



## **SUMMARY OF DISCUSSIONS OF THE SOUTH ATLANTIC SAFETY OVERSIGHT GROUP**

### **FIRST MEETING**

(Miami, Florida, United States, 13 to 17 March 2023)

#### **0. Introduction**

**0.1** The First Meeting of the South Atlantic Safety Oversight Group (SAT SOG/01) was held, thanks to the kind collaboration of IATA, from 13 to 17 March 2023, in Miami, Florida, United States.

**0.2** Mr. Luiz Antonio (Brazil) chaired the meeting with support of Mr. Alexis Braithwaite (SAT SOG Vice Chair, from Trinidad and Tobago) and Mrs. Virginia Mignoni (Brazil). The Secretariat was conducted by Mr. Fernando Hermoza, ATM/SAR Regional Officer, ICAO SAM Office.

**0.3** Mr. Antonio welcomed the participants and stress the importance of enhancing Safety in the SAT airspace and to foster the harmonization with the NAT Region. The support offered by IATA for the meeting was highly recognized.

**0.4** The lists of participants and meeting documentation are provided in **Appendix A** and **Appendix B** respectively. The list of appendices to this summary is shown in **Appendix C**.

**0.5** The Action item list is provided in **Appendix D**, as well the SAT SOG/01 Decisions list in **Appendix E**. The Report to the Steering group – SAT SG is shown in **Appendix F**.

**0.6** At its opening session the Group adopted the following agenda and agreed on the proposed work schedule:

Agenda Item 1: Opening and review of latest developments.

- 1.a) Adoption of the Agenda
- 1.b) Status of follow-up actions from ACM-S meeting
- 1.c) Latest significant international aviation developments
- 1.d) Review outcome of last meetings (SAT IMG) which are of relevance to the SAT SOG

Agenda Item 2: SAT SOG ToRs implementation

- 2.a) SAT SOG working plan
- 2.b) Communications plan: SAT SOG stakeholders
- 2.c) SAT Safety Policy
- 2.d) Deliverable guidelines to SAT Safety Report

- 2.e) SAT geographical area and assignments for reviewing SAT-SOG Terms of Reference (TOR)
- 2.f) States/ANSP Safety Management Updates

Agenda Item 3: Database and common repository

- 3.a) Analysis on results of RMAs survey and sample data collection
- 3.b) Analysis of actions to harmonize/standardize RMAs procedures.
- 3.c) Feasibility of a common repository of safety occurrences.
- 3.d) Benchmarking with NAT SOG and NAT CMA. Fast Track Procedures

Agenda Item 4: SAT Air Traffic statistics

- 4.a) Status of Conclusion 24/06: Traffic Statistics
- 4.b) RMAs capacities regarding Statistic on navigation specifications of aircraft. EUR-SAM corridor and AORRA airspaces.
- 4.c) Sources of statistical forecast. Traffic forecasting and statistical analysis.
- 4.d) Reports on Traffic Statistics

Agenda Item 5: Collision risk assessment and LHD

- 5.a) Status of Conclusion 24/07: Reduction in Collision Risk Assessment and large Height Deviation LHD
- 5.b) States responsibilities on height monitoring.
- 5.c) Mitigation of LHD: ATS incidents analysis, Human factors and AIDC. Related states /ANSPs programs.
- 5.d) Collision risk assessment: CARSAMMA, ARMA; SATMA
- 5.e) Analysis on RMAs issues on data reporting quality and format
- 5.f) Analysis on RMAs issues on coordination, streamlining of processes.
- 5.g) Actions to harmonize/standardize RMAs procedures related to LHD, LLD and LLE calculation.

Agenda Item 6: Safety Training and Workshops

- 6.a) ICAO Safety Training
- 6.b) IATA Safety Training
- 6.c) Other Safety Training Issues (Industry, Organization, etc.)

Agenda Item 7: Any other business

- 7.a) Future work programme and follow-up actions
- 7.b) Next meetings
- 7.c) Report to the next SAT SG/01 meeting

## 1. Review of latest developments

<i>1.b</i>	<i>Status of follow-up actions from ACM-S meeting {WP/1.2}</i>
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1.1 The Special Atlantic Coordination Meeting (ACM-S) was held in Madrid, Spain from 23 to 24 June 2022. The main objective of the Special Atlantic Coordination Meeting was to re-start the South Atlantic (SAT) discussions on the harmonization and cross-regional coordination for the enhancement of remote oceanic operations in the Atlantic that were interrupted during the COVID-19 crisis. The full SoD of the ACM-S meeting is provided at the portal.icao.int, in the following link:

[https://portal.icao.int/SATSOG/SAT%20SOG\\_01/Shared%20Documents/\\_SATIMG01%20SoD%20Final.pdf](https://portal.icao.int/SATSOG/SAT%20SOG_01/Shared%20Documents/_SATIMG01%20SoD%20Final.pdf)

1.2 The ACM-S meeting approved 10 actions, referred to SAT SOG and/or SAT IMG activities. A follow up Table and comments on the actions is presented at **Appendix G**, supported with references from SAT-24 and S-SAT meetings. The Meeting verified that all the actions concerned to SAT SOG group were addressed by the present meeting agenda.

1.3 The Meeting stressed the importance of cooperation among all SAT groups, and harmonized activities with NAT Region groups. Thus, the need of an adequate planning and coordination of SAT groups Meetings was remarked, to avoid overlaid dates in the working programme.

<i>1.c</i>	<i>Latest significant international aviation developments {IP/1.3}</i>
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1.4 The Meeting noted the information on the ICAO priorities for the 41st Assembly ICAO (A-41) and the next triennium, which stressed the focus on innovation and resilience.

<i>1.d</i>	<i>Review outcome of last meetings (SAT IMG) which are of relevance to the SAT {WP/1.3}</i>
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1.5 The First Meeting of the South Atlantic Implementation Management Group (SAT IMG/01) was held from 21 to 24 November 2022, in Abidjan, Côte d'Ivoire. Several safety management matters were discussed at SAT IMG/01, based on papers presented by SAT SOG members, inter alia, the proposed SAT Safety policy that aims to provide a framework to introduce the necessary safety enhancement and enable the Region to align its work with the Global Aviation Safety Plan (GASP) goals.

1.6 The Meeting remarked the need of maintain a mutual collaboration between both, SAT IMG and SAT SOG groups, also the harmonization of priorities of the two corresponding working plans.

1.7 The SAT IMG/01 approved Decisions are provided at **Appendix H**. The SAT SOG/01 meeting take note of **SAT IMG Decision 01-03**, directed to share the results of survey on PBCS implementation with the 3 RMAs. Thus, the Meeting appointed the Secretariat to follow up the sharing of the named survey results. (**Action SOG01-01**).

## 2. SAT SOG ToRs implementation

2.a)	<i>SAT SOG working plan {WP/2.5}</i>
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2.1 A bi-annual working programme was presented to the Meeting that will allow SAT SOG to review and update its safety oversight strategies, identify emerging risks, and collaborate with stakeholders to address them. The implementation of the bi-annual will involve the following steps:

- a) Formation of a dedicated team: SAT SOG will form a team comprising industry experts, regulators, and stakeholders to oversee the programme's implementation.
- b) Development of a work plan: The team will develop a comprehensive work plan that outlines the activities, timelines, and resources needed to execute the programme, including methods and tools to analyze the implementation of a common safety-related occurrence database for the three regional monitoring agencies.
- c) Communication and Collaboration: The team will engage stakeholders to ensure that they understand the goals and objectives of the programme, it will foster collaboration and enhance its effectiveness.
- d) Execution and Monitoring: The team will execute the programme according to the work plan and monitor its progress to ensure it meets its objectives.

2.2 The implementation of a bi-annual working programme will have the following benefits:

- a) Improved Safety Oversight: it will enhance SAT SOG's ability to identify and manage safety risks, leading to improved safety oversight and a safer aviation industry.
- b) Compliance with ICAO Standards: it will ensure that the region remains compliant with ICAO safety standards, enhancing its reputation in the international aviation community.
- c) Collaboration: it will promote collaboration among stakeholders, facilitating the sharing of best practices and developing innovative safety solutions.
- d) Alignment with meetings conclusions/decisions: The bi-annual working programme will allow SAT SOG to implement actions related to the conclusions drawn from item 07 of the ACM-S meeting, which refers to the pending items of Conclusions SAT 24/06 and SAT 24/07. This plan also aims to monitor the actions regarding the SAT IMG 01 Decisions.

2.3 The Meeting agrees the *SAT SOG's Bi-annual Working Programme Version* as shown in the **Appendix I**, however highlighted the need of a constant synchronization of the SAT SOG's calendar with the programs of other parties, among others:

- SAT IMG, ESCIT and contributory bodies;
- SAT SG, ACM;
- NAT SPG, GREPECAS, APIRG; and
- NAT Regional groups.

As well, the Secretariat shall consider the interval between SAT SOG consecutive meeting, and between SAT SOG and SAT IMG meetings. The Secretariat informed that tentative dates for SAT SG meeting have not been defined.

2.4 The working programme is a living document. It is recommended to be periodically reviewed, thus producing new document versions. The Secretariat (SAM Regional Office) was appointed

to coordinate / harmonize the biannual working programme with its pairs of Paris, Dakar, Nairobi and Mexico Regional Offices, in order to adjust and maintain updated the said programme. (**Action SOG01-02**)

<i>2b) Communications plan: SAT SOG stakeholders {WP/2.3, WP/2.1}</i>
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2.5 The meeting analyzed that a communication plan is a document that outlines how this group will communicate with its stakeholders. First, SAT SOG did a stakeholder analysis by identifying key stakeholders' needs, expectations, and concerns. As a result, SAT SOG's Stakeholders Register was created (see **Appendix J1**), which must be filled with the following data by the POC point according to its identification (ID):

- a) Stakeholder;
- b) Point of Contact (POC) full name;
- c) Country and organisation;
- d) Telephone; and
- e) E-mail.

2.6 The engagement of the stakeholders will be performed together with the communication plan. Communication management and stakeholder management are intrinsically linked since communication is essential to promote stakeholder engagement, allowing interaction between stakeholders and the group's chair. Through this process, it will be possible to identify the stakeholders, plan their engagement, and manage it. Thus, communication must be appropriate to avoid misunderstandings of tasks, and it is possible to map the needs, relationships, and expectations of all stakeholders.

2.7 The communication plan proposed for this group (see **Appendix J2**) contains 5 fields, organised in the following way:

- a) Receiving stakeholder;
- b) Message sender;
- c) Communication objective (message);
- d) Channels used; and
- e) Frequency of communication.

2.8 The Meeting observed best practices of NAT working groups, that maintain records of references (working or information papers, documents, studies, precedent reports, etc.) to facilitate the follow up of Decisions, Actions items, Conclusions, etc. In that sense, the Delegates agreed on the use of the SATSOG repository within the portal.icao to keep and organize that information, to be used in the following meetings in a list of references included in each working/information paper.

2.9 Thus, the Secretariat was appointed to collect and upload in the portal.icao the background documents and reports on the previous SAT meetings, as well as follow up the application of the Communication Plan, and to keep it updated. In addition an assessment on the efficiency of the Communication Plan, must be conducted twice in the year. (**Action SOG01-03**)

2.10 IATA proposes the creation of a South Atlantic (SAT) Oceanic Error and Safety Bulletin (OESB) that will complement the existing North Atlantic (NAT) OESB. The SAT OESB will distribute

information on best practices and ways to avoid errors when operating in the SAT Region and will align States and regulatory authorities' safety activities as it relates to regional safety management. The report proposes that the NAT OESB topics be reviewed by the SAT SOG for applicability in the SAT, by a project team to be created to facilitate the creation of a SAT OESB, and the SAT SOG consider and decide whether a current member from SAT States could support ongoing maintenance and revision of the regional document.

2.11 IATA requests that the SAT SOG agrees to develop and implement a SAT OESB document and invite SAT States to nominate a representative that would provide SAT OESB maintenance and revision on a continual basis. The Meeting was invited to review the NAT OESB document and decide on its applicability to the SAT region, create a project team, support nomination of a state representative, and endorse the draft SAT SOG Decision, as described below.

2.12 The meeting remarks that the flight safety program's main objective is to reduce risk by identifying and analyzing errors and promoting safety awareness. The OESB plays a crucial role in promoting continuous education and awareness to improve safety. Foundational work needs to be done before adding a scrutiny group.

2.13 Delegates emphasizes the need of establishing a SAT safety policy, report, and safety culture. Brazil offered to be the representative to manage the bulletin.

