INTERNATIONAL CIVIL AVIATION ORGANIZATION

CAR/SAM PLANNING AND IMPLEMENTATION REGIONAL GROUP (GREPECAS)
EIGHTEENTH SCRUTINY WORKING GROUP MEETING

GTE/18

FINAL REPORT

MEXICO CITY, MEXICO, 22 – 26 OCTOBER 2018

Prepared by the Secretariat

March 2019

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HISTORICAL

ii.1 Place and Date of the Meeting

The CAR/SAM Planning and Implementation Regional Group (GREPECAS) Eighteenth Scrutiny Working Group Meeting (GTE/18) was held at the ICAO NACC Regional Office, Mexico City, Mexico, from 22 to 26 October 2018.

ii.2 Opening Ceremony

Mr. Roberto Sosa, Regional Officer, Air Navigation Services and Safety of the ICAO South American (SAM) Regional Office, thanked the NACC Regional Office for hosting this meeting and conveyed the message of support from the SAM Regional Office.

Mr. Julio Lewis, GTE Rapporteur, thanked the ICAO NACC and SAM Regional Offices for their support to the work of the GTE and reminded that the work of CARSAMMA and the GTE requires the permanent collaboration from States/Territories and International Organizations providing air traffic services in the CAR/SAM Regions.

Mr. Julio Siu, Deputy Regional Director of the North American, Central American and Caribbean (NACC) Regional Office of the International Civil Aviation Organization (ICAO) provided opening remarks and thanked the Scrutiny Working Group (GTE) for its work, carried out with the support of the CAR/SAM Monitoring Agency (CARSAMMA), which has brought significant benefits to safety, supporting the growth of air traffic in the CAR/SAM Regions while maintaining the acceptable level of risk in the Reduced Vertical Separation Minimum (RVSM) airspace. He welcomed the participants to Mexico and officially opened the meeting.

ii.3 Officers of the Meeting

The GTE/18 Meeting was chaired by the GTE Rapporteur, Mr. Julio Lewis. Mr. Roberto Sosa Regional Officer, Air Navigation Services and Safety of the South American (SAM) Office served as Secretary of the Meeting, assisted by Mr. Eddian Méndez, Regional Officer, Air Traffic Management and Search and Rescue from the ICAO NACC Regional Office. Mrs Ruviana Zimmerman, Associate Analysis Officer, SIMS Focal Point, from ICAO Headquarters also attended the meeting.

ii.4 Working Languages

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

ii.5 Schedule and Working Arrangements

It was agreed that the working hours for the sessions of the meeting would be from 09:00 to 15:00 hours daily with adequate breaks. Ad hoc Groups were created during the Meeting to do further work on specific items of the Agenda.

ii.6 Agenda

Agenda Item 1: Review of the Previous CARSAMMA and Scrutiny Group Meetings Conclusions and Recommendations

a) Results on 2017 safety assessment (CRM) in Reduced Vertical Separation Minimum (RVSM) airspace
b) Statistics on LHD events in CAR/SAM Regions
c) Identification of point with highest occurrences of LHD events in CAR/SAM Regions

Agenda Item 2: Review of Reduced Vertical Separation Minimum (RVSM) Airspace Safety Assessment Project for the CAR and SAM Regions

a) Composition
b) Objectives
c) Deliverables
d) Statistics

Agenda Item 3: Large Height Deviation (LHD) Analysis

a) Application of GREPECAS approved methodology for safety assessment of reported LHD events
b) Identify trends
c) Lessons learned by CAR/SAM States to reduce the number of LHDs
d) Creation of safety indicators to measure points with highest number of LHD events
e) GTE recommendations

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

a) Indicators on points with highest occurrences of LHD events
b) Actions taken to improve the capture of LHD events data and to improve the capture of RVSM status by States of registry or Operator
c) CARSAMMA Manual Version 2.0
d) Training programme to States' Authorities and Air Navigation Services providers POCs s concerning LHD events
e) Results of the Reduced Vertical Separation Minimum (RVSM) airspace safety assessment Project for the CAR and SAM Regions

Agenda Item 5: Other Business

ii.7 Attendance

The Meeting was attended by 13 States/Territories from the CAR Region and 2 International Organizations, totalling 37 delegates as indicated in the list of participants.

ii.8 Draft Conclusions and Decisions

The Meeting recorded its activities as Draft Conclusions as follows:

DRAFT CONCLUSIONS: Activities requiring endorsement by the CAR/SAM Regional Planning and Implementation Group Meeting (GREPECAS).

DECISIONS: Deal with matters of concern only to the GREPECAS and its Contributory Bodies organization.

An executive summary of these conclusions/decisions is presented in **Appendix A** to this report.

List of Draft Conclusions and Decisions

ii.9 List of Working and Information Papers and Presentations

Refer to the Meeting web page:
https://www.icao.int/NACC/Pages/meetings-2018-gte18.aspx

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01	1	Review and Approval of the Provisional Agenda and Schedule of the Meeting	11/09/18	Secretariat
WP/02	1	Review of the previous CARSAMMA and Scrutiny Group meetings Conclusions and Recommendations	10/09/18	Secretariat
WP/03	5	Air Traffic Services Regional Performance Measurement	16/09/18	Secretariat
WP/04	5	GTE and RASG- PA Implementation of Strategy to Review Risk Associated with Mid-Air-Collision	12/09/18	IATA
WP/05	1	Risk of Vertical Collision (CRM) of the year 2016 in the CAR/SAM Regions (including all validated LHDs)	13/09/18	CARSAMMA
WP/06	1.a)	Risk of Vertical Collision (CRM) of the year 2016 in the CAR/SAM Regions	13/09/18	CARSAMMA
WP/07	1	Scrutiny of the RVSM Air Movements of the CAR/SAM FIR	13/09/18	CARSAMMA
WP/08	1	Relevant FIR to the RMA (Revision of ICAO Doc 9937)	13/09/18	CARSAMMA
WP/09	1	Failures of Coordination in the Oceanic Sector Between the Montevideo and Johannesburg FIR	13/09/18	CARSAMMA
WP/10	3	Safety Assessment in the RVSM Airspace of the CAR/SAM FIRs	13/09/18	CARSAMMA
WP/11	3	Trends Identification	13/09/18	CARSAMMA
WP/12	1	Updating of the CARSAMMA Terms of Reference	04/10/18	Secretariat
WP/13	2	Project to Improve the Safety Assessment in RVSM Airspace	09/10/18	GTE Rapporteur
WP/14	3.b)	Coordination Failures between Adjacent ACC	18/10/18	Uruguay

