GTE/12

INTERNATIONAL CIVIL AVIATION ORGANIZATION

CAR/SAM REGIONAL PLANNING AND IMPLEMENTATION GROUP

(GREPECAS)

TWELFTH GREPECAS SCRUTINY WORKING GROUP MEETING (GTE/12)

FINAL REPORT

(Mexico City, Mexico 10 - 14 September 2012)

Presented by the Secretariat

September 2012

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HISTORICAL

ii.1 Place and Duration of the Meeting

The Twelfth GREPECAS Scrutiny Working Group Meeting (GTE/12) was held in Mexico City, Mexico, from 10 to 14 September 2012.

ii.2 Opening Ceremony and Other Matters

Mr. Victor Hernandez, Regional Officer Air Traffic Management and Search and Rescue, representing the ICAO NACC Office and host of the meeting, welcomed the participants highlighting the importance of the work to be accomplished and its positive effect on the reduction of risk in the airspace of the Regions. Mr. Hernandez also stressed the importance of operational Large Height Deviations (LHDs) analysis and review of its Terms of Reference (TORs) to support the GREPECAS safety initiatives.

ii.3 Schedule, Organization, Working Methods, Officers and Secretariat

The Meeting agreed to hold its sessions from 0900 to 1530 hours, with appropriate breaks. The work was completed with the Meeting as a plenary. Mr. Johann Estrada, delegate from Dominican Republic, and Rapporteur, served as Chairman of the Meeting. Mr. Victor Hernandez acted as the Secretary of the Meeting, assisted by Mr. Celso Figueiredo both Regional Air Traffic Management and Search and Rescue Officers from the NACC and SAM Regional Offices respectively.

ii.4 Working Languages

The working languages of the Meeting were English and Spanish. The documentation and report of the meeting were available in both languages.

ii.5 Attendance

The Meeting was attended by 9 CAR/SAM States and 2 International Organizations, totalling 23 participants. The complete List of Participants can be found in pages iii-1 to iii-2.

ii.6 List of Working Papers and Information Papers

LIST OF WORKING PAPERS AND INFORMATION PAPERS

(Presented by the Secretariat)

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01		Draft Agenda and Schedule of the Meeting	18/05/12	Secretariat
WP/02	1	RVSM Airspace Safety Assessment in the CAR/SAM FIRs	31/08/12	CARSAMMA
WP/03	1	Methodology to Calculate Risk Value and Risk Level Large Height Deviations (LHD) (a proposal to modify the methodology used by CARSAMMA)	31/08/12	Dominican Republic

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01	--	List of Working Papers and Information Papers	03/08/12	Secretariat
IP/02	1	Background of Regional Monitoring Agencies and Scrutiny Groups	28/08/12	United States

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Agenda Item 1: Background of Regional Monitoring Agencies and Scrutiny Groups

1.1 In the analysis of Working Papers 2, 3 and Information Paper 2, the Meeting reviewed a new methodology of qualitative evaluation and also agreed on the need for all Air Navigation Systems Providers (ANSPs) to carry out an evaluation of operational safety of all ATS incidents and ATC errors based on the ICAO Safety Management Systems (SMS) provisions.

1.2 The Meeting agreed that the States are responsible of implementing their State Safety Programme (SSP), and also of the evaluation of air navigation services provision on SMS perspective to identify the risks and the appropriate mitigation measures. The Meeting was reminded that these programmes are also related to the ICAO Universal Safety Oversight Audit Programme - Continuous Monitoring Approach (USOAP-CMA).

1.3 The meeting discussed WP/02, presented by CARSAMMA, which contains the results of applying the qualitative methodology used by CARSAMMA to analyse 2011 Large Height Deviations (LHDs) in accordance with Conclusion GTE/11-3. The Meeting raised questions of clarification concerning the methodology and its applicability to determining the regional compliance with the accepted Target Level of Safety (TLS) of $5x10^{-9}$ fatal accidents per flight hour.

