level of Safety (TLS). At the seventh meeting of the RGCSP in November 1990, the Panel concluded the global guidance material for the implementation of RVSM.

1.1.2 The main objective of the document "Manual on a 300 m (1,000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive" of ICAO (Doc 9574) is to provide the criteria, requirements and methodology for the Regional Planning Group (RPG) planning groups for the development of documents, procedures and programs to facilitate the introduction of RVSM in their regions.

1.1.3 CARSAMMA was established by the GREPECAS/10 meeting held in Manaus, Brazil, in 2002. Brazil assumed responsibility for providing the resources necessary for the agency's operation. The agency is tasked with overseeing RVSM airspace within the CAR/SAM regions and maintaining a database of aircraft certified for RVSM/PBCS by the civil aviation authorities of the States in both regions. Located in Rio de Janeiro, the agency's scope covers 34 Flight Information Regions (FIRs) across the Caribbean and South American regions—as detailed in Table (1)—encompassing all FIRs in the SAM Region and a portion of the CAR Region. In the CAR Region the FIRs of Mexico, Mazatlán Oceanic, Houston, Houston Oceanic, Miami, Miami Oceanic, Nassau, New York West, and San Juan are excluded.~~CARSAMMA was established by the 10th meeting of GREPECAS held in Manaus in 2002. Brazil assumed the responsibility of providing the means for the functioning of the Agency monitoring the CAR/SAM Regions RVSM airspace and as a repository of a data base of RVSM/PBN certified aircraft by the civil aviation authorities of the States of the regions. This Agency is located in Rio de Janeiro, having as its scope, the whole region of the Caribbean and South America, which comprises a total of 34 FIRs, including 21 States, with the exception of Mexico.~~

1.1.4 Derived from the CARSAMMA assignments, there is a need for collection of data for the study of the level of risk of the airspace under its jurisdiction. The level of risk considered acceptable was named "Target Level of Safety" (TLS), which is expressed as 5 x 10-9 fatal accidents per flight hour in the RVSM airspace.

1.1.5 Starting from GTE 11, and derived from the assignments to CARSAMMA, an evaluation methodology of the LHD is applied with the SMS methodology. At first, the established "risk value (VR)" was a degree of 25 points, but after GTE 12 this risk value was changed to a degree of 20 points.

1.2 Purpose of the Manual

1.2.1 Establish the procedures to be applied by the Points of Contact (PoCs) of the CAR/SAM States, responsible for coordinating the filling of the forms used by CARSAMMA for RVSM airspace monitoring, as well as providing guidance to CAAs in order to fill and send the forms related to the "status" of RVSM

approval of aircraft to CARSAMMA. This manual also serves as a guide for the PoCs for the analysis of the LHD events and their validation.

1.3 Scope

1.3.1 The procedures of this Manual are applied to the PoCs of air navigation service providers and Civil Aviation Authorities Members of GREPECAS that coordinate with CARSAMMA

RMA	REGION	STATE/TERRITORY	FIR
CARSAMMA	CAR	Belize	
		Costa Rica	
		El Salvador	
		Guatemala	Central America (CENAMER)
		Honduras	
		Nicaragua	
		Curacao	Curacao
		Cuba	Habana
		Jamaica	Kingston
		Antigua and Barbuda	
		Barbados	
		Dominica	
		France	
		Grenada	Piarco
		Saint Lucia	
		Saint Kitts and Nevis	
		Saint Vincent and the Grenadines	
		Trinidad and Tobago	
		Haiti	Port-Au-Prince
		República Dominicana	Santo Domingo
	SAM	Argentina	Cordoba
			Ezeiza
			Mendoza
			Resistencia
			Comodoro
		Bolivia	La Paz
		Brazil	Atlantico
			Amazonica
			Brasilia
			Curitiba
			Recife
		Chile	Punta Arenas
			Santiago
			Antofagasta
			Pascua
			Puerto Montt
		Colombia	Barranquilla
			Bogotá
		Ecuador	Guayaquil
		Guyana	Georgetown
		France	Cayena
		Panama	Panamá
		Paraguay	Asunción
		Perú	Lima
		Surinam	Paramaribo
		Uruguay	Montevideo
		Venezuela	Maiquetia

Table 1. Flight Information Regions accredited to the CARSAMMA

1.4 List of Acronyms

ACC Area Control Centre
ANSP Air Navigation Service Provider
ATC Air Traffic Control

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ATCO	Air Traffic Controller
CAA	Civil Aviation Authority
CARSAMMA	Caribbean and South America Monitoring Agency
CRM	Collision Risk Model
FIR	Flight Information Region
FL	Flight Level
GREPECAS	CAR/SAM Regional Planning and Implementation Group
GTE	Scrutiny Working Group
ICAO	International Civil Aviation Organization
IMC	Instrument Meteorological Conditions
LHD	Large Height Deviation
LoS	Operational Level of Safety
PoC	Point of Contact
RGCSP	Review of the General Concept of Separation Panel
RPG	Regional Planning Group
RVSM	Reduced Vertical Separation Minimum
SMS	Safety Management System
TCAS	Traffic alert and collision avoidance system
TCP	Transfer Control Point
TELECON	Teleconferences
TLS	Target Level of Safety
ToRs	Terms of Reference
VMC	Visual Meteorological Conditions
VR	Risk Value

Chapter 2

Guidance for Points of Contact (PoCs) Accredited to CARSAMMA.

2.1 Filling and Submission of Forms

2.1.1 Air Navigation Service Providers (ANSP) that provide services in the RVSM airspace must report the occurrences related to the LHDs and aircraft movements, since this information serves as the main component for the risk assessment carried out by CARSAMMA. The RVSM w/PBCS operational approvals issued by the CAAs have the same importance value since they help to keep the CARSAMMA database updated.

2.1.2 The guidelines for these documents are contained within the forms used by CARSAMMA. In Appendix H and I we can observe the flow process for the management of LHDs and Collision Risk Calculation and RVSM Operational Approval w/PBCS Record.

2.1.3 State regulators (or safety oversight inspectors) responsible for overseeing safety within the Flight Information Regions (FIRs) falling under the scope of CARSAMMA should ensure that their Air Navigation Service Providers (ANSPs) coordinate with CARSAMMA regarding LHD-related occurrences, aircraft movements, and any other information necessary for CARSAMMA to carry out its functions.

2.2 Used forms

2.2.1 The forms are the tools used by CARSAMMA and its Focal Points to exchange data and generate the results for RVSM airspace monitoring. The forms are available on the CARSAMMA website.

2.2.2 In order to carry out the tasks efficiently, it is necessary for the Focal Points to fill in the Forms, in the appendices, as accurately as possible, following the guidelines of the models presented.

Data Collection Form (F0)

2.2.3 To analyze the air traffic data in the determination of the parameters of the Vertical Collision Risk Model (CRM), ANSPs responsible for the upper airspace will email to CARSAMMA, via e-mail carsamma@cgna.decea.mil.br, the information from December 1 to 31 for each year of the movement of aircraft that occurred in its FIR using the form in Appendix A. CARSAMMA will request this form in coordination with the GTE and the ICAO NACC and SAM Regional Offices.

Note. – In cases where the volume of data to be sent exceeds the attachment capacity of email, CARSAMMA will provide alternative mechanisms for receiving the required information.

2.2.4 The period that will be published will always coincide with the movement of the month of December. The ANSPs, responsible for the upper airspace, must send the extracts of the air Movement to CARSAMMA before February 15 of the following year. If necessary, CARSAMMA may request the air movement in another period, prior coordination with points of contact of the CAR / SAM States.

CAR/SAM Regions Points of Contact Form (F1)

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2.2.5 States will notify CARSAMMA, with copy to the ICAO Regional Office to which is accredited to, the information regarding the Points of Contact (PoCs) of the CAR/SAM Regions using the form in Appendix B, by sending it to CARSAMMA via the email carsamma@cgna.decea.mil.br.

RVSM Operation Approval Registry Form (w/PBCS) (F2).

2.2.6 In order to maintain a registry of the RVSM operational approval w/PBCS of the aircraft operating in the RVSM airspace of the CAR/SAM Regions, it is necessary that CARSAMMA receive, from the CAA certifying the aircraft, the information from Form F2 of Appendix C. The F2 must be sent by the CAA within 5 days after issuing it, sending it to CARSAMMA via e-mail carsamma@cgna.decea.mil.br, in order to maintain the database of RVSM approved aircraft w/PBCS updated.

Cancelation of the RVSM Operation Approval Form (w/PBCS) (F3)

2.2.7 CAAs shall send to CARSAMMA information in form F3 from Appendix D, in the case of cancelling the RVSM operational approval w/PBCS, of the aircraft they certify. The submission of the F3 Form from the CAA must be done within the 5 following days after issuing the cancelation of the approval, sending it to CARSAMMA via the email carsamma@cgna.decea.mil.br, in order to maintain updated the data database of RVSM w/PBCS approved aircraft.

LHD Form (F4)

2.2.8 During day-to-day operations in the RVSM airspace, ANSPs shall report LHDs of 300 feet or more, in relation to the aircraft's cleared flight level. For the registration of these occurrences, the LHD Form from Appendix E shall be used Appendix E and emailed to CARSAMMA via carsamma@cgna.decea.mil.br.

2.2.9 LHD Forms shall be sent to CARSAMMA before the 15th day of the following month of the reported period.

Flight Plan Data Form for RVSM audit (F5)

2.2.10 CARSAMMA compares between the list of aircraft operating in RVSM airspace in the CAR/SAM Regions and the database of approved aircraft in all Regional Monitoring Agencies (RMA), for this purpose, Form 5 FLIGHT PLAN DATA FOR RVSM AUDIT is established, Appendix F. The data submitted must contain the complete flight plan message, as detailed in Appendix 2 of Doc 4444 and Appendix F, sending it to CARSAMMA via the e-mail carsamma@cgna.decea.mil.br.

The data of the flight plans of the aircraft operating in RVSM airspace will be sent monthly, before the 15th day of the month following the reported period.

Note. - The data of the F5 forms, which are sent to CARSAMMA after the 15th of the following month of the reported period, not having respected the submission deadline, will not be processed by CARSAMMA for operational and statistical reasons.

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ASE Monitoring Validation Request Form (F6)

2.2.11 Validation is the process of authenticating the results obtained by foreign institutions. Requests for follow-up of monitoring results with flights carried out outside the CAR/SAM regions rely on the search in the KSN (Knowledge System Network) website. For this, it is necessary to provide minimum data to perform the search, such as: Registration, ICAO aircraft type, MSN, Mode "S", Date of flight and Location of the antenna flown. The more information, the greater the hit in the result. In possession of the monitoring results, the creation of the ASE CHARTER is carried out by CARSAMMA, and said ASE Validation Letter is sent only to the relevant RVSM State Certifying Authority.

2.2.12 To formalize the validation request made by the Civil Aviation Authorities of the CAR/SAM regions, this form is established, exemplified in Appendix G. It will be completed by the CAA, at their request, and sent to CARSAMMA via e- mail carsamma@cgna.decea.mil.br.

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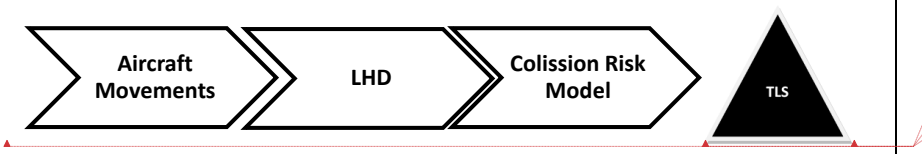
Form	*Purpose of the Form*	*Deadline to be sent to CARSAMMA*
Form 0	Collects movements in RVSM airspace from December 1 to December 31 of each year and is used to calculate the Vertical Collision Risk (CRM) model.	Before February 15 of the following year to the reported period.
Form 1	Establish points of contact for each State, submitted when the PoC or any data from the PoC changes.	Immediately, when appointment is made or data changes.
Form 2	Keep track of the RVSM operational approval of aircraft operating in the RVSM airspace of the CAR/SAM regions	Within 5 days after approval is issued.
Form 3	Keep track of the RVSM operational approval cancelation of aircraft operating in the RVSM airspace of the CAR/SAM regions	Within 5 days after approval is cancelled.
Form 4	Report LHDs	Before the 15 of the month following the reported period.
Form 5	Compare between the list of aircraft operating in RVSM airspace in the CAR/SAM Regions and the database of approved aircraft in all Regional Monitoring Agencies (RMA)	Before the 15 of the month following the reported period.
Form 6	authentication of the results obtained by foreign institutions	Submitted to CARSAMMA at the request of each CAA of the CAR/SAM States, each time validation is required

Table 1

2.3 Flow of Data.

2.3.1 Records gathered from the data collection (F0) will be used in the collision risk calculation (CRM) and in the verification of RVSM non-approved aircraft operations performed in the RVSM airspace, carried-out every year.