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01	--	List of Working and Information Papers	18/10/18	Secretariat
IP/02	5	Vertical Safety Monitoring Report for Mexico Airspace	14/09/18	NAARMO
IP/03	3.c)	LHD Mitigation Measures Implementation – Progress by Trinidad and Tobago	14/09/18	Trinidad and Tobago
IP/04	3.c)	Status of Mitigating Actions Implemented by Dominican Republic for the Reduction of LHD Events in Santo Domingo FIR	08/10/18	Dominican Republic
IP/05	5	New York West Airspace Horizontal Safety Monitoring Report	05/10/18	United States
IP/06	3	Miami Oceanic, New York West, and San Juan Airspace Vertical Safety Monitoring Report	05/10/18	United States
NI/07	3.c)	Análisis y Mitigación de LHD (available only in Spanish)	09/10/18	COCESNA

PRESENTATION

Number	Agenda Item	Title	Presented by
P/01	5	Safety Information Monitoring System (SIMS)	22/10/18

LIST OF PARTICIPANTS

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Agenda Item 1 **Review of the previous CARSAMMA and Scrutiny Group meetings Conclusions and Recommendations**

a) Results on 2017 safety assessment (CRM) in Reduced Vertical Separation Minimum (RVSM) airspace
b) Statistics on LHD events in CAR/SAM Regions
c) Identification of point with highest occurrences of LHD events in CAR/SAM Regions

1.1 The Meeting reviewed the previous CARSAMMA and GTE conclusions and recommendations, as follows:

- Conclusion GTE/14/4 was considered to be *Completed*.
- Conclusion GTE/16/3 was considered to be *Superseded* and the Meeting agreed to open another conclusion to address this and other tasks on a permanent basis, as part of the GTE work.
- Conclusion GTE/16/4 was considered to be addressed in other ICAO Regional working groups, so it was considered to be *Superseded*.
- Conclusion GTE/16/5, Mexico has already started to share the data, therefore it is considered to be *Completed*. The Meeting recommended to request NAARMO to present the safety assessments of Mexico airspace in future GTE meetings.

1.2 The rest of the conclusions remain *Valid*. The updated list of conclusions of the GREPECAS Scrutiny Group is shown in **Appendix B**.

1.3 The status and follow-up comments on each conclusion are based on the review carried out by the Secretariat and the representatives of the States and International Organisations.

Risk of Vertical Collision Using Collision Risk Model (CRM) of the year 2016 in the CAR/SAM Regions (including all validated LHDs)

1.4 Under WP/05, the Meeting reviewed again the Risk of Vertical Collision (CRM) of the year 2016, since the original analysis did not include Code E events. After including the Code E events in this analysis, the resulting level of safety is still below the Target Level of Safety (TLS). North American Approvals Registry and Monitoring Organization (NAARMO) and CARSAMMA agreed to review the possibility of presenting the data of adjacent Flight Information Regions (FIRs) in a more cohesive way.

1.5 Therefore, the total of Large Height Deviations (LHD) analysed by the CRM parameters were as follows:

Code	A	B	C	D	E	F	G	H	I	J	L	Total
#LHD	6	8	2	6	1007	16	2	3	11	1	3	1065

1.6 The following table describes the distribution of LHD per month:

MONTH	LHD	Duration (min)	Average Duration (min)
January	115	105.58	0.92
February	70	144.97	2.07
March	92	141.02	1.53
April	77	107.67	1.40
May	97	489.83	5.05
June	70	197.67	2.82
July	108	308.53	2.86
August	104	106.67	1.03
September	102	215.25	2.11
October	74	73.35	0.99
November	89	105.03	1.18
December	67	154.92	2.31
Total	1065	2150.48	2.02

1.7 Aircraft movement data received from the 32 CAR/SAM FIRs was processed and used to assess the safety of RVSM airspace, as recommended by ICAO. The number of flight hours used is shown in following table:

Region	Flight Hours	%
CAR	32,914.32	28.36 %
SAM	83,147.15	71.64 %
CAR/SAM	116,061.47	100.00 %

1.8 The technical error of the CAR/SAM FIRs meets the objective that it must not exceed 2.5 x 10^{-9} fatal accidents per flight hour due to the loss of the standard vertical separation of 1000 feet and all other causes.

CAR/SAM RVSM airspace Estimated Flight Hours = 116,061.47 hours			
Source of Risk	**Estimated Risk**	**TLS**	**Observation**
Technical Error	0.0263×10^{-9}	2.5×10^{-9}	Below
Operational Error	1.3919×10^{-9}	-	-
Risk	1.4182×10^{-9}	5.0×10^{-9}	Below

Risk of Vertical Collision Using Collision Risk Model (CRM) of the year 2017 in the CAR/SAM Regions

1.9 Under WP/06, regarding the occurrence of LHD reported in the CAR/SAM regions, CARSAMMA received a total of 1,127 LHD in 2017. After the analysis and validation carried out through teleconferences with representatives of CARSAMMA, IATA, and the ICAO Lima and Mexico Regional Offices, 982 of these LHD were considered valid, being 947 in the CAR/SAM Regions.

CODE	A	B	C	D	E	F	G	H	I	J	K	L	M	Total
LHD	8	7	0	5	900	12	0	2	7	3	0	2	1	**947**

1.10 The following table describes the distribution of LHDs duration per month:

MONTH	LHD	Total Duration (min)	Average Duration (min)
January	**93**	**105.5**	**1.13**
February	**92**	**101.3**	**1.10**
March	**91**	**154.9**	**1.70**
April	**100**	**119.5**	**1.19**
May	**56**	**53.1**	**0.94**
June	**64**	**67.3**	**1.05**
July	**81**	**119.3**	**1.47**
August	**76**	**89.5**	**1.17**
September	**75**	**90.5**	**1.20**
October	**69**	**77.9**	**1.12**
November	**74**	**76.2**	**1.02**
December	**76**	**65.8**	**0.86**
Total	**947**	**1120.8**	**1.18**

1.11 Aircraft movement data received from the 32 CAR/SAM FIRs were processed and used to assess the safety of RVSM airspace, as recommended by ICAO. The number of flight hours used is shown in the table below.

Region	Flight Hours	%
CAR	**46801.58**	**21.98%**
SAM	**166126.5**	**78.02%**
CAR/SAM	**212,928.04**	**100.00%**

1.12 The technical error of the CAR/SAM FIRs meets the objective that establishes that it must not exceed 2.5 x 10^{-9} fatal accidents per flight hour due to the loss of the standard vertical separation of 1000 feet and all other causes.