1.4 CARSAMMA presented the Document of Safety Management (DGSO) on LHD received and validated during 2011. 260 reports were analysed, 255 were validated and 5 required further revision using the Safety Management System (SMS) methodology for LHD reports approved by GTE/11, held in Lima, Peru. In this DGSO the LHD were consolidated by FIR and by the state of risk occurrence, which can be found in the **Appendix** to this part of the report.

1.5 The DGSO was considered by the States as a valuable tool because it visually presents the geographical position of higher frequency or seriousness in the LHD events (LHD *Hot spots*) in the Reduced Vertical Separation Minimum (RVSM) airspace of the CAR/SAM Regions, in order to help the Civil Aviation Authorities (CAAs) of these regions with regards to better planning and decision making in developing mitigation measures.

1.6 The Meeting approved a few modifications to the parameter values and to the formula used to assess LHD with SMS en future analysis. The modifications of the parameter values in TLS include PROBABILITY in some specific cases and in the Radar/Automatic Dependent Surveillance RADAR/ADS coverage quantity. The following formula and Table show the agreed calculus of the parameter values.

VR=(PxDxS)+R+W+T, where:

Parameter	Description	Value
VR	Risk Value	**To be calculated**
P	Position probability	**Varies from 1 to 5**
D	Event duration	**Varies from 1 to 3**
S	Event severity	**Varies from 1 to 5**
R	With or without ADS/RADAR	**With=5 or Without=10**
W	Weather conditions	**VMC=0 or IMC=5 if there is another aircraft**
T	Other traffic (if any)	**Range goes from 1 to 10 (of separation)**
	TOTAL	**Maximum 100**

Risk Value Parameters Calculation

ATC Operational Event Classification

		Separation Minima				
		sep ≤ 50%	50%< sep < 66%	66%≤ sep < 100%	Sep ≥ 100%	One-Sided Event
Resolution		**A**	**B**	**C**	**D**	**E**
Same ATC	**4**					
Other ATC	**3**					
Pilots/Others	**2**					Not Applicable
Without Resolution (effective)	**1**					

ATC Events Safety Classification

1.7 With the consolidation of the approved changes by GTE12, CARSAMMA will use a TLS of 20 instead of 25, having in mind that all LHD above of this value will be considered of medium risk up to a value of 75, and above of this value it will be considered high risk up to 100.

1.8 Regarding the formula used in the analysis of SMS-LHD, the change in the LHD M and N category cases, the probability will always be a value of 4, regardless of the incidence position. In respect with the RADAR/ADS coverage the value 5 and 10 will be applied respectively.

Gravity	5	4	3	2	1
Codes	F	B, D, E, G,	A, C, I, J, K, L, N	H, M	O, P

Probability	ATC System
	Operational
Frequent 5	**It is expected to happen each 1-2 days**
Probable 4	**It is expected to happen several times a month**
Remote 3	**Happen almost once a few months**
Unlikely 2	**It is expected to happen nearly once every three years.**
Extremely Unlikely 1	**It is expected to happen at least once every 30 years**

1.9 It was agreed that the qualitative methodology is a variable for performing periodic quantitative risk assessment conducted in accordance with ICAO Doc 9574 and Doc 9937. The Meeting recommended that the qualitative methodology developed could be presented to the ICAO Separation and Airspace Safety Panel (SASP), for its discussion and input. This may enable the methodology to become a globally harmonized tool for use in State Safety Programmes.

1.10 The application of the new qualitative methodology formula allows a definition of airspaces with higher LHD number and, therefore, with a possible higher level of risk. The full processes identifies the cause of the event and its geographical position, evaluates the level of the risk and proposes mitigation measures to be adopted by States, before validating LHD reports and mitigation measures made by GTE.

1.11 With this new approach, States should have the capacity to evaluate the LHD events under risk analysis and implement mitigation measures from a systematic perspective in their air navigation system. This methodology allows identifying the causes of the event, even those that do not have a direct relation with operational aspects.