2.3.2 In the first case of the CRM, after the calculations, the risk is compared with ICAO's TLS, which is 5 x 10-9 fatal accidents per flight hour. This information is presented to the GTE, the ICAO NACC and SAM Regional Offices and the GREPECAS.



2.3.3 From the results of the aircraft movement evaluation, CARSAMMA will send ICAO NACC and SAM Regional Offices an annual list of non-RVSM approved aircraft that operated in RVSM airspace, the State of registry and/or of the operator, as submitted by the CAA, which are not in CARSAMMA's database.



GTE

2.3.4 2.3.4 LHDs are validated between the FIRs involved. Subsequently, the FIR exposed to the risk shall submit the individual F4 form and multiple reports to CARSAMMA. In the event that an F4 form lacks the necessary data or information, CARSAMMA will request that the relevant PoC submit the report and provide the information required for analysis and assessment. Validation may be carried out using the method deemed most appropriate, such as teleconference, official email from the PoC, among others.~~LHDs (F4) are validated through monthly teleconferences, in the case any F4 Form lacks the necessary data and information, the PoC is required to submit the report and provide the required information during this teleconference for analysis and validation.~~

2.3.5 2.3.5 Following the publication of the LHD list for the CAR/SAM Region by CARSAMMA—which includes risk values for the periods of January–March, April–June, July–September, and October–December—POCs shall have a period of ten calendar days to conduct a review and provide final approval. If necessary, teleconferences will be held to coordinate and resolve any discrepancies regarding the LHD data, as well as to present the causes, contributing factors, and corrective actions for those events with a medium or high SMS risk value.~~Some States report the LHD to CARSAMMA, but do not notify the ANSP or the CAA of the State of the FIR involved in it, which prevents them from keeping the records related to the event so that the investigation of the same event can be carried out. This results in CARSAMMA being obligated to complete the process with incomplete data. This impedes the identification of latent conditions~~

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~~by the concerned FIR and hinders the competent authority from taking the appropriate mitigating actions. It is a mandatory requirement to perform the validation before submission of the LHD.~~

Note. – If CARSAMMA identifies a risk occurrence that requires immediate evaluation, the agency will convene a meeting; the same applies to addressing recurring issues, high-risk levels, or emerging trends.

2.4 Responsibilities of the States and International Organizations for the work of the Points of Contact (PoCs) accredited to CARSAMMA

2.4.1 States shall promote the establishment of internal processes that allow the provision of all the data required by CARSAMMA, in its different forms, with regularity, fidelity, and in the established format. To this end, they will designate Points of Contact accredited to CARSAMMA, which will be in charge of collaborating to achieve its regional monitoring actions. In this sense, roles are defined to be covered by both the AAC and the ANSP, through formal appointment before CARSAMMA (Form 1), and that should exist within their local structures:

a) Equipment Points of Contact to CARSAMMA: They provide information on RVSM w/PBCS operational approvals issued by the different CAAs;

b) FIRs Points of Contact to CARSAMMA: They send information about LHD, aircraft movement in RVSM airspace and participate in the investigation as well as in its validation, collect RVSM data and data for flight plan audits.

Note.- Typicaly, Equipment Points of Contact are located within the Civil Aviation Authorities (CAAs). FIR points of contact must possess the appropriate operational expertise and are generally provided by Air Navigation Service Providers (ANSPs) in collaboration with the respective CAAs.~~Normally the Equipment Points of Contact are part of the CAAs. The FIRs Points of Contact are usually part of the ANSPs in collaboration with the different CAAs.~~

2.4.2 The States will provide training in the procedures established in this Manual to the PoCs that are duly accredited by CARSAMMA. Support will be provided to the operations of the Points of Contact accredited to CARSAMMA, providing the framework for the establishment of information flow processes between the AAC and the ANSP, which allow the sending of the information requested by CARSAMMA, as well as to maximize the exchange of information between the AAC and the ANSP regarding operational approvals and the detection of aircraft operations in RVSM airspace without the proper operational approval. The States will provide all the information required by CARSAMMA that leads to clarifying doubts about the RVSM approval status of aircraft and operators.

2.4.3 The AAC and the ANSP will collaborate so that the training programs for air traffic controllers, supervisors and ATM operational personnel in general, contain guidelines on filling out the forms as well as the importance of the data sent to CARSAMMA; guaranteeing and supervising the quality of the data sent to it.

2.4.4 The International Organizations will work together with the CAAs, the ANSPs of the different States, as well as with CARSAMMA, whenever it is required to collaborate in the investigation of LHD or discrepancies in RVSM operational approvals.

2.4.5 The AAC and the ANSP in collaboration, in the face of validated LHD events that have a risk value greater than 20, will take the respective mitigation measures, and will present a Working Paper (WP) in the GTE that contains a summary of the mitigating measures adopted by the State.

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Chapter 3

Guide to the Evaluation of Large Height Deviations (LHDs) based on a Safety Management System (SMS)

3.1 Scope

3.1.1 The GTE and CARSAMMA have developed a methodology for the LHD analysis and assessment, based on SMS, aiming to increase the safety level in the RVSM air space of the CAR/SAM Regions.

3.1.2 This methodology allows making a risk level assessment of each event in an individual manner and helps to identify the tendencies and the critical points of occurrence.

3.1.3 CARSAMMA will continue calculating the risk value using the CRM established in ICAO Doc 9574 - Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive, taking as reference a TLS of 5 X 10-9 fatal accidents per flight hour. The objective is to make a quantitative (CRM) and a qualitative (SMS) assessment of the operations in the RVSM airspace and increase the safety level in the CAR/SAM regions.

3.1.4 The GTE acknowledged the necessity to analyze the LHD using an approach based on SMS, because the collision risk model is carried out through the use of a mathematic formula to calculate the risk level in the Regions without showing a detail of the analyzed events.

3.1.5 The GTE has been using the SMS methodology for the analysis and LHD assessment since 2011. This methodology allows States and International Organizations in the CAR/SAM Regions, to analyze the LHDs of its FIRs, adopt and implement the corresponding mitigation
measures.

3.2 Analysis and Evaluation of LHDs

3.2.1 During the analysis, the cause of the event is identified, for which the LHD codes table is used. This table can be found at Chapter 5 of this manual.

3.2.2 After the identification of the causes (LHD code) by CARSAMMA, the GTE must perform the risk analysis associated with each one of the LHD codes identified, assessing the severity and probability of the occurrence.

3.2.3 For the severity analysis, the experience of the GTE team members is taken into consideration, using the severity table, as follows:

Effects	Severity (LHD)				
	Catastrophic 5	Dangerous 4	Major 3	Minor 2	Insignificant 1
ATC	Collision with an aircraft, the terrain or obstacle warning, and TCAS (RA)	Important reduction of the prescribed separation or the total loss of ATC provision (ATC Zero)	Significant reduction of the prescribed separation or ATC capacity	Reduction in the ATC capacity or significant increase of the ATC workload	Minor increase of the ATC workload

Table 2: LHD

3.2.4 Each code will have a LHD severity that is associated according to the safety impact:

5	4	3	2	1
J, K	B, D, F, G, H, I	A,C, E2, L	E1	M

Table 3 : LHD Codes Table

*Note. - In Table 3, and only for the calculation of risk value in terms of qualitative valuation in the category "E" is subdivided into "**E1** -Poor coordination" and "**E2** -Lack of coordination", which imply a risk value of a different ending. In the table of codes for LHD, these codes do not exist, but in the old table there were codes M (used for bad coordination), with value = 2 and N (lack of coordination), with value = 3. In order not to to lose the historical series in that analysis, the E code is divided in two for this analysis*

3.2.5 After determining the severity, the **probability** is established, based on the statistical data, which shows the points of the highest occurrence index in the CAR/SAM Regions, considering the worst-case scenario. The following table is used for this purpose:

Probability	Level of Services /ATC System	Operational
Frequent 5	Continuously experienced in the system	It is expected to occur each 1-2 days
Occasional 4	It is expected to occur frequently in the system	It is expected to occur several times in a month
Remote 3	It is expected to occur several times in the lifetime of the system.	Occur close to once every few months
Improbable 2	Unlikely, but can reasonably be expected to occur in the system life cycle	It is expected to occur once every 3 years
Extremely Improbable 1	Unlikely, but possible in the system life cycle	It is expected to occur at least once each 30 years

Table 4: LHD Probability Table

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3.2.6 After the probability is determined, the duration of the event is calculated using the following table:

1 Short	**d ≤60 seconds**
2 Medium	**60 seconds < d ≤ 120 seconds**
3 Long	**d > 121 seconds**

Table 5: Event duration

3.2.7 Accordingly, the following matrix can be used:

Probability (P)	Duration (D)	Severity (G)
5 Frequent		**5 Catastrophic**
4 Occasional		**4 Dangerous**
3 Remote	**3 Long**	**3 Major**
2 Improbable	**2 Medium**	**2 Minor**
1 Extremely Improbable	**1 Short**	**1 Insignificant**

Table 6: LHD Risk Matrix

3.2.8 Once the previous values are obtained the GTE Team proceeds to determine if the FIR in risk has or does not have an ATS Surveillance System, if the meteorological conditions were Visual Meteorological Conditions (VMC) or Instrument Meteorological Conditions (IMC) and if there were other air traffic that resulted in a conflict, granting the following values:

Surveillance System	Meteorological Conditions	Other transit
Yes = 5	VMC = 0	With Surveillance 5
No = 10	IMC = 5	Without surveillance 10

Table 7:Values associated with specific parameters

3.3 Risk Value Calculation

3.3.1 To calculate the risk value, once the previous data is obtained, the following formula is used:

$$VR = (PxDxG)+R+W+T,$$

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Parameter	Description	Value
VR	**Risk value**	**To be calculated**
P	**Probability of occurrence in the position**	**Varies from 1 to 5**
D	**Event duration**	**Varies from 1 to 3**
G	**Event severity**	**Varies from 1 to 5**
R	**With or without ATS surveillance**	**With = 5 or Without = 10**
W	**Weather conditions**	**VMC=0 or IMC=5**
T	**Other traffic (if there would be)**	**With surveillance =5 or Without surveillance =10**
	TOTAL:	**Maximum of 100 points**

Table 8: Description and value of parameters

3.4 Level of Safety (LoS)

3.4.1 Once the LHD analysis and evaluation process has been completed individually, the Risk Value resulting from each LHD is inserted into the Risk Matrix, designed to determine if the Risk Level of each event is equal to or below the established TLS for the CAR/SAM Regions, an acceptable level of which is 20 points.

VR	Risk Level	Control
76 – 100	**High**	**Unacceptable.** **Will proceed according to 2.3.5**
21 - 75	**Medium**	Acceptable risk, but the follow-up and risk-management are mandatory
01 - 20	**Low**	Acceptable without restriction or limitation, hazards do not require an active risk-management, but must be documented

Table 9: Risk values and associated risk levels and control measures

3.4.2 After determining the Risk Level of each LHD, the States and relevant stakeholders will have to develop and implement the necessary mitigation plans. These will be presented in the GTE meetings. The analysis performed by CARSAMMA and the GTE in the virtual meetings, as well as in the face to face meetings will be documented in a final report to the ICAO Regional Offices in Mexico and Lima, and in the GREPECAS meetings.

