



Agenda Item 3: Air navigation activities at global, intra-regional and inter-regional level

3.3 Inter-regional air navigation activities

**Follow-up on GREPECAS Scrutiny Working Group activities -
Safety assessment in CAR/SAM RVSM airspace**

(Presented by the Rapporteur of the Scrutiny Working Group - GTE)

SUMMARY	
This working paper presents the report of the GREPECAS Scrutiny Working Group (GTE) activities and future work programme for approval by the Meeting.	
References: <ul style="list-style-type: none">• Final Report of the GTE/11 Meeting• Final Report of the GTE/12 Meeting• Final Report of the GTE/13 Meeting• ICAO Document 9574	
ICAO Strategic Objectives	<i>A - Safety B - Air navigation capacity and efficiency E - Environmental protection</i>

1. Introduction

1.1 Since the decision was made to implement reduced vertical separation minima (RVSM) in the CAR/SAM Regions, the Scrutiny Working Group (GTE) has made an analysis of large-height deviations (LHD) to assess the Target Level of Safety (TLS), as established in ICAO Documents 9574 and 9937.

1.2 Part of this process is carried out by the CAR/SAM Regional Monitoring Agency (CARSAMMA), responsible to conduct performance monitoring of the system. The work programmes of the Scrutiny Working Group (GTE) and the CARSAMMA were approved by GREPECAS.

1.3 The objective of the CARSAMMA is to analyse large-height deviation (LHD) reports and produce an estimate of flight time spent at an incorrect flight level. This estimate is used to calculate the operational risk after RVSM implementation.

1.4 The CARSAMMA analyses the technical risk (affected by the reliability and aircraft avionic precision) and operational risk (affected by operational errors and in-flight contingencies) in the development of safety assessment.

1.5 Once a LHD is classified, data is reviewed to identify trends in safety performance. If an adverse trend exists, the GTE formulates recommendations to reduce or mitigate the effect of such trends in the RVSM airspace. The GTE meets periodically to analyse the safety performance so as to ensure that operational errors are kept to the minimum.

1.6 The LHDs are analysed periodically to comply with the safety objectives for technical and operational risk established in ICAO Doc 9574, which is necessary for RVSM operations continuity. From this evaluation process, suggested recommendations or other mitigating strategies can be made to reduce the occurrence of LHDs.

2. Discussions

2.1 GTE noticed the importance of the Virtual Meetings using the Go-To-Meeting tool. Since this methodology was established, a great amount of LHD reports have been analysed: GTE conducted a total of 7 virtual meetings in 2012, 16 in 2013 and 7 in 2014.

2.7 The Final Report of the Twelfth GREPECAS Scrutiny Working Group Meeting (GTE/12) held in Mexico City, Mexico, from 10 to 14 September 2012, was sent to States/Territories and International Organizations for comments and approval no later than 7 January 2013. The CARSAMMA and the GTE Terms of Reference (TOR), as well as GTE/12 conclusions approved by the GREPECAS fast track mechanism, are included in the **Appendix A** to this working paper.

2.3 The GTE/13 Meeting adopted a new methodology, available to States, to analyse and evaluate LHD reports based on Safety Management System (Conclusion GTE/13-1). This new methodology will provide a qualitative approach to the analysis of LHD's, also creating the need of implementing mitigation actions to reduce LHD's in both Regions even if technical and overall safety objectives are met. This new methodology is contained in working paper WP/06.

2.4 The GTE/13 Meeting analyzed a total of 686 reports for CAR and SAM regions reported during the period of 1 January 2013 through 30 June 2013. A summary of reported events and GTE analysis is included in **Appendix B** to this working paper. Conclusions adopted by the GTE/13 Meeting are included in **Appendix C**.

2.5 The GTE/13 Meeting concluded that the estimated annual vertical collision risk for 2012 in CAR/SAM RVSM airspace had been below the TLS recommended by ICAO ($TLS = 5 \times 10^{-9}$ fatal accidents per flight hours), based on the CRM methodology. Accordingly, it could be said that it had been a safe airspace during 2012.

