International Civil Aviation Organization
CAR/SAM Planning and Implementation Regional Group (GREPECAS)
Fourth Meeting of the Programmes and Projects Review Committee (PPRC/4)
Lima, Peru, 12 - 14 July 2016

Agenda Item 2: Air navigation activities at global, intra- and inter-regional level

2.4 RASG-PA coordination matters

CONTRIBUTION TO THE SEVENTH EDITION OF THE RASG-PA ANNUAL SAFETY REPORT

(Presented by the Secretariat)

SUMMARY

This working paper presents a summary of some initiatives implemented by ICAO Regional Offices, CARSAMMA and the GREPECAS Scrutiny Group (GTE) to strengthen safety in air navigation services in relation to LHD events in the CAR and SAM Regions and the need to inform RASG-PA on the safety level in RVSM airspace within the PIRG-RASG cooperation mechanism.

References:

- Third Meeting of the GREPECAS Programmes and Projects Review Committee (PPRC/3), Mexico City, Mexico, July 2015;
- GTE/14 (Mexico City, Mexico, September 2014) and GTE/15 (Lima, Peru, November 2015) reports.

Strategic objectives	*A - Safety*

1. Introduction

1.1 The PPRC/3 meeting agreed that some RASG-PA safety risk mitigation actions could be part of the projects that are already being developed under GREPECAS scope, and therefore RASG-PA needs to be informed to avoid any duplication of efforts, and that GREPECAS projects could be benefited with the safety intelligence information generated by RASG-PA to establish implementation priorities of operational improvements.

1.2 The PPRC/3 meeting agreed to contribute with one section of the seventh edition of RASG-PA Safety Annual Report, on the RVSM airspace safety analysis, and approved a text to be included on that Report to support safety management process developed by RASG-PA.

1.3 One of the main objectives of CARSAMMA is to monitor the use of RVSM airspace in the CAR and SAM Regions. Based on this monitoring, the level of risk is calculated using the collision risk model (CRM) established by ICAO in Doc 9574, and large height deviation (LHD) trends are identified in order to coordinate actions with the countries to mitigate and reduce deviations.

1.4 The acceptable level of risk, or "target level of safety" (TLS), is expressed as 5×10^{-9} fatal accidents per flight hour in RVSM airspace. The Regional Offices are continuously monitoring the action taken by States to ensure that the level of risk in the airspace remains within "acceptable limits" through risk management, using the information provided by the monitoring agency.

2. Discussion

2.1 When validating the LHDs corresponding to 2013 (GTE/14 report), calculations showed that operations in RVSM airspace exceeded the acceptable level of risk (TLS), 11.9×10^{-9}. Accordingly, the work of the Regional Offices increased during 2014 and 2015, with the establishment of a series of mitigation strategies that had a positive impact on the reduction of LHD events.

Mitigation strategies

2.2 As part of the strategies implemented to maintain the level of safety, ICAO (CAR and SAM Regional Offices), CARSAMMA, and the States conduct monthly teleconferences to validate the reported events (LHDs) and to design mitigation activities at the operational level in order to maintain the level of risk within acceptable levels. These activities are a priority for ICAO Regional Offices. Within this context, two types of strategies are developed:

2.2.1 **Individual strategies**: Each State of the Region has implemented actions to reduce the number of LHDs and maintain an acceptable level of risk. These mitigation measures were identified based on the risk management performed by the States. These actions include the following:

a) En-route sector capacity and workload studies.

b) Development of workload analysis applications as well as additional sector control positions.

c) LHD training for executives, supervisors and controllers.

d) Dissemination of information on LHDs within areas of responsibility.

e) Workshops on "ATC human factors".

f) Airspace reorganisation.

g) Establishment of parallel routes.

h) Improvement in the quality and timely delivery of OPMET information.

i) Exchange of radar data between ACCs of adjacent States.

j) Implementation of automated coordination as the AIDC.

k) Coordination of errors and problems mitigation actions on the flight plans information.

l) Implementation of air traffic management operational procedures.

m) Improvement in air-ground communications as in the case of the Curaçao FIR.

n) Implementation of radar screens – improves situational awareness of Eastern Caribbean States.

o) Inclusion of aircraft attitude specifications such as "aircraft descending" or "aircraft climbing" to the coordinated flight level, when reaching the point of transfer.

p) Extraordinary efforts to alleviate very specific situations that have emerged in the South Atlantic due to lack of coordination with flights from the Falkland Islands headed to Europe.