2.14 The Meeting decided that the proposal is feasible and should be conducted by a dedicated project team should be established for a thorough review the NAT OESB and determine which topics are relevant to the SAT region. Thus, a Project was defined, and a correspondent Decision was formulated, as follows:

<b>Project Title:</b>	SAT OCEANIC ERRORS SAFETY BULLETIN PROJECT TEAM (SAT OESB) PROJECT TEAM - SAT OESB PT
<b>Parent Group:</b>	SAT SOG
<b>Project Supervisory body:</b>	SAT SOG
<b>Project Period:</b>	SAT SOG/02
<b>Project Objectives:</b>	Establish a South Atlantic (SAT) Oceanic Errors Safety Bulletin (OESB) document based on the North Atlantic (NAT) OESB. The SAT OESB document aims to provide guidance and best practices to operators in the SAT region to avoid errors and promote regional safety management.
<b>Project High Level Tasks:</b>	<ol style="list-style-type: none"> <li>1. Review the NAT OESB and determine what topics are applicable to the SAT: <ol style="list-style-type: none"> <li>a. Review and compare the NAT OESB with existing safety information, reports, and data relevant to the SAT region.</li> <li>b. Determine which topics and information from the NAT OESB are applicable to the SAT region and should be included in the SAT OESB.</li> </ol> </li> <li>2. Establish the project scope, timeline and project expectations:</li> </ol>

- a. Clearly define the project scope, including the specific objectives, deliverables, and timeline for completing the project.
  - b. Identify the resources needed for the project, including personnel, funding, and technology.
  - c. Establish project expectations for communication, reporting, and decision-making.
  - d. Ensure that all team members have a clear understanding of their roles and responsibilities.
3. Identify subject matter experts'(SME) skills to ensure that the OESB is based on the latest best practices and trends in the region:
    - a. Identify subject matter experts (SME) with experience and expertise in the SAT region, as well as in areas such as safety management, aviation operations, and risk analysis.
    - b. Establish a process for involving SMEs in the development of the SAT OESB, including how they will provide input and review the document.
    - c. Ensure that the SAT OESB is based on the latest best practices, trends, and technologies in the region, and that it is aligned with relevant international standards and regulations.
  4. Compose a prototype of a SAT OESB with relevant topics of concern for the region:
    - a. The project team will use the information gathered during the review of the NAT OESB and the input from SMEs to compose a prototype of the SAT OESB.
  5. Double cross check with RASG PA and GTE, to leverage synergies, availability of statistics, safety data, incidents analysis, etc.
  6. Present a recommendation to the SAT SOG/2:
    - a. Once the SAT OESB prototype is complete, the project team will present a recommendation to the SAT SOG/2 regarding the implementation and publication of the bulletin. The recommendation should include details on the content of the SAT OESB, the process for ongoing maintenance and revision, and any other relevant information.
  7. The project team should establish a process for ongoing maintenance and revision of the OESB to ensure that it remains up-to-date and relevant:
    - a. The project team will establish a process for ongoing maintenance and revision of the SAT OESB.
    - b. This process should include regular reviews of the content, input from SMEs and stakeholders, and a mechanism for updating the bulletin in response to changes in regulations, technology, or safety trends.
    - c. The team should also identify roles and responsibilities for maintaining the bulletin and establish a schedule for updates and

	revisions.
<b>Membership:</b>	<p>Team:</p> <ul style="list-style-type: none"> <li>- Subject matter experts (SME) from each state member of SAT;</li> <li>- Brazil is the project manager/leader;</li> <li>- United States;</li> <li>- ASECNA</li> <li>- IATA; and</li> <li>- Other aviation industry groups. <ul style="list-style-type: none"> <li>o Observers: IFALPA, CANSO.</li> <li>o Other SME will be invited as appropriate.</li> </ul> </li> </ul>
<b>Coordination Requirements:</b>	NAT SOG
<b>Project Outcomes:</b>	Report back to the SAT SOG with a summary of the project team's review and a draft of a prototype of SAT OESB.
<b>Project Lead:</b>	<b>Brazil</b>
<b>Kick-off meeting</b>	Tentative date 21, June 2023 – 12:00 UTC
<b>Project Artefacts folder:</b>	Link to be created by ICAO (portal.icao)
<b>Communication channels/ frequency:</b>	<ul style="list-style-type: none"> <li>- WhatsApp / permanent</li> <li>- E-mail / permanent</li> <li>- Videoconference / monthly or as needed</li> <li>- Meeting Agenda / monthly or as needed</li> <li>- Meeting minutes / monthly or as needed</li> </ul>
<b>Project Secretariat Support:</b>	Not applicable

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<b>WHY</b>	The project aims to improve safety in the South Atlantic (SAT) by developing a SAT OESB document, based on the North Atlantic (NAT) OESB, to satisfy the SAT needs.
<b>WHAT</b>	Project team is tasked with reviewing the NAT OESB document and determining if it can be applied to the South Atlantic (SAT) region.
<b>WHO</b>	Project Team headed by Brazil and composed by SME from SAT states, United States, ASECNA, IATA and other aviation industry groups.
<b>WHEN</b>	Report on the feasibility of the OESB, to be presented in the SAT SOG 02.

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**SAT SOG Decision 01/01 – SAT OCEANIC ERRORS SAFETY BULLETIN PROJECT TEAM (SAT OESB PT)**

That, a Project Team be established to elaborate the SAT oceanic errors safety bulletin (SAT OESB) aimed to improve safety in the South Atlantic airspace. The project team will review the NAT OESB document and determine which topics are relevant to the SAT region, compose a SAT OESB with relevant topics specific to the region, and will present a recommendation to the SAT SOG/2 regarding the implementation and publication of the SAT OESB document.

2.c)	<i>SAT Safety Policy {WP/2.2}</i>
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2.15 The Meeting analyzed that establishing and disseminating the Safety Policy is crucial to promote stakeholder commitment and awareness in our Region. Establishing guidelines, parameters, and indexes are tools for solid Operational Safety development.

2.16 The policy fostering in the Group aims to create and maintain a positive operational safety environment that is supportive towards meeting safety objectives of the National Aviation Safety Plans (NASP) of the Civil Aviation Authorities (CAA) and the ICAO Global Aviation Safety Plan (GASP).

2.17 The Meeting approved the Safety Policy (**Appendix K**) and agreed to submit the Policy to the SAT SG for validation, to be adopted by all members of the Group for the continued improvement of Air traffic services over the South Atlantic (SAT). The Secretariat was tasked to the coordinate elaboration of a working paper. (**Action SOG01-04**)

2.d)	<i>Deliverable guidelines to SAT Safety Report {WP/2.4}</i>
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2.18 The Meeting was informed on the importance of establishing deliverable guidelines for an SAT Annual Safety Report. The paper outlines the provisions for statistical data and monitoring advice related to safety assessment and occurrence reporting, along with the recommended structure and metrics for the SAT Annual Safety Report. The guidelines proposed will help establish an effective annual safety report for the SAT group, focusing on identifying and mitigating regional safety risks.

2.19 The feasibility study to establish deliverable guidelines and KPIs for the SAT's Annual Safety Report (ASR) is proposed, and the creation of a project team is recommended to carry out the study, involving subject matters from various aviation groups and associations. The meeting is invited to approve the feasibility study, the creation of a project team with subject matters from SAT States, United States, IATA and other aviation industry groups.

2.20 During the meeting, it was suggested that the North Atlantic and South Atlantic work towards harmonization by starting with a few key items from the North Atlantic's list of safety key performance indicators (KPIs). As the South Atlantic's capabilities and competencies evolve, more items could be added from the list. The United States also declares its support and assistance in identifying updated safety KPIs for the SAT Annual Safety Report initiative through their SME. Senegal offered to be the state representative to SAT Annual Safety Report.

2.21 After the discussion, the Group decided that the proposal is feasible, and it should be conducted by a dedicated project team should be established for a thorough review and creation of the SAT ASR. Thus, a Project was defined, and a correspondent Decision was formulated, as follows:

<b>Project Title:</b>	SAT ANNUAL SAFETY REPORT (SAT ASR) PROJECT TEAM – SAT ASR PT
<b>Parent Group:</b>	SAT SOG
<b>Project Supervisory body:</b>	SAT SOG
<b>Project Period:</b>	SAT SOG/02
<b>Project Objectives:</b>	<p>Improve aviation safety in the South Atlantic airspace by developing an annual safety report that will analyze safety data, identify trends, propose enhancements, and mitigate risks.</p> <p>The project aims to enhance safety awareness and culture, improve data quality and analysis, and promote collaboration among stakeholders in the region.</p>
<b>Project High Level Tasks:</b>	<ol style="list-style-type: none"> <li>1. Review the NAT ASR and determine which KPIs and topics are applicable to the SAT.</li> <li>2. Develop a prototype of a SAT Annual Safety Report with relevant topics of concern for the region.</li> <li>3. Present a recommendation to the SAT SOG/2.</li> <li>4. Identify any additional resources needed to complete the SAT ASR project.</li> <li>5. Establish a timeline for completing the project and meeting key milestones.</li> <li>6. Assign specific tasks and responsibilities to project team members and ensure that there is clear communication and collaboration throughout the project.</li> <li>7. Develop a plan for how the SAT ASR will be updated and revised in the future to ensure it remains relevant and effective.</li> <li>8. Conduct a risk assessment to identify potential risks and obstacles that could impact the success of the SAT ASR project and develop contingency plans to address them.</li> <li>9. Develop a sustainability plan to ensure that the SAT ASR is regularly updated and revised to remain relevant and effective over time.</li> </ol>
<b>Membership:</b>	<p>Team:</p> <ul style="list-style-type: none"> <li>- SME from states members of SAT;</li> <li>- Senegal is the project manager/leader;</li> <li>- United States;</li> <li>- ASECNA</li> </ul>

	<ul style="list-style-type: none"> <li>- IATA; and</li> <li>- Other aviation industry groups. <ul style="list-style-type: none"> <li>o Observers: IFALPA, CANSO.</li> <li>o Other SME will be invited as appropriate</li> </ul> </li> </ul>
<b>Coordination Requirements:</b>	NAT SOG
<b>Project Outcomes:</b>	Report back to the SAT SOG with a summary of the project team's review and a draft of a prototype of SAT ASR.
<b>Project Lead:</b>	<b>Senegal</b>
<b>Kick-off meeting</b>	To be defined by the project team leader – Proposed hours 12:00 UTC
<b>Project Artefacts folder:</b>	Link to be created by ICAO (portal.icao)
<b>Communication channels/ frequency:</b>	<ul style="list-style-type: none"> <li>- WhatsApp / permanent</li> <li>- E-mail / permanent</li> <li>- Videoconference / monthly or as needed</li> <li>- Meeting Agenda / monthly or as needed</li> <li>- Meeting minutes / monthly or as needed</li> </ul>
<b>Project Secretariat Support:</b>	Not applicable

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<b>WHY</b>	The project aims to improve safety in the SAT airspace by developing a SAT annual safety report (ASR), based on the NAT ASR, to satisfy the SAT needs.
<b>WHAT</b>	Project team is tasked with reviewing the NAT ASR document and developing a SAT ASR.
<b>WHO</b>	Project Team headed by <b>Senegal</b> , composed by subject matter experts from SAT States and United States, ASECNA, IATA, and other aviation industry groups.
<b>WHEN</b>	To be presented in the SAT SOG 02

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### SAT SOG Decision 01/02 – SAT ANNUAL SAFETY REPORT PROJECT TEAM (SAT ASR PT)

That, a Project Team be established to elaborate the SAT annual safety report (SAT ASR) aimed to improve safety in the South Atlantic airspace. The project team will review the NAT ASR, compose a SAT ASR with relevant topics specific to the region, and will present the drafted document to the SAT SOG/2 to be validated.

2.e) *SAT geographical area and assignments for reviewing SAT-SOG Terms of Reference (TOR) {WP/2.8}*

2.22 The Meeting analyzed the conformation of the vast SAT airspace, which involves many States and ANSP providers. The difficulty faced by the SAT SOG in coordinating monitoring activities was recognized, considering the coexistence of two areas with different characteristics, respectively, the EUR-SAM corridor and the AORRA airspace.

2.23 At the same time, some areas of the SAT, of smaller extension and less traffic flow, that currently do not have traffic data or safety monitoring, were identified, and the great importance of defining the boundaries of the airspace in the vertical plane was highlighted. The Meeting identify the need of evaluate the volume and also the complexity of the various traffic flows in the SAT airspace.

2.24 The Meeting discussed options for improving the description of SAT airspace, and the identification of responsibilities for the provision of air navigation services. This description could involve the analysis of political and economic matters; however, it should benefit the planning of SAT SOG monitoring activities, including a gradual expansion of the area of interest for safety monitoring.

2.25 It was noted that any initiative that is approved to improve or clarify the description of SAT airspace, the traffic flows that need to be recorded and monitored, and the safety performance of ANSP services, should generate an amendment to the Terms of Reference of the SAT Manual.

2.26 The Meeting agreed to submit, in coordination with SAT IMG, a Paper to the SAT SG, presenting the interest to better define the Routes, FIR/UIRs, ACCs, ANSPs, States concerned in the SAT airspace. Also, the mentioned paper will urge the need for delineation of the airspace in the vertical plane. The Secretariat was tasked to the coordinate elaboration of a working paper. **(Action SOG01-05)**

2.f) *States/ANSP Safety Management Updates {WP/2.6, WP/2.7, WP/2.9}*

2.27 ASECNA provided an overview of current ATM operations in Dakar Oceanic FIR. The objective is to help the meeting identify the priority projects to be implemented and to provide inputs for the definition of the SAT Region CONOPS. As well, the meeting takes note on the implementation of Space Based Automatic Dependent Surveillance in Broadcast Mode (SBA) (ADS-B out 1090 MHz Extended Squitter (ES)) related to the continental survey carried out by ASECNA during the 3 years of use of this technology over oceanic and/or remote continental airspace; and the future ConOps on the implementation of ASEPS (Advanced Surveillance-Enhanced Procedures Separation).

2.28 The ASECNA safety events collection and processing system was analyzed. It provides information regarding the safety events reporting and notification, the safety events analysis, the mitigation and correctives actions implementation and effectiveness, and the related documentation as well as the safety information sharing.

2.29 ASECNA safety events collection and processing system, including reporting, notification, storage, and analysis is illustrated in the **Appendix L**.

### 3. Database and common repository

3.a), b), c) *Analysis on results of RMAs survey and sample data collection / Analysis of actions to harmonize/standardize RMAs procedures / Feasibility of a common repository of safety occurrences. {WP/3.3, WP/3.4, WP/3.5, WP/3.1}*

3.1 An update on the analysis of the results of the RMAs survey and sample data collection performed by the South Atlantic Safety Oversight Group (SAT SOG) was presented. The SAT SOG aims to develop a plan to implement an SAT Region database and harmonize the procedures adopted by states for repository provision. The paper highlights the importance of establishing a safety database baseline and discusses the methodology and tools used to implement and maintain a database of safety-related occurrences reported by various stakeholders.

3.2 The SAT SOG conducted an online survey and a sample data collection from RMAs in the SAT Region to assess the feasibility of implementing a single database. All the actions mentioned in the paper are included in the SAT-SOG annual working program for 2023. The meeting is invited to analyze the content of the paper and it triggered to other papers with actions related to the survey.

3.3 This Meeting took note of an analysis of actions aimed at harmonizing and standardizing the Regional Monitoring Agencies' (RMAs) procedures for a shared database between the three RMAs in their jurisdiction. The report resulted from the analysis of survey results, which identified common procedures among the RMAs and proposed creating a project team to analyze the feasibility of standardizing these procedures. The **United States** offered support on leading and coordinating the project team, which is formed by one subject matter expert from each RMA in the South Atlantic Region, as well as a representative from the United States.

3.4 The project team will conduct a detailed analysis of the current state of data collection, processing, and dissemination across the three RMAs and propose standardizing RVSM monitoring procedures, including standardizing forms, database management, and notification procedures, to ensure consistency and accuracy of data.