Chapter 4

Terms of Reference

4.1 Introduction

4.1.1 The Terms of Reference (ToRs) of the Regional RVSM CAR/SAM GTE were established with the purpose to review the events affecting the TLS based on the LHD information provided by States and International Organizations.

4.2 Terms of Reference (ToRs) of the GTE

4.2.1 The Terms of Reference of the GTE are detailed in Appendix B of the GREPECAS Procedures Handbook.

~~A) Gather safety experts in safety management, air traffic control, aircraft flight operations, regulation and certification, data and risk models analysis;~~

~~B) Analyse and review the LHDs of 300 feet or more, as defined in ICAO Doc 9574, Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive;~~

~~C) Coordinate with CARSAMMA the collection and review of data on LHDs;~~

~~D) Determine and validate an estimate of the flight time out of the cleared flight level used to calculate the CRM by CARSAMMA;~~

~~E) Identify the safety trends based on the reports of the LHDs and recommend mitigation actions associated with the LHDs in accordance with the ICAO SMS provisions. Send annual reports on the results of safety assessments to GREPECAS to improve safety in the CAR/SAM RVSM space; and;~~

~~F) Perform other duties as indicated by GREPECAS.~~

~~4.2.1 Composition:~~

~~CAR and SAM States, CARSAMMA, COCESNA, IATA, IFALPA, IFATCA, and Rapporteur:~~

4.3 Functions of the CARSAMMA T~~erms of Reference (ToR)~~

4.3.1 CARSAMMA Functions are detailed in the CARSAMMA procedures Manual.~~:~~

~~A) Maintain a central registry of RVSM approvals from operators and aircraft from each State/Territory using the CAR/SAM RVSM airspace;~~

~~B) Facilitate the transfer of the approved data to and from other RVSM Regional Monitoring Agencies (RMAs);~~

~~C) Establish and maintain a data base containing altimetry altitude system errors and deviations of 300 feet or more within the CAR/SAM RVSM airspace;~~

~~D) Disseminate timely information to the CAAs the changes or monitoring status of the aircraft type classifications;~~

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~~E) Disseminate the results of the monitoring flights using the GPS-based Monitoring System (GMS);~~

~~F) Provide the means to identify aircraft without RVSM approval operating in CAR/SAM RVSM airspace and report it to the State of Registry CAA;~~

~~G) Develop the means to summarize and communicate the content of the data bases relevant to the RVSM GTE for the corresponding safety evaluation; and~~

~~H) Review the Collision Risk Level assessment in the RVSM airspace in the CAR/SAM Regions, in accordance with ICAO Doc 9574 and Doc 9937~~

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Chapter 5

Reference Guide for Validation of LHD events

5.1 Introduction

5.1.1 This reference guide is a consolidation of materials describing the creation, purpose and methodology of the CAR/SAM RVSM Scrutiny Group (GTE). It is intended to be used as a basic reference for anyone interested in Scrutiny Group activity.

5.1.2 It is essential that regional authorities consider all possible means of ascertaining and reducing the level of risk of collision resulting from operational errors that cause LHDs. The CAR/SAM RVSM GTE is the primary group to evaluate and assess the operational aspects of LHDs.

5.2 System Performance Monitoring.

5.2.1 Experience has shown that LHDs, a deviation in the vertical dimension from the cleared flight level whereby established margins of separation may be eroded, of 90 m (300 ft) or greater in magnitude have a significant impact on operational and technical risk in RVSM airspace. The causes of such deviations have been found to be, but are not limited to:

a. An error in the altimetry or automatic altitude control system of an aircraft;
b) Turbulence and other weather-related phenomena;
c) An emergency descent by an aircraft without the crew following established contingency procedures;
d) Response to airborne collision avoidance system (ACAS) resolution advisories;
e) Not following an ATC clearance, resulting in flight at an incorrect flight level;
f) An error in issuing an ATC clearance, resulting in flight at an incorrect flight level; and
g) Errors in coordination of the transfer of control responsibility for an aircraft between adjacent ATC units, resulting in flight at an incorrect flight level.

5.2.2 The additional risk associated with operational errors and in-flight contingencies influence the outcome of RVSM safety assessments. Appendix H includes a diagram illustrating the LHD contribution to the overall risk assessment.

5.2.3 System performance monitoring, as outlined in ICAO doc 9574, is necessary to ensure the continued safe use of reduced vertical separation minimum (RVSM) and that established safety goals are met. This activity includes monitoring the minimum risk of collision associated with operational errors and in-flight contingencies. The monitoring process is divided into two main categories:

a) Risk associated with the aircraft technical height-keeping performance (technical risk), and
b) The overall risk, i.e. risk due to all causes.

5.2.4 The monitoring process involves the collection and evaluation of operational data. Appropriate methodologies will need to be in place to process this data in order to enable comparison with regionally agreed overall safety objectives.

5.3 Identification of an LHD

5.3.1 The GTE will evaluate all reports of interest and, based upon established GTE methodology, identify any altitude variation of 90m (300ft) or greater from the assigned or planned altitude. If a qualified deviation is identified, the event is categorized as a large height deviation.

5.3.2 When evaluating altitude variation events of 90m (300ft) or greater, it is not always clear that the event qualifies as a large height deviation. CARSAMMA, and the GTE, have developed policies for LHD validation, which are explained in this section.

5.4 Parameter Values

Cleared Flight Level

5.4.1 The flight level at which the pilot was cleared or currently operating. For example, aircrew accepts a clearance intended for another aircraft and ATC fails to capture the read back error or aircrew conforms to a flawed clearance delivered by ATC.

5.4.2 This parameter, in some cases, will require expert judgment and operational experience to assign a value. The Scrutiny Group must take into consideration the controller's planning compared with the cleared flight level.

Event Flight Level

5.4.3 The event flight level is the flight level of error or the incorrect altitude of operation for an identifiable period of time without having received an ATC clearance.

Duration at Unplanned Flight Level

5.4.4 The greatest exposure to risk is the time spent level at a flight level other than the cleared level. This parameter value contributes significantly to the calculation of operational risk.

5.4.5 The duration at unplanned flight level is the length of time that an aircraft was level at an altitude (flight level) that was not cleared, or planned, by air traffic control. Duration is recorded in one second increments.

5.4.6 The calculation of duration begins once the aircraft is level at a flight level other than the cleared level or planned level by ATC, and terminates once ATC initiates remedial action.

5.4.7 5.4.7 If the receiving FIR has no prior knowledge of the traffic and the aircraft contacts it—after passing the buffer zone established in 5.5.1—to report its current flight level, this constitutes an LHD (Level Handling Deviation) with a duration of zero (0), provided that the actions taken by the ATC are immediate and occur before the aircraft enters its area of responsibility.~~Figure 1 illustrates a large height deviation that has a duration value larger than zero. The duration calculation begins and point A and terminates and point B.~~

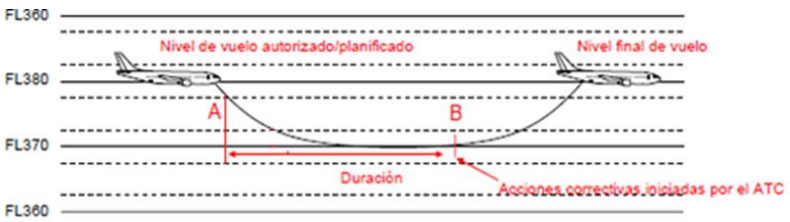


Figura 1

5.4.8 If an aircraft enters airspace at an unauthorized flight level without establishing communication, and the Flight Information Region (FIR) is equipped with surveillance services, the duration of the event shall be calculated from the moment the aircraft enters the FIR until Air Traffic Control (ATC) completes the appropriate identification. The reasons why timely communication with the aircraft was not established must be documented in Form F4.~~It is important to note that not all large height deviations result in the aircraft being level at a flight level other than that cleared or planned by ATC; therefore, some events are assigned a duration value of zero.~~

5.4.9 It is also important to note the duration value determined or assigned by the GTE of LHDs that occur in a surveillance ATC system environment will vary significantly from that of a non- surveillance ATC system environment.

5.4.10 If the Scrutiny Working Group is unable to determine the time spent at incorrect flight level, a default value is assigned.

5.4.11 The GTE identified the need to establish a default duration value to assign to those events where there is not enough information included in the report to determine the time spent at incorrect flight level. Two default values were established, one for a surveillance ATC system Environment of 60 seconds and one for a non- surveillance ATC system Environment of 90 seconds.

Total Vertical Deviation

Note. – The GTE identified the need to establish a default duration value to be assigned to events where there is insufficient information in the report to determine the time spent at an incorrect flight level. Two default values were established: 60 seconds for an environment with ATS surveillance systems, and 90 seconds for an environment without ATS surveillance systems.

5.4.12 Total vertical deviation is the distance in feet between the altitude of current operation prior to the deviation and the point at which the aircraft is once again under ATC supervision. A deviation that resulted in an increase of altitude will be recorded as a positive number and a deviation that resulted in a decrease of altitude will be recorded as a negative number

5.4.13 Figures 2 and 3 illustrate two LHDs of different magnitudes. The first example, Figure 2, illustrates a large height deviation with a magnitude of 1000ft. The second example, Figure 3, illustrates a large height deviation with a magnitude of 1300 ft.

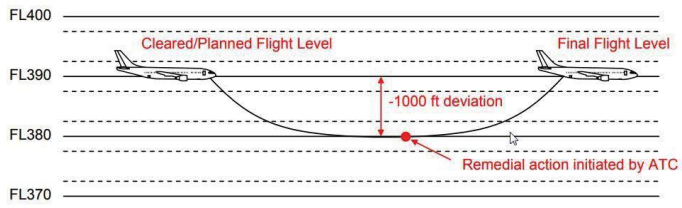


Figure 2.

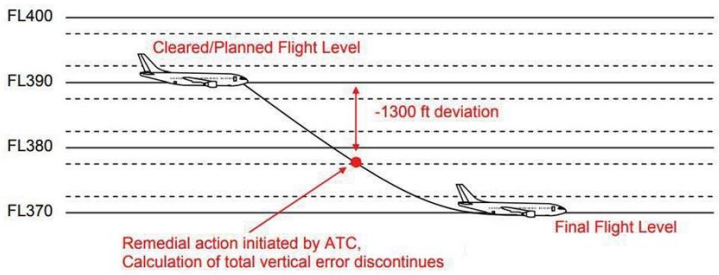


Figure 3.

Levels Crossed

5.4.14 The total number of flight levels between the point that the aircraft exits the cleared flight level and is once again under ATC supervision is calculated to determine the number of levels crossed. For example, in the examples provided in figures 2 and 3 in section 5.4.2, one level was crossed.

5.4.15 The Scrutiny Group must consider the hazard zone when calculating the number levels crossed. The hazard zone is also referred to as the buffer zone.

5.4.16 The hazard zone is the minimum physical distance of defined dimensions to accommodate:

a) Variations in an aircraft's flight path due to air movements, etc.;
b) The size of the aircraft;
c) An additional "miss" distance

5.4.17 The value of the hazard zone was determined to be ± 90 m (300ft). A brief explanation of the considerations underlying this value is included in Appendix J of this Manual.

5.4.18 This buffer zone criterion shall be used to determine that a specific level is occupied by an aircraft. In the LHD illustrated in figure 4, the aircraft penetrates the buffer zone but does not reach the next flight level. Applying the criterion described in paragraph 5.4.16, the total number of levels crossed in this example is 1.

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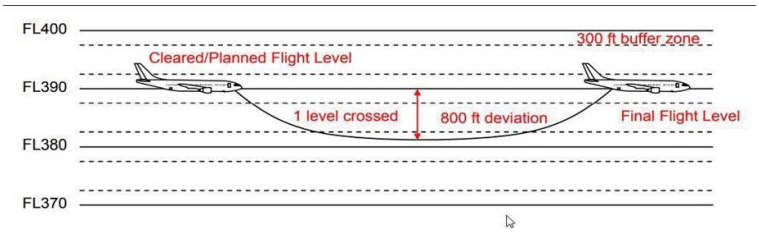


Figure 4

Final flight level

5.4.19 The final flight level is the re-cleared flight level after the error/deviation.

5.4.20 Some reports of LHDs do not contain the final flight level. When this information is not available in the LHD report, the Scrutiny Group relies on operational expert judgment to determine the final flight level. The final flight level of the LHD illustrated in figure 5 is FL370.