CAR/SAM RVSM airspace Estimated Flight Hours estimated = 212,928.04			
Source of Risk	**Estimated Risk**	**TLS**	**Observation**
Technical Error	**0.0299×10^{-9}**	**2.5×10^{-9}**	**Below**
Operational Error	**2.157×10^{-9}**	**-**	-
Risk	**2.187×10^{-9}**	**5.0×10^{-9}**	**Below**

1.13 Following conclusion GTE/17-1, ICAO NACC and SAM Offices will send a State Letter urging States/Territories and International Organizations to send the data, collected during the month of December, of the flight operations in the RVSM airspace. The dateline shall be 31 January of each year.

Scrutiny of the RVSM Air Movements of the CAR/SAM FIR

1.14 Under the WP/07, based on conclusion GTE/17/5, the Meeting reminded CARSAMMA to comply with the requirements of this conclusion, for the ICAO NACC and SAM Regional Offices to remind States/Territories to send the information about the RVSM approval status requested by CARSAMMA.

1.15 The Meeting analysed the impact of the lack of information from States, regarding the information required by CARSAMMA to perform its duties. It was mentioned that, due to the impact to the safe provision of Air Traffic Services (ATS), the lack of compliance with CARSAMMA information request may be considered a deficiency under the GREPECAS Air Navigation Deficiencies Database (GANDD).

1.16 It was also mentioned that many of the required processes for LHD identification could not be performed due to the lack of registration of aircraft in the flight plan. The Meeting considered a recommendation encouraging operators to include registration in the flight plan.

Relevant FIRs to the Regional Monitoring Agency (RMA) (Revision of ICAO Doc 9937)

1.17 Under the WP/08, it was commented that during the 13th meeting of the Regional Monitoring Agencies (RMA) Coordination Group Meeting (RMACG/13), by request of CARSAMMA, it was agreed that the ATLANTICO FIR should return to be handled by CARSAMMA and to update the name of the ROCHAMBEAU FIR to be denominated as CAYENNE FIR, requiring an amendment to ICAO Doc 9937.

Failures of Coordination in the Oceanic Sector between the Montevideo and Johannesburg FIR/Coordination Failures between Adjacent Area Control Centre (ACC)

1.18 The Meeting took note of the information presented under WP/09 and WP/14 and the events related to the coordination failures between the Montevideo FIR, the Comodoro Rivadavia FIR and Mount Pleasant Control Zone (CTR). Accordingly, the ICAO SAM Office will follow up this issue and previous GTE agreements.

Updating of the CARSAMMA Terms of Reference

1.19 Under WP/12 the Meeting reviewed the approved amendment to the CARSAMMA Terms of Reference, in order to include lateral deviations with safety assessments. The Meeting raised comments with regards to the criteria that would be utilized to perform the lateral deviations analysis as part of the new assessments. The meeting approved the creation of an Ad hoc Group to establish the scope of the new task, procedures, deliverables, and priority of this analysis to provide a concrete added value to the work of the GTE. The Ad hoc Group will be comprised by Chile, Colombia, Cuba, CARSAMMA, and the GTE Rapporteur, supported by NAARMO and IATA. The ICAO NACC and SAM Regional Offices will serve as the Secretariat.

1.20 In view of the foregoing, the Meeting formulated the following Draft Conclusion:

<table>
<tr><td colspan="3">DECISION
GTE/18/1 SAFETY ASSESSMENT FOR LATERAL AND LONGITUDINAL DEVIATION</td></tr>
<tr><td colspan="2">What:
Based in the GREPECAS Conclusion 18/22, that approved the amendment of the CARSAMMA Terms of Reference and the fact that there was not enough time to present a project by CARSAMMA at GTE/18 in order to include the safety assessment for lateral and longitudinal deviations:
– An Ad hoc group comprised by Chile, Colombia, Cuba, CARSAMMA, and the GTE Rapporteur, supported by NAARMO and IATA is approved. The ICAO NACC and SAM Regional Offices will serve as the Secretariat, to present a project to include the safety assessment for lateral and longitudinal deviations, with methodology of analysis, the Collision Risk Model to be used, the establishment of a Target Level of Safety and the guidance material to be used by the Points of Contacts (POC) by 31 January 2019.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To Comply with GREPECAS Decision 18/22</td></tr>
<tr><td>When: 31 January 2019</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☒ Other:</td><td colspan="2">Ad hoc group</td></tr>
</table>

Agenda Item 2 **Review of Reduced Vertical Separation Minimum (RVSM) airspace safety assessment Project for the CAR and SAM Regions**

a) Composition
b) Objectives
c) Deliverables
d) Statistics

2.1 Under this agenda item, the Meeting reviewed WP/13 Project to Improve the Safety Assessment in RVSM Airspace, presented by the GTE Rapporteur.

2.2 This Working Paper presented the work done in the Project for the Improvement to the Safety Assessment within the RVSM airspace, and it highlighted opportunities for improvement.

2.3 The Meeting deemed convenient to maintain the cooperation and the exchange of safety information between the GTE and other CAR/SAM implementation groups, with the objective of providing information on the impact of the work of these groups in the definitive reduction of the LHD events.

2.4 The Meeting considered appropriate to raise to GREPECAS the concern about the reporting by some States about the non-occurrence of LHD events (0 LHD), even when the adjacent FIRs present a considerable number of events induced by FIRs that have reported 0 events; It was also deemed necessary to notify GREPECAS on the lack of compliance by some States regarding the exchange of CARSAMMA data.

2.5 The Meeting raised comments regarding the need to reestablish the validation teleconferences with CARSAMMA, due to the added value to the process and in some cases to support the training requirements of PoCs. Most participants considered that the frequency of teleconferences should not be less than three months.

2.6 The Meeting agreed that just by reviewing data evidence of positive results by both Regions can be appreciated, a fact that must also be emphasized. The effort done by some States to comply with the requirements of CARSAMMA and the GTE was noted, and the lack of support from other States. It was reminded the responsibility of States to comply with this work. The importance to compare different sources of information in order to validate the data received was noted.

Agenda Item 3 **Large Height Deviation (LHD) analysis**

a) Application of GREPECAS approved methodology for safety assessment of reported LHD events
b) Identify trends
c) Lessons learned by CAR/SAM States to reduce the number of LHDs
d) Creation of safety indicators to measure points with highest number of LHD vents
e) GTE recommendations

LHD trends in the CAR/SAM Regions

3.1 The GTE Rapporteur presented the information of the LHD events and their trends in the CAR and SAM Regions.

3.2 The Secretariat noted that it would be convenient to present the behavior of the LHD events in proportion to the number of operations by FIR, to visualize the trend of LHDs.

Safety Assessment in the RVSM Airspace of the CAR/SAM FIRs

3.3 Under WP/10, presented by CARSAMMA, the Meeting reviewed the results of the safety assessment in the RVSM airspace of the CAR/SAM regions based on the Safety Management System (SMS) approach.