3.5 A proposal considering implementation a common repository of safety-occurrences for the SAT Region was exposed. The SAT SOG seeks to develop a plan to implement an SAT Region database and harmonize the procedures adopted by the States for repository provision. To achieve this, the SAT SOG conducted research with the RMAs to determine the best approach for data collection, processing, and dissemination. After standardizing the collected data, the note proposes conducting a feasibility study to determine whether centralizing the SAT SOG database within one RMA or partitioning the database across the three RMAs would be more viable.

3.6 The feasibility study will consider various factors such as data collection, processing, and dissemination efficiency, resource availability, and training requirements. The proposed feasibility study will provide valuable insights and inform the decision-making process for the SAT SOG and its stakeholders in the South Atlantic Region.

3.7 The meeting agreed that the proposal related to harmonizing and standardizing the Regional Monitoring Agencies' (RMAs) and feasibility analysis to implement an SAT Region database is feasible, and it should be conducted by a dedicated project team should be established to establish actions to harmonize and standardize RMAs procedures and analyze the feasibility of a database implementation. Thus, a Project was defined, and a correspondent Decision was formulated, as follows:

<b>Project Title:</b>	SAT RMAs' HARMONIZATION/STANDARDIZATION PROJECT TEAM – SAT RMA H/S PT
<b>Parent Group:</b>	SAT SOG
<b>Project Supervisory body:</b>	SAT SOG
<b>Project Period:</b>	SAT SOG/02
<b>Project Objectives:</b>	<p>The objectives of the project are:</p> <ol style="list-style-type: none"> <li>1. Conduct a feasibility study consisting of a detailed analysis of the current state of data collection, processing, and dissemination among the three RMAs (ARMA, CARSAMMA &amp; SATMA). The focus of the study should be on the SAT region, including all types of analysis (e.g., RVSM approval database, aircraft height monitoring, RVSM airspace audits, traffic data analysis, safety assessments, etc.)</li> <li>2. Identify differences in the current processes employed by SAT RMAs and propose solutions to harmonize and standardize procedures where needed.</li> <li>3. Assess the feasibility of implementing a centralized SAT RMA database for collection of LHDs, LLDs and LLEs. (e.g. SERA database)</li> <li>4. Adopt standardized collision risk assessment methodology to ensure consistent and accurate assessment of risk in the SAT Region</li> </ol> <p>Regular updates on the progress of these tasks will be presented at SAT SOG meetings.</p>
<b>Project High Level Tasks:</b>	<ol style="list-style-type: none"> <li>1. Harmonizing/ standardizing RMAs common procedures</li> <li>2. Feasibility study and database implementation progress</li> <li>3. Analysis of Collision Risk Assessment Methodologies in the EUR/SAM Corridor</li> </ol>
<b>Membership:</b>	<p>Team:</p> <ul style="list-style-type: none"> <li>- SME from each RMA of SAT;</li> <li>- <b>United States</b> is the project manager/leader/coordinator; <ul style="list-style-type: none"> <li>o Observers</li> <li>o Other SME will be invited as appropriate.</li> </ul> </li> </ul>
<b>Coordination Requirements:</b>	NAT SOG
<b>Project Outcomes:</b>	Report back to the SAT SOG meetings with outcomes of the established tasks
<b>Project</b>	<b>United States</b>

<b>Lead/Coordinator:</b>	
<b>Kick-off meeting</b>	To be defined by the project team leader – hours 12:00 UTC
<b>Project Artefacts folder:</b>	Link to be created by ICAO (portal.icao)
<b>Communication channels/ frequency:</b>	<ul style="list-style-type: none"> <li>- WhatsApp / permanent</li> <li>- E-mail / permanent</li> <li>- Videoconference / monthly or as needed</li> <li>- Meeting Agenda / monthly or as needed</li> <li>- Meeting minutes / monthly or as needed</li> </ul>
<b>Project Secretariat Support:</b>	Not applicable

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<b>WHY</b>	The project aims to harmonize and standardize RMAs' procedures and methods to improve safety in the SAT.
<b>WHAT</b>	Project team is tasked to identify the gaps and/or differences in the current procedures and methods of the three RMAs, thus, propose solutions to harmonize and standardize them. The PT would also conduct a feasibility study and implement a database. A project's progress report should be presented on SAT SOG meetings, ensuring transparency and accountability.
<b>WHO</b>	Project Team will be led by United States, composed by a SME from each RMA.
<b>WHEN</b>	Feasibility study and progress report to be presented in the SAT SOG meetings.

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### **SAT SOG Decision 01/03 – SAT RMAs' HARMONIZATION / STANDARIZATION PROJECT TEAM – (SAT RMA H/S PT)**

That, a Project Team be established to identify the gaps and/or differences in the current procedures and methods of the three RMAs, thus, propose solutions to harmonize and standardize them. The PT would also conduct a feasibility study and implement a database. A project's progress report should be presented on SAT SOG meetings, ensuring transparency and accountability.

<i>3.d)</i>	<i>NAT SOG and NAT CMA Fast Track Procedures {WP/3.2}</i>
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3.8 The Meeting was informed that NAT Region applies a fast-track methodology to advance safety occurrences between formal meetings: a decision-making procedure that does not require a meeting of all participants. This methodology's application to SAT SOG is of great value. Given that the Region has 3 RMAs from 2 different PIRGs, we might expect some challenges. As a result of these particularities,

it would be helpful to analyse the fast-track methodology and determine its requirements, needs and risks to assess the feasibility of applying this procedure in the SAT SOG Region.

3.9 IATA and United States clarified that the fast-track procedure applied to a safety event or condition that requires a very quick response from the NAT bodies. In fact, the NAT has applied the procedure just once in the past years.

3.10 The Meeting decided to prepare a draft fast track procedure for the SAT GROUP taking into account the best practices of the document NAT SPG HANDBOOK - DOC 001. The study must identify the differences between NAT and SAT in terms of structures and resources. The drafted procedure will be presented in the SAT SOG /02 (**Action SOG01-06**).

#### 4. SAT Air Traffic statistics

4.a), b), c), d) *Status of Conclusion 24/06: Traffic Statistics / RMAs capacities regarding Statistic on navigation specifications of aircraft. EUR-SAM corridor and AORRA airspaces / Sources of statistical forecast. Traffic forecasting and statistical analysis / Reports on Traffic Statistics. {WP/4.1, WP/4.2, WP/4.3}*

4.1 The Conclusion 24/06 - *Traffic Statistics*, was approved in June 2019 by SAT/24 meeting (See **Appendix G**) encouraging SAT States and RMAs, as well as the FAA. The Meeting observed that mandates of this Conclusion is referred to acquisition of traffic data, aircraft equipage status, and global forecasts, not directly connected to the SAT SOG activities, except the item f), that urged to harmonize procedures and methods among the three RMAs. The Meeting remarks that this topic is already being addressed in Agenda Item 3.

4.2 Regarding the feasibility of SAT SOG on assuming data managing and forecasting the Meeting benchmarked and analyzed such capabilities in the NAT Region, noting that the North Atlantic Economic, Financial and Forecast Group (NAT EFFG) is responsible to the NAT SPG for providing economic, financial and traffic forecasting advice to the NAT SPG in order to ensure the cost-effective management of the aviation system within the ICAO NAT Region. Such supporting group has not been defined in the SAT structure.

4.3 The importance of statistics to elaborate traffic forecast for all bodies of the SAT GROUP was stressed, however, it was observed that the Conclusion 24/06 was approved in the past context of the Group, before the current composition that includes the SAT SOG. Indeed, according to the ToRs, the elaboration of traffic forecasts is not part of the SAT SOG duties.

4.4 As well, the meeting take note that SATMA is already receiving data, related to the EUR SAM corridor, from the Demand Data Repository (**DDR**) provided by EUROCONTROL. See paragraph 4.14.

4.5 The Meeting decided to prepare a paper to be submitted to the SAT SG, pointing out the importance of traffic forecasts in the general framework of the SAT, and recommending the coordination between the Steering Group and the concerned PIRGs, in order to identify options to receive adequate traffic forecast for the AORRA airspace and other sectors of SAT. (**Action SOG01-07**)



*Traffic Picture in the EUR SAM corridor - 2022*

4.6 SATMA has, among other duties, the compilation of statistical data regarding movements of all the ACCs in the EUR/SAM corridor (ACCs in the Canary Islands, Recife, Sal and Dakar) as well as the coordination in the drafting of the "Safety Assessment" document and further studies related with the Risk Analysis (RVSM and RNP10).

4.7 The importance of SATMA collection and treatment of statistical data of air traffic movements along the EUR-SAM Corridor during last years, has been strongly highlighted in earlier SAT meetings as a relevant data to take preventive actions, in line with the past evolution of these figures. Nevertheless, several issues were detected during last SATs meetings related to the statistical data presented:

- Provided figures do not represent whole EUR/SAM Corridor since data is based exclusively on traffic that fly over Canarias FIR;
- Regarding EUR/SAM Corridor Traffic Statistics Program, one of five programmes established by SAT 22 ATM WG, it was required to include information about Flight Level occupancy. This issue was needed also in the last AMC-S;
- There are inconsistent and lack of operational data among ANSP to perform studies like safety analysis or traffic statistics.

4.8 The aim of this working paper is to cover the mentioned detected issues, SATMA monitoring performed in the EUR-SAM Corridor as well as the SAT CONCLUSION 24/06.

4.9 On the other hand, considering the needed to identify required traffic statistics and analysis to enable the SAT SG to make more accurate and predictable planning decisions, ENAIRE/SPAIN in collaboration with SATMA suggested establishing a new and unique air traffic data source to conduct this kind of reports: statistics analysis and Safety Assessments. This new data source was agreed in SAT-IMG01 where decision 01/01 and 01/02 provided also new recommendations:

- There is a lack of foreseen traffic. Next report must include an expansion of time horizon for traffic figure monitoring (Task under revision).
- That, Spain amends the aircraft equipment monitoring tables for the EUR/SAM corridor so that they include the values for PBCS requirements: mainly RCP240 and RSP180.

4.10 Even though global figures and conclusions could be obtained directly from the data provided by each ANSP with an easy and uncomplicated process, the data provided were not coherent among them. For instance, there were flight plans that are not registered by all involved ANSP, the operational information showed differences in terms of time, flight levels or coordination points, and even flight plans of the same day reported by the same ANSP with the same times but different trajectories.

4.11 Therefore, to increase the consistency of this operational data, hypothesis and assumptions were considered:

- The information supplied should be treated globally, so that lacking or mistaken information provided by an ANSP were corrected according with the rest of existing information for that flight. Therefore, time, flight level and coordination points were revised. For example: a total of 130.000 position reports was provided to SATMA.

More information was extrapolated from this original data. Likewise, coordinates reports were associated with the closer waypoint possible.

- Whereas flight plan information had only a first and last point, the flight plan was extrapolated to the closer route. For instance, if the first flight plan was TENPA SAMAR, the final flight plan would be TENPA USOTI APASO VIDRI GDV SAMAR.
- Although the provided data of traffic outside of the EUR-SAM corridor were not relevant for the safety and statistical assessments, all data was processed similarly.

4.12 To sum up the information presented above, SATMA, to conduct the traffic and safety monitoring of the EUR/SAM corridor, every year has faced to main recurrent issues:

- Elaboration of statistical data based on do not represent whole EUR/SAM Corridor since data is based exclusively on traffic that fly over Canarias FIR.
- The data provided by each ANSP, to perform the "Safety Assessment, to increase the consistency of this operational data, several hypothesis and assumptions were considered.

4.13 ENAIRE/Spain in collaboration with SATMA suggested to the **SAT IMG 01** establishing of new data source to cover the following area of interest identified for the SAT IMG: "Identify required traffic statistics and analysis to enable the SAT SG to make more accurate and predictable planning decisions".

4.14 The new one is the **Demand Data Repository (DDR)** provided by EUROCONTROL, as the Network Manager (NM). The DDR provides Past traffic data. These focus on traffic demand, and most recently filed flight plan traffic trajectories and actual trajectories from which can be used for any past analysis.

4.15 Regarding forecast, NM provides the following: Short-term forecasts are published four times a year. Medium-term forecasts look seven years ahead and build on the short-term forecasts.

4.16 The medium-term forecasts combine flight statistics with economic growth and with models of other important drivers in the industry such as costs, airport capacity, passengers, load factors, aircraft size, etc. The medium-term forecast is published in February and refreshed in September. This task will be carried out for next IMG meeting.

4.17 The analysis conducted by SATMA in 2022 for the EUR SAM corridor is shown in **Appendix M**

#### *RCP/RSP trials in EUR/SAM corridor*

4.18 In the scope of RMACG (Regional Monitoring Agencies Coordination Group), the Regional PBCS Monitoring Program has been assigned to existing RMAs. To determine compliance in the applicable airspace, the State should obtain a sufficient sample from the applicable airspace of the Actual communication performance (ACP) of relevant communication transactions and Actual surveillance performance (ASP) of surveillance data delivery measured against RCP/RSP time values.

4.19 EUR/SAM Corridor States, thru ESCIT group (contributory to SAT IMG), are studying the best approach to achieve a reduction of the longitudinal separation minima. One of the proposed options is to follow a PBCS implementation, ensuring RSP180 and RCP240 requisites in the area.

4.20 In that line, it has been concluded (in RMACG group) that already nominated RMAs are to be responsible of the monitoring of PBCS (RCP240 and RSP180) once PBCS is implemented. That will require an RMA monitoring plan for RSP180 and RCP240, and the first step is validate ATC Systems (PBCS local programs) to ensure they may measure properly CPDLC and ADS-C message delays.

4.21 To determine ground systems capabilities, and amendments to be incorporated in case, a trial was agreed between EUR/SAM states. Both CPDLC (RCP240) and ADS-C (RSP180) messages delays would be measured in a time window, comparing results with required time.

4.22 Although formal results have not been put in together for a global conclusion, it was concluded that all ground systems in EUR/SAM Corridor comply with TSP/RCP requisites.

4.23 Consequently, EUR/SAM Corridor States has established a procedure to send PBCS monitoring data to SATMA periodically, once PBCS is implemented, as part of the Regional Monitoring PBCS program for the Corridor.