1.12 With this purpose in mind, the Meeting agreed on the need that pilot's and ATC controllers complete in a proper manner the approved RVSM reporting forms, which are available in the CARSAMMA webpage *(http://www.carsamma.decea.gov.br/es/).*

1.13 In this regard, the NACC and SAM Regional Offices will organize a regional seminar with the following objectives:

a) disseminate the information of the new methodology;
b) completing the RVSM approval and non-approval forms (F2, F3 and F4) by aircrafts operators, controllers and pilots; and
c) promote LHD assessments in relation to their respective SSP and SMS.

1.14 The above with the objective that Civil Aviation Authorities (CAA) apply the qualitative evaluation methodology.

DRAFT
CONCLUSION GTE/12/1 RISK LEVEL

That the GTE, in carrying out LHD report assessments:

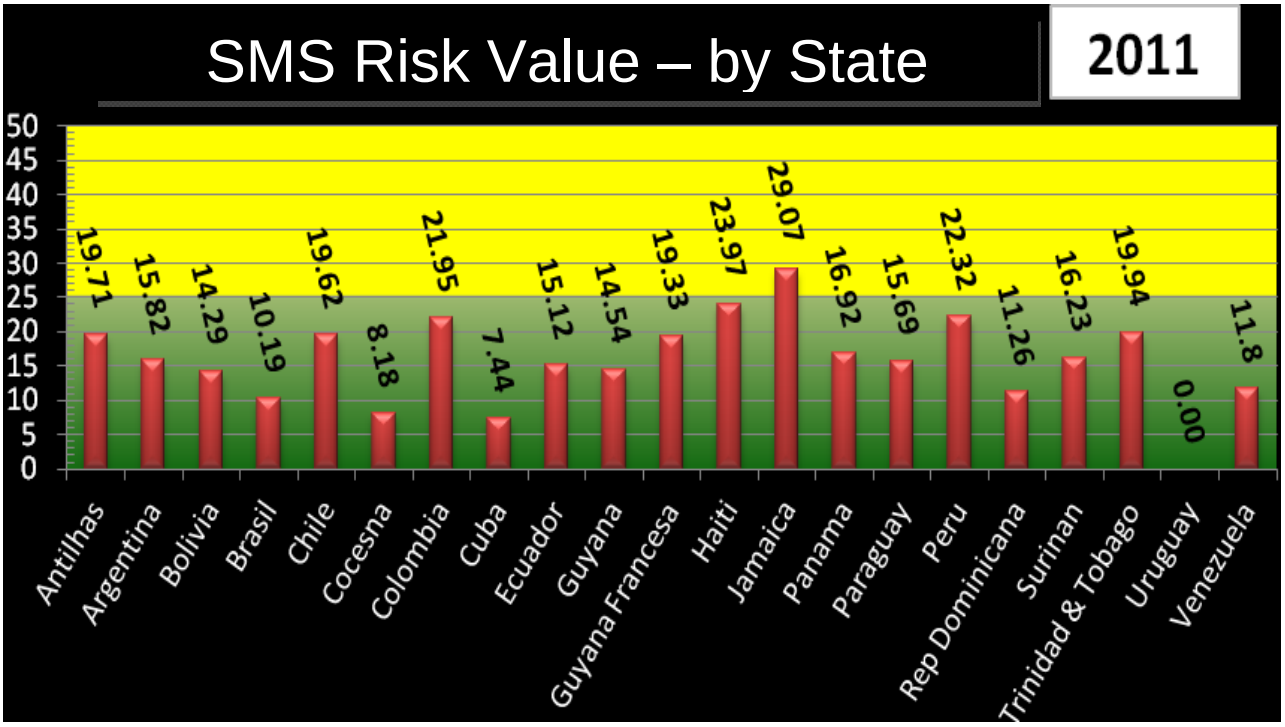
a) apply TLS parameter in risk level up to 20 points used; and

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.