3.4 The Meeting pointed out the trend in Code E events, which represent over 90% of the total events. Another aspect raised during the presentation of this paper was the low number of events related to Traffic Alert and Collision Avoidance System (TCAS) resolutions, for which the Meeting recognized the importance of the exchange of information with Pan America Regional Aviation Safety Team (PA RAST) based on the IATA proposal to make a comparison with the handled information.

3.5 The representatives of the States and International Organizations expressed their concern with respect to Code E Events. After reviewing the previous information, the Meeting agreed the following Conclusion:

<table>
<tr><td colspan="2">DRAFT CONCLUSION
GTE/18/2 REDUCTION OF CODE E LHD EVENTS</td></tr>
<tr><td>What:
That considering that in the classification of LHD events, the trend in code E events represents 95.03 % of the total events; and that this behavior has been maintained during the last three years, identifying several points in the CAR/SAM Regions where the reduction in the number of events has been low. Include in the GTE work programme the following actions:

a) the States of the CAR/SAM Regions develop the necessary strategies for the reduction of Code E events based on the information provided by CARSAMMA and NAARMO, including the necessary training for air traffic controllers, the improvement of the Communications, Navigation and Surveillance (CNS) infrastructure, including the exchange of radar data and the improvement of ATS communications among the involved FIRs among other activities;

b) ICAO promotes bilateral and multilateral meetings to address specific issues between involved FIRs, especially at the border of the CAR and SAM Regions; and

c) CAR/SAM States notify in the GTE meetings the results of these actions for the reduction of Code E events.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="2">Why:
To reduce the Code E LHD events in the CAR SAM airspace</td></tr>
<tr><td>When: GTE/19</td><td>Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td></td></tr>
</table>

3.6 WP/10 also presented the events that had the highest level of risk.

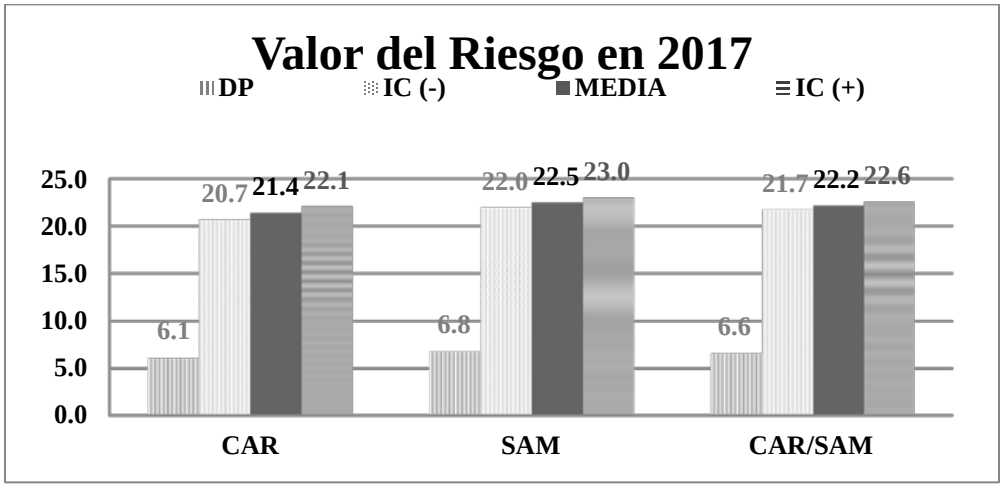
MONTH	LHD QUANTITY	DURATION Total (min.)	DURATION Median (min.)	RISK Median	HIGHER RISK
JANUARY	97	110	1,13	21,9	41
FEBRUARY	94	123	1,31	22,2	39
MARCH	94	158	1,68	23,0	**51**
APRIL	99	119	1,20	21,9	46
MAY	58	56	0,96	22,3	39
JUNE	64	67	1,05	19,5	39
JULY	86	132	1,54	21,4	46
AUGUST	77	91	1,18	24,6	46
SEPTEMBER	77	95	1,23	23,7	46
OCTOBER	72	81	1,12	23,2	39
NOVEMBER	77	79	1,03	21,4	41
DECEMBER	78	68	0,87	20,2	39
TOTAL	**973**	**1.178**	**1,21**	**22,1**	

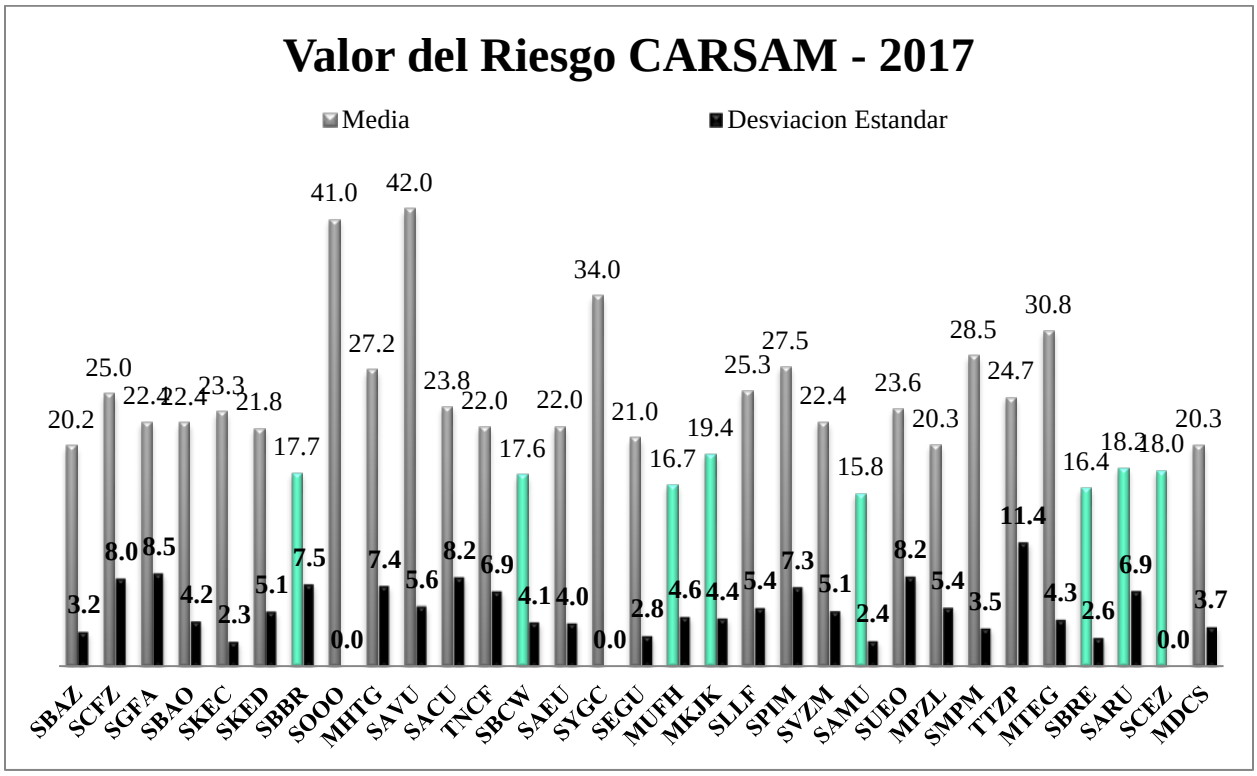
3.7 WP/10 referenced the table below where the number of events suffered and the number of events occurred by each FIR are highlighted.