## 5. Collision risk assessment and LHD

5.a),b),c) *Status of Conclusion 24/07: Reduction in Collision Risk Assessment and large Height Deviation LHD / States responsibilities on height monitoring / Mitigation of LHD: ATS incidents analysis, Human factors and AIDC. Related states /ANSPs Programs. {WP/5.1, IP/5.2, IP/5.1, WP/5.3, WP/5.6}*

5.1 The Conclusion 24/07: *Reduction in Collision Risk assessment and large height deviation LHD*, was approved by SAT/24 in June 2019 (See **Appendix G**) encouraging SAT States to implement height monitoring for its registered aircraft, AIDC facilities in ATS units (addressing human factors) and mitigation measures for ATS coordination failures that generate LHD events. The Meeting observed that mandates of the Conclusion 24/07 is referred to implementation matters, not necessarily connected to the SAT SOG activities.

5.2 However, it was recognized that the SAT SOG is enough prepared to address the LHD matters thru synergies with the scrutiny groups. Thus, the Meeting decided to foster joint activities with the Scrutiny Groups, in order to strengthen the mitigation actions for LHD events generated by ATS coordination errors.

5.3 The Secretariat was appointed to coordinate the discussion of the SAT SOG needs in the next GREPECAS Scrutiny GTE meeting (CAR SAM regions), also push the participation of Scrutiny Groups' focal points in the incoming SAT SOG meetings. (**Action SOG01-08**)

### *PBCS Implementation and Monitoring*

5.4 Following the discussion at APIRG/25 (November 2022) and the presentation by the AFI Regional Monitoring Agency (ARMA) on the implementation of procedures supporting Performance Based Communications and Surveillance (PBCS) and non-compliance reporting in the AFI Region, the

SAT IMG decided that all South Atlantic States would be invited to complete a survey (based on the ARMA questionnaire) on the status of planned PBCS implementation in their respective Radar Information Service (RISs).

5.5 CARSAMMA sent the questionnaire to the CAR SAM Contact Points in their respective languages, English and Spanish. Only five (05) states responded to the invitation and completed the requested questionnaire. The others did not respond or stated that they did not know about the theme and asked for clarification.

5.6 CARSAMMA believes that in the near future the PBCS concept should be familiarized with the Civil Aviation Authorities through a symposium.

5.7 It is also worth noting that CARSAMMA makes available on its portal the F2 RVSM Airworthiness Approval form with PBCS related fields. However, most states use an older version of the form. A new call is urgently needed to Civil Aviation Authorities to update and fill out the most recent form, so that CARSAMMA can start developing a PBCS database.

5.8 The Meeting agreed the need of a PBCS Symposium that brings together the South Atlantic States. The Secretariat was appointed to coordinate the support on training activities from some Agency / Organization in EUR/NAT or APAC Regions. **(Action SOG01-09)**

5.9 CARSAMMA informed that, aiming at maximum efficiency in its database maintenance work this March 2023, has made a new survey of aircraft with RVSM approvals. A ten-year sample from the oldest records, from 2000 to 2010, was used. The survey conclusions were exposed, as follows;

- a) Point out that despite our efforts, the Agency faces certain difficulties concerning processes that depend on the contact of the Civil Aviation Authorities of the States in the Caribbean and South American region.
- b) There are records, whose RVSM approvals should have already been renewed or cancelled; there are records that have changed operators, the RMA has not been notified, or an operator that no longer exists. However, these aircraft remain in the database as the communication to the RMA has not been made. This is the kind of issue that a **PBCS** database, when implemented, will face.
- c) To demonstrate that, in the same way, CARSAMMA maintains an RVSM database, currently with about 8,000 files of F2/F3 forms and a list of approved RVSM aircraft, which, as of the date of this document, has 2,715 aircraft certified, it is perfectly possible to efficiently manage a **PBCS** database in the South Atlantic region, as long as the Civil Aviation Authorities collaborate to maintain direct and efficient communication.
- d) Emphasize the importance of meeting the deadlines set by the relevant authorities, the need for transparent communication between the States and the RMA's, and completing the tasks necessary for the smooth progress of the work for the safety of the airspace.

5.10 The Meeting took note of a list of mitigation actions presented by SATMA in the Information Paper IP/5.1. These actions were recommended on the scope of SAT meetings (SAT/14, SAT/15, etc.) since RVSM was implemented.

5.11 IATA presented a working paper on the implementation of processes in the SAT aimed to analyze, monitor and disseminate the Strategic Lateral Offset Procedure (SLOP) uptake in the named airspace to create a positive safety impact.

5.12 SLOP allows pilots to fly centerline or 1NM (1.85 km) or 2NM (3.7 km) to the right of the centerline within oceanic boundaries without informing ATC. It is designed to be a standard operating procedure specifically used to spread aircraft out laterally about their tracks, to minimize the chance of collision given an operational error or adoption of contingency procedure. The method for incorporating SLOP estimates into the vertical collision risk assessment is presented in **Appendix N**.

5.13 The Meeting acknowledged that the use of lateral offset by ADS-reporting aircrafts would enable the adequate capture of SLOP application in the SAT region as most aircraft are capable of being programmed with automatic offsets and operate in the North Atlantic (NAT) by applying this offset to both OTS (Organized track system) flights and non-OTS flights.

5.14 Since SLOP is designed to be a standard operating procedure specifically used to spread aircraft out laterally about their tracks when parallel routes centerlines are more than 30NM apart, to minimise the chance of collision given an operational error or adoption of contingency procedure, dense oceanic air traffic flows, such as the Europe and South America (EUR/SAM) corridor would be the airspace where specific monitoring and analysis could be accomplished.

5.15 Consequently, the Meeting urge SAT states/Regulators and ANSPs to disseminate and oversight the application of SLOP procedure in their FIR/UIRs, aimed to reinforce safety and adequate TLS in SAT. **(Action SOG01-10)**

5.16 As well, agreed to request the support of SATMA in order to carry on studies on the feasibility of integrating data of SLOP procedures in the methodology applied to Collision Risk Assessment, recognizing the complexity of such matter. **(Action SOG01-11)**

5.17 In addition, the SAT SOG appointed Brazil and ASECNA, working in close coordination, and SATMA (coordinating with Spain) to initiate feasibility studies on acquisition of SLOP data taken from ATS automation systems, and prepare a preliminary report no later than six months. **(Action SOG01-12)**

5.18 Trinidad and Tobago exposed that Data Visualizations should be an integral element in the mitigation efforts and risk management of LHDs and Loop Errors. Using organized data from 2019 for the ANSP, the ATS and ANS Safety Department deployed an interactive Dashboard to drive the mitigation process in assessing the trends, ranking the deficiencies, improving collaboration between ATC interfaces, and raising Safety Awareness among all stakeholders.

<https://prezi.com/i/c2jipwjluw6f/>

<https://prezi.com/i/8-t8s0nctx7h/>

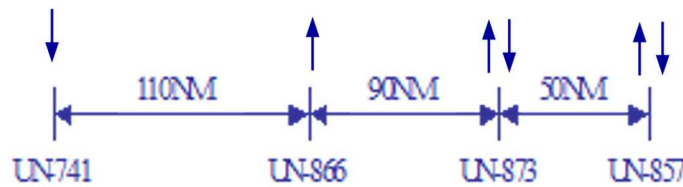
5.19 The Meeting commended the progress made by Trinidad and Tobago and recognized the value of the proposed tool to present in a simple manner the information on LHD, in benefit of understand the safety context of such events, however the Meeting consider that, as a priority, the SAT SOG must focus on implement the provision of data by states and improve the processes for LHD analysis. CARSAMMA also is working in a dashboard to improve data visualization to be presented in the next Scrutiny Group (GTE) meeting.

5.20 The Meeting recommended the use and deployment of visualization data tools in all the scrutiny groups, looking forward the opportunity to use those tools in the next future, in support of the SAT SOG activities.

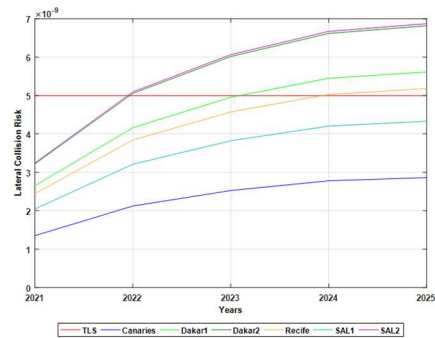
5.d) Collision risk assessment: CARSAMMA, ARMA, SATMA {WP/5.4, WP/5.2, WP/5.8}

5.21 SATMA informed the results of 2021 EUR/SAM Corridor CRM (safety assessment). Detailed technical aspects of the assessment are shown in **Appendix O**.

5.22 Lateral collision risk is below the  $TLS = 5 \cdot 10^{-9}$  with the current traffic flow and it is estimated that, considering an annual traffic growth rate of 57%, 19%, 10% and 3% in 2022, 2023, 2024 and 2025 respectively, the TLS would be exceeded in the period under consideration in all analysed locations except Canarias and SAL1.



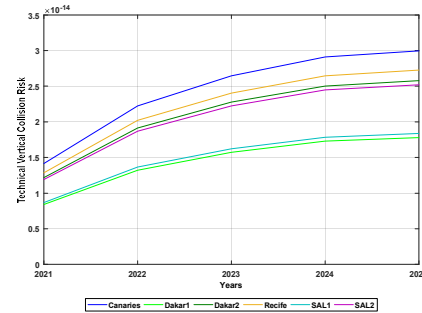
FIR	Lateral Collision Risk 2021	Lateral Collision Risk 2025
Canarias	1.3514*10 <sup>-9</sup>	2.8607*10 <sup>-9</sup>
SAL1	2.0462*10 <sup>-9</sup>	4.3313*10 <sup>-9</sup>
SAL2	3.2452*10 <sup>-9</sup>	6.8693*10 <sup>-9</sup>
Dakar1	2.6516*10 <sup>-9</sup>	5.6130*10 <sup>-9</sup>
Dakar2	3.2194*10 <sup>-9</sup>	6.8148*10 <sup>-9</sup>
Atlantico/Recife	2.4476*10 <sup>-9</sup>	5.1810*10 <sup>-9</sup>



**Table 1. Lateral Risk (CRM 2021)**

5.23 Technical vertical risk represents the risk of a collision between aircraft on adjacent flight levels due to normal or typical height deviations of RVSM approved aircraft. It is attributable to the height-keeping errors that result from the combination of altimetry system errors (ASE) and autopilot performance in the vertical dimension.

FIR	Technical Collision Risk 2021	Technical Collision Risk 2025
Canaries	$1.4153 \times 10^{-14}$	$2.9959 \times 10^{-14}$
SAL1	$8.6874 \times 10^{-15}$	$1.8389 \times 10^{-14}$
SAL2	$1.1904 \times 10^{-14}$	$2.5197 \times 10^{-14}$
Dakar1	$8.4062 \times 10^{-15}$	$1.7794 \times 10^{-14}$
Dakar2	$1.2185 \times 10^{-14}$	$2.5793 \times 10^{-14}$
Atlantico/Recife	$1.2871 \times 10^{-14}$	$2.7246 \times 10^{-14}$

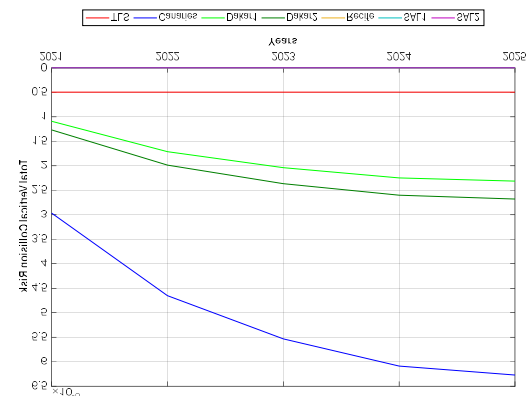


**Table 2. Technical vertical risk (CRM 2021)**

5.24 It can be seen that, the estimates of the technical vertical risk are below the technical TLS even in 2025 in all the locations, and similar to the values obtained in the last year assessment .

5.25 Total Vertical Risk. - After an analysis of the deviation reports, it can be concluded that all of the registered deviations are due to errors in coordination between adjacent ATC units, resulting in either no notification of the transfer or in transfer at an unexpected flight level.

FIR	Overall vertical Collision Risk 2021	Overall vertical Collision Risk 2025
Canaries	$2.9636 \times 10^{-8}$	$6.2732 \times 10^{-8}$
SAL1	$8.7105 \times 10^{-15}$	$1.8438 \times 10^{-14}$
SAL2	$1.1904 \times 10^{-14}$	$2.5197 \times 10^{-14}$
Dakar1	$1.0929 \times 10^{-8}$	$2.3134 \times 10^{-8}$
Dakar2	$1.2658 \times 10^{-8}$	$2.6794 \times 10^{-8}$
Atlantico/Recife	$1.2871 \times 10^{-14}$	$2.7246 \times 10^{-14}$



**Table 3. Total vertical risk (CRM 2021)**

5.26 The total vertical risk calculated using the deviations reported by the States is lower than the TLS in all locations except in Canaries and Dakar.

5.27 It was remarked that all the received deviations had been due to coordination errors between ATC units and not related to RVSM operations. In the same way, it was also explained that the deviation reports indicated that there was not any traffic in conflict. That is also the case of this study.

5.28 The same problem, the collision risk being higher than the TLS if coordination errors are taken into account, was already identified in the previous safety assessments and the corresponding conclusions were presented. Nevertheless, it is advisable to insist on the need of implementing adequate corrective actions to reduce operational errors in the Corridor, thus, the Meeting stressed the importance of

the approved Decision 01/01 on the elaboration of the SAT OESB, and the aforementioned joint activities with Scrutiny Groups.

5.29 The Meeting observed that in the SATMA studies the most optimistic scenario was chosen (High Scenario), in which the 2019 level is recovered in mid-2023. The next four years was calculated, assuming a traffic growth rate of 57%, 19%, 10% and 3% in 2022, 2023, 2024 and 2025 respectively.

5.30 ARMA presented an overview of six SAT States in the AFI Region, it also included the collision risk assessment results for the AFI Region for Collision Risk assessment CRA 16. In addition, ARMA presented, attached to its working paper (WP/5.2), references on LHD frequently asked questions - FAQ, LHD taxonomy and Cross-Boundary LHD coordination procedures.

