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

Second Edition - 2021

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**				

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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 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

1.4 List of Acronyms

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

2.2 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.

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)

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.

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.

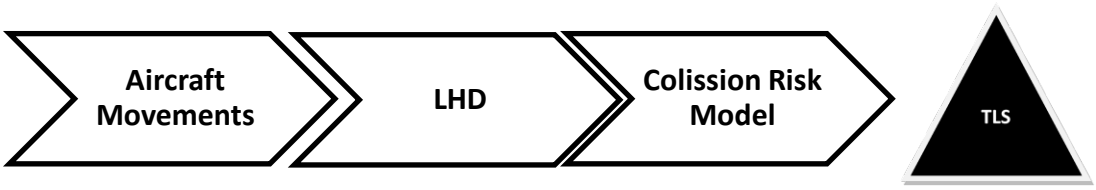
Form	*Purpose of the Form*	*Deadline to be sent to CARSAMMA*
Form 0	Collects movements in RVSM airspace from December 1 to December 31 of each year and is used to calculate the Vertical Collision Risk (CRM) model.	Before February 15 of the following year to the reported period.
Form 1	Establish points 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 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 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 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.

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 and participate in the investigation as well as in its validation, collect RVSM data and data for flight plan audits.

Note.- 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.

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

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:

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

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 risk, the RVSM space must be cancelled until the danger is mitigated and the risk is reduced to the medium or low level
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

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 CARSAMMA Terms of Reference (ToR)

4.3.1 CARSAMMA Functions:

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;

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

Chapter 5

Reference Guide for Validation of LHD events

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 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.

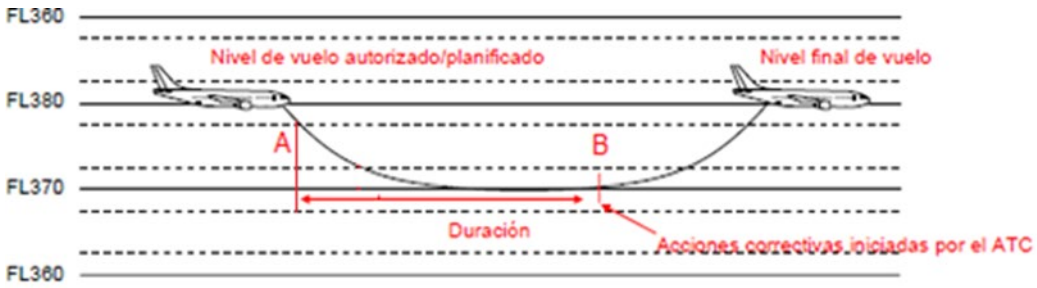


Figura 1

5.4.8 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

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.

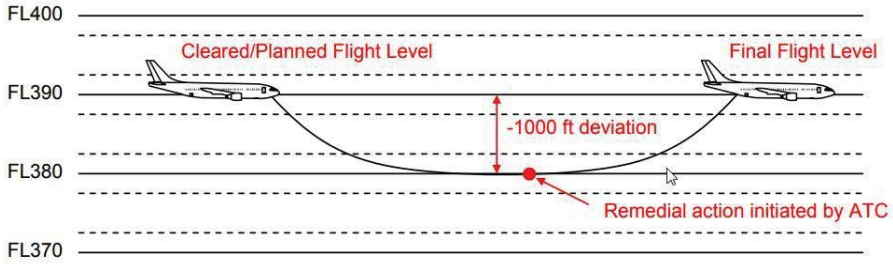


Figure 2.

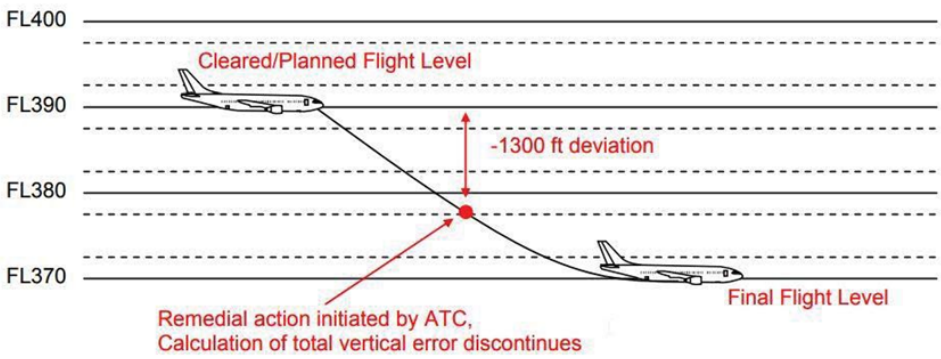


Figure 3.