2.2.2 **Regional strategies**: NACC and SAM Regional Office, in coordination with the States, have developed strategies for the provision of training in CARSAMMA and for strengthening communication and surveillance services in support of air navigation. These strategies have had a positive impact on services and have contributed to increase the level of safety established for RVSM airspace, improving the situational awareness of ATCOs. These actions include:

a) Courses in CARSAMMA for LHD focal points responsible for the collection, analysis, and preliminary investigation of LHDs in each State, who at the same time, also make up the Scrutiny Group (GTE).

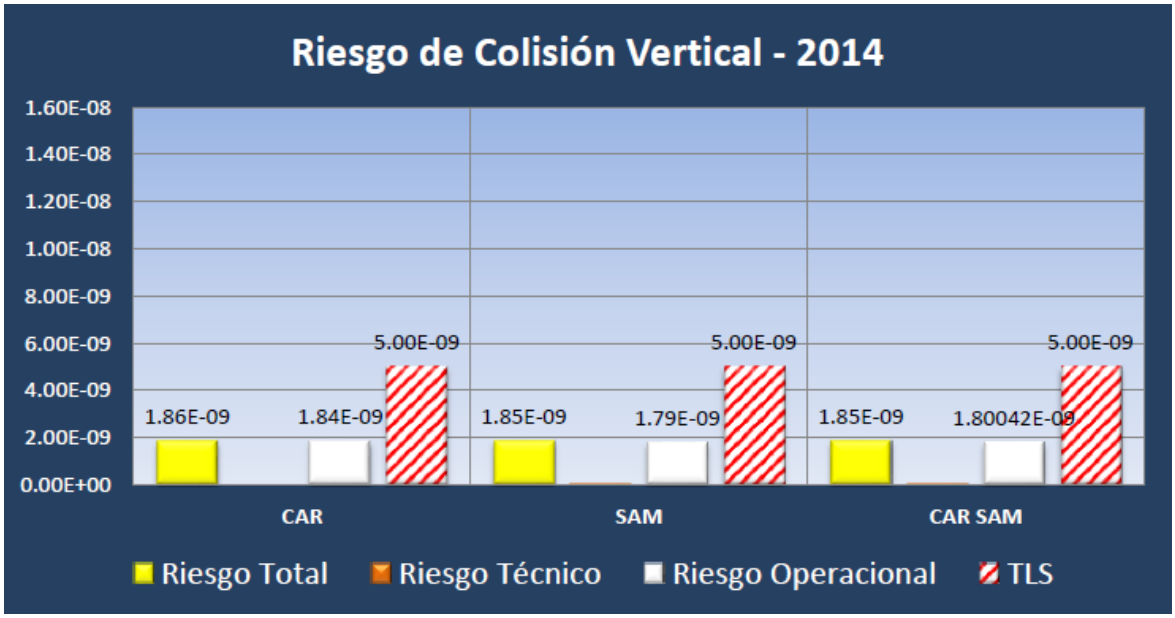
b) Courses on ATC sector capacity calculation to help States identify the lack of human resources and take action to solve this deficiency.

c) ADS-C/CPDLC in the Comodoro Rivadavia and Montevideo FIRs (final training of ATCOs is still required at the Montevideo FIR), ensuring better surveillance in the AORRA and South Atlantic areas, as well as the implementation of ADS-C/CPDLC in the Central American and Piarco FIRs by 2016.

d) MEVA III and REDDIG II networks for modernizing the ATS speech circuit network with voice and data.