5.31 Results of CRA 16 are shown in Tables below;

FIR/UIR	2022		2021	
	Months with no or a blank ARMA Form 1 submitted	Months with a completed ARMA Form 1 submitted, text provided	Months with no or a blank ARMA Form 1 submitted	Months with a completed ARMA Form 1 submitted, text provided
Accra				
<i>Accra</i>	5	7		12
<i>Lome</i>	1	11, 1 event summary		12
Cape Town	3	9	10	2, 2 event summary
Dakar				
<i>Abidjan</i>		12		12
<i>Bamako</i>	2	10		12
<i>Dakar</i>		12		12
<i>Nouakchott</i>		12		12
Johannesburg		12		12
Johannesburg Oceanic		12		12
Luanda	12		12	
Windhoek	12			12

Table 1: Summary of ARMA Form 1 information provided by 27 FIR/UIRs for 2022 (2021 included for reference)



FIR/UIR	Nr of Months with Form 3 submitted	Nr of Coordination failures	Nr of Communication failures	Nr of Turbulence events	Nr of ACAS events
Accra					
- Accra	7	1	2	5	0
- Lomé	11	0	1	1	0
Cape Town	9	0	0	0	0
Dakar					
- Abidjan	12	0	0	0	0
- Bamako	10	0	0	0	0
- Dakar	12	0	0	0	0
- Nouakchott	12	4	0	59	0
Johannesburg	12	14	11	8	0
Johannesburg Oceanic	12	2	7	0	0
Luanda	0	-	-	-	-
Windhoek	0	-	-	-	-
<b>Total</b>	<b>97</b>	<b>21</b>	<b>21</b>	<b>73</b>	<b>0</b>

Table 2: Summary of other operational considerations reported in ARMA Form 3 by 27 FIR/UIRs

$$N_{az}^{total} = 9.64 \times 10^{-12} + 1.92 \times 10^{-9} + 13.5 \times 10^{-9} + 1.00 \times 10^{-9} + 2.44 \times 10^{-10}$$

$$= 16.6 \times 10^{-9}$$



Figure 1: The total vertical collision risk estimates of the successive post-implementation CRAs on a normal scale (top figure) as well as on a logarithmic scale (bottom figure). The red horizontal lines indicate the TLS of  $5.0 \times 10^{-9}$  fatal accidents per flight hour.

5.32 The estimate of the total vertical collision risk was  $16.6 \times 10^{-9}$  fatal accidents per flight hour, i.e. approximately 3 times the total vertical TLS. This estimate of the total vertical collision risk is the

two but lowest of the post-implementation estimates of the total vertical collision risk under AFI RVSM. The total vertical collision risk is made up of five components and the largest component is the risk due to aircraft leveling off at a wrong opposite- or same-direction flight level.

5.33 There remain several factors that require the estimate of the total vertical collision risk to be treated with caution. The estimate is most likely affected by under-reporting of vertical events involving large height deviations as well as lack of details in the reporting. Continued efforts to bring the total vertical risk further down to below the total vertical TLS and to improve the event reporting in AFI must be sustained.

5.34 CARSAMMA presented a summary of the calculation of the vertical collision risk in the SBAO FIR for 2021, using the CRM methodology. The internationally accepted collision risk methodology (CRM) has been used for the safety assessment of RVSM airspace in the SBAO FIR. Estimates of the CRM parameter:

$$N_{ax} = 2P_y(0)P_z(0) \left( \frac{|\dot{x}(m)|}{2\lambda_x} + \frac{|\dot{y}_0|}{2\lambda_y} + \frac{|\dot{z}_0|}{2\lambda_z} \right) \frac{2\lambda_x}{|\dot{x}(m)|} \frac{1}{T} \sum_s E(s)Q(s)$$

Figure 1 – General formula of the REICH collision risk model

5.35 The material and quantity of the source used for estimating the values of each parameter of the internationally accepted collision risk model (CRM) applied for the assessment of RVSM airspace safety are summarized in Table 3 below;

Parameter	Description	Values
$\Delta x$	Average aircraft sample length	0.029081 nm
$\Delta y$	Aircraft Sample Mean Spread	0.027894 nm
$\Delta z$	Average height of the aircraft sample	0.008577 nm
$ \dot{V} $	Aircraft sample mean speed (modulus)	447.656 kt
$ \Delta \dot{V} $	Relative speed of the same direction of the aircraft sample (module)	31.57 kt
$ \dot{y} $	Average speed relative to the transverse approach of the aircraft sample (modulus)	13 kts
$ \dot{z} $	Mean relative vertical speed during loss of vertical separation of aircraft sample (modulus)	1.5 kts

<b>Pz(0)</b>	Probability that two aircraft with the same nominal level overlap laterally in the aircraft sample	<b>0.298265</b>
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Table 3 – RVSM parameters in the SBAO FIR

5.36 Cc Pass frequency, Nx – This is the airspace parameter in which the aircraft is exposed to vertical collision risk. The equivalent pass frequency was estimated considering aircraft flying in the same direction and in opposite directions, as shown in Table 4

SBAO Pass frequency	Same direction	Opposite direction	Equivalent
	0.009937	0.083167	0.058727

Table 4 – Pass frequency

5.37 Values are related to the CAR/SAM airspace system. It should be noted that the equivalent pass frequency shown in Table 6 (0.058727) was calculated based on flight hours in the 28 CAR/SAM FIRs. The estimated value of Pz (1000) used in our calculations was  $2.46 \times 10^{-8}$ .

5.38 **Collision Risk:** Table 5 contains the sets of physical and dynamic parameters estimated in the risk profile, as well as the follow-up of the main parameters for the SBAO FIR. All parameters were determined based on the airspace of SBAO FIR that is considered as an isolated system.

SBAO	Ez (same)	Ez (opposite)	Ez	$\Delta V$ (same)	$\Delta V$ (opposite)	V
	0.08277	0.02079	0.04113	31.5762	886.344	447.656 kt

Table 5 - Parameters

5.39 Table 6 shows the consolidated collision risk in the CAR/SAM FIRs for 2021, showing the estimated vertical collision risk by FIR. It must be understood that the FIRs that present an LHD report have a higher risk, but frequently due to failures in the FIRs adjacent to their airspace.

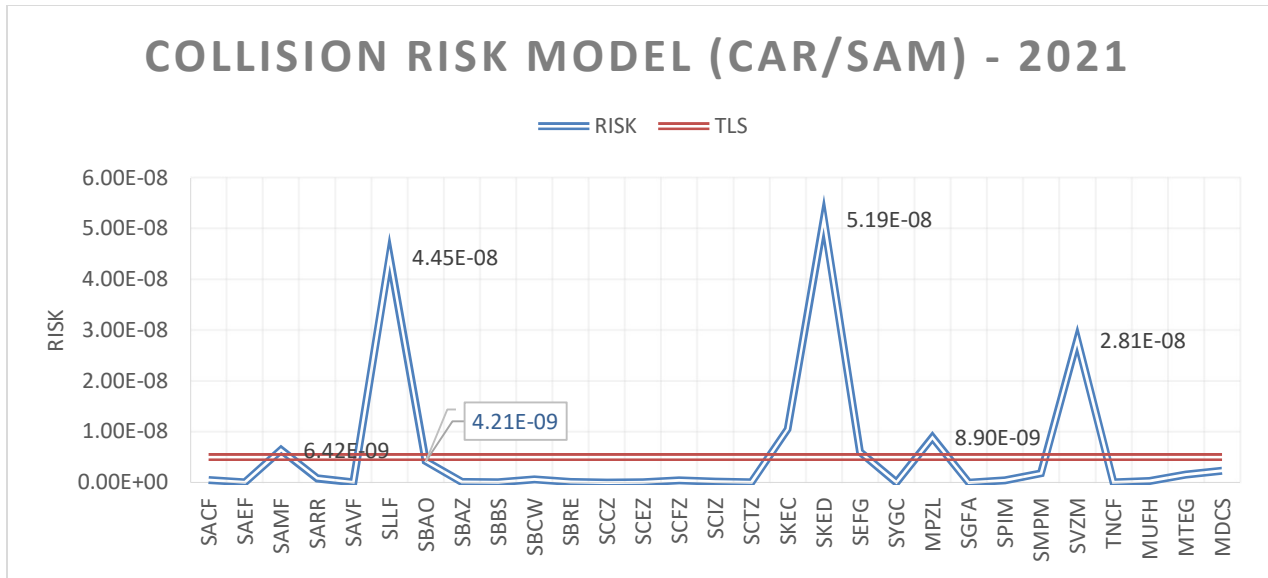


Table 6 – Vertical Collision Risk

5.40 **Conclusions of the safety assessment (CRM)**

The risk was estimated based on the FIR values presented in Table 7, which were obtained after processing all data received, compiled, and processed in the specific CRM software.

FIR	Vertical Risk
BRASIL – ATLANTICO - SBAO	4.21E-09
CAR	0.52E-09
SAM	3.09E-09
VERTICAL RISK CAR/SAM	2.76E-09

Table 7

The technical risk of the SBAO FIR meets the TLS value, not exceeding  $2.5 \times 10^{-9}$  fatal accidents per flight hour due to loss of the standard vertical separation of 1,000 ft and all other causes. The operational risk does not have a predefined limit, in accordance with ICAO Doc 9574.

The study was founded on 2021 data. The estimated total risk for the SBAO FIR is  **$4.21 \times 10^{-9}$  below the TLS ( $5.0 \times 10^{-9}$ )**.

5.41 The Meeting pondered the CRAs and safety assessments presented by SATMA, ARMA and CARSAMMA that showed that the SAT region is still facing challenges on LHD incidence and weaknesses on events reporting. As well, the representatives remarked the increased traffic flow in the SAT area that is tending to a continuous growth in the next 3 years.

5.42 Consequently, SAT members were urged to reinforce mitigation measures on ATS procedures, operational errors, ATM/CNS issues, etc. and boost their participation in the activities carried on by the SAT Group in benefit of safety and flights efficiency. The Meeting decided to follow up this matter closely, and to request feedback from SAT states/regulators and ANSPs, to be received before the SAT SOG/02 (**Action SOG01-13**)

5.e),f) *Analysis on RMAs issues on data reporting quality and format / Analysis on RMAs issues on coordination, streamlining of processes. {WP/5.5}*

5.43 SATMA stressed that the reliability of the collision risk assessments greatly depends on the availability and accuracy of the used data. In the studies made up to now for the EUR/SAM Corridor, it has been made clear the lack of data, without which it is not possible to model the parameters of the collision risk model adequately.

5.44 Following that purpose, a document named “RMA DATA NEEDED FOR EUR/SAM MONITORING AND ASESSEMENTS” (see **Appendix P**) was presented to the Meeting as a guide to be followed by EUR/ SAM States.

5.45 The Meeting reminded that, since 2002, all EUR/SAM States has been sending both Traffic Data and LHD occurrences to SATMA as main information to perform CRM Model, in which Safety Assessment is based. It was agreed that between days 1st and 5th of each month that information should be received by SATMA. Though States used to be disciplined, it is true that there is lack of information due to some of the following three causes.

- a. ATC/Pilots do not Report the occurrence of an LHD/LD. We deal -still- with a lack of “reporting culture” after the traffic has been serviced. Pilots are not involved in RVSM monitoring, as LHD Reports from Pilots is zero.
- b. ACC do not send report LHD to SATMA. Very unusual.
- c. ACC LHD Report is incomplete. Very usual. When an incomplete LHD is received by SATMA the investigation is hard to follow, as it occurred weeks or even a month ago.

5.46 To minimize this lack of information LHD delivery formats were modified, and a ‘no report deviation’ flag was incorporated. See **Appendix Q and Appendix R**.

5.47 On the other hand, new generation surveillance systems (ADS-C, ADS-B) are not evaluated by CRM Model. This implies that some agreement about LHD considerations should be reformulated, so TLS calculation is more in line with the truth concept of “deviation” as “unexpected flight level”. LHD events reported are sometimes not so unexpected, thanks to surveillance monitoring.

5.g) *Actions to harmonize/standardize RMAs procedures related to LHD, LLD and LLE calculation. [WP/5.7]*

5.48 By the survey submitted to the RMAs analysis, it was identified that the collision risk assessment methodologies used by the Regional Monitoring Agencies (RMAs) in the EUR/SAM Corridor. The analysis found that only one RMA calculates lateral and longitudinal deviations, while all RMAs calculate vertical deviation. To address this discrepancy, SAT SOG proposes the establishment of a project team to evaluate the feasibility of disseminating knowledge on the collision risk assessment methodology used by SATMA and to consider the feasibility of a workshop to promote the implementation of this calculation in other RMAs.

5.49 By adopting a standardized methodology, consistent and accurate assessment of collision risks in the region can be granted. The proposal was endorsed, and the meeting decided that this task should be added to SAT RMAs' Harmonization and Standardizing RMAs Procedures and Methodologies Project Team. See SAT SOG/01 **Decision SOG01-03**.

## 6. Safety Training and Workshops

6.a), b), c)	<i>Safety Training</i>	{WP/6.1}
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6.1 On this Agenda Item, the Meeting recognized that the current SAT structure has been instituted expecting that identified objectives and deliverables are likely to be achieved under a format that has proven success in the NAT region. The NAT region offers many examples and best practices for both the SAT SOG and IMG.

6.2 A significant constraint in the SAT states is the lack of trained safety personnel with the necessary experience. In addition to limited access to training, we are unaware of who has what level of training. The ACM/1 proposed a buddy system whereby NATSPG States support and mentor SAT States. This laudable initiative may meet limited success as the personnel from the partnering States may simply be unable to collaborate effectively because of the different levels of expertise and experience.

6.3 Providing more accessible training would significantly increase organizational capacity to deliver on the objectives of safe and harmonized air traffic services in the SAT region. Some options and programs delivered by ICAO, IATA and CANSO were analyzed by the Meeting.

6.4 The Meeting admitted that one basic problem is that most of this training is not free nor easily accessible to individual personnel. Many States or ANSPs are constrained by budgets that limit the number personnel that can receive training.

6.5 Representative of IATA noted that the training provided may not directly meet the needs of SAT states. The organization also has limited budgets. The importance of identifying in more detail the training needs for States and ANSPs in matters of safety and flight operations was stressed. IATA will continue to explore options to give training support and report before the SAT SOG/2 accordingly.