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.

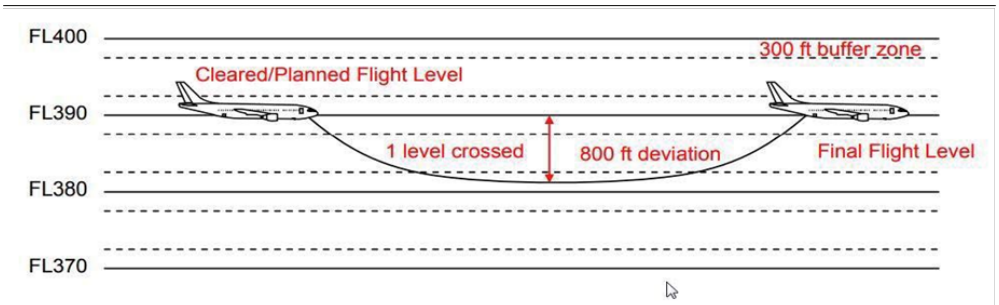


Figure 4

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.

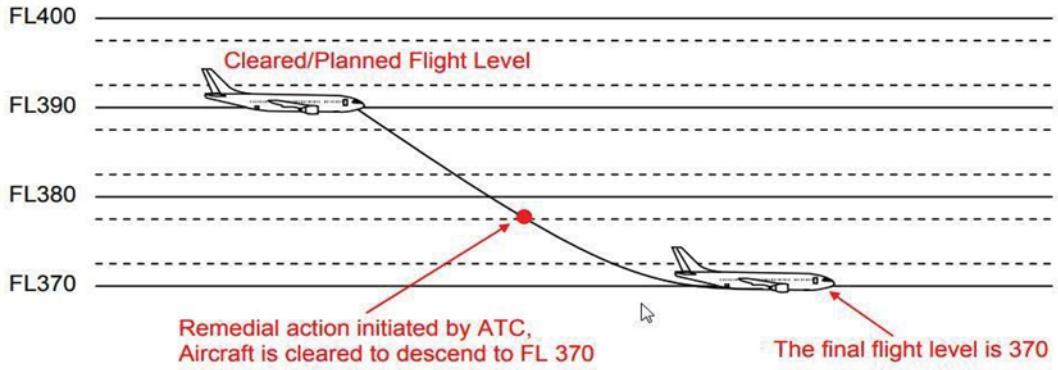


Figure 5.

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.

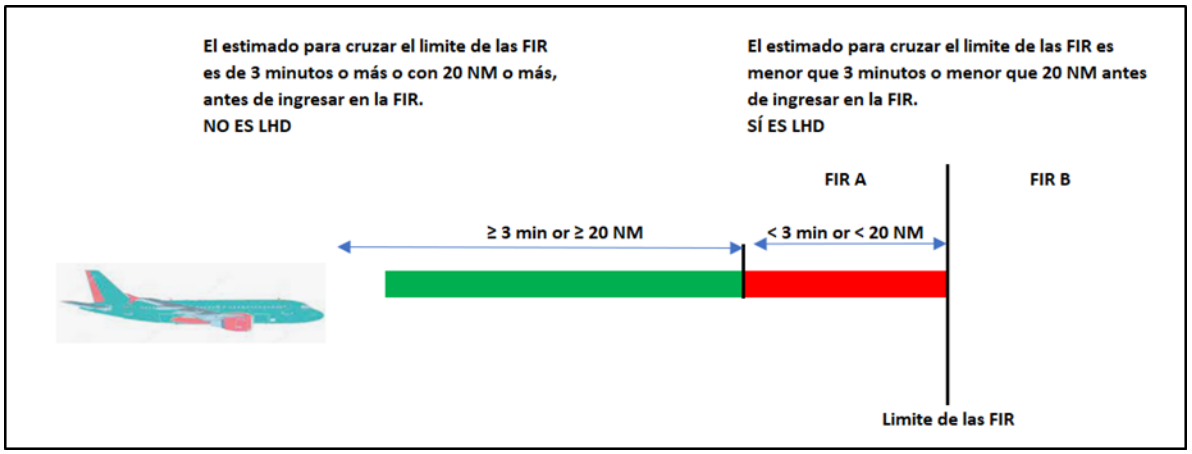
5.4.22 The GTE established climb and descent rate default values.