2.6 Some ACCs have implemented automated transfers, but there was still a coordination issue that is not reflected in the Letters of Operational Agreement between adjacent FIRs, especially with respect to the reception of flight plans, duplication of flight plans, or lack of aircraft attitude specifications (climb/descent) for transfer purposes. Furthermore, the absence of handover had increased significantly, resulting in severe loss of situational awareness affecting safety.

2.7 Based on GTE analysis, coordination errors in the ATC-to-ATC transfer or control responsibility represent 97% of the LHDs reported. Many bilateral meetings have been held in an attempt to minimize or eliminate operational errors that fall within the M and N LHD categories. Some transfer points between FIRs remain with lacked reliable handover procedures. The GTE emphasized the benefits of conducting multilateral meetings and discussions and the impact of such discussions has to improve safety.

2.8 The application of the SMS methodology for LHD analysis revealed the weak points in the CAR/SAM FIRs to transfer traffic between ATS units, and that these data could be used to enhance coordination procedures in the Letters of Operational Agreement (LOAs).

2.9 In this regard, it is necessary that States review their LOAs in order to include the necessary procedures to ensure that traffic is correctly transferred, thus minimizing M- and N- coded LHD reports.

2.10 In the light of the above, the meeting should encourage States to implement GREPECAS Conclusion 15/36 (*Measures to reduce operational errors in the ATC coordination loop between adjacent ACCs*) as well as other recommendations, as needed, to improve safety in the CAR/SAM Regions.

2.11 Many LHD reports to CARSAMMA without valuable information, delay the analysis and evaluation of those reports. The reason is that not all of the focal points have the proper training on the information to be provided, how to fill out the form and submit the LHDs report.

2.12 The GTE expresses concern for the absence of data collection in some FIRs, since the quantitative safety assessment (CRM) would not be complete if a FIR failed to send its aircraft movement data. Based on the above, the GTE considered that States should be requested to properly follow the procedures for completing the air traffic data collection templates in their respective FIRs, and to submit such data to CARSAMMA in a timely fashion.

2.13 In this regard, the GTE recommended a training course to be organized by CARSAMMA for 2014. This training is set for the second week of August at the venue of CARSAMMA.

2.14 The GTE has recognized that altitude deviations generated by operational errors and in-flight contingencies occur in the whole airspace, regardless of minimum separation. Therefore mitigation actions need to be analysed to reduce the risk not only in the RVSM airspace.

2.15 The GTE/13 Meeting unanimously elected Mr. Julio Alexis Lewis from the Dominican Republic as the new CAR/SAM GTE Rapporteur and thanked Mr. Johann Estrada for his dedication and ability to lead the Group in a positive direction, emphasizing the progress achieved under his leadership.

3. **Suggested actions**

3.1 The Meeting is invited to:

- a) Take note of the information contained in this working paper;
- b) Encourage States/Territories and International Organizations to implement the GREPECAS Conclusion 15/36 - "*Measures to reduce operational errors in the ATC coordination cycle between adjacent ACCs*";
- c) Encourage States/Territories and International Organizations to participate in CARSAMMA's Training Course for Focal Points, to be held in August at CARSAMMA; and
- d) Recommend other actions that are deemed necessary.

APPENDIX A

CONCLUSIONS

TWELFTH GREPECAS SCRUTINY WORKING GROUP MEETING (GTE/12)

CONCLUSION GTE/12-1 - RISK LEVEL

That the GTE, in carrying out LHD report assessments:

- a) apply TLS parameter in risk level up to 20 points used; and
- b) identify the LHDs hazards as low, medium or high risk, based on the ICAO Safety Management System (SMS) containing the number, description, cause, severity, likelihood and initial risk value of LHDs.