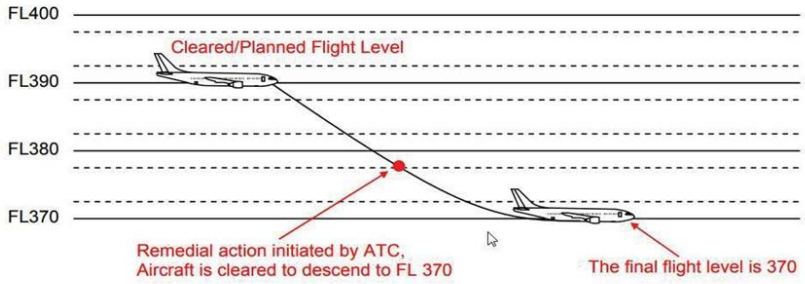


Figure 5.

Vertical speed of ascent or descent

5.4.21 The rate of climb or descent of an aircraft crossing through an uncleared level also contributes to the estimate of operational risk. In most cases, this parameter value is not included in reports of large height deviations. The GTE must rely on operational expert judgment to determine the rate of climb or descent.

5.4.22 The GTE established climb and descent rate default values.

Vertical descend speed	Vertical climb speed

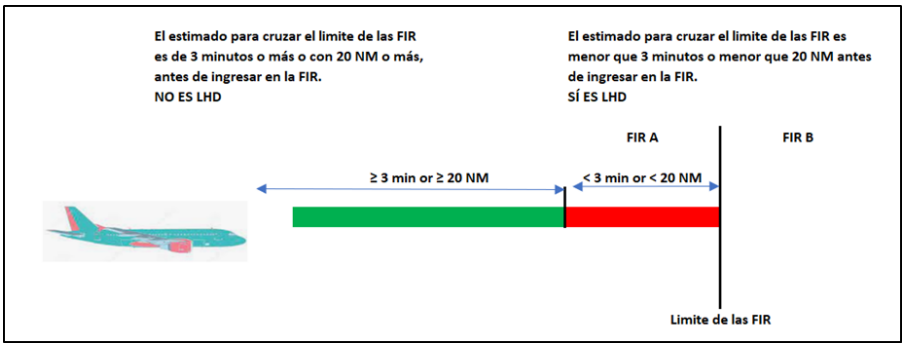
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Drift	**1000 FT per minute**	**Minimum**	**500 FT per minute**
Normal	**1500 FT per minute**	**Normal**	**750 FT per minute**
Rapid	**2500 FT per minute**	**Rapid**	**1250 FT per minute**

5.5 Events that qualify as LHD and events that do not qualify as LHD

5.5.1 LHDs for coordination errors

5.5.1.1 The GTE establishes a buffer zone, which is the period used to determine if a coordination error between facilities should be considered as an LHD. The current value set is to 3 minutes or 20 nm. In other words, if the estimate of the crossing to the boundary is provided before the agreed "buffer" lapse/distance, either the pilot communicates with the receiving unit or the estimate is transferred through the official coordination channel (PANS-ATM DOC 4444, Chapter 10), then the event is not considered as an LHD; Conversely; if the estimate is received at the equivalent or less of the established buffer value, then the event is an LHD.



5.5.2 LHD with ATS surveillance system coverage in the adjacent FIR

5.5.2.1 When the receiving FIR has coverage of ATS surveillance systems that reaches the airspace of the transferring FIR and it is observed that the aircraft has a flight level different from the one previously coordinated, which has not been modified, it is considered LHD. Duration is recorded in one-second increments in accordance with 5.4.5. If the ATC unit does not have enough information in the LHD report to determine the time (seconds) spent at an incorrect flight level, the default value established by the GTE in 5.4.11 of this manual is assigned. In case the transferring ATC unit revise the flight level error before crossing the transfer of control point (TCP) then it is not considered as LHD.

5.5.3 LHD with NO ATS surveillance system coverage in the adjacent FIR

5.5.3.1 When the receiving FIR has contact with the aircraft before entering its airspace, and becomes aware of the change in the aircraft's flight level with respect to the previously coordinated level, it is considered as an LHD. Duration is recorded in one-second increments in accordance with 5.4.5. If the ATC unit does not have enough information in the LHD report to determine the time (seconds) spent at an incorrect flight level, the default value established by the GTE in 5.4.11 of this manual is assigned. In case the transferring ATC unit revise the flight level error before crossing the control transfer point (TCP) then it is not considered as LHD.

5.5.4 LHD with NO ATS surveillance system coverage in both FIRs

5.5.4.1 When an aircraft enters a receiving FIR and reports a flight level other than the one previously coordinated, it is considered an LHD. The time when the aircraft crosses the FIR boundary must be taken into account and whether the corresponding ACC becomes aware of the traffic and takes action regarding the deviation, whether this action means leaving the aircraft at the level that is notifying, or moving the aircraft to a level where it is not in conflict with the FIR's air traffic control planning. Duration is recorded in one-second increments in accordance with 5.4.5. If the ATC unit does not have enough information in the LHD report to determine the time (seconds) spent at an incorrect flight level, the default value established by the GTE in 5.4.11 of this manual is assigned.

5.5.5 Lateral deviation ~~with NO ATS surveillance system coverage in the adjacent FIR~~.

5.5.5.1 When an aircraft reports a position that is laterally offset from the original transfer point—whether due to the use of a different route or a deviation requested by the flight crew for operational convenience—and this offset is less than 30 NM, the situation shall not, in itself, be considered an LHD, as the criteria for LHD reporting focus on vertical, rather than lateral, deviations. However, if the lateral deviation causes the aircraft to enter a FIR other than the one for which coordination was established, an E2-type LHD shall be considered to have occurred in the affected FIR, due to the occupation of a flight level without the corresponding prior coordination. In such cases, the description of the event must clearly specify that the LHD was caused by an uncoordinated lateral deviation.

5.5.5.2 When an aircraft reports a position that is laterally offset from the original transfer point—whether due to the use of a different route or a deviation requested by the flight crew for operational convenience—and this offset is 30 NM or greater, an LHD shall be considered to have occurred, regardless of whether the aircraft enters the FIR for which coordination was established or a different FIR. In the former case, the LHD is classified as type E1; in the latter, it is classified as type E2, as the aircraft is occupying airspace other than that specified in the original coordination. In such cases, the event description must clearly state that the LHD was caused by an uncoordinated lateral deviation.~~5.5.5.1 When an aircraft reports a position deviated laterally from the original point of transfer, either via another route or due to a deviation requested by the crew for reasons of operational convenience, LHD is not considered to exist as the initial philosophy of the reports on LHD refer to vertical and not lateral deviations. However, for RVSM airspace safety purposes, these deviations will be reported to CARSAMMA for analysis and study.~~

~~5.5.6 Lateral deviation with ATS surveillance system coverage in both FIRs.~~

~~5.5.6.1 When an aircraft enters an airspace that has not been included in its route, due to an operational deviation, it is not considered an LHD. However, for RVSM airspace safety purposes, these deviations will be reported to CARSAMMA for analysis and study.~~

5.6 Cause of the event

5.6.1 Classification of each LHD event is necessary for risk assessment purposes and for the identification of adverse trends. Each LHD event is assigned an error type code that identifies the type of event that caused the deviation. The error codes are categorized as operational or technical for consideration in the Collision Risk Model (CRM). A complete list of the error codes is included in table 10.

Code	LHD cause
A	The flight crew did not ascend/descend the aircraft according to clearance Example: Aircraft A was at FL 300 and was assigned FL 360. An authorized level maintenance watch alert was detected when the aircraft reached FL 364. The level value in Mode C reached FL 365 before to retake the FL 360.

B	The flight crew ascended / descended without ATC clearance Example: At 06:48, aircraft A reported that it was leaving the cruise level FL 340. The last flight level clearance coincided with the STAR notification issued at 06:23, when the aircraft was requested to stay at the FL 340. ATC applied vertical separation between aircraft A and two other flights. The evolution of the descent allowed aircraft A to leave the conflict zone with respect to the first aircraft and sufficient time was available to apply an adequate separation with respect to the second.

C	Incorrect operation or interpretation of on-board equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of authorization or new ATC authorization, flight plan followed instead of ATC authorization, flight plan followed instead of the ATC clearance, the original clearance was followed instead of the new clearance, etc.) Example: The aircraft maintained a flight level below the assigned altitude. The altimeters had not been reset when the transition occurred. FL 350 had been assigned. The aircraft held FL 346 for an additional 4 minutes.
D	ATC system loop error (eg ATC issues wrong clearance or flight crew misinterprets clearance message). Situations are included in which the dispatch of ATC operational information does not take place, is delayed, or occurs incorrectly or incompletely, in particular as a consequence of confirmation and / or collation errors, with the possibility of producing a loss of separation. Example: All communications between ATC and the aircraft were via a third-party voice communication relay on HF. Aircraft A remained at FL 360 and applied for FL 380. A clearance of FL 370 was transmitted, in anticipation of higher levels in later stages. A clearance to climb to FL 390 was then transmitted to aircraft B. Although the HF operator carried out the relevant collation, the transmission was made to aircraft A. The error was detected when aircraft A reported that it was holding the FL 390.
E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors (e.g. late or missed coordination, incorrect estimated / actual time, or non-observance of flight level, ATC route, etc. ., according to the agreed parameters) Solely for the purpose of calculating risk value in the context of qualitative assessment, category "E" is subdivided into "E1 – Poor coordination" and "E2 – Absence of coordination," which result in a different final risk value. Example 1: Sector A coordinated the transfer of aircraft 1 to Sector B at FL 380. The aircraft was actually at FL 400. Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive Example 2: The Sector A controller received coordination from Aircraft 1 regarding waypoint X at FL 370 in Sector B. At 05:04, Aircraft 1 was at waypoint X at FL 350 and applied for FL 370.
F	Coordination errors in ATC-to-ATC transfer of control responsibility as a result of equipment decommissioning or technical problems Example: The controller of FIR A tried to send an AIDC message to coordinate the transfer of the aircraft on FL 320. The message could not be transmitted and attempts to establish telephone contact with the adjacent FIR were unsuccessful. The aircraft contacted the adjacent FIR without coordination being completed.
Aircraft contingency event	
G	Deviation due to an aircraft contingency event that led to a sudden inability to maintain the assigned flight level (eg, pressurization failure, engine failure) Example: Aircraft A descended from FL 400 to FL 300 due to a pressurization problem.
H	Deviation due to on-board equipment failure that led to an unintended or undetected change in flight level Example: Aircraft A was flying at cruising altitude at FL 380. ATC received an alert indicating that the aircraft was climbing at FL 383. The flight crew reported that they were trying to resume the authorized flight level with failure of the autopilot and navigation system.