Vertical descend speed		**Vertical climb speed**	
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 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) 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.

Table 10

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 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.

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).

6.2 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	VURKI	12:20	310	UW12	IMEDI	12:29	310								annex: exampl
01/09/03	GLO1713	PRGFT	B737	SBRF	SBGL	NUQ	19:30	390	UW60	PONGA	20:12	390								annex: exampl
01/09/03	ARG1303	LVSDE	B747	KMIA	SAEZ	ELAKA	09:45	370	UT410/UA30	ISOPO	10:47	370	CERES	10:40	370					annex: exampl
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: exampl
...	...	...	...	...	...	...	...	...	...	...	...	...								
...	...	...	...	...	...	...	...	...	...	...	...	...								
30/09/03	PTSAC	PTSAC	E135	SBCG	SBEG	TOSAR	10:57	350	UW28	RAPAT	11:41	390								annex: exampl

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.

22. WRITE THE CREW COMMENTS, IF ANY.

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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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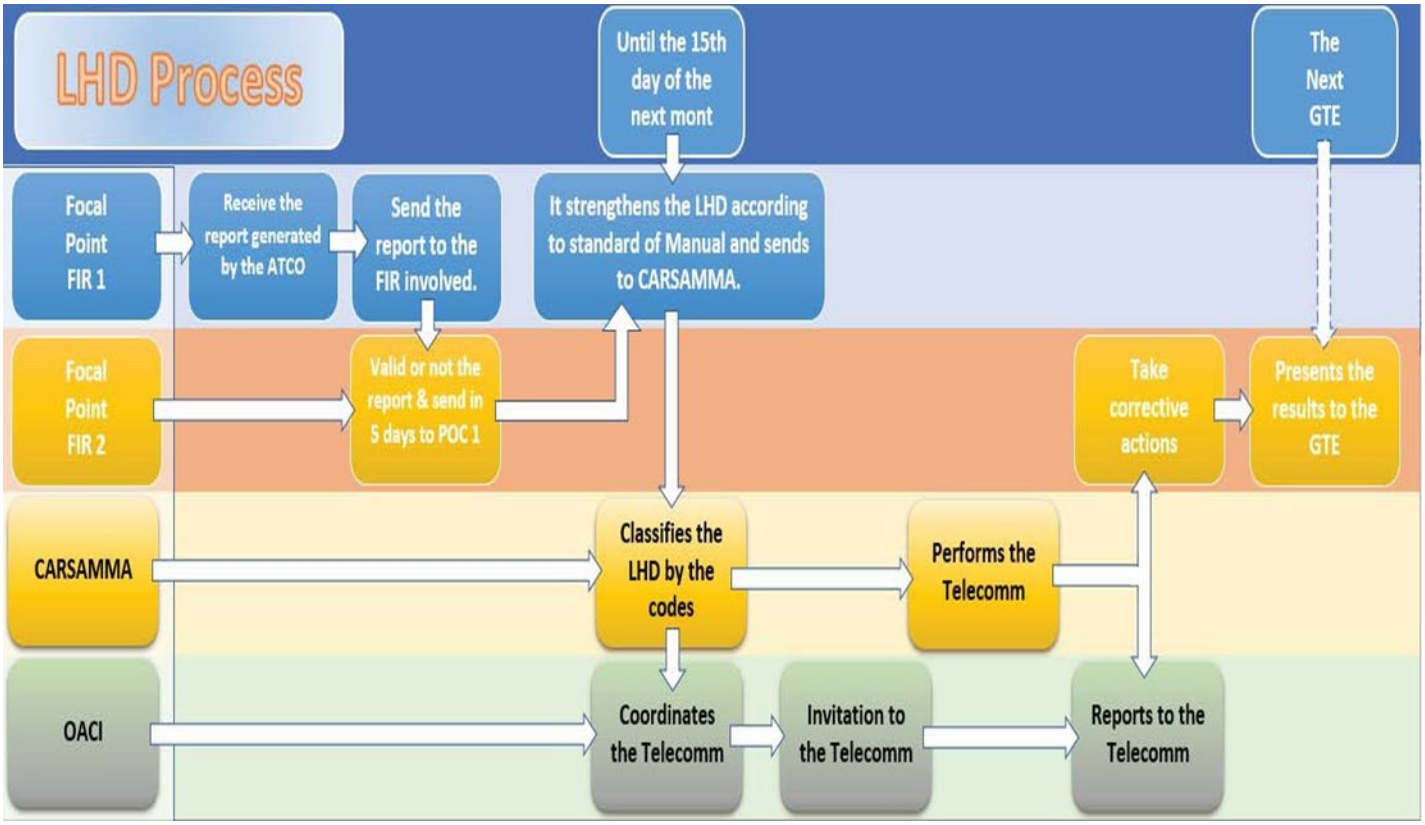
APPENDIX H