6.6 The meeting recognized the importance of identify the training gaps in the SAT members states in order to define a programme that fulfil the members necessities. Trinidad and Tobago was appointed to draft a survey on oceanic operation training needs, and will coordinate with Secretariat to be submitted to States. The results will be reported ASAP. (**Action SOG01-14**)

## 7. Any other business

7.1 Delegates solicited that the Secretariat address a State Letter to administrations, requesting the nomination of the designated focal points and/or the SME/members/leaders/coordinators of the project teams defined in the present meeting. (**Action SOG01-15**)

7.2 The SAT SOG group Delegates were urged to prepare and address the working papers to the Secretariat within the deadlines, in order to make available all the documents in the repository two weeks before the respective meeting. (**Recurrent Action SOG R1-01**)

7.3 The list of SAT SOG/ 01 Decisions, as attached in **Appendix E** and the Action Item list as attached in **Appendix D** were endorsed by the SAT SOG.

7.4 All SAT SOG meeting documentation will be made available on the ICAO Secure Portal <https://portallogin.icao.int/>, Group name **SATSOG** (all caps, no space).

#### *Next meetings*

7.5 **The Meeting agreed the next meetings:**

- **SAT SOG/02 Virtual, tentative 6-8 November 2023, hours 1200 – 1500 UTC.**
- **SAT SOG/03 Sao Paulo, Brazil, tentative 15-19 April 2024.**

#### *Report to the next SAT SG/01 meeting*

7.6 The report to SAT SG/01, with proposed actions, is at **Appendix F**

#### *Closing Remarks*

7.7 In the closing remarks, the Chairman thanked IATA and United States for their excellent support, their very nice hospitality and generosity which were instrumental factors for the successful outcome of the SAT SOG/01.

**APPENDIX A**  
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**APPENDIX B**  
**LIST OF MEETING DOCUMENTS**

<b>WORKING PAPERS</b>	<b>AGENDA ITEM</b>	<b>TITLE</b>	<b>PRESENTED BY</b>
1.1	1 a	Draft Agenda	Secretariat
1.2	1 b	ACM-S meeting SOD	Secretariat
1.3	1 d	SAT IMG/01 meeting SOD	Secretariat
2.1	2 b, d	IATA Proposal to Establish a South Atlantic Oceanic Errors Safety Bulletin	IATA
2.2	2 c	Proposal for the SAT Safety policy	SAT SOG
2.3	2 b	Proposal for an SAT SOG Communication Plan	SAT SOG
2.4	2 d	Proposal for deliverable guidelines for a SAT annual safety report	SAT SOG
2.5	2 a	SAT SOG working Plan	SAT SOG
2.6	2 f	Status of ATM operations in Dakar oceanic FIR	ASECNA
2.7	2 f	Increase ASECNA Airspace Capacity: Implementation of ASEPS (Advanced Surveillance-enhanced procedural separations) in Dakar oceanic airspace	ASECNA
2.8	2 e	Delimitation of the SAT geographical area and assignments for reviewing SAT-SOG Terms of Reference (TOR)	SAT SOG
2.9	2 f	ASECNA safety events collection and processing system	ASECNA
3.1	3	Operational safety occurrence reports (Air Safety Report) effective management	IATA
3.2	3 d	Benchmarking with NAT SOG and NAT CMA. Fast Track Procedures	SAT SOG
3.3	3 a	Analysis on results of RMAs survey and sample data collection	SAT SOG
3.4	3 b	Analysis of actions to harmonize/standardize RMAs procedures	SAT SOG
3.5	3 c	Feasibility of a common repository of safety occurrences	SAT SOG
4.1	4 a	Status of Conclusion 24/06: Traffic Statistics	SAT SOG
4.2	4 b	Traffic Picture in the EUR/SAM Corridor 2022	SATMA
4.3	4	RCP/RSP trials in EUR/SAM Corridor	SATMA
5.1	5 b	PBCS Preparation Questionnaire for SAT States	CARSAMMA
5.2	5	ARMA report on SAT States from the AFI region	ARMA

<b>WORKING PAPERS</b>	<b>AGENDA ITEM</b>	<b>TITLE</b>	<b>PRESENTED BY</b>
5.3	5	Creating positive safety impact through capture and analysis of Strategic Lateral Offset Procedure (SLOP)	IATA
5.4	5 d	EUR/SAM Corridor CRM (2021)	SATMA
5.5	5 e	Data for Collision Risk Model in EUR /SAM	SATMA
5.6	5 c	Data Visualization in Air Traffic Management: Mitigation of LHDs, Risk Management and Monitoring	Trinidad and Tobago
5.7	5 g	Analysis of collision risk assessment methodologies in the EUR/SAM corridor	SAT SOG
5.8	5	2021 Vertical Collision Risk (CRM) in the SBAO	CARSAMMA
6.1	6	Creating an effective SAT SOG training framework	Trinidad and Tobago
<b>INFORMATION PAPERS</b>	<b>AGENDA ITEM</b>	<b>TITLE</b>	<b>PRESENTED BY</b>
1.1	1	Meeting schedule	Secretariat
1.2	1	List of meeting documents	Secretariat
1.3	1 c	Review of the ICAO 41 Assembly	Secretariat
5.1	5 c	List of Mitigation actions	SATMA
5.2	5 b	Prospects for a PBCS database	CARSAMMA

**APPENDIX C — LIST OF APPENDICES**

Id.	Title	Reference	Notes
<b>APPENDIX A</b>	List of participants	Para 0.4	
Appendix B	Meeting documentation	Para 0.4	
Appendix C	List of appendices	Para 0.4	
Appendix D	Action item list	Para 0.5, 7.3	
Appendix E	SAT SOG/01 decisions	Para 0.5, 7.3	
Appendix F	Report to SAT Steering group	Para 0.5, 7.6	
Appendix G	Follow up - ACM-S (Madrid, June 2022) meeting actions	Para 1.2, 4.1, 5.1	
Appendix H	SAT IMG/01 Decisions	Para 1.7	
Appendix I	<i>SAT SOG's Bi-annual Working Programme Version 1.</i>	Para 2.3	
Appendix J1	<i>SAT SOG'S Stakeholders register</i>	Para 2.5	
Appendix J2	<i>SAT SOG'S Communication plan</i>	Para 2.7	
Appendix K	SAT Safety Policy	Para 2.17	
Appendix L	ASECNA safety events collection and processing system	Para 2.29	
Appendix M	SATMA Analysis performed in 2022	Para 4.17	
Appendix N	Method for incorporating SLOP estimates into the vertical collision risk estimate.	Para 5.12	
Appendix O	CRM EUR/SAM 2021	Para 5.21	
Appendix P	RMA DATA needed for EUR SAM Monitoring and Assessments	Para 5.44	Delivered in a separate file.
Appendix Q	Coordination LHD (Investigation form)	Para 5.46	
Appendix R	SATMA deviations monitoring report	Para 5.46	

**APPENDIX D — ACTION ITEM LIST**

ID #	ACTION	References	WHO	WHEN
SOG R-01 (RECURRENT)	The SAT SOG group Delegates were urged to prepare and address the working papers to the Secretariat within the deadlines defined in the convening letter.	SAT SOG/01 SoD, para 7.2	All SAT members	Every meeting
SOG01-01	Follow up the sharing of the results of SAT IMG Decision 01-03, survey on PBCS implementation with the 3 RMAs.	SAT SOG/01 SoD, para 1.7	Secretariat	SAT SOG/02
SOG01-02	Coordinate / harmonize the biannual working programme with its pairs of Paris, Dakar, Nairobi and Mexico Regional Offices, in order to adjust and maintain updated the said programme	SAT SOG/01 SoD, para 2.4	Secretariat	SAT SOG/03
SOG01-03	Collect and upload in the portal.icao the background documents and reports on the previous SAT meetings, as well as follow up the application of the Communication Plan, and to keep it updated. An assessment on the efficiency of the Communication Plan, must be conducted twice in the year	SAT SOG/01 SoD, para 2.9	Secretariat	SAT SOG/02
SOG01-04	Submit the Safety Policy to the SAT SG for validation, to be adopted by all members of the SAT Group.	SAT SOG/01 SoD, para 2.17, and Appendix K.	Secretariat	SAT SG first meeting
SOG01-05	Submit, in coordination with SAT IMG, a Paper to the SAT SG, presenting the interest to better define the Routes, FIR/UIRs, ACCs, ANSPs, States concerned in the SAT airspace. Also, the mentioned paper will urge the need for delineation of the airspace in the vertical plane.	SAT SOG/01 SoD, para 2.26	Secretariat Coordinating with SAT IMG	SAT SG first meeting
SOG01-06	Draft a fast-track procedure for the SAT GROUP taking into account the best practices of the document NAT SPG HANDBOOK - DOC 001. The study must identify the differences between NAT and SAT in terms of structures and resources.	SAT SOG/01 SoD, para 3.10	Secretariat	SAT SOG/02
SOG01-07	Prepare a paper to be submitted to the SAT SG, pointing out the importance of traffic forecasts in the general framework of the SAT, and recommending the coordination between the Steering Group and the concerned PIRGs, to	SAT SOG/01 SoD, para 4.5	Secretariat	SAT SG first meeting

ID #	ACTION	References	WHO	WHEN
	identify options to receive adequate traffic forecast for the AORRA airspace and other sectors of SAT.			
SOG01-08	Coordinate the discussion of the SAT SOG needs in the next GREPECAS Scrutiny GTE meeting (CAR SAM regions), also push the participation of Scrutiny Groups' focal points in the incoming SAT SOG meetings.	SAT SOG/01 SoD, para 5.3	Secretariat	GREPECAS 21
SOG01-09	Coordinate the support on PBCS training activities from some Agency / Organization in EUR/NAT or APAC Regions.	SAT SOG/01 SoD, para 5.8	Secretariat	SAT SOG/02
SOG01-10	Disseminate and oversight the application of SLOP procedure in their FIR/UIRs, aimed to reinforce safety and adequate TLS in SAT.	SAT SOG/01 SoD, para 5.15	All SAT IMG states/regulators	SAT SOG/02
SOG01-11	Request the support of SATMA to carry on studies on the feasibility of integrating data of SLOP procedures in the methodology applied to Collision Risk Assessment, recognizing the complexity of such matter.	SAT SOG/01 SoD, para 5.16	Secretariat SATMA	SAT SOG/02
SOG01-12	Initiate feasibility studies on acquisition of SLOP data taken from ATS automation systems and prepare a preliminary report.	SAT SOG/01 SoD, para 5.17	Brazil ASECNA SATMA	September 29, 2023
SOG01-13	Considering the increased traffic flow in the SAT area that is tending to a continuous growth in the next 3 years; Reinforce mitigation measures on ATS procedures, operational errors, ATM/CNS issues, etc. and boost their participation in the activities carried on by the SAT Group.	SAT SOG/01 SoD, para 5.42	All SAT members	SAT SOG/02
SOG01-14	Identify the training gaps in the SAT members states in order to define a programme that fulfil the members necessities. Survey on oceanic operation training needs.	SAT SOG/01 SoD, para 6.6	Trinidad and Tobago Secretariat	Q3 , Q4 2023
SOG01-15	State Letter to administrations, requesting the nomination of the designated focal points and/or the SME/members/leaders/coordinators of the project teams defined in the present meeting.	SAT SOG/01 SoD, para 7.1	Secretariat	May 2023

### APPENDIX E — SAT SOG/01 DECISIONS

Reference / Title	Description	Notes	Status
SAT SOG Decision 01/01 –SAT Oceanic Errors Safety Bulletin Project Team (SAT OESB PT)	That, a Project Team be established to elaborate the SAT oceanic errors safety bulletin (SAT OESB) aimed to improve safety in the South Atlantic airspace. The project team will review the NAT OESB document and determine which topics are relevant to the SAT region, compose a SAT OESB with relevant topics specific to the region, and will present a recommendation to the SAT SOG/2 regarding the implementation and publication of the SAT OESB document.	State Letter to administrations, requesting the nomination of the designated focal points and/or the SME/members/leaders/coordinators of the PT	On-going
SAT SOG Decision 01/02 – SAT annual safety report project team (SAT ASR PT)	That, a Project Team be established to elaborate the SAT annual safety report (SAT ASR) aimed to improve safety in the South Atlantic airspace. The project team will review the NAT ASR, compose a SAT ASR with relevant topics specific to the region, and will present the drafted document to the SAT SOG/2 to be validated.	State Letter to administrations, requesting the nomination of the designated focal points and/or the SME/members/leaders/coordinators of the PT	On-going
SAT SOG Decision 01/03 – SAT RMAs’ harmonization / standardization project team (SAT RMA h/s PT)	That, a Project Team be established to identify the gaps and/or differences in the current procedures and methods of the three RMAs, thus, propose solutions to harmonize and standardize them. The PT would also conduct a feasibility study and implement a database. A project's progress report should be presented on SAT SOG meetings, ensuring transparency and accountability.	State Letter to administrations, requesting the nomination of the designated focal points and/or the SME/members/leaders/coordinators of the PT	On-going



**APPENDIX F —Report to SAT Steering Group (SG)**

Notes	References
a. Note that the Action Items from the ACM-S had been addressed at the SAT SOG/01	Para 1.1, 1.2, APP G
b. Note that the Decisions of SAT IMG/01 had been addressed at the SAT SOG/01	Para 1.7 APP H
c. Note the SAT SOG Working Plan and SAT SOG Communication Plan	Para 2.1 to 2.9 APP J1 and J2
d. Note and support the establishment of the SAT Oceanic errors safety bulletin project team	Para 2.10 to 2.14
e. Note the SAT Safety Policy for SG validation. Action SOG01-04	Para 2.15 to 2.17 APP I and APP K
f. Note and support the establishment of the SAT safety report project team	Para 2.18 to 2.21
g. Note the SAT SOG analysis on SAT geographical area. Action SOG01-05	Para 2.22 to 2.26
h. Note and support the establishment of the SAT RMAs harmonization and standardization project team	Para 3.1 to 3.7
i. Note the SAT SOG analysis on fast-track procedures.	Par 3.8 to 3.10
j. Note the analysis of SAT SOG on air traffic statistics. Action SOG01/07	Par 4.1 to 4.17
k. Note the analysis of SAT SOG on RCP/RSP trial in EUR SAM corridor	Par 4.18 to 4.23
l. Note the results of collision risk analysis in SAT area, performed by SATMA, ARMA, CARSAMMA.	Par 5.1 to 5.49
m. Note the analysis of SAT SOG and tasks identified on Safety and training matters.	Par 6.1 to 6.6
n. Note the schedule of next meetings	Par 7.5