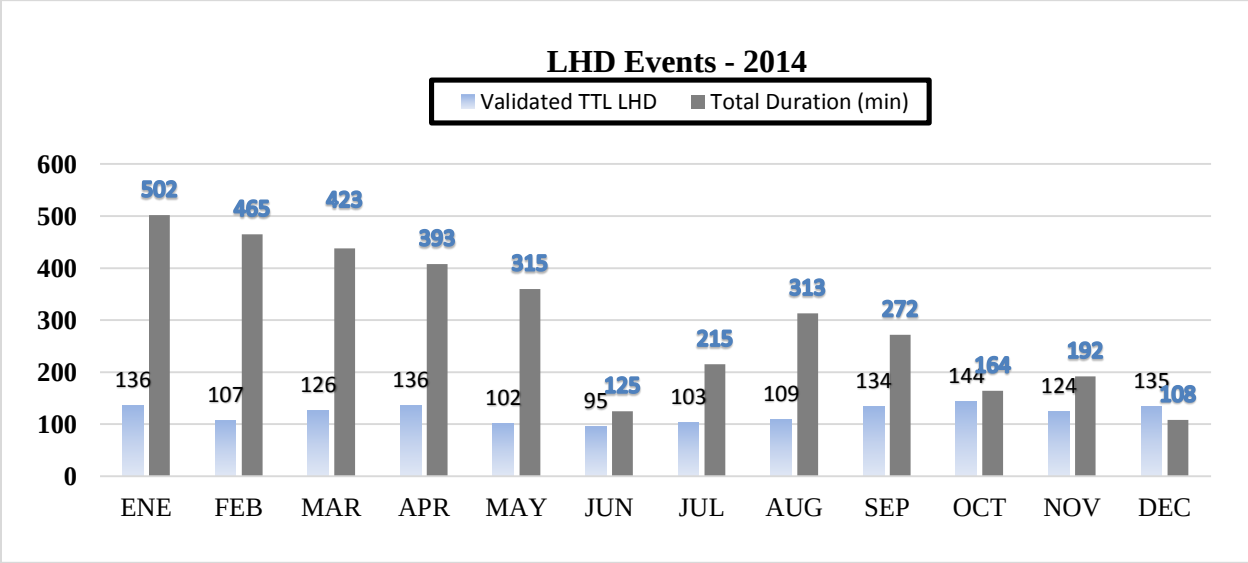
e) AIDC to improve coordination between ATC units. (An implementation percentage of 83% in the NAM/CAR Region and a smaller percentage in the SAM Region, which implementation is not yet fully operational, since several States are in the test phase).

2.3 As a result of actions taken by the States and ICAO, operations in RVSM airspace in the CAR and SAM Regions are within acceptable levels of risk, as shown by the validation of LHDs corresponding to 2014 (GTE/15 report). The calculated total risk in the CAR/SAM Regions is 1.85×10^{-9}, way below the TLS, which is 5.0×10^{-9}, as shown in **Graph 1**.



Graph 1 – Vertical collision risk in RVSM airspace for 2014

2.4 Actions taken by the States in coordination with ICAO have had an incremental impact on the reduction of validated LHDs, whose total duration, which is associated to severity, shows that the severity of events in the CAR and SAM Regions has dropped, as shown in **Graph 2** below:



Graph 2 – Variation of LHDs in 2014, and severity based on duration in minutes

2.5 It should also be noted that, although figures way below the TLS have been obtained for the first time since RVSM implementation in 2005, there has been an improvement in the reporting culture among ATCs and pilots.