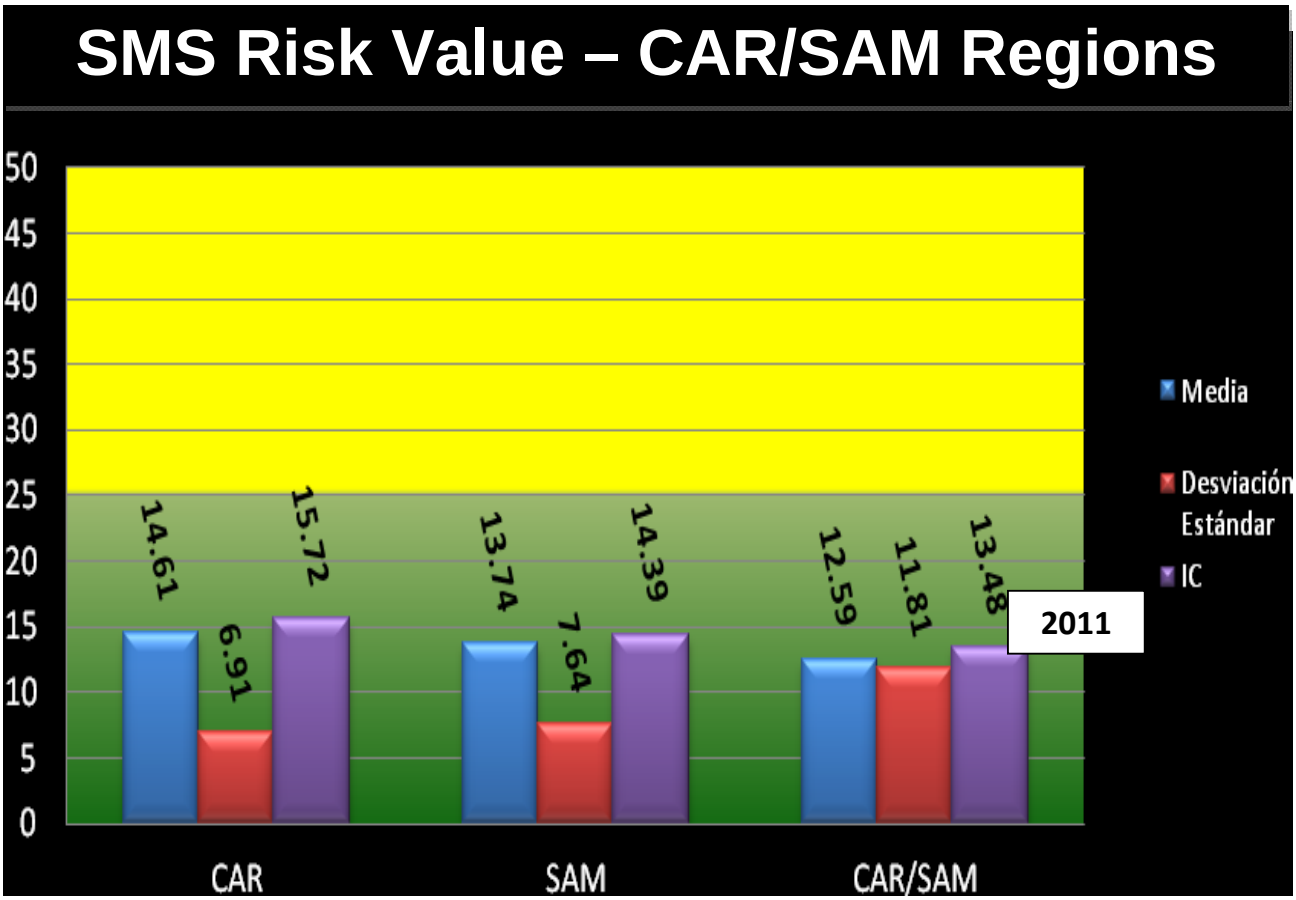
APPENDIX

Sequence	FIR with Risk	Risk Generated in	GTE Code	Risk Value
171	**LIMA**	**BOGOTA**	**N**	**46**
383	KINGSTON	PILOTO	**I**	42
117	LIMA	GUAYAQUIL	**N**	40
159	LIMA	ANTOFAGASTA	**N**	40
220	LIMA	GUAYAQUIL	**N**	40
573	LIMA	GUAYAQUIL	**N**	40
691	LIMA	GUAYAQUIL	**N**	40
126	LIMA	GUAYAQUIL	**N**	37
316	ATLANTICO	MONTEVIDEO	**N**	37
415	ATLANTICO	MONTEVIDEO	**N**	37
44	LIMA	GUAYAQUIL	**N**	34
218	GUAYAQUIL	BOGOTA	**M**	34
274	PIARCO	MAIQUETIA	**N**	34
447	LIMA	GUAYAQUIL	**N**	34
636	LIMA	GUAYAQUIL	**N**	34
268	LIMA	ANTOFAGASTA	**M**	30
465	LIMA	LIMA	**M**	30
587	ANTOFAGASTA	LIMA	**M**	30
629	LIMA	GUAYAQUIL	**M**	30
652	GUAYAQUIL	LIMA	**C**	30
677	LIMA	ANTOFAGASTA	**M**	30
257	ROCHAMBEAU	DAKAR	**N**	28
266	ATLANTICO	MONTEVIDEO	**N**	28
438	LIMA	GUAYAQUIL	**M**	28
438_1	GUAYAQUIL	CENTRAL AMERICA	**M**	28
452	LIMA	AMAZONICA	**N**	28
105	RESISTENCIA	CURITIBA	**N**	27
382	ATLANTICO	PILOTO	**B**	27
102	PIARCO	MAIQUETIA	**N**	26
292	LIMA	GUAYAQUIL	**M**	26
320	LIMA	GUAYAQUIL	**M**	26
345	LIMA	GUAYAQUIL	**M**	26
615	LIMA	GUAYAQUIL	**M**	26

Greater risk value estimates for LHD



State Risk Value Contribution



CAR, SAM and CAR/SAM Regions Risk Value Contribution

Agenda Item 2: Review of the GTE Terms of Reference (TORs)

2.1 The Meeting updated the terms of reference (TORs) of the GTE and the CARSAMMA taking into consideration the ATS safety requirements in the CAR and SAM Regions based on the new structure and guidelines of GREPECAS and ICAO Doc 9574, Doc 9937 and Doc 9859. The Terms of Reference are included in the **Appendix** to this part of the report.