**APPENDIX G - FOLLOW UP - ACM-S (MADRID, JUNE 2022) MEETING ACTIONS**

<i>ID #</i>	<i>ACTION</i>	<i>REMARKS</i>	<i>WHO</i>	<i>WHEN</i>	<i>COMMENTS</i>
<i>ACM-S-01</i>	<i>States in the SAT area to submit their occurrence reports, including Large Height Deviation (LHD) reports, as well as the monthly data returns to the respective regional monitoring agencies</i>	<i>ACM-S SoD, Para. 2.1.</i>	<i>All</i>	<i>With immediate effect</i>	<i>WHO : ALL COMPLETED. ADDRESSED BY SAT SOG/01</i>
<i>ACM-S-02</i>	<i>Develop and present a detailed AIDC implementation activity plan and associated implementation status/updates to the SAT IMG/1 meeting</i>	<i>ACM-S SoD, Para. 2.3.</i>	<i>All</i>	<i>SAT IMG/1</i>	<i>ON GOING SEE SAT IMG/01 SoD Action Item R-02</i>
<i>ACM-S-03</i>	<i>Review the coordinated PBCS monitoring process for all FIRs in the SAT Region and discuss this with the RMAs and RMACG</i>	<i>ACM-S SoD, Para. 3.2</i>	<i>All</i>	<i>SAT IMG/1</i>	<i>ON GOING SEE SAT IMG/01 SoD Decision SAT IMG/01-3</i>
<i>ACM-S-04</i>	<i>Prepare an action item table from the S-SAT SoD Appendix D, with updated information on implementation status</i>	<i>ACM-S SoD, Para. 5.1.</i>	<i>Secretariat SAT IMG chair SAT SOG chair</i>	<i>SAT IMG/1 SAT SOG/1</i>	<i>NOT APPLICABLE TO SAT SOG *** COMPLETED. ADDRESSED BY SAT SOG/01</i>
<i>ACM-S-05</i>	<i>Proceed with ToRs implementation in close coordination with RMAs, States, ANSPs, airspace users and stakeholders</i>	<i>ACM-S SoD, Para. 7.7.</i>	<i>SAT SOG</i>	<i>SAT SOG/1</i>	<i>ITEM 2 COMPLETED. ADDRESSED BY SAT SOG/01</i>
<i>ACM-S-06</i>	<i>Submit the survey on data collection to the three RMAs, analyze the results obtained, and define the feasibility to implement a common repository of safety occurrences</i>	<i>ACM-S SoD, Para. 7.7.</i>	<i>SAT SOG</i>	<i>SAT SOG/1</i>	<i>ITEM 3 COMPLETED. ADDRESSED BY SAT SOG/01</i>

<i>ID #</i>	<i>ACTION</i>	<i>REMARKS</i>	<i>WHO</i>	<i>WHEN</i>	<i>COMMENTS</i>
ACM-S-07	Address the pending items of Conclusions SAT 24/06 and SAT 24/07, regarding traffic statistics and reduction in collision risk assessment and LHD, respectively	ACM-S SoD, Para. 7.7.	SAT SOG	SAT SOG/I	ITEM 4 Conc SAT 24/06**  ITEM 5 Conc SAT 24/07**  <b>COMPLETED. ADDRESSED BY SAT SOG/01</b>
ACM-S-08	Submit a progress report to the SAT SG meeting	ACM-S SoD, Para. 7.7.	SAT SOG	SAT SOG/I	<b>COMPLETED. ADDRESSED BY SAT SOG/01</b>
ACM-S-09	State Letter for the nomination of SAT-IMG members	ACM-S SoD, Para. 8.1.	Secretariat SAT IMG chair	August 2022	<b>COMPLETED.</b>
ACM-S-10	Collect data/information from the SAT ANSPs and airspace users in preparation of SAT IMG/1	ACM-S SoD, Para. 8.5.	Secretariat All SAT IMG members	SAT IMG/1	<b>COMPLETED.</b>

\*\* Note: See the following references from SAT/24:

### **CONCLUSION 24/06: TRAFFIC STATISTICS**

That,

- a) ASECNA and SATMA are requested to conduct and provide statistic on navigation specifications of aircraft which operate in the EUR/SAM corridor and report to SAT 25;
- b) FAA is requested to share global traffic forecast to assist SAT Group with forward planning, and the SAT Group to obtain from the NAT its existing programmes in traffic forecasting and statistical analysis tools;
- c) ARMA and CARSAMMA to explore the possibility of providing the SAT with additional traffic statistics and analysis to enable the SAT Group to make more accurate and predictable planning decisions;
- d) All SAT States/FIRs in the AFI Region which have not done so, are requested to provide traffic data from January 2017 to March 2019 to ARMA, not later than

*30 June 2019, to be included in the Collision Risk Assessment 13 which commences on 1 July 2019; and*

- e) *SAT Regional Monitoring Agencies are urged to consider as far as practicable, harmonization of reporting subjects and/or format for traffic statistics, taking into consideration the feedback provided by the mathematicians computing the TLs, and in collaboration with the NAT where feasible.*

*Note: It is recommended to use ICAO sources of statistical forecast as bases for Regional planning decisions.*

**CONCLUSION 24/07: REDUCTION IN COLLISION RISK ASSESSMENT AND LARGE HEIGHT DEVIATION LHD**

*That,*

- a) *Civil Aviation Authorities of SAT member States/FIRs are requested to ensure that height monitoring is conducted regularly for all aircraft on their registry.*
- b) *SAT States/FIRs that have not done so are requested to implement AIDC and to address the Human Factors in Coordination Failures which are factors impacting negatively on the Target Levels of Safety and report to SAT 25.*
- c) *SAT States/FIRs are urged to give priority attention to addressing Coordination Failures between ACCs in order to enhance RVSM safety, including the implementation of awareness programmes to mitigate human error induced Coordination Failures, and conduct remedial actions to mitigate the risks.*

**\*\*\*Note: Reference from S-SAT Appendix D**

APPENDIX – D	
LIST OF SAT PRIORITY PROJECTS FROM ACM/I	
<i>First priority</i>	<ol style="list-style-type: none"> <li>1. Contingency plans harmonization;</li> <li>2. Performance based (PBCS/PBN) separation minima implementation;</li> <li>3. Space based ADS-B implementation and operation.</li> </ol>
<i>Second priority</i>	<ol style="list-style-type: none"> <li>4. AIDC/AMHS implementation;</li> <li>5. Harmonization of NAT and SAT CONOPS elements to the extent possible;</li> <li>6. Assignment of flight levels;</li> <li>7. HF communication issues (urgent safety issue);</li> </ol>

## APPENDIX H - SAT IMG/01 DECISIONS

E-1

SAT IMG/01 –Summary of Discussions

E-1

### APPENDIX E — SAT IMG/01 DECISIONS

Reference/Title	Description	Comments	Status
SAT IMG/01-1 Inclusion of RCP240 and RSP 180 values into the aircraft equipment monitoring tables	That, Spain amends the aircraft equipment monitoring tables for the EUR/SAM corridor so that they include the values for RCP240 and RSP 180.	To be included into the next report for the SAT IMG/02 meeting	On-going
SAT IMG/01-2 Expand the time horizon for traffic number monitoring in the EUR/SAM corridor	That, Spain expands the time horizon for traffic figures within the EUR/SAM corridor so that the range includes traffic figure from the past year (Y-1), the actual/current year (Y) and the next year (Y+1)	To be included into the next report for the SAT IMG/02 meeting	On-going
SAT IMG/01-3 Submit survey on PBCS implementation, analyze the results obtained, and present them to the next meeting	That: a) the SAT IMG members are invited to complete a survey (similar to the one from ARMA) in order to determine the readiness for PBCS Implementation; b) the ICAO Secretariat analyse the results of the survey; and c) report the results to the next SAT IMG/02 meeting.	Survey launch before end 2022 3 months comments period Share the results with the 3 SAT RMAs Preparation of WP for SAT IMG/02	On-going
SAT IMG/01-4 Implement solutions for the improvement of flight efficiency and flight level occupancy in the EUR-SAM corridor	That, SAT ANSPs are invited to provide the solutions to mitigate flight level limitations and improve flight level occupancy for existing and future flights within the EUR/SAM corridor	State Letter to be sent Follow up at SAT IMG/02	On-going
SAT IMG/01-5 Organisation of ESCIT/03 meeting in Q1/2023	That, in accordance with the SAT IMG ToRs, the ESCIT/03 meeting will be organized as early as possible in 2023 with the main priority to assess and improve the air navigation system capacity and efficiency within the EUR/SAM corridor.	State Letter invitation to be sent ESCIT report to be presented at SAT IMG/02	On-going
SAT IMG/01-6 Establishment of a SAT Contingency Plan Review Project Team	That, a Project Team be established in order to review and propose amendments to the ATM Operational Contingency Plan for the South Atlantic, to verify the accuracy of the information particular to each SAT FIR, and to publish the SAT Contingency Plan as a new SAT DOC 002.	State Letter for nominations to be sent Series of virtual meetings Participation in the AFI workshop PT report to be presented at SAT IMG/02	On-going

**APPENDIX I - SAT SOG's Bi-annual Working Programme Version 1.**

**\*Note.- V= Virtual meeting**

Activity	Participants	Frequency	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023	October 2023	November 2023	December 2023	January 2024	February 2024	March 2024	April 2024	May 2024	June 2024	July 2024	August 2024	September 2024	October 2024	November 2024
Bi-Annual SAT-SOG meeting (alternating in person/virtual)	SAT-SOG members	Bi - Annually	x								V*				x								V*
Video conference for coordination of planning and action monitoring	SAT-SOG Chairteam and ICAO	Bimonthly	x		x		x		x		x		x		x		x		x		x		x
Coordination of activities - RMA	SAT-SOG and RMA representatives	Bimonthly or as needed		x		x		x		x		x		x		x		x		x		x	
Coordination of implementation actions - SAT IMG	SAT-SOG and IMG representatives	Quarterly				x				x				x				x				x	
Project team meetings: SAT Oceanic Errors Safety Bulletin Project Team (SAT OESB PT)	Project team	Frequency will be established by the project Team	The project Team, which was approved at SAT SOG/01 meeting, will establish its communication plan																				
Project team meetings: SAT Annual Safety Report (SAT ASR PT)	Project team	Frequency will be established by the project Team	The project Team, which was approved at SAT SOG/01 meeting, will establish its communication plan																				
Project team meetings: SAT RMAS' Harmonization/Standardization project team (SAT RMA H/S PT) Task 1: harmonizing/ standardizing RMAs common procedures Task 2: feasibility study and database implementation progress) Task 3: Analysis of Collision Risk Assessment Methodologies in the EUR/SAM Corridor	Project team	Frequency will be established by the project Team	The project Team, which was approved at SAT SOG/01 meeting, will establish its communication plan																				

**APPENDIX J1 - SAT SOG'S STAKEHOLDERS REGISTER**

<b>ID</b>	<b>Stakeholder</b>	<b>Point of Contact (POC) full name</b>	<b>Country/ Organisation</b>	<b>Telephone</b>	<b>E-mail</b>
ALFA	Chairteam SAT SOG	Luiz Antônio dos Santos (Chairman) Alexis Brathwaite (Vice Chairman) Virginia Mignoni (Assistant)	DECEA/Brazil DECEA/Brazil		
BRAVO	South American (SAM) Office - ICAO				
CHARLIE	SAT Regional Monitoring Agencies				
DELTA	States and Organisations in the SAT Region				
ECHO	IATA Regional Offices				
FOX	Other ICAO Regional Offices				
GOLF	SAT IMG				
HOTEL	SAT SG				
INDIA	NAT SOG				
JULIET	NAT CMA				
KILO	Other NAT groups				
LIMA	SAT observers				

**APPENDIX J2 - SAT SOG'S COMMUNICATION PLAN**

Receiving Stakeholder	Message Sender	Communication objective (message)	Channels used	Frequency of communication
Vice Chair and ICAO LIMA RO	SAT SOG Chairman /Assistant	Coordination of action planning and monitoring	E-mail and/or WhatsApp	Permanent
			Videoconference	Bimonthly
RMAs and stakeholders	SAT SOG Chairman /Assistant	Coordination of activities	Meetings/meeting date	Bimonthly
			WhatsApp	
			E-mail	Permanent
SAT	SAT SOG Chairteam	Coordination of actions	E-mail	Permanent
			Videoconference	Annual
SAT IMG	SAT SOG Chairteam	Coordination of implementation actions	E-mail	Permanent
			Videoconference	Annual
SAT SG	SAT SOG	Sending actions for approval	Study notes at meetings	Semiannual
NAT Groups	SAT SOG Chairteam	Coordination of Harmonisation actions	E-mail	Permanent
			Videoconference	On-demand
All stakeholders	SAT SOG Chairteam and ICAO Lima Regional Office	Disseminate meeting minutes and SAT group initiative	Newsletter sent by e-mail	Bimonthly
		Disseminate documents and actions of the group	Group page on ICAO Portal	Permanent
		Presenting initiatives of the SAT Region	Face-to-Face Meeting	Semiannual
International Civil Aviation Organization (ICAO)	ICAO LIMA Regional Office	Coordinate actions of interest to the SAT SOG	Video conference	Annual
		Submit dissemination material.	E-mail	Annual
SAT Member States and observers	SAT SOG	Surveys to map needs and expectations	<i>SurveyMonkey</i>	On-demand
	SAT SOG	Presentation and dissemination of the group's actions	Meeting	Semiannual
	RMAs	Point of Contact (POC) training and reporting updates.	Training	Annual



## APPENDIX K - SAT SAFETY POLICY

Safety is the SAT SOG core function. The Group is committed to developing an organisational culture that provides the conditions for executing safe practices and encourages effective operational safety reporting (voluntary and mandatory). SAT-SOG aims to foster effective communication between its *stakeholders* (ANSPs, airspace users, CSPs, States and relevant stakeholders) to promote the safety of operations. Further seeking to develop, implement, maintain, and constantly improve strategies and processes to ensure that all our aviation activities receive balanced organisational resources. SAT SOG will aim to achieve the highest level of safety performance and meet regional safety objectives under national and international standards, the Global Aviation Safety Plan (GASP), and the Global Air Navigation Plan (GANP).