CONCLUSION GTE/12-2 - TERMS OF REFERENCE AND WORK METHODOLOGY OF THE GTE AND THE CARSAMMA

That:

- a) the GTE and the CARSAMMA adopt the terms of reference presented in the Appendix to this part of the Report;
- b) States, Territories and International Organizations of the CAR and SAM Regions nominate experts from their Administrations, providing name, position and email address, to regularly participate in the GTE meetings; and
- c) the CARSAMMA evaluate the Collision Risk Level (CRM) in the RVSM airspace of the CAR/SAM Regions, based on ICAO Doc 9574 and Doc 9937 guidelines and upload in its webpage the results of the CRM risk assessment for States, Territories and International Organizations knowledge.

CONCLUSION GTE/12-3 - SURVEY OF FLIGHT PLAN DATA OF DECEMBER 2012 BY CARSAMMA

That States, Territories and International Organizations send before 31 January 2013, the aircraft data movements in the RVSM airspace between 1-31 December 2012 to CARSAMMA (carsamma@decea.gov.br), with copy to the ICAO NACC (icaonacc@icao.int) and SAM (icaosam@icao.int) Regional Offices.

CARSAMMA TERMS OF REFERENCE (TORs)

RVSM DUTIES OF CARSAMMA:

- a) Maintain a central registry of RVSM-approved operators and aircraft of each State/Territory use the CAR/SAM RVSM airspace;
- b) Facilitate the transfer of approved data to and from other Regional Monitoring Agencies (RMAs);
- c) Establish and maintain a database containing height-keeping errors and height deviations of 300 ft or more within CAR/SAM RVSM airspace;
- d) Submit timely information to States Civil Aviation Authorities (CAAs) on changes or monitoring status of aircraft type classifications;
- e) Submit the result of monitored flight using the GPS Monitoring System (GMS);
- f) Provide the means for identifying aircraft non-RVSM approved operating in CAR/SAM RVSM airspace and to notify the appropriate State Civil Aviation Authority (CAA) accordingly;
- g) Develop the means for summarizing and communicating the content of the relevant databases to RVSM Scrutiny Group (GTE) for the evaluation of the corresponding safety; and
- h) Conduct the assessment of the risk collision level (CRM) in the RVSM airspace of the CAR/SAM Regions, in accordance with ICAO Doc 9574 and Doc 9937.

**TERMS OF REFERENCE (TORS) OF THE
GREPECAS SCRUTINY WORKING GROUP (GTE)**

The Terms of Reference (TOR) of the Regional CAR/SAM RVSM Scrutiny Group (RVSM/SG), known as GTE were established with the purpose of reviewing the problems affecting the TLS based on the LHD information provided by the States.