Deviation due to meteorological conditions	
I	Deviation due to turbulence or other meteorological phenomenon. Example: When flying at cruising altitude on FL 400, the aircraft encountered severe turbulence, causing it to descend 1000 feet without authorization.
Deviation due to TCAS-RA	
J	Deviation due to TCAS RA; the flight crew correctly followed the RA (the cause of the RA should be specified in the LHD report) Example: Aircraft A was flying at cruising altitude at FL 350. The flight crew received a traffic alert from TCAS, and almost immediately thereafter, an RA climb instruction. As a result, the flight crew climbed Aircraft A to approximately FL 353, as instructed by TCAS. The TCAS display indicated that Aircraft B descended in the opposite direction to approximately FL 345 and passed under Aircraft A
K	Deviation due to TCAS RA; the flight crew incorrectly followed the RA (the cause of the RA should be specified in the LHD report)
Others	
L	Providing RVSM separation to an aircraft not approved for RVSM (e.g. flight plan indicates RVSM approval but the aircraft is not approved; misinterpretation of the flight plan by ATC) Example 1: In the detailed initial flight plan presented by FIR A for the departure segment, it was indicated that aircraft 1 was not approved for RVSM. In the next flight plan presented by FIR B, it was stated that aircraft 1 was approved for RVSM. The FIR A controller consulted with the aircraft shortly after it entered FIR A and the pilot confirmed that the aircraft was not RVSM approved. Example 2: Aircraft 2, located at cruising altitude at FL 310, was transferred to the controller in Sector X, who found that the specification for said aircraft contained RVSM approval. The Sector X controller had examined the aircraft the day before and found that it was not RVSM approved. The controller consulted the situation of aircraft 2 with the pilot, who reported negative RVSM for said aircraft.
M	Other cases, including situations where: i) an aircraft separation standard has not been established or observed; or ii) flights (including climb / descent phases) are conducted in airspace where flight crews are unable to establish normal air-ground communications with the responsible ATS unit. Example 1: Aircraft A was flying at cruising altitude at FL 350. At HH: MM hours, said aircraft reported "RVSM negative" due to equipment failure. At that time, Aircraft B was following a converging opposite track at FL 360, less than 10 minutes from the rendezvous point. Note. – When classifying these events, a distinction must be made between those related to a lack of communication and all other possible "M-code" events.

Table 10

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5.7 Identify trends

5.7.1 The cumulative LHD summary is also used to identify adverse trends. The Scrutiny Group will evaluate grouped event categories and determine whether one particular event type occurs more often than another. This particular analysis can also be applied to geographic regions.

5.7.2 State regulators (or safety oversight inspectors) responsible for overseeing safety within the Flight Information Regions (FIRs) falling under the scope of CARSAMMA should ensure that their Air

Navigation Service Providers (ANSPs) coordinate with CARSAMMA regarding LHD-related occurrences, aircraft movements, and any other information necessary for CARSAMMA to carry out its functions.

5.7.32 The Scrutiny Group will also identify operational trends that may be revealed in the data. If any exist, the Group may make recommendations for reducing the effect of those trends.

5.8 Remedial Recommendations

5.8.1 If adverse trends are identified, the Scrutiny Group will submit recommendations for remedial actions to ensure that operational errors are kept to a minimum and that the airspace being examined continues to satisfy the requirements of the target level of safety, which is necessary to support continued RVSM operations.

5.8.2 It is important to bear in mind that height deviations, as a consequence of operational errors and in-flight contingencies, occur in all airspace irrespective of the separation minimum. The purpose of this monitoring activity is to ensure that operations in RVSM airspace do not induce an increase in the risk of collision from these events and that the total vertical risk does not exceed the agreed overall safety objectives. The actions and measures proposed to reduce risk should not be exclusive to RVSM airspace.

Chapter 6

Training Programme for Points of Contact (PoCs) to the CAR/SAM Monitoring Agency (CARSAMMA)

6.1 General Purpose:

6.1.1 At the end of this training, the States Points of Contact to the CAR / SAM Regions Monitoring Agency (CARSAMMA) will be able to perform the tasks according to their functions in an optimal manner, sending to CARSAMMA the corresponding data with the expected quality and within the established deadlines.

6.2 Specific objectives:

a) Train the points of contact for the proper completion of the Data collection Form (F0).
b) Train the points of contact to properly fill out the RVSM Operation Approval Registry Form (w/PBCS) (F2) as well as the Cancelation of the RVSM Operation Approval Form (w/PBCS) (F3)
c) Train the points of contact to properly fill out the LHD Form (F4)
d) Train the points of contact to properly fill out the Data Flight Plan Form for RVSM Audit (F5)
e) Train the points of contact to properly fill out the ASE Monitoring Validation Request Form (F6)
f) Train the Points of contact to carry out the proper LHD analysis using the methodology based on the Safety Management Systems.
g) Train points of contact in the use of the LHD Reference Guide for the identification of a LHD event.
h) Train the points of contact to interpret the result of safety measurements using the Collision Risk Model (CRM).

6.~~3~~2 Lessons Plan

The States will have the responsibility of training in the modality that they determine in a timely manner (face-to-face, distance, on demand, etc.) the points of contact that will be formally designated to CARSAMMA, in compliance with the content program detailed below:

Module 0: Introduction

Provide guidance to staff about the background in the implementation of Reduced Vertical Separation, the need for constant monitoring, the creation of CARSAMMA, as well as current regulations.

Explain personnel the functions of CARSAMMA and the GTE, the work methodology including Teleconferences.

Module 1: Filling of the Data Collection form (F0)

Provide guidance to staff about the information required to complete the F0 form of CARSAMMA, complying with the required data format as well as the deadlines for the delivery of this information.

Module 2: Filling the RVSM Operation Approval Registry Form (w/PBCS) (F2) and the Cancelation of the RVSM Operation Approval Form (w/PBCS) (F3)

Provide guidance to CAA staff on the information required to complete forms F2 and F3 that update the regional database. Train in the delivery times of information, submission methods, as well as in response times to requests from CARSAMMA for information on approval or cancellation of operations.

Module 3: Filling of the LHD Form (F4)

Provide guidance to staff about the information required to complete the F4 form of the CARSAMMA, complying with the required data format as well as the deadlines for the delivery of this information.

Module 4: Filling the FLIGHT PLAN DATA FORM FOR RVSM AUDIT (F5)

Provide guidance to Staff regarding the required information to complete the Form F5 from CARSAMA, complying with the required data format, and the deadlines for submission of this information.

Module 5: Filling the ASE MONITORING VALIDATION REQUEST FORM (F6)
Provide guidance to Staff regarding the information required to complete the Form F6 from CARSAMMA, complying with the required data format.

Module 6: LHD Analysis using the SMS based Methodology

Provide guidance to staff about the LHD analysis using the methodology based on the Safety Management System, using the Manual Guide on LHD Evaluation based on a Safety Management System (SMS) for the CAR/SAM Regions.

Module 7: Use of the LHD Reference Guide

Provide guidance to staff to validate the LHD events using the LHD reference guide.

Module 8: Interpretation of the CRM evaluation

Induce staff in the correct interpretation of the results of the CRM assessment carried out by CARSAMMA in order to provide feedback to their organization with respect to the level of Operational Safety of their Flight Information Region (FIR) or their State.

Module 9: Use of the Excel Template for the calculation of the Average Risk level

Provide guidance to the PoCs in the use of the Excel Template for the Calculation of the Average Risk Level of their Flight Information Region.

Appendix A

CARSAMMA DATA COLLECTION FORM (F0)

MANDATORY FIELDS													OPTIONAL FIELDS						
FIR IDENTIFICATION:													PROGRESSING IN RVSM AIRSPACE						
DATE	AIRCRAFT CALL SIGN	AIRCRAFT REGISTRATION	AIRCRAFT TYPE	ORIGIN AERODROME	DESTINATION AERODROME	ENTRY FIX INTO RVSM AIRSPACE	TIME AT ENTRY FIX	FL AT ENTRY FIX	AIRWAY AT ENTRY FIX	EXIT FIX FROM RVSM AIRSPACE	TIME AT EXIT FIX	FL AT EXIT FIX	FIX 1	TIME AT FIX 1	FL AT FIX 1	FIX 2	TIME AT FIX 2	FL AT FIX 2	CONTINUE IF NECESSARY	
01/09/03	...	PTLPN	C550	SBBH	SBBR	VUPKI	12:20	310	UW12	IMEDI	12:29	310								annex: example 1
01/09/03	GLO1713	PRGFT	B737	SBRF	SBGL	NUQ	19:30	390	UW60	PONGA	20:12	390								annex: example 2
01/09/03	ARG1303	LVSDE	B747	KMIA	SAEZ	ELAKA	09:45	370	UT410/UA30	ISOPO	10:47	370	CERES	10:40	370					annex: example 4
02/09/03	TAM8097	PRMDF	A332	LFPG	SBGR	KAKUD	07:29	390	UG741	MENDS	08:33	390	MCL	07:35	390					
...	...	...	...	...	...	...	...	...	...	...	...	...								
...	.....	.....	...	...	...	...	...	...	...	...	...	...								
18/09/03	IBE6824	EC1944	A340	SBGR	LEMD	BGC	20:06	290	UW13	RIGEL	21:10	370	COTON	20:40	330	CNF	20:54	370		annex: example 4
...	...	...	...	...	...	...	...	...	...	...	...	...								
...	...	...	...	...	...	...	...	...	...	...	...	...								
30/09/03	PTSAC	PTSAC	E135	SBCG	SBEG	TOSAR	10:57	350	UW28	RAPAT	11:41	390								annex: example 3

Update Form 0

1 Introduction

1.1 This guidance is to standardize the fulfilment of data collection template, aiming to obtain an air traffic movement sample for safety assessment of operations in CAR/SAM airspace.

1.2 An "EXCEL" electronic form should be used and all events (air traffic movements) of every day of whole requested period, should be shown in chronological sequence in only one form without any interposed blank line or heading.

1.3 The fulfilment of all fields is mandatory, except the fields contained in the entitled interval "Optional Fields" that should only be filled out if there is any change of flight level and/or airway.

1.4 Data Sample should describe daily air traffic movement between FL290 and FL410 included, in requested period, by FIR and in all air routes of the FIR.

2 Mandatory Fields

• Field: FIR Identification
It shall be filled out according to ICAO designators contained in Doc. 7910. Examples: SBBS, SLLF, SAEU.

• Column A: Date
It shall be filled just with numeric characters in the following way: dd/mm/yy
Examples: February 01, 2003 enter 01/02/03.

• Column B: Aircraft Call Sign
It shall be filled with seven alphanumeric characters at most, with no blank space or hyphen.
Examples: AAL906, PTLCN, VRG8764.

• Column C: Aircraft Registration
It shall be filled with alphanumeric characters (if any).
Examples: N758T, YV1920, CUT3457

• Column D: Aircraft Type
It shall be filled out according to ICAO designators contained in Doc. 8643.
Examples: for Airbus A320-211 enter A320;

• Column E: RVSM Approved
Shall be completed with "W" if the aircraft is RVSM approved.
Example: Put "W" if the aircraft is RVSM approved.

• Column F: Origin Aerodrome
It shall be filled out according to ICAO designators contained in Doc. 7910.
Examples: SBGR, SCEL, SAEZ.

• Column G: Destination Aerodrome
It shall be filled out according to ICAO designators contained in Doc. 7910.
Examples: SKBO, MPTO, SEQU.

• Column H: Entry Fix into RVSM Airspace
It shall be filled with five alphabetical characters at most, according to the name of the fix of entrance in corresponding airspace.
Examples: UGADI, ILURI, BAQ

Note: For flights climbing into the RVSM airspace, without crossing FIR boundary, the entry fix will be the fix before the first fix that the aircraft pass leveled.

• Column I: Time at Entry Fix

It shall be filled with numeric characters in the following way: hh:mm
Examples: for 01 hour and 09 minutes enter 01:09; for 12 hours and 23 minutes, enter 12:23.

• Column J: Flight Level at Entry Fix

It shall be filled with three numeric characters corresponding to the flight level at entry fix of RVSM airspace.
Examples: for FL290 enter 290; for FL310 enter 310.

• Column K: Airway at Entry Fix

It shall be filled with five alphanumeric characters at most, without space or hyphen. Examples: UA301; UB689; UW20; UW7.

Note: When aircraft change airway during the flight in RVSM airspace, the new airway must be reported after the first one separated by the character "/ ".
Example: UL302/UW650, UA302/UZ21/UL761

• Column L: Exit Fix from RVSM Airspace

It shall be filled with five alphabetic characters at most, according to the name of the fix of exit from corresponding airspace.

Note: This fix will normally be the FIR limit, or the last one crossed by aircraft while in leveled flight.
Examples: INTOL, NIKON, CARPA

• Column M: Time at Exit Fix

It shall be filled with numeric characters in the following way: hh:mm
Examples: for 08 hours and 07 minutes enter 08:07;

• Column N: Flight Level at Exit Fix

It shall be filled with three numeric characters, corresponding to the flight level at exit fix of RVSM airspace. Examples: for FL330 enter 330; for FL350 enter 350.