FLOWCHART OF THE LHD REPORTING AND VALIDATION PROCESS



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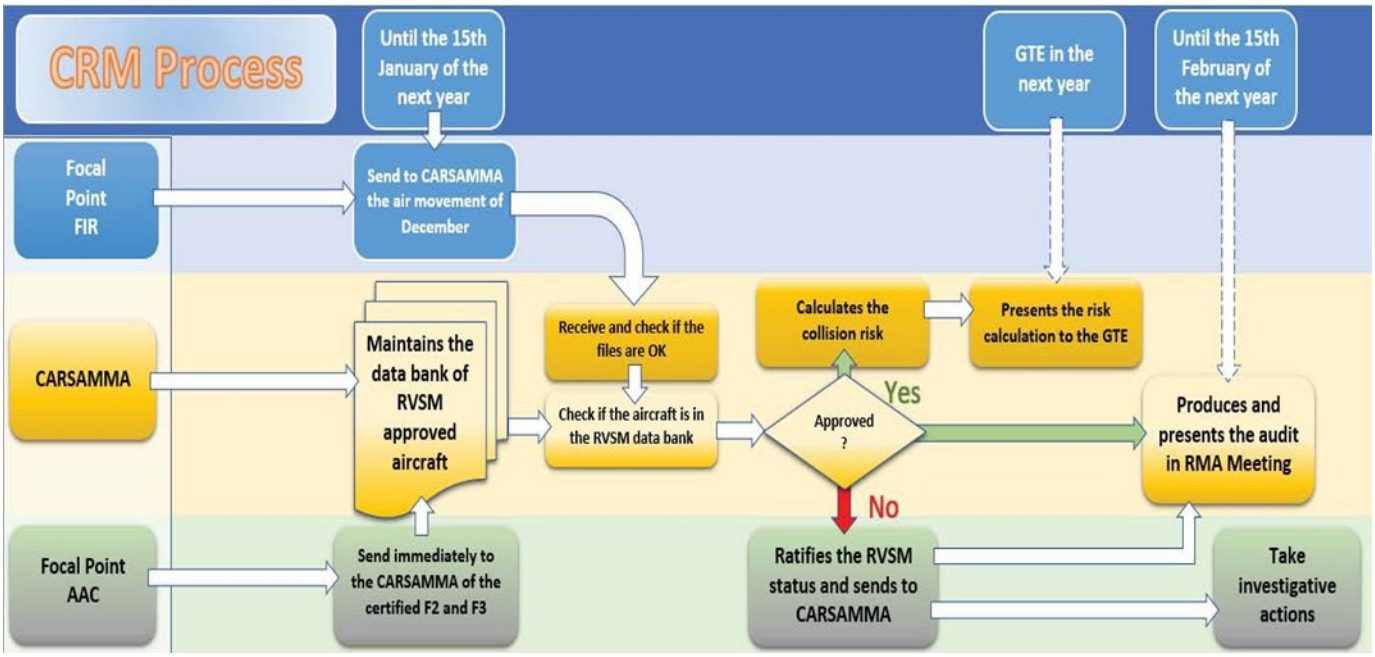
Appendix I

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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