2.2 The result of the analysis of the Scrutiny Group LHD reports will be used as an input in the preparation of a risk level in the use of RVSM in the CAR/SAM Regions. Once this analysis has been done, the data will be used to determine the safety risk trends, and to provide recommendations to lower the risks in the RVSM airspace. In view of the above, the Meeting adopted the following:

DRAFT
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 e-mail 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.

2.3 The Scrutiny Group will meet regularly to analyze the safety performance data and will hold periodically teleconferences, as follows:

PROPOSAL FOR LHD TELCONS FOR THE FIRST SEMESTER 2013

JAN – NO
FEB – 01, 15, 29
MAR – 14, 28
ABR – 11, 25
MAY – 9, 23
JUN – 6, 20

APPENDIX

Based on GREPECAS Conclusion 11/34, the Meeting updated the CARSAMMA Terms of Reference as follows:

RVSM DUTIES OF CARSAMMA

a) ~~establish and~~ 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 RVSM Regional M~~m~~onitoring A~~a~~gencies *(RMAs);*

c) establish and maintain a database containing the ~~results of~~ height-keeping *errors* ~~performance monitoring~~ and height deviations of 300 ft or more within CAR/SAM *RVSM* airspace~~, and to include in the database the results of CARSAMMA requests to operators and States for information on the causes of large height deviations observed~~;

d) ~~provide~~ *submit* timely information for~~to~~ State *civil aviation* authorities *(CAA)* ~~and operators~~ on changes or monitoring status of aircraft type classifications;

e) ~~administer~~ *submit the result of the monitored flight using* the GPS monitoring system (GMS);