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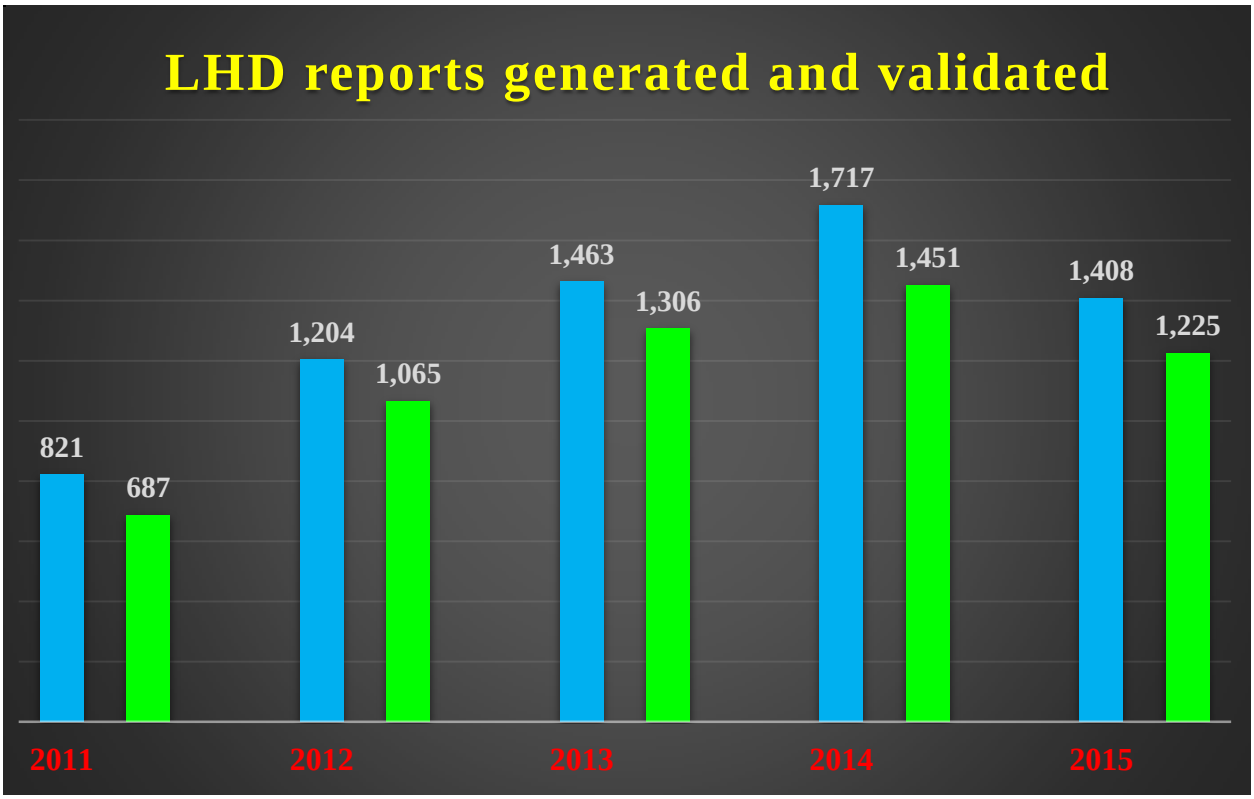
2.6 In this regard, events caused by pilots or aircraft have shown an upward trend in the most recent validation, which may warrant mitigation strategies with the industry to reduce LHDs, especially refresher courses for the crew on RVSM procedures.

Year	Number of events caused by pilots or aircraft
2012	32
2013	23
2014	36

2.7 A very important piece of information is the validation indices of reported LHDs related to their growth. This validation index is the result of the final scrutiny and corresponds to the number of LHDs accepted by the Scrutiny Group. In this sense, **Graph 3** shows the number of LHD reports between 2011 and 2015 in blue, and the number of validated reports in green, noting a sustained increase in the number of reports until 2014 and a reduction in the number of validated LHDs in 2015 to levels below those of 2013 after many of the measures implemented to mitigate risk started to have an effect.



Graph 3 – LHD reports generated and validated between 2011 and 2015

3. **Suggested action:**

3.1 The Meeting is invited to take note of the contents of this working paper, and to:

a) acknowledge the risk management efforts made by CAR and SAM Regions States to maintain the levels of safety in RVSM airspace to mitigate LHD occurrences and severity;

b) acknowledge the activities of CARSAMMA and the GREPECAS Scrutiny Group aimed at mitigating the occurrence of LHDs; and

c) endorse the text proposed in **Appendix A** to this working paper to contribute with the seventh edition of the Annual Safety Report, within the PIRG-RASG cooperation mechanism.