3 – Optional Fields (“Progressing of the flight in Airspace”)

• Column O: Fix 1

It shall be filled with five alphabetical characters at most, according to the name of fix where flight level and/or airways changes have been made.

Note: This fix will be the last one the aircraft has crossed in leveled flight. Examples: BAQ, KUBEK

• Column P: Time at Fix 1
It shall be filled with numeric characters in the following way: hh:mm. Examples: for 10 hours and 05 minutes enter 10:05;

• Column Q: Flight Level at Fix 1
It shall be filled with three numeric characters corresponding to the flight level in the fix 1. Examples: for FL370 enter 370;

Note: In the case of more than one change in flight level and/or airway, fill in as many fixed/hour/flight level columns as necessary.

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Appendix B

CAR/SAM REGIONS POINTS OF CONTACT FORM (F1)

CARSAMMA FORM F1
POINT OF CONTACT
DETAILS/CHANGE OF POINT OF CONTACT

This form should be completed and returned to the address below on the first reply to the CARSAMMA or when there is a change to any of the details requested on the form (PLEASE USE BLOCK CAPITALS).

STATE OF REGISTRY: _____

STATE OF REGISTRY (ICAO 2 LETTER IDENTIFIER): _____
Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the event that there is more than one identifier for the same State, the one that appears first in the list should be used.

ADRESS:
Digite aqui o endereço completo do contato

CONTACT

Full Name: _____

Title: _____ Surname: _____ Initials: _____

Post/Position: _____

Telephone: _____ # Fax: _____

E-mail: _____

*Initial Reply ☐ *Change of Details ☐ (**Mark as appropriate)*

When complete, please return to the following address:
Caribbean and South American Monitoring Agency - CARSAMMA
AV. GENERAL JUSTO, 160/Térreo - CENTRO
22295-090 - RIO DE JANEIRO - RJ
Telefone: (55-21) 2101-6358 Fax: (55-21) 2101-6293
E-Mail: carsamma@decea.gov.br

NOTE TO AID COMPLETION OF CARSAMMA FORM F1

1. It is important for the Regional Monitoring Agencies to have an accurate record of a point of contact for any queries that might arise from on-going height monitoring. Recipients are therefore requested to include a completed form CARSAMMA F1 with their first reply to CARSAMMA. Thereafter, there is no further requirement unless there has been a change to the information requested on the form.

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Appendix C

RVSM OPERATION APPROVAL REGISTRY FORM (W/PBCS) (F2).



CARSAMMA F2 FORM
RECORD OF APPROVAL TO OPERATE IN CAR/SAM AIRSPACE

1. When a State of Registry approves or amends the approval of an operator/aircraft for operations within the CAR/SAM airspace, details of that approval must be recorded and sent to CARSAMMA to reach it by the tenth day of the month following the month that the approval was issued.
2. *Before providing the information as requested below, reference should be made to the accompanying notes* **(PLEASE USE BLOCK CAPITALS).**

State of Registry[1]: _____

Name of Operator[2]: _____

State of Operator[3]: _____

Aircraft Type[4]: _____

Aircraft Series[5]: _____

Manufacturer's Serial Number[6]: _____

Registration Number[7]: _____

Mode S Address Code[8] (if applicable): _____

Airworthiness Approval[9]: _____

Date Issued[10]: _____

RVSM Approval[11]: _____

Date Issued[12]: _____

Date of Expiry[13] (If applicable): _____

Remarks[14]: Fill in if necessary.

When complete, please return to the following address by the next business day:
CARIBBEAN AND SOUTH AMERICA MONITORING AGENCY - CARSAMMA
AV. GENERAL JUSTO, 160/Térreo - CENTRO
22295-090 - RIO DE JANEIRO - RJ
Telefone: (55-21) 2101-6358 Fax: (55-21) 2101-6293
E-Mail: carsamma@decea.gov.br

Responsible inspector for the above information: Name and signature.

NOTES TO AID COMPLETION OF CARSAMMA FORM F2

1) Enter the two letter ICAO identifier as contained in ICAO Doc 7910.

2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA" (write the name of the operator/ owner in the Remarks 14 field). For military aircraft, enter "MIL".

3) Enter the two letter ICAO identifier as contained in ICAO Doc 7910.

4). Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A322; for Boeing B747-438 enter B744.

5) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.

6) Enter aircraft serial number as given by manufacturer.

7) Enter aircraft's current registration number.

8). Enter ICAO allocated Aircraft Mode S address code (if applicable).

9) Enter yes or no indication of airworthiness approval.

10) Enter date of airworthiness approval. Example: For October 26, 2008 write 10/26/08.

11) Enter YES or NO.

12) Enter date of RVSM approval. Example: For November 26, 2008 write 11/26/08.

13) Enter date of expiry for RVSM approval. Example: For November 26, 2010 write 11/26/10.

14) Fill with YES or NO.

15) Fill in the PBCS approval date. Example: For August 14, 2019, write 08/14/19.

16) Fill in the authorization date RCP240. Example: For August 14, 2020, write 08/14/20.

17) Fill in the RSP180 authorization date. Example: For August 14, 2022, write 08/14/22.

18) Fill in the PBCS approval expiration date (if applicable)

19) Fill in if necessary. Use a separate sheet of paper if insufficient space available.

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Appendix D

CANCELATION OF THE RVSM OPERATION APPROVAL FORM (W/PBCS) (F3)

CARSAMMA FORM F3
WITHDRAWAL OF APPROVAL TO OPERATE IN CAR/SAM RVSM AIRSPACE

1. When a State of Registry has cause to withdraw the approval of an operator/aircraft for operations within the CAR/SAM airspace, details as requested below, must be submitted to CARSAMMA by the most appropriate method.
2. *Before providing the information as requested below, reference below, reference should be made to the accompanying notes* **(PLEASE USE BLOCK CAPITALS).**

State of Registry[1]:	
Name of Operator[2]:	
State of Operator[3]:	
Aircraft Type[4]:	
Aircraft Series[5]:	
Manufacturers Serial No[6]:	
Registration[7]:	
Aircraft Mode S Address Code[8]:	
Date of Withdrawal of RVSM Approval[9]:	
Reason of Withdrawal of RVSM Approval[10]:	
Remarks[11]:	Fill in if necessary.

When complete, please return to the following address by the next business day:
CARIBBEAN AND SOUTH AMERICAN MONITORING AGENCY - CARSAMMA
AV. GENERAL JUSTO, 160/Térreo - CENTRO
22295-090 - RIO DE JANEIRO - RJ
Telefone: (55-21) 2101-6358 Fax: (55-21) 2101-6293
E-Mail: carsamma@decea.gov.br

Responsible inspector for the above information:: Name and Signature.

NOTES TO AID COMPLETION OF CARSAMMA FORM F3

1. Enter the two letter ICAO identifier as contained in ICAO Doc 7910.

2. Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA" (write the name of the operator/ owner in the Remarks 11 field). For military aircraft, enter "MIL".

3. Enter the two letter ICAO identifier as contained in ICAO Doc 7910.

4. Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A322; for Boeing B747-438 enter B744.

5. Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.

6. Enter aircraft serial number as given by manufacturer.

7. Enter aircraft's current registration number.

8. Enter ICAO allocated Aircraft Mode S address code.

9. Enter date of cancellation of RVSM approval. Example: For November26, 2010 write 26/11/10.

10. Enter the reason of cancelation of RVSM approval.

11. Enter the date of the cancelation of PBCS approval. Example: for 26 November 2010, write 26/11/10

12. Enter the reason for the cancelation of the PBCS approval. In the case the space is not sufficient, use a separate page.

13. Fill in if necessary. Use a separate sheet of paper if insufficient space available.

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Appendix E

LHD Form

Report to the Caribbean and South American Monitoring Agency (CARSAMMA) of a height deviation of 300ft or more, including:

1) Those due to TCAS/ACAS;

2) Turbulence and contingency events; and

3) Operational errors resulting in flight at an incorrect level or coordinated by ATC units.

Note. – If there is NO altitude deviation in the area of responsibility of the FIR in the period in question, it STILL is a requirement for the completion of SECTION I of this report and is sent to the address that appears at the bottom page of this form until the 15th of the following month.

Name of FIR _____

Please complete Section I or II as appropriate.

SECTION I:

There were NO reports of large altitude deviation for the month/year _____

SECTION II:

There was (were) report(s) of ____ height deviation(s) of 300ft or more between FL 290 and FL410. Details of the height deviation are attached (Large Deviation Report Form).

(Please use a separate form for each report of height deviation).

SECTION III:

When complete, please return to the following address by the next business day:
CARIBBEAN AND SOUTH AMERICA MONITORING AGENCY - CARSAMMA
AV. GENERAL JUSTO, 160/Térreo - CENTRO
22295-090 - RIO DE JANEIRO - RJ
Telephone: (55-21) 2101-6868 o (55-21) 2101-6867
E-Mail: ~~carsamma@decea.gov.br,~~ carsamma@cgna.decea.mil.br.

The information contained in this form is confidential and will be used for statistical safety analysis purposes only.

CARSAMMA F4 FORM
LARGE HEIGHT DEVIATION

Report to the CARSAMMA of an altitude deviation of 300ft or more, including those due to TCAS, Turbulence and Contingency Events

1. Today's date:	2. Reporting Unit:		
DEVIATION DETAILS			
3. Operator Name:	4. Call Sign: ACFT Registration Number:	5. Aircraft Type:	6. Mode C/ADS Displayed: ☐ Yes. Which FL? _____ ☐ No.
7. Date of Occurrence:	8. Time UTC:	9. Occurrence Position (lat/long or Fix):	10. Weather Conditions: ☐ VMC ☐ IMC
11. Cleared Route of Flight:			
12. Cleared Flight Level:	13. Estimated Duration at Incorrect Flight Level (seconds):		14. Observed Deviation (+/- ft):
15. Other Traffic Involved and Distance:			
16. Cause of Deviation (*brief title*): (Examples: ATC Loop Error, Turbulence, Weather, Equipment Failure)			
AFTER DEVIATION IS RESTORED			
17. Observed/Reported Final Flight Level*: *Please indicate the source of information: ☐ Mode C ☐ ADS ☐ Pilot ☐ Other	Mark the appropriate Box 18. Is the FL above the cleared level: ☐ 19. Is the FL below the cleared level: ☐	20. Did this FL comply with the ICAO Annex 2 Tables of Cruising Levels? ☐ Yes ☐ No	

NARRATIVE
21. Detailed Description of Deviation (*Please give your assessment of the actual track flown by the aircraft and the cause of the deviation.*)

22 - CREW COMMENTS (IF ANY)

When complete, please return to the following address by the next business day:
CARIBBEAN AND SOUTH AMERICA MONITORING AGENCY - CARSAMMA
AV. GENERAL JUSTO, 160/Térreo – CENTRO
22295-090 – RIO DE JANEIRO - RJ
Telefone: (55-21) 2101-6358 Fax: (55-21) 2101-6293
E-Mail: carsamma@decea.gov.br

NOTES TO AID COMPLETION OF CARSAMMA F4 FORM

Specification of the fields:

1. ENTER FORM COMPLETION DATE.

2. ENTER THE 4 (FOUR) LETTER ICAO IDENTIFIER FOR THE FIR OR ENTER THE NAME OF THE REPORTING UNIT.

3. ENTER THE OPERATOR´S 3 (THREE) LETTER ICAO IDENTIFIER. FOR INTERNATIONAL GENERAL AVIATION, ENTER “YYY”.

4. ENTER THE CALL SIGN AND THE ACFT REGISTRATION NUMBER.

5. ENTER THE ICAO DESIGNATOR AS CONTAINED IN ICAO DOC 8643, E.G., FOR AIRBUS A320-211, ENTER A322; FOR BOEING B747-438, ENTER B744.