~~f) assess compliance with RVSM height keeping performance requirements by operators and aircraft, and introduction of RVSM in the CARSAM Regions;~~

~~g)~~f) provide the means for identifying *aircraft* non-RVSM approved ~~operators using~~ *operating in the* CAR/SAM RVSM airspace and to notify the appropriate State *civil aviation* authority *(CAA)* accordingly;

~~h)~~g) develop the means for summarizing and communicating the content of relevant databases to RVSM *Scrutiny Group (GTE) for the evalution of the corresponding safety;* ~~Task Force decision makers, so that it can be used to decide when and to what extent RVSM will be applied in the airspae under their responsibility;~~ and

~~i)~~h) conduct *the assessment of the risk collision level (CRM)* in the ~~–~~*RVSM* airspace of the CAR/SAM Regions*, in accordance with* ~~safety assessment,~~ *ICAO Doc 9574 and Doc 9937*.

Terms of Reference (TORs) of the CAR/SAM Regional RVSM Scrutiny Working Group (GTE)

The Terms of Reference (TORs) of the CAR/SAM Regional RVSM Scrutiny Working Group (RVSM/WSG) known as GTE are established with the purpose to review the problems affecting the TLS based on the LHD information provided by the States

1. Terms of reference

a) *To assemble safety management subject matter experts in air traffic control, aircraft flight operations and maintenance, regulation and certification, data analysis and risk modeling;*

b) To analyze and evaluate large height deviations of 300 ft or greater as defined in ICAO Doc 9574, Manual for the minimum vertical separation of 300 m (1000 ft) between FL290 and FL 410 inclusive.

c) *To coordinate the assembly collection and review of large height deviation data with the Regional Monitoring Agency CARSAMMA;*

d) determine and validate an estimate of flight time away from the cleared flight level to be used as a primary input in the preparation of an to estimate of the Ccollision Rrisk mModel (CRM) made by the Regional Monitoring Agency CARSAMMA;

e) To report annually safety assessment to GREPECAS through ATM/CNS/SG *To identify safety trends based on analysis of Llarge Hheight Ddeviation (LHD) reports, recommend mitigation actions in accordance with according to ICAO SMS provisions and submit annual reports on safety assessment results to GREPECAS so ANSPs of States improve safety in the RVSM airspace of the CAR/SAM Regions;*

f) To accomplish other tasks as directed by GREPECAS.

2. Composition

2.1 CAR/SAM States, CARSAMMA, COCESNA, IATA, IFALPA, IFATCA. (*Rapporteur Dominican Republic)

Agenda Item 3: Large Height Deviation (LHD) Analysis

3.1 After analyzing operational LHD's and its causes, the Meeting proved that they were not related with RVSM operations but with the implementation of operational procedures for pilots and Air Traffic Controllers (ATCOs). The details of the LHD reports received by the CARSAMMA are available on the restricted GTE/12 website at: http://www.mexico.icao.int/restricted/Meetings/GTE12.html

3.2 The Meeting noted that some States are not reporting LHD events and since the airspace below FL 290 is not evaluated with these methodologies and therefore, the level of risk is unknown.

3.3 The Meeting determined that most LHDs are related to code M and N related to ATC operational errors. Based on ICAO Annex 2 and Doc 4444, the Meeting recalled that all ANSPs should periodically review their Letters of Agreement (LOAs) with adjacent ACCs, so as to ensure Current Flight Plan (CPL) coordination messages at least 20 minutes or as soon as possible before the aircraft crosses the boundary of the adjacent Flight information regions/Upper Control Areas (FIRs/UTAs).

3.4 Similarly, awareness must be created in the ATCOs community about the importance of ensuring the coordination of the data with other adjacent ATC units on aircrafts movement and control.

3.5 When using Flight Data Processing Systems (FDPS) the applicable ATS messages should also be programmed to reduce the possibility of error related to the coordination process. In accordance to the GREPECAS Conclusion15/37, the ANSP should review the interconnection between control centres to achieve operational advantages in safety between the adjacent ATC units.