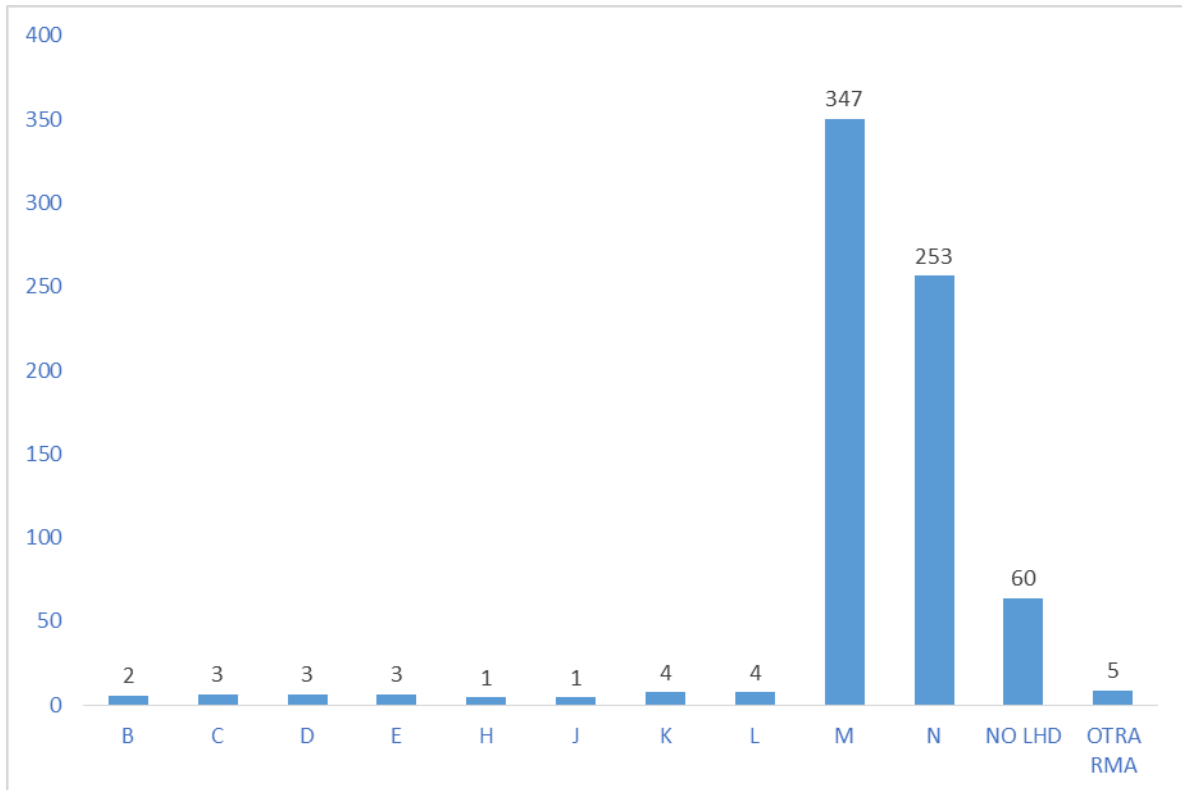
Terms of Reference:

- a) To assemble safety management subject matter experts in air traffic control, aircraft flight operations, regulation and certification, data analysis and risk modeling;
- b) To analyse and evaluate large height deviations of 300 feet or more, as defined in ICAO Doc 9574, Manual on Implementation of a vertical separation minimum of 300 m (1000 ft) between FL 290 and FL 410 inclusive;
- c) To coordinate collection and review of large height deviations data with the CARSAMMA;
- d) Determine and validate an estimate of flight time away from the cleared flight level to be used to estimate the collision risk model (CRM) made by CARSAMMA;
- e) Identify safety trends based on the analysis of large height deviation (LHD) reports, recommend mitigation actions in accordance with the provisions of ICAO SMS and send annual reports on the results of the safety advisory to the GREPECAS to improve safety in RVSM airspace of the CAR/SAM Regions; and
- f) To accomplish other tasks as directed by GREPECAS.

Composition: CAR/SAM States, CARSAMMA, COCESNA, IATA, IFALPA and IFATCA.

Rapporteur: Julio Alexis Lewis (Dominican Republic)

- - - - -

APPENDIX B**SUMMARY OF REPORTED EVENTS AND GTE ANALYSIS**

APPENDIX C

CONCLUSION GTE/13-1 DOCUMENT ON SAFETY ASSESSMENT IN RVSM AIRSPACE OF THE CAR/SAM FIRS

That CAR/SAM States and International Organisations apply the methodology described in the Document on safety assessment in RVSM airspace of the CAR/SAM FIRs starting on 1 January 2014 for the LHDs generated within the FIRs under their responsibility.

CONCLUSION GTE/13-2 NEW LHD CODES TABLE

That CARSAMMA adopt the new Codes Table agreed worldwide for the Regional Monitoring Agencies that appears in Appendix A to this part of the report and apply it for quantitative assessment (CRM) as of 1 January 2014.

CONCLUSION GTE/13-3 COLLECTION OF DATA ON AIRCRAFT MOVEMENT IN RVSM AIRSPACE OF THE CAR/SAM REGIONS

That CAR/SAM States and International Organisations collect data on aircraft movements in RVSM airspace between 1 and 30 November 2013 and send the corresponding data in CARSAMMA Form F0 to that body with copy to ICAO NACC and SAM Regional Offices before 31 January 2014.