FIR	Suffers the risk	Generates the risk
AMAZONICA	65	20
ANTOFAGASTA	55	9
ASUNCION	10	8
ATLANTICO	11	1
BARRANQUILLA	3	**70**
BOGOTA	**73**	**153**
BRASILIA	7	18
CAYENNE	1	1
CENTRAL AMERICA	23	32
COMODORO RIVADAVIA	8	0
CORDOBA	42	30
CURAZAO	65	**49**
CURITIBA	26	18
EZEIZA	3	40
GEORGETOWN	1	3
GUAYAQUIL	**135**	48
HABANA	6	14
ISLA DE PASCUA	0	0
KINGSTON	**75**	15
LA PAZ	28	62
LIMA	**93**	**78**
MAIQUETIA	5	47

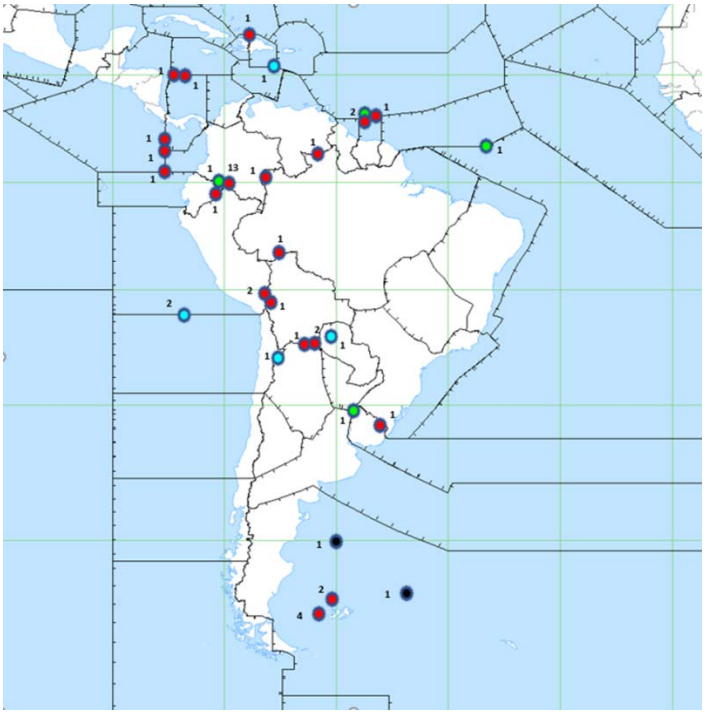
FIR	Suffers the risk	Generates the risk
MENDOZA	13	11
MONTEVIDEO	8	20
PANAMA	10	**51**
PARAMARIBO	2	11
PIARCO	9	13
PORT AU PRINCE	10	45
PUERTO MONTT	0	0
PUNTA ARENAS	0	0
RECIFE	14	2
RESISTENCIA	42	11
SANTIAGO	1	1
ST. DOMINGO	**102**	32
TOTAL	**946**	**913**
NOTE: Total reports made by FIR CAR 290, by FIR SAM 656.		
ADJACENT FIR OTHER (*) (**)	**Suffers the risk**	**Generates the risk**
AERONAVE (*)	0	3
APP SP	0	1
DAKAR	1	2
MERIDA	2	2
MIAMI	6	5
MOUNT PLEASANT (**)	0	7
NEW YORK	6	0
PILOTO (*)	0	24
SAN JUAN	12	16
TOTAL	**27**	**60**

3.8 The Meeting noted that the risk level for the CAR/SAM Regions for 2017 had an average value higher than the desired level of safety under the SMS approach.





3.9 The Meeting also identified the points where the greatest number of events occurred for both regions.



LHD Trends Identification

3.10 With WP/11 the Meeting reviewed the trend in LHD-related events in the CAR/SAM Regions. Some trends are related to events when an aircraft enters a FIR climbing or descending to the coordinated flight level without previous notification.

3.11 Similarly, the LHD events were noted due to the aircraft entering the FIR in a Transmission Control Protocol (TCP) different than the one coordinated, and events related to failure on the read back procedures in ATS coordination.

3.12 CARSAMMA also presented the 20 most reported points in both Regions.

Mitigating actions from Dominican Republic /Trinidad and Tobago

3.13 The Meeting took note of IP/03, presented by Trinidad and Tobago, and IP/04, presented by the Dominican Republic. Both States show a great commitment to the work of the GTE and have implemented effective strategies to reduce the occurrence of LHD events.

Miami Oceanic, New York West, and San Juan Airspace Vertical Safety Monitoring Report

3.14 United States NAARMO presented the IP/06 with the 2017 vertical safety monitoring report for the Miami Oceanic, New York West, and San Juan airspace. The purpose of this report is to compare actual performance to safety goals related to continued use of the RVSM in the aforementioned FIRs. The vertical collision risk estimate for the airspace exceeds the TLS value of 5.0 x 10^{-9} fatal accidents per flight hour.

Agenda Item 4 Large Height Deviation (LHD) analysis

a) Indicators on points with highest occurrences of LHD events
b) Actions taken to improve the capture of LHD events data and to improve the capture of RVSM status by States of registry or Operator
c) CARSAMMA Manual Version 2.0
d) Training programme to States' Authorities and Air Navigation Services providers POCs s concerning LHD events
e) Results of the Reduced Vertical Separation Minimum (RVSM) airspace safety assessment Project for the CAR and SAM Regions

4.1 The Meeting took note of the following issues to be reported to GREPECAS:

a) The lack of information from several States, regarding the compliance with the information required by CARSAMMA to perform its duties. It was mentioned that, due to the impact to the safe provision of air traffic services, the lack of compliance with CARSAMMA information request may be considered a deficiency under the GANDD.

b) Many of the required processes for LHD identification could not be performed due to the lack of registration of aircraft in the flight plan.

c) The Meeting considered appropriate to raise to GREPECAS the concern about the reporting by some States on the non-occurrence of LHD events (0 LHD), even when the adjacent FIRs presents a considerable number of events induced by FIRs that have reported 0 events.