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APPENDIX A

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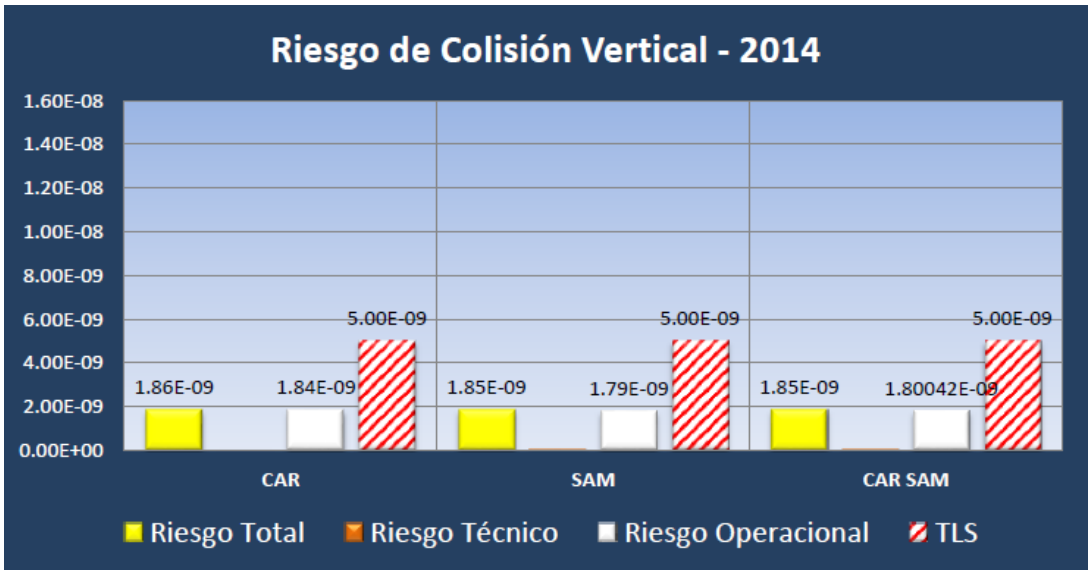

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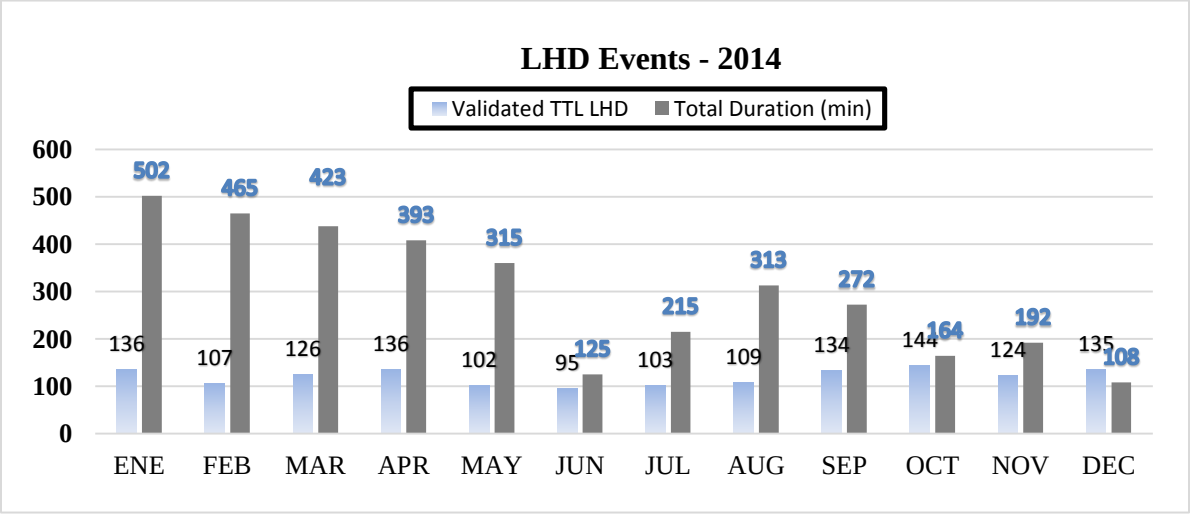

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