6. ENTER “YES” OR “NO”. IF “YES”, INFORM THE FLIGHT LEVEL.

7. ENTER THE DATE OF OCCURRENCE (DD/MM/AA).

8. ENTER THE TIME UTC OF OCCURRENCE(HH:MM).

9. ENTER THE OCCURRENCE POSITION (FIX, LAT/LONG OR RADIAL AND NAUTICAL MILES).

10. ENTER THE METEOROLOGICAL CONDITIONS (IMC OR VMC) AT THE TIME OF THE OCCURRENCE.

11. ENTER THE CLEARED ROUTE OF FLIGHT (IN CASE OF DIRECT OR RANDOM FLIGHTS, ENTER “DCT”).

12. ENTER THE CLEARED FLIGHT LEVEL.

13. ENTER THE ESTIMATED DURATION AT INCORRECT FLIGHT LEVEL (IN SECONDS).

14. ENTER THE OBSERVED DEVIATION IN FEET (FOR UPWARDS DEVIATIONS, WRITE “+”, FOR DOWNWARDS DEVIATIONS, WRITE “-“).

15. ENTER THE OTHER TRAFFIC INVOLVED, IF ANY (CALL SIGN, REGISTRATION NUMBER, FLIGHT LEVEL, AIRCRAFT TYPE, ROUTE AND DISTANCE).

16. ENTER THE CAUSE OF DEVIATION ACCORDING TO 5.6 CHAPTER 5

17. ENTER THE OBSERVED/REPORTED FINAL FLIGHT LEVEL, PROVIDING THE SOURCE OF INFORMATION (MODE C AND/OR PILOT).

18. SELECT THIS OPTION IF THE AIRCRAFT WAS ABOVE THE CLEARED LEVEL.

19. SELECT THIS OPTION IF THE AIRCRAFT WAS BELOW THE CLEARED LEVEL.

20. SELECT ONE OF THE OPTIONS: IF THE FL COMPLIED WITH THE ICAO ANNEX 2 TABLES OF CRUISING LEVELS.

21. WRITE A BRIEF DESCRIPTION OF DEVIATION, including human or additional factors contributing to the event.

22) Provide a description of the procedure as follows: FIR successfully validated, but the system is unresponsive; a teleconference is required.

23~~2~~. WRITE THE CREW COMMENTS, IF ANY.

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NOTES TO ASSIST IN COMPLETING THE CARSAMMA FORM (F4) – MULTIPLE REPORTS
http://portal.cgna.decea.mil.br/carsamma/home/formularios?l=es_es
(CARSAMMA F4 forms, numbered 1 through 20, will be filled out automatically.)
Column specifications:
A: Enter the sequential number for each report, organized by date and time.
B: Enter the 4-letter ICAO identifier for the FIR or the agency reporting the occurrence.
C: Enter the 4-letter ICAO identifier or the name of the FIR involved in the reported occurrence (or where the error/deviation took place).
D: Enter the date of the occurrence (dd/mm/yy).
D: Enter the date on which this form was completed.
E: Enter the 3-letter ICAO identifier for the aircraft operator; for general aviation, enter the name of the operator/owner.
F: Enter the call sign.
G: Enter the aircraft registration.
H: Enter the ICAO designator as found in ICAO Doc 8643 (e.g., for an Airbus A320-211, enter A322; for a Boeing B747-438, enter B744).
I: Enter the time of the occurrence (hh:mm).
J: Enter the location of the occurrence (a specific fix, lat/long coordinates, or a radial and distance in nautical miles from a reference point).
K: Risk assessment/position. Leave blank; this will be completed by CARSAMMA.
L: Enter the meteorological conditions at the time of the occurrence. (IMC or VMC)
M Enter the name of the airway that contains the reporting point listed in column "J". (If the flight is direct or random, enter "DCT".)
N Enter the flight origin/destination using the 4-letter ICAO aerodrome identifier. (If column "M" is "DCT," enter the authorized route.)
O Indicate whether Mode C or ADS is displayed by entering "yes" or "no."
P Enter the flight level authorized for the route.

Q Enter the final observed/reported flight level.
R Enter the maximum observed deviation (in feet). Use "+" for upward deviations and "-" for downward deviations. (For upward deviations, the "+" sign may be omitted.)
S Enter the estimated time (in seconds) spent at an incorrect flight level. (If not measured, enter "n/a".)
T GTE duration. Leave blank; this will be filled in by CARSAMMA.
U Enter the source of the information regarding the final observed/reported flight level (Mode C, pilot, ADS, or other).
V, W, X, Y: time (s), time (op), n (s), n (op). Leave blank; these will be filled in by CARSAMMA.
Z Enter the fault/error code, according to the table below. (Not mandatory.)

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Appendix F

FLIGHT PLAN DATA FORM FOR RVSM AUDIT (F5)

FORMULARIO DE DATOS DEL PLAN DE VUELO PARA AUDITORIA RVSM (F5)
Este formulario debe completarse y devolverse a la dirección de CARSAMMA (USE LETRAS MAYÚSCULAS, POR FAVOR)

Después de rellenar, favor regresarlo a la siguiente dirección:

AGENCIA DE MONITOREO DE LAS REGIONES DEL CARIBE Y AMÉRICA DEL SUR- CARSAMMA

Prédio do CGNA – Centro de Gerenciamento da Navegação Aérea, 3º andar Praça Salgado Filho, s/n – CENTRO

CEP: 20021-370 – Rio de Janeiro, RJ – BRAZIL

Telefone: (55-21) 2101-6868 o (55-21) 2101-6867

E-Mail: carsamma@cgna.decea.mil.br

ANNOTATION TO HELP FILLING IN THE CARSAMMA FORM (F5)

1. Introduction

This guide aims to provide an example format to send data related to flight plans for verification of RVSM approval status to be carried out by CARSAMMA in aircraft operating in the airspace of the Caribbean and South American regions. It is also possible that other file formats than XLS meet the needs of CARSAMMA. If any Civil Aviation Authority or ANSP already has an application that creates lists of flight plans received in some other format (txt, csv, sql, json, xml, etc.), it is also possible to send this file to CARSAMMA. Whichever format is adopted, it is essential that it is in a tabular format that allows automated data processing.

FPL MESSAGE
(FPL-PTOHH-YG-BE9L/L-SGR/C-SBBH0000-N0200F170 Z32 TOKIM/N0200F135 VFR DCT 2224S04339W/N0180A035 DCT-SBJR0100 SBRJ-PBN/B2C2D2O2S1 DOF/201001 EET/SBCW0010 OPR/SEBASTIAO CHAGAS DE MIRANDA ORGN/SBSPYOYX PER/B RALT/F090 DCT SBRJ RMK/REA LIMA CHARLIE DELTA JA VOADO VMC SBJR BALIZAMENTO CFM FROM SBBH)
(FPL-ACA091-IS-B77W/H-SDE3FGHIJ2J3J5M1P2RWXYZ/LB1D1-SBGR0000-N0499F320 BCO1A UKBEV UZ26 NESRA/N0493F340 UZ26 BSI UL452 ESUNA/N0490F360 UL452 TONOM/N0490F360 UA312 LEPOD UG449 KORTO/M084F360 UL776 GEECE L776 FERNA DCT MACOR/M084F370 L455 VESRA DCT DUPOX L455 SAVIK/N0486F380 Y486 JFK DCT GAYEL Q818 WOZEE LINNG2 -CYYZ0928 KBUF-PBN/A1B1C1D1L1O2S2T1 NAV/RNP2 DAT/1FANS2PDC CPDLCX SUR/260B RSP180 DOF/201001 REG/CFIVQ EET/SBBS0001 SBAZ0144 SMPM0324 SYGC0348 TTZP0420 TJZS0513 KZWY0611 MACOR0615 MCOOP0631 VESRA0640 DUPOX0700 DUNIG0707 TASNI0723 BEXUM0741 SKPPR0759 SAVIK0813 KZNY0814 KZBW0833 KZNY0838 KZBW0846 KZNY0847 KZOB0904 CZYZ0921 SEL/BRGM CODE/C01753 ORGN/SBGRYOYX PER/D RALT/SBBR RMK/TCAS RMK/CYYZACAW)
(FPL-PPIVA-IG-1C56X/M-SDFGRWY/SB1-SBEG0001-N0400F390 GIKVI UM417 ASTOB DCT AAQ DCT UGOVU-SBJH0340 SBKP-PBN/A1B2B3C2D2L1O2O3 DOF/201001 EET/SBBS0200 SBCW0300 SBBS0310 SBCW0320 OPR/MILL TAXI AEREO ORGN/SBEGYOYX PER/B RMK/FROM SBBR)
(FPL-TAM9000-IS-A320/M-SDE2FGHIM1RWXYZ/S-SBBR0005-N0430F350 NIMKI UZ38 MOXEP-SBGR0121 SBPA-PBN/A1B1C1D1L1O2S2 DAT/SV DOF/201001 REG/PRMYP EET/SBCW0120 SEL/CRBG CODE/E48B65 OPR/TAM ORGN/SBSPSIGX PER/C RMK/TCAS)
(FPL-OWT5620-IS-1C208/L-SDFGR/C-SBFZ0005-N0150F090 DCT 0448S03653W DCT-SBSG0145 SBRF-PBN/B2C2D2O2S1 DOF/201001 REG/PRWOT OPR/TWOFLEX LTDA ORGN/SBRFYOYX PER/D RMK/INDICATIVO DE CHAMADA AZUL CONECTA JAH VOADO VMC FROM SBPL)

(FPL-PTLOE-IN-LJ35/M-SDFGRW/CB1-SBPV2100-N0420F410 UZ40 SIGAX UZ40-SBBR0245 SBGO-PBN/B2C2D2 NAV/GNSS DOF/200930 EET/SBBS0050 OPR/SETE TAXI AEREO ORGN/SBSPSIGX PER/C RMK/FROM SBBR)
…

Flight plan data does not need prior filtering. The CARSAMMA team will take care of all the pertinent procedures.

2- Required fields

Single column: Complete flight plan message, as detailed in Appendix 2 of Doc 4444 and exemplified on page A2-19 of this reference.

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Appendix G

ASE MONITORING VALIDATION REQUEST FORM (F6)

FORMULARIO DE
SOLICITUD DE CONVALIDACIÓN DE MONITOREO DE ASE CARSAMMA (F6)

Este formulario debe completarse y devolverse a la dirección a continuación para solicitar el resultado del monitoreo de errores del sistema de altimetría fuera de las regiones CAR / SAM.
(USE LETRAS MAYÚSCULAS, POR FAVOR).

1.AUTORIDAD DE AVIACIÓN SOLICITANTE

DATOS DE AERONAVES

2. REGISTRO	*3. TIPO*	*4. MSN*	*5. MODO "S"*

DATOS DE VUELO

6. ANTENA DE DATOS	*7. VOLÓ SOBRE EL SITIO*

8. OBSERVACIÓN

Después de rellenar, favor regresarlo a la siguiente dirección:

AGENCIA DE MONITOREO DE LAS REGIONES DEL CARIBE Y AMÉRICA DEL SUR- CARSAMMA

Prédio do CGNA – Centro de Gerenciamento da Navegação Aérea, 3° andar Praça Salgado Filho, s/n – CENTRO

CEP: 20021-370 – Rio de Janeiro, RJ – BRAZIL

Telefone: (55-21) 2101-6868 o (55-21) 2101-6867

E-Mail: carsamma@cgna.decea.mil.br

ANNOTATION TO HELP COMPLETE THE CARSAMMA F6 FORM

1) COMPLETE WITH THE IDENTIFICATION OF THE APPLICANT AVIATION AUTHORITY.

2) FILL IN THE CURRENT REGISTRATION NUMBER OF THE AIRCRAFT.

3) COMPLETE WITH THE ICAO DESIGNATOR, ACCORDING TO THE CONTENTS OF DOC 8643 ICAO. EXAMPLE: FOR AIRBUS A320-211, FILL A322; FOR BOEING B747-438, FILL B744.

4) FILL IN WITH THE AIRCRAFT SERIAL NUMBER, SUPPLIED BY THE MANUFACTURER.