Agenda Item 5 Other Business

Air Traffic Services Regional Performance Measurement

5.1 WP/03 analyses the opportunity to take advantage of the mechanism of regional collection of safety information, developed for the functioning of CARSAMMA, to gather information for the regional safety performance measurement in the provision of ATS in the CAR/SAM Regions.

5.2 The Meeting agreed to request the GTE Rapporteur and the Secretariat to carry out an analysis on the extension of the GTE mandate, to consider the evaluation of regional safety performance for the provision of ATS in the upper airspace in the CAR/SAM Regions, focusing on events related to the nature of the GTE work, and present the results and recommendations in the GTE/19.

Safety Information Monitoring System (SIMS)

5.3 Along with WP/03 the ICAO Integrated Aviation Analysis (IAA) Office delivered P/01 Safety Information Monitoring System (SIMS), on the project developed by ICAO, to support States to collect, analyse, monitor and share safety data and information.

5.4 The participants were interested in the possibilities of this tool, to support individual measurement of safety performance and monitoring of States, as well as a support for the regional measurement of the same parameters.

5.5 The Meeting agreed to encourage the States/Territories/International Organizations responsible for the provision of ATS services in the CAR/SAM Regions, to connect to SIMS of ICAO, for the continuous monitoring of their safety performance and to share with ICAO the data provided to CARSAMMA.

5.6 After reviewing both WP/03 and P/01, the following Draft Conclusion was agreed:

<table>
<tr><td colspan="3">DRAFT CONCLUSION
GTE/18/3 AIR TRAFFIC SERVICES REGIONAL PERFORMANCE MEASUREMENT</td></tr>
<tr><td colspan="2">What:
That considering that the collection of safety information, developed for the functioning of CARSAMMA can contribute to improving the regional safety performance measurement in the provision of ATS in the CAR/SAM Regions:

a) the GTE Rapporteur and the Secretariat carry out an analysis on the extension of the GTE TORs, to consider the evaluation of regional safety performance for the provision of ATS in the upper airspace in the CAR/SAM Regions, focusing on events related to the nature of the GTE work; the results of this analysis shall be presented in the GTE/19 for the consideration of the GTE; and

b) States/Territories/International Organizations responsible for the provision of ATS services in the CAR/SAM Regions, connect to SIMS of ICAO, for the continuous monitoring of their safety performance and share with ICAO the data provided to CARSAMMA.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To improve safety levels performance in CAR/ SAM airspace</td></tr>
<tr><td>When: GTE/19</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☒ Other:</td><td colspan="2">GTE Rapporteur</td></tr>
</table>

GTE and RASG- PA Implementation of Strategy to Review Risk Associated with Mid-Air-Collision

5.7 Under WP/04, it was discussed that strengthening the coordination of risk mitigation review in the CAR/SAM Regions by the GTE and PA-RAST Mid-air collision (MAC) team is needed.

5.8 It is necessary to improve the synergies between the groups on safety hotspots in the risk identification to ensure that duplication of efforts does not exist, and it is essential that recommendations for improvements be aligned.

5.9 Exchange of the LHD events especially TCAS events data with the PA-RAST MAC Group including lateral and longitudinal deviations (navigation errors) in RVSM airspace and outside of the RVSM airspace for the CAR and SAM Regions is vital in the identification of contributing factors to Mid-air collision.

5.10 The Meeting recognized the benefits of sharing information between the PA-RAST and the GTE, and the synergy of both groups positive impact to safety levels in our Regions.

5.11 The Meeting agreed that it was necessary to seek the States consent to share this data.

5.12 The Meeting requested the GTE to draft a Conclusion to analyse the possibility to perform a strategic review of safety hotspots in the upper airspace for mid-air collision risk with the PA-RAST MAC team. Therefore, the following Draft Conclusion was formulated:

<table>
<tr><td colspan="3">DRAFT CONCLUSION
GTE/18/4 IMPLEMENTATION OF A STRATEGY TO REVIEW RISK ASSOCIATED WITH MID-AIR-COLLISION BETWEEN THE GTE AND RASG- PA</td></tr>
<tr><td colspan="2">What:
That, considering the benefits on the synergy between the GTE and the PA-RAST groups on safety hotspots in the identification of risk to ensure duplication of efforts does not exist, and that recommendations for improvements are aligned are of utmost importance:

a) the GTE promote the exchange of the LHD events, especially TCAS events data with the PA-RAST MAC Group, including lateral and longitudinal deviations (navigation errors) errors in RVSM airspace and outside of the RVSM airspace for the CAR and SAM Regions to improve the identification of contributing factors to Mid-air collision;

b) the GTE establish an analysis mechanism between the GTE and PA-RAST to provide CAR/SAM States with safety data for the decision-making process to help reduce LHDs events and improve the safety performance in the RVSM airspace of the CAR/SAM Regions. This analysis should include the possibility of performing a strategic review of safety hotspots in the upper airspace for mid-air collision risk with the PA-RAST MAC team; and

c) the Secretariat will report in the GTE/19 meeting, the results obtained from this cooperation mechanism.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To improve safety levels performance in RVSM airspace</td></tr>
<tr><td>When: By GTE/19</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☐ States ☒ ICAO ☒ Other:</td><td colspan="2">GTE</td></tr>
</table>

Vertical Safety Monitoring Report for Mexico Airspace

5.13 IP/02 contains the 2017 vertical safety monitoring report for Mexico's airspace. There was a total of 38 reported large height deviations during calendar year 2017.

5.14 The Meeting took note of the reported deviations and an estimate of the vertical collision risk. The vertical collision risk estimate for Mexico's airspace meets the target level of safety value of 5×10^{-9} fatal accidents per flight hour.

5.15 Questions were raised regarding reported LHDs involving an aircraft's failure to communicate with ATC or NORDO. In 2017, the 27 reported NORDO events accounted for 805 minutes of time in which ATC could not communicate with an aircraft. A significant number of this type of events could have been avoided if the pilots would have called before entering the following FIR. IATA considered that necessary actions shall be taken to raise awareness of operators regarding this situation.

5.16 In order to do this, it was considered that both the Mexico CAA and IATA must carry out immediate awareness actions among the airlines operators in order to reduce these events, since this type of situation may be the subject of legal actions by the authority.

5.17 The Meeting agreed this situation shall be included in the combined GTE and RASG-PA work programme. On this issue, a WP to the next PA-RAST should be presented.

New York West Airspace Horizontal Safety Monitoring Report

5.18 IP/05 presented the 2017 horizontal safety monitoring report for the New York West airspace. The purpose of this report is to compare actual performance to safety goals related to continued use of reduced horizontal separation minima in New York West Airspace. This report contains a summary of Large Lateral Deviation (LLD) and Large Longitudinal Error (LLE) reports received by the NAARMO for the calendar year 2017. There are 78 reported events accounting for 164 minutes spent at an uncleared/incorrect route during calendar year 2017.