3.6 Taking into account the problems and the risk of LHD operational errors, the ANSPs should develop training programmes focused on ATS messages in the ATC coordination cycle to mitigate risk, including ATC supervision and LHD assessment.

3.7 ANSPs should require pilots to report to the next air traffic service unit 5 minutes prior to entering the succeeding FIR to reduce the frequency of these errors. For this, a circular to inform the airspace users on this requirement should be issued.

3.8 During the discussion the GTE addressed the adverse conditions that exist for the provision of aviation navigation services to aircraft in civil aviation operations in the South Atlantic airspace.

3.9 The GTE has determined that the risk to safe operation of civil aircraft in the FIRs of the South Atlantic airspace, e.g. Ezeiza, Montevideo and Atlántico is increased due the lack of report of flight plans when civil aircraft depart Port Stanley in the Falkland Islands (Malvinas) and the risk is not abated due to the lack of position reporting by flight crews as required by ICAO SARPS.

3.10 The GTE concluded that ICAO Regional Offices continue to facilitate the discussions among the parties concerned to make more normal the provision of air safety services that can be provided to civil airplanes operating with properly filed flight plans in accordance with ICAO SARPS.

3.11 The GTE also concluded that ICAO Regional Offices should send a State Letter reminding air operators of the significant contribution to reduction of risk in the airspace by complying with the requirements to periodically report position to the air navigation service provider in the applicable FIR in accordance with cleared flight plan.

Agenda Item 4: Other business

4.1 Based on one of the recommendations made in the Seventh Meeting of the Regional Monitoring Agencies Coordination Group (RMACG/7), held in Beijing, China, 28 May to 1 June 2012, the Meeting took note that all Regional Monitoring Agencies (RMAs) will carry out a global evaluation on the aircrafts not approved that are operating in the RVSM airspace. To this end, the Meeting took note that some civil aviation agencies have not sent the 2011 corresponding information.

4.2 For this reason, the CARSAMMA, in coordination with ICAO NACC and SAM Regional Offices, will send a survey to recollect the data of 1-31 December 2012 that contains information on aircraft type, aircraft call sign, waypoint and flight level when entering in the RVSM Airspace/FIR; with these forms the CARSAMMA will conduct a safety assessment/collision risk calculation of the CAR/SAM Regions for the year 2012 (quantitative method) in accordance with ICAO Doc 9574 and Doc 9937.

4.3 States and Territories should send the forms to CARSAMMA with a copy to the NACC and SAM Regional Offices before 31 January 2013, with the purpose to allow their analysis during the first quarter of 2013. CARSAMMA will take advantage of these forms for the safety assessment/collision risk estimate of the CAR/SAM Regions for the year 2012 (quantitative method) in accordance with ICAO Doc 9574 and Doc 9937. Therefore, the meeting adopted the following:

DRAFT
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

4.4 Taking into consideration the number of LHD reports within the FIR Guayaquil, Colombia presented information on the mitigation measures that have been implemented. Among these measures stands out the coordination task evaluation with other ATC adjacent facilities that ATCO should comply, which are integrated in the Standard Operational Procedures (SOPs) of ATC facilities.

4.5 COCESNA presented information on the operational safety risk management based on SMS which it is conducting by means of the quality management integral process. The programme is characterized by the automated process and their impact in the strategic objectives of the organization that identifies and analyses the risks and their consequences and promotes mitigation measures toward a continuous enhancement of the safety aspects in different air navigation fields.

4.6 The Meeting reviewed the follow-up of the implementation of GTE/11 Conclusions. The status of GTE/11 conclusions is as follows, for the review and approval of GREPECAS.

- Conclusions GTE/11-1, 11-2, 11-5, 11-7, 11-8, y 11-9 – Completed.

- Conclusions GTE/11-3, 11-4 y 11-6 – Superseded by Conclusions GTE 12-1, 12-2 y 12-3 respectively.