5) FILL IN THE AIRCRAFT MODE "S" CODE SUPPLIED BY ICAO.

6) COMPLETE WITH THE IDENTIFICATION OF THE OVERFLOW ANTENNA, OR

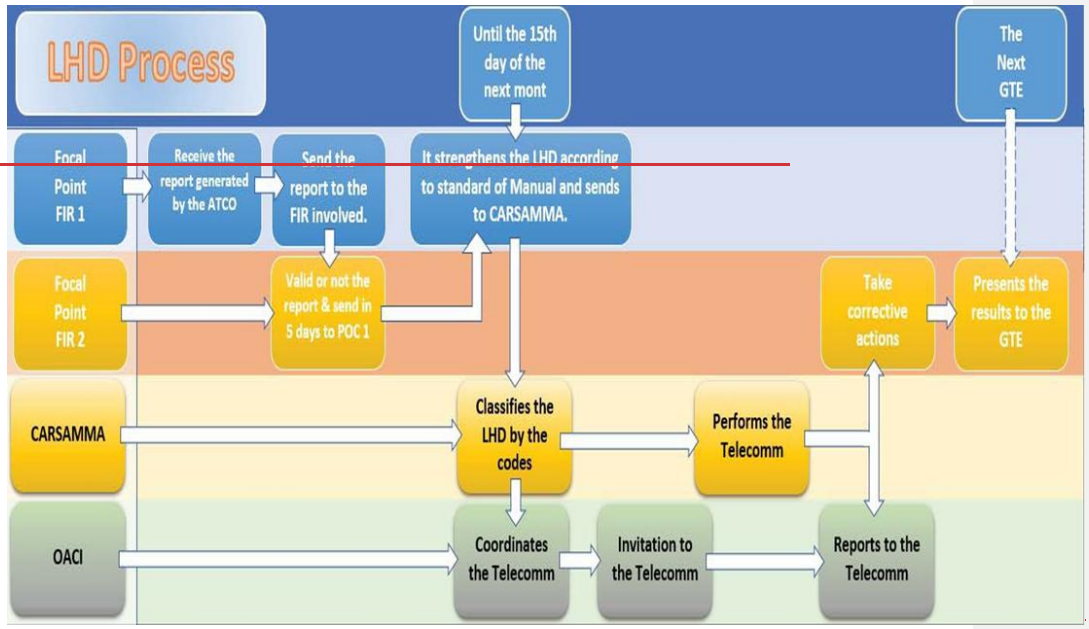
7) MAKE A DESCRIPTION OF THE LOCATION, COORDINATE, ETC.

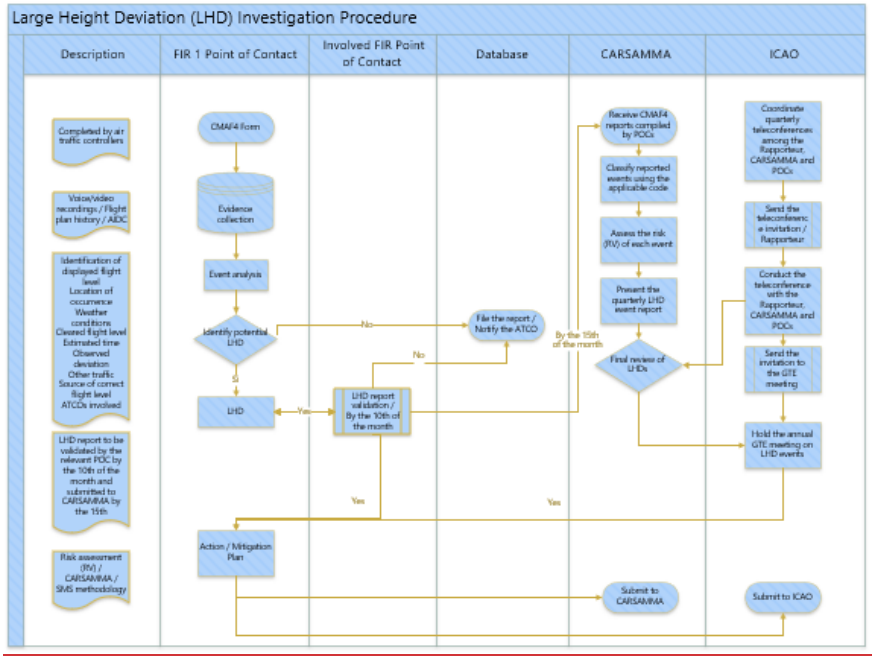
8) FILL IN, IF NECESSARY, IF THE SPACE IS NOT ENOUGH, USE A SEPARATE SHEET OF PAPER.

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APPENDIX H

FLOWCHART OF THE LHD REPORTING AND VALIDATION PROCESS

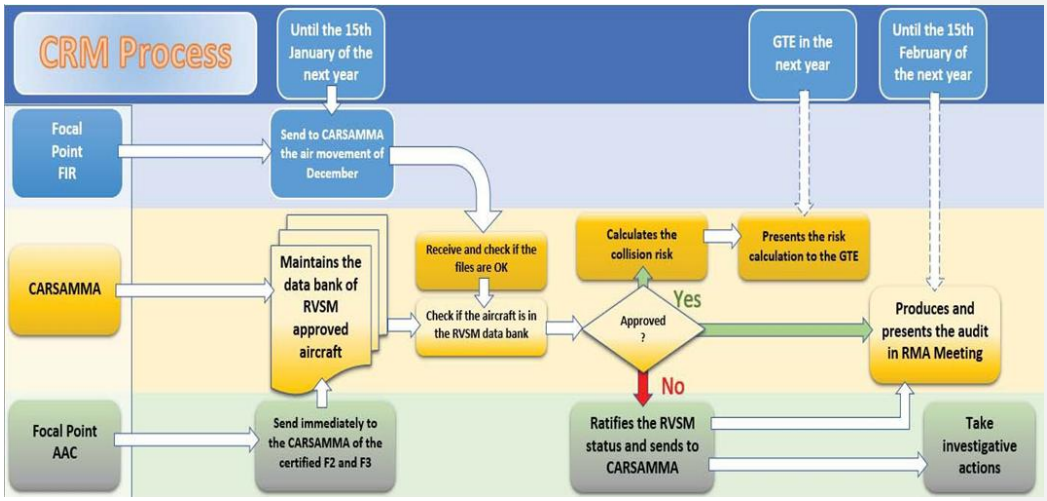



Large Height Deviation (LHD) Investigation Procedure
Description
FIR 1 Point of Contact
Involved FIR Point of Contact
Database
CARSAMMA
ICAO
Completed by air traffic controllers
Voice/Video recordings / Flight plan history / AIDC
Identification of displayed flight level
Location of occurrence
Weather conditions
Cleared flight level
Estimated time
Observed deviation
Other traffic
Source of correct flight level
ATCOs involved
LHD report to be validated by the relevant POC by the 10th of the month and submitted to CARSAMMA by the 15th
Risk assessment (RV) / CARSAMMA / SMS methodology
CMAF4 Form
Evidence collection
Event analysis
Identify potential LHD
No
Yes
LHD
LHD report validation / By the 10th of the month
No
File the report / Notify the ATCO
By the 15th of the month
Yes
Yes
Action / Mitigation Plan
Receive CMAF4 reports compiled by POCs
Classify reported events using the applicable code
Assess the risk (RV) of each event
Present the quarterly LHD event report
Final review of LHDs
Submit to CARSAMMA
Coordinate quarterly teleconferences among the Rapporteur, CARSAMMA and POCs
Send the teleconference invitation / Rapporteur
Conduct the teleconference with the Rapporteur, CARSAMMA and POCs
Send the invitation to the GTE meeting
Hold the annual GTE meeting on LHD events
Submit to ICAO

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Appendix I

FLOWCHART OF THE CRM ANALYSIS PROCESS OF THE LHD



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Appendix J

PRECISION OF SSR DATA MODE C

When using SSR mode C data, the following errors that affect accuracy must be taken into account:

a) Correspondence Error, which reflects discrepancies between the level information used and the encrypted level information for automatic transmission. The maximum value of this error f ± 38 m (125 ft) (95 percent probability) has been accepted (see annex 10, Volume I,
Part I, 3.8.7.12.2.5, ICAO);

b) Technical Flight Error, which reflects inevitable deviations from the aircraft with respect to the planned level, in response to flight control operations, turbulence, etc. This error, when related to manual flight aircraft, tends to be greater than that of an aircraft controlled by autopilot. The maximum value of this error that has been used to date, based on a probability of 95 percent, is ± 60 m (200 ft) (see the report of the Departmental Meeting COM/OPS (1966), question 9, page 9-35, 4.2). However, it should be noted that since then there have been improvements in several factors contributing to this value.

The mathematical combination of the unrelated errors indicated in the headings a) and b) above results in a value of ± 72 m (235 ft) (based on a probability of 95 percent), so it is believed that a value of f ± 90 m (300 ft) represents a valid criterion of decision to be applied in practice at the time of:

a) Verify the accuracy of SSR mode C data;

b) Determine the rate of occupancy of the levels

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Appendix K

FUNCTIONAL DUTIES OF THE POINTS OF CONTACT ACCREDITED TO CARSAMMA

1.1 The functional duties of the FIR Points of Contact are:

A. Collect reports on LHD events.
B. Collect and protect data on LHD events.
C. Conduct the investigation of the LHD events.
D. Exchange information about the LHD events with the FIR´s involved, as well as with the operator (s) involved, where appropriate.
E. Develop form F4.
F. Send form F4 to CARSAMMA through the channels and within the established deadline.
G. Send the F5 Form to CARSAMMA through the established channels and required deadline.
H. Participate in teleconferencing and validate the LHD events.
I. Collect data on aircraft movements in airspace RVSM.
J. To debug the data on aircraft movements and to elaborate the form F0.
K. Send the form F0 to CARSAMMA through the channels and within the established deadline.
L. Participate in the annual meetings of the Scrutiny Group.
M. Participate in the training or meeting actions on the LHD issue that ICAO convenes.
N. Interact with the Equipment PoC, in accordance with the internal procedures of each State, in each situation that warrants or is required.
O. Collaborate in the preparation of working papers (WP) presented by their State in the GTE on LHD with a risk value greater than 20.

1.2 Functional duties of the Equipment Points of Contact are:

A. Send Form F2 to CARSAMMA through the channels and within the established period.
B. Send Form F3 to CARSAMMA through the channels and within the established period.
C. Send Form F6 to CARSAMMA through the established channels as soon as possible.
D. Interact with the FIR PoC, in accordance with the internal procedures of each State, in each situation that warrants or is required.
E. Provide information to CARSAMMA, whenever it is required, in order to clarify doubts about the RVSM operational approval status (w / PBCS) of the fleet of its State through the channels and within the established term.
F. Inform the FIR PoC, in accordance with the internal procedures of each State, the list of aircraft that do not have RVSM operational approval (w / PBCS).
G. Participate in the annual meetings of the Scrutiny Work Group.
H. Participate in training actions or meetings on RVSM that ICAO convenes.
I. Collaborate, when required, in the preparation of working papers (WP) presented by their State in the GTE.

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Appendix L

REFERENCE DOCUMENTS

List of reference documents

CANADA. International Civil Aviation Organization. Manual on Implementation of a 300m (1000ft) Vertical Separation Minimum Between FL290 and FL410 Inclusive: Doc 9574. Montreal, 2012.

CANADÁ. International Civil Aviation Organization. Manual of Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1000ft) Vertical Separation Minimum above FL 290: Doc 9937-AN477. Montreal, 2019.

CANADÁ. International Civil Aviation Organization. Location Indicators: Doc. 7910.Montreal, 2021.

CANADÁ. International Civil Aviation Organization. Aircraft Type Designators: Doc 8643. Montreal, 2021.

CANADÁ. International Civil Aviation Organization. Performance-Based Manual: Doc 9613-AN 937. Montreal, 2012.

CUBA. Working Paper *Mejores Prácticas para Validación*: **GTE 14**. México, 2014

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