5.19 This report also contains an estimate of the lateral collision risk. The lateral collision risk estimate for the airspace meets the Target Level of Safety (TLS) value of 5.0×10^{-9} fatal accidents per flight hour. NAARMO is developing a process to examine the application of reduced longitudinal separation using the archived ATOP DR&A data. This work is being accomplished along with the development of longitudinal monitoring through the ICAO Separation and Airspace Safety Panel (SASP). The NAARMO expects to provide information on this method to the next GTE meeting.

Schedule of Future GTE Meetings

5.20 The Meeting discussed the convenience to change the normal dates for the GTE annual Meeting.

5.21 The Meeting considered that convening the meeting at an earlier date during the year would be positive because it would allow validating the data regarding the previous year LHD events without having to wait until the last quarter of the year as it has been done in the previous meetings; this would allow, among other things, that the States have valid information before the end of the year, and that this may be included in some reports such as the RASG-PA safety report.

5.22 ICAO NACC and SAM Regional Offices will coordinate with States and International Organizations the dates for the GTE/19.

APPENDIX A

EXECUTIVE LIST OF CONCLUSIONS/DECISIONS

Number	Conclusion/Decision	Responsible for action	Deadline
GTE/18/1	**REVISION OF CARSAMMA TERMS OF REFERENCE**		
	Based in the GREPECAS Conclusion 18/22, that approved the amendment of the CARSAMMA Terms of Reference and the fact that there was not enough time to present a project by CARSAMMA at GTE/18 in order to include the safety assessment for lateral and longitudinal deviations: - An Ad hoc group comprised by Chile, Colombia, Cuba, CARSAMMA, and the GTE Rapporteur, supported by NAARMO and IATA is approved. The ICAO NACC and SAM Regional Offices will serve as the Secretariat, to present a project to include the safety assessment for lateral and longitudinal deviations, with methodology of analysis, the Collision Risk Model to be used, the establishment of a Target Level of Safety and the guidance material to be used by the Points of Contacts (POC) by 31 January 2019.	States/ICAO/ Ad hoc Group	31 January 2019
GTE/18/2	**REDUCTION OF CODE E LHD EVENTS**		
	That considering that in the classification of LHD events, the trend in code E events represents 95.03 % of the total events; and that this behavior has been maintained during the last three years, identifying several points in the CAR/SAM Regions where the reduction in the number of events has been low. Include in the GTE work programme the following actions:		
	a) the States of the CAR/SAM Regions develop the necessary strategies for the reduction of Code E events based on the information provided by CARSAMMA and NAARMO, including the necessary training for air traffic controllers, the improvement of the Communications, Navigation and Surveillance (CNS) infrastructure, including the exchange of radar data and the improvement of ATS communications among the involved FIRs among other activities;	States/ICAO	GTE/19

Number	Conclusion/Decision	Responsible for action	Deadline
	b) ICAO promotes bilateral and multilateral meetings to address specific issues between involved FIRs, especially at the border of the CAR and SAM Regions; and	States/ICAO	GTE/19
	c) CAR/SAM States notify in the GTE meetings the results of these actions for the reduction of Code E events.	States/ICAO/Other	GTE/19
GTE/18/3	**AIR TRAFFIC SERVICES REGIONAL PERFORMANCE MEASUREMENT**		
	That considering that the collection of safety information, developed for the functioning of CARSAMMA can contribute to improving the regional safety performance measurement in the provision of ATS in the CAR/SAM Regions:		
	a) the GTE Rapporteur and the Secretariat carry out an analysis on the extension of the GTE TORs, to consider the evaluation of regional safety performance for the provision of ATS in the upper airspace in the CAR/SAM Regions, focusing on events related to the nature of the GTE work; the results of this analysis shall be presented in the GTE/19 for the consideration of the GTE; and	States/ICAO/ GTE Rapporteur	By GTE/19
	b) States/Territories/International Organizations responsible for the provision of ATS services in the CAR/SAM Regions, connect to SIMS of ICAO, for the continuous monitoring of their safety performance and share with ICAO the data provided to CARSAMMA.	States/ICAO/ GTE Rapporteur	By GTE/19
GTE/18/4	**IMPLEMENTATION OF A STRATEGY TO REVIEW RISK ASSOCIATED WITH MID-AIR-COLLISION BETWEEN THE GTE AND RASG- PA**		
	That, considering the benefits on the synergy between the GTE and the PA-RAST groups on safety hotspots in the identification of risk to ensure duplication of efforts does not exist, and that recommendations for improvements are aligned are of utmost importance:		

Number	Conclusion/Decision	Responsible for action	Deadline
	a) the GTE promote the exchange of the LHD events, especially TCAS events data with the PA-RAST MAC Group, including lateral and longitudinal deviations (navigation errors) errors in RVSM airspace and outside of the RVSM airspace for the CAR and SAM Regions to improve the identification of contributing factors to Mid-air collision;	ICAO/GTE	By GTE/19
	b) the GTE establish an analysis mechanism between the GTE and PA-RAST to provide CAR/SAM States with safety data for the decision-making process to help reduce LHDs events and improve the safety performance in the RVSM airspace of the CAR/SAM Regions. This analysis should include the possibility of performing a strategic review of safety hotspots in the upper airspace for mid-air collision risk with the PA-RAST MAC team; and	ICAO/GTE	By GTE/19
	c) the Secretariat will report in the GTE meetings, the results obtained from this cooperation mechanism.	ICAO/GTE	By GTE/19

APPENDIX B

REVIEW OF PREVIOUS CARSAMMA AND SCRUTINY GROUP MEETING CONCLUSIONS

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
Conclusion GTE/14-2	ORIENTATION HANDBOOK FOR CARSAMMA ACCREDITED POINTS OF CONTACT	That, CAR/SAM Regions States use the Orientation Handbook for CARSAMMA Accredited Points of Contact attached in Appendix B to this part of the Report, with a view to train their Points of Contact (PoC), as well as to improve the submission of the needed data, so that CARSAMMA can perform its responsibilities.	CAR/SAM Regions States			**VALID**
Conclusion GTE/14-3	METIGATION MEASURES FOR REDUCTION OF OPERATIONAL RISKS CAUSED BY LHD	That, considering that the CAR/SAM Regions are significantly above the maximum acceptable operational risk values caused by LHD, the following measures to be taken: requesting the correspondent mitigation actions, considering the urgency that risk caused by LHD requires:				**VALID**
		a) that the CAR/SAM States adopt mitigation measures to reduce operational risk caused by LHD as soon as possible, considering the best practices attached as Appendix A to this part of the report.	CAR/SAM States			**VALID**

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
		b) that the CAR/SAM States present Operational Risk caused by LHD Mitigation National Plans, as well as adopted mitigation measures to the GTE/15 meeting.	CAR/SAM States			**VALID**
		c) that the ICAO NACC and SAM Offices send an individual letter to each CAR/SAM State and ANSP informing the situation of LHD that affect operational safety in their airspace, based on detailed data obtained from CARSAMMA, and	States and ANSP			**COMPLETED**
		d) the States and ANSP present a report on mitigation measures implementation progress, based in SMS to ICAO NACC and SAM Regional Offices.	States and ANSP			**VALID**
Conclusion GTE/14-4	**IMPLEMENTATION OF REGIONAL MONITORING AGENCY (RMA) FOR THE CAR REGION**	That, considering infrastructure and qualified personnel, Dominican Republic in coordination with CAR States, develops a project for the implementation of a Regional Monitoring Agency (RMA) venued in Dominican Republic for the CAR Region in accordance with ICAO requirements and provides this project to GREPECAS by 31 December 2015	Dominican Republic in coordination with CAR States	31 December 2015		**COMPLETED**

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
Conclusion GTE/16-1	USE OF CARSAMMA PROCESS HANDBOOK IN CAR/SAM AREA CONTROL CENTRE (ACCs)	That, States and International Organizations of the CAR/SAM Regions use the CARSAMMA Process Handbook, attached in Appendix B to GTE/16 report, to train ATCOs of ACCs to improve the submission of LHDs data to CARSAMMA.	States and ANSP			**VALID**
Conclusion GTE/16-2	USE OF HANDBOOK CERTIFICATION AND OPERATION OF STATE AIRCRAFT IN THE CAR/SAM RVSM AIRSPACE	That, States and International Organizations of the CAR/SAM Regions use the Handbook Certification and Operation of State Aircraft in the CAR/SAM RVSM Airspace attached in Appendix D to GTE/16 report, for certification and approval of height-keeping performance requirement for State aircrafts.	States and ANSP			**VALID**

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
Conclusion GTE/16-3	MITIGATION MEASURES TO IMPROVE TARGET LEVEL OF SAFETY IN THE RVSM AIRSPACE	That, a) States and International Organizations of the CAR/SAM Regions adopt the reactive, proactive and predictive actions related to the implementation of SMS in the RVSM airspace; and b) The ICAO NACC and SAM Regional Offices, in coordination with States and International Organizations, encourage bilateral meetings to analyse and implement measures to reduce LHD events that affect safety in their airspace; the impact of these measures shall be presented in the GTE/17 meeting.	States, ANSP and Regional Offices			**COMPLETED** Recommended opening another conclusion to address this and other tasks on a permanent basis, as part of the GTE work.
Conclusion GTE/16-4	URGENT ACTIONS TO IMPROVE FLIGHT PLAN PROCESSING AND COORDINATION IN THE CAR/SAM REGIONS	That, States and International Organizations of the CAR/SAM Regions take urgent measures to require operators the correct use of established standards for timely processing and coordination of flight plans based on ICAO provisions.	States and ANSP			COMPLETED It was considered to be addressed in other ICAO Regional working groups.

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
Conclusion GTE/16-5	AGREEMENT BETWEEN MEXICO AND THE NORTH AMERICAN APPROVALS REGISTRY AND MONITORING ORGANIZATION (NAARMO) FOR DATA EXCHANGE REGARDING SAFETY ASSESSMENT IN THE RVSM AIRSPACE	That, Mexico and the NAARMO exchange data information regarding aircraft movement, Large Height Deviations (LHD) reports in the RVSM airspace, as well as register of aircraft with RVSM approval, according to the information of Appendix F to GTE/16 report, and present this activities progress to the next GTE/17 meeting.	Mexico and NAARMO			**COMPLETED** Mexico has already started to share the data, therefore it is considered to be concluded. Request NAARMO to present the safety assessments of Mexico airspace in future GTE meetings.
GTE/17-1:	COLLECTION OF AIRCRAFT MOVEMENT AND LHD DATA	Taking into account that aircraft movement and LHD data is indispensable for measuring RVSM airspace performance in the CAR/SAM Regions, the States and international organisations must ensure the timely and regular delivery of this data in the form established by CARSAMMA and the GTE. Accordingly, the ICAO Regional Offices will follow up on the timely and proper delivery of data by the States and international organizations.	States, ANSP and Regional Offices		Aircraft movement and LHD data	**Valid**

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
CONCLUSION GTE /17-2:	REVISION OF CARSAMMA AND GTE TERMS OF REFERENCE	That, having agreed on the importance of continued monitoring of horizontal deviations, the Secretariat request GREPECAS to revise the terms of reference (TORs) of the Regional Monitoring Agency (CARSAMMA) to include such monitoring as part of the functions of the Agency, leading to the exchange of such information with ICAO, the States and international organisations through the appropriate channels. Accordingly, that GREPECAS be requested to revise the terms of reference of the GTE to account for the expanded functions of CARSAMMA.	CARSAMMA and Regional Offices	GREPECAS/18	Amended TOR´s	**Completed**
CONCLUSION GTE/17-3:	TRAINING FOR FOCAL POINTS	That, taking into account the need to schedule training activities through CARSAMMA for LHD focal points of the CAR/SAM Regions, the Secretariat request the support of GREPECAS for the conduction of these activities in 2018	States, ANSP and Regional Offices	Reschedule for March 2019	Trainning	**Valid**

Conclusion	Title	Text	Responsable of action	Completion date	Deliverable	Status (valid, completed or superseded)
CONCLUSION GTE/17-4:	OPERATION OF STATE AIRCRAFT IN CAR/SAM RVSM AIRSPACE	That the ICAO Regional Offices coordinate with the States under their responsibility to ensure that State aircraft operating in RVSM airspace have the required approval to operate in such airspace, or complete the flight plan as established in the Manual on Certification and Operation of State aircraft in CAR/SAM RVSM airspace	States, ANSP and Regional Offices		State letters	**Completed**
CONCLUSION GTE/17-5	: OPERATION OF NON-CERTIFIED AIRCRAFT IN CAR/SAM RVSM AIRSPACE	That CARSAMMA inform the ICAO Regional Offices, on a monthly basis, of any occurrence involving the operation in RVSM airspace of a non-RVSM aircraft with registry of a CAR/SAM State, so that the corresponding ICAO Regional Offices may contact the State in order for it to take the necessary measures to ensure that this type of operations are not carried out.	Regional Offices and CARSAMMA			**Valid**

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