### Objective

The objective of the SAT Member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of Air Navigation Services in the SAT Region:

- All states involved are responsible for delivering the agreed level of safety performance in providing Air Navigation Services in the South Atlantic Region.
- All involved states are accountable for delivering the agreed safety performance in aircraft operations in the South Atlantic Region.
- All states involved must raise awareness of the importance of the good reporting culture with internal and external users and follow the processes established in processing messages for the monitoring bodies.
- Safety in the SAT Region is managed through the organisation and activities of the relevant implementation and oversight groups established by the SAT SG, in coordination with non-member States and observers, to achieve its Safety Objective.

### Guiding principles

The SAT SOG will act to:

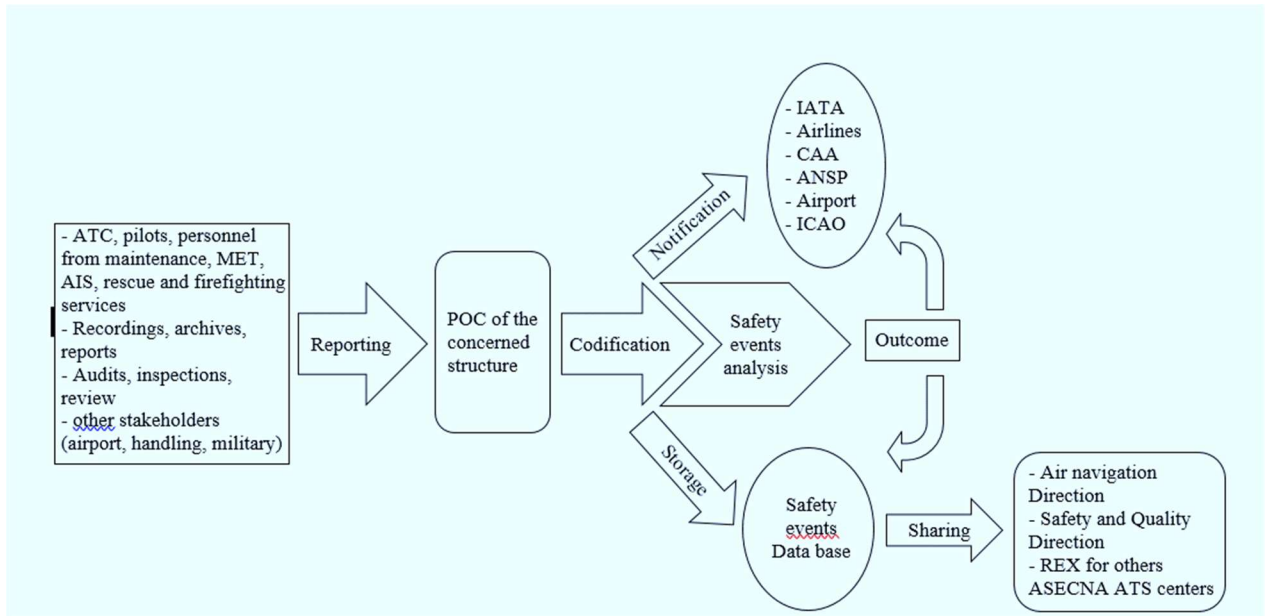
- **Clearly** define all accountabilities and responsibilities for the delivery of safety performance concerning the provision of air navigation services and participation in SAT SOG and its contributory bodies;

- **Maintain** continuous processes that monitor safety performance and establish and measure objectives, targets and performance indicators for operational safety to follow up the level of safety achieved;
- **Encourage** operational safety assurance activities as a way to continuously improve the services provided concerning safety performance, as well as to monitor the implementation processes for maintaining operational safety;
- **Support** safety management activities that will result in a Just Culture, foster safety best practices, encourage effective reporting and communication;
- **Distribute** safety information and SAT operating requirements to stakeholders;
- **Establish** and **implement** hazard identification and risk management processes in order to eliminate or mitigate safety risks associated with air navigation services supporting aircraft operations in the South Atlantic Region; and
- Incentivize all SAT member states to contribute experts to the SAT SOG or one or more of its various subgroups and support the overall safety management in the Region.

## **Conclusion**

The achievement of an effective safety culture is recognised as a vital element in establishing, achieving and maintaining satisfactory levels of safety performance. To accomplish it, a just culture is crucial to promote best management practices to improve safety awareness. The SAT Safety Policy was created to harmonise with ICAO objectives and civil aviation safety-related activities within its jurisdiction. Promoting the SAT Safety Policy also enables a system where all airspace users are invited to collaborate on understanding the safety concept in the SAT Region and how we, as members of its airspace, can improve it.

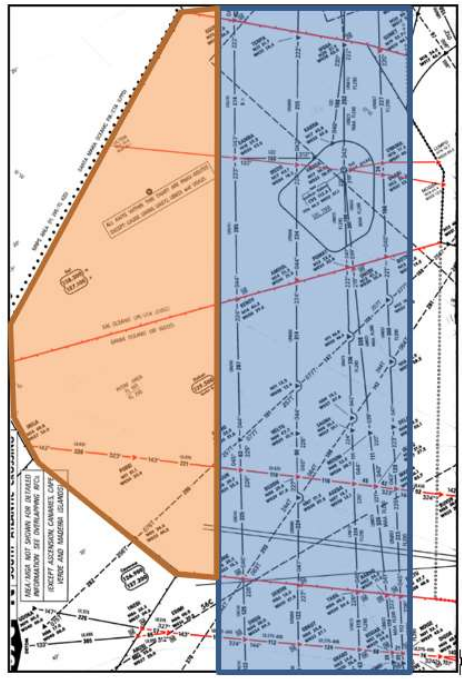
## APPENDIX L - ASECNA safety events collection and processing system



## APPENDIX M - SATMA ANALYSIS PERFORMED IN 2022

It is needed to clarify the scope of the figures in the EUR/SAM corridor:

- The traffic that has overflowed any part of UN741, UN866, UN873 and UN857 ATS ROUTE is considered Traffic in the EUR/SAM corridor (blue area).
- The traffic that has overflowed any part of the ACCs in the EUR/SAM corridor (ACCs in the Canary Islands, Recife, Sal and Dakar) represented like blue and orange areas, see next image, is considered Traffic in the EUR/SAM Area.



Picture 1. Global flights– EUR/SAM Corridor (2022)

Considering the mentioned new source data, a dept analysis has been conducted in the EUR/SAM corridor/area. An extract of this study, focused on the global figures, are broken down as follows:

EUR/SAM Corridor (2022)					
MONTH	2022			2021	% VAR
	Random	Corridor	Area	TOTAL	
JANUARY	467	3141	3608	1728	109%
FEBRUARY	481	2613	3094	1339	131%
MARCH	494	3022	3516	1536	129%
APRIL	537	3170	3707	1456	155%
MAY	541	3160	3701	1856	99%
JUNE	520	3424	3944	1898	108%
JULY	540	3704	4244	2274	87%
AUGUST	589	3659	4248	2450	73%
SEPTEMBER	525	3543	4068	2345	73%
OCTOBER	459	3415	3874	2707	43%
NOVEMBER	484	3592	4076	2876	42%
DECEMBER	625	3814	4439	3397	31%
AVERAGE	522	3355	3877	2155	90%
TOTAL	6262	40257	46519	25862	80%

Table 4. Traffic picture in the EUR/SAM Corridor (2022)

EUR/SAM Corridor (2022)		
YEAR	COP	%
2022 (Area)	69177	53.5%
2022 (Corridor)	53155	54.0%

GCCC	GVSC	GVSC	GOOO	SBAO
EDUMO	AMDOL	OBOMO	ARAGO	JOBER
GOBEG	BAMUX	ONOB	DEKON	MAGNO
GUNET	BIKOM	PIXED	ERETU	MOVGA
INSAD	BORTA	POMAT	GANAK	UTRAM
IPERA	BOTNO	RUKAV	GOGSO	VUNOK
IXIKU	ERNEK	SEPOM	MOVGA	
KUXOV	GARPO	TARIM	NANIK	
LAPTU	ILGAS	TEGTO	OPADO	
PIXED	KENOX	ULTEM	POKSI	
TENPA	LUMPO	VEPOP	RAKUD	
XIGLU	MOGSA	XIBOT	TASIL	
	NATAS	XIGLU		
		XUVIT		

Table 5. Global figures NOT Planned RFL – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)			
AIRLINE	FLIGHTS	% TOTAL	% AC.
TAP	9400	20.2%	20.2%
IBE	3556	7.6%	27.9%
TAM	3153	6.8%	34.6%
AFR	2927	6.3%	40.9%
AEA	2524	5.4%	46.3%
DAL	1908	4.1%	50.4%
KLM	1883	4.0%	54.5%
TOM	1801	3.9%	58.4%
UAL	1524	3.3%	61.6%
AZU	1387	3.0%	64.6%
BAW	1342	2.9%	67.5%
LAN	1303	2.8%	70.3%
DLH	1256	2.7%	73.0%
TUI	754	1.6%	74.6%
ETH	727	1.6%	76.2%
ARG	591	1.3%	77.5%

EUR/SAM Corridor (2022)			
AIRLINE	FLIGHTS	% TOTAL	% AC.
TAP	8586	21.3%	21.3%
TAM	2945	7.3%	28.6%
IBE	2826	7.0%	35.7%
AEA	2011	5.0%	40.7%
AFR	1926	4.8%	45.4%
DAL	1908	4.7%	50.2%
TOM	1708	4.2%	54.4%
UAL	1524	3.8%	58.2%
AZU	1381	3.4%	61.6%
KLM	1099	2.7%	64.4%
DLH	985	2.4%	66.8%
BAW	827	2.1%	68.9%
TUI	754	1.9%	70.7%
LAN	745	1.9%	72.6%
ETH	718	1.8%	74.4%
TFL	512	1.3%	75.7%

Table 6. Global figures per airline – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)			
TYPE	CANT	%	% A.
A339	6916	14.9%	14.9%
B789	6081	13.1%	27.9%
A332	4198	9.0%	37.0%
B77W	4003	8.6%	45.6%
B788	3558	7.6%	53.2%
B38M	3046	6.5%	59.8%
B763	2749	5.9%	65.7%
A359	2282	4.9%	70.6%
A21N	1875	4.0%	74.6%
A20N	1250	2.7%	77.3%

EUR/SAM Corridor (2022)			
TYPE	CANT	%	% A.
A339	6190	15.4%	15.4%
B789	4515	11.2%	26.6%
A332	3648	9.1%	35.7%
B77W	3254	8.1%	43.7%
B788	3126	7.8%	51.5%
B38M	2873	7.1%	58.6%
B763	2720	6.8%	65.4%
A21N	1803	4.5%	69.9%
A359	1497	3.7%	73.6%
A20N	1247	3.1%	76.7%

Table 7. Global figures per aircraft type – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)			
TRAFFIC FLOWS	FLIGHTS	%	% A.
LIMAL IPERA POMAT TASIL VUNOK	5888	13.6%	13.6%
VUNOK TASIL POMAT IPERA LIMAL	4745	11.0%	24.6%
MAGNO DEKON AMDOL TENPA ORVEK	3483	8.1%	32.7%
CVS IPERA LIMAL	2393	5.5%	38.3%
LIMAL IPERA CVS	2071	4.8%	43.1%
BIPET GUNET BOTNO ERETU UTRAM	1697	3.9%	47.0%
ROSTA EDUMO KENOX NANIK JOBER	1396	3.2%	50.2%
LIMAL IPERA BVT	1190	2.8%	53.0%
MOVGA BIKOM ULTEM	981	2.3%	55.3%
MAGNO DEKON AMDOL TENPA PUCLO	899	2.1%	57.4%
ULTEM XUVIT NANIK JOBER	834	1.9%	59.3%
LIMAL IPERA SNT	785	1.8%	61.1%
ULTEM BIKOM MOVGA	758	1.8%	62.9%
SNT IPERA LIMAL	723	1.7%	64.5%
ULTEM LUMPO	689	1.6%	66.1%

Table 8. Global figures per trajectory/Route – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)		
EQUIPMENT	2022	%
RNP10	46288	99.5%
RNP4	34639	74.5%
CPDLC	39900	85.8%
RSP180 *	22698	48.8%
RCP240	29813	64.1%
<b>RSP180/RCP240</b>	<b>22320</b>	<b>48.0%</b>
<b>RSP180/RCP240 ***</b>	<b>22347</b>	<b>62.0%</b>
ADS-C FANS	38867	83.6%
9- ADS-B	45808	98.5%

(\* ) RSP information is obtained from flight plan (B2B services from NM)

(\*\*) Hypothesis based on: Traffic crossing LPPO FIR has RSP180/RCP240.

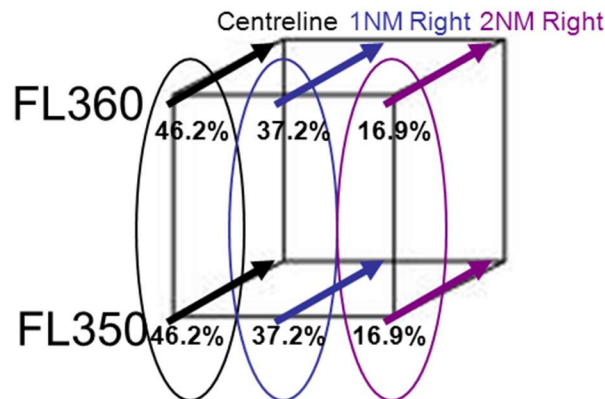
Table 9. Global figures equipment and capabilities – EUR/SAM Corridor (2022)

**APPENDIX N - Method for incorporating SLOP  
estimates into the vertical collision risk estimate.**

The effect of SLOP on  $P_y(0)$  is different for same and opposite direction traffic depending on the usages of the offsets (i.e. 1NM Right or 2NM Right of track centreline).

Figure 1 shows the pairwise vertical interaction for same direction traffic, using illustrative flight levels and the SLOP proportions.

**Figure 1: SLOP for same direction pairwise vertical interaction for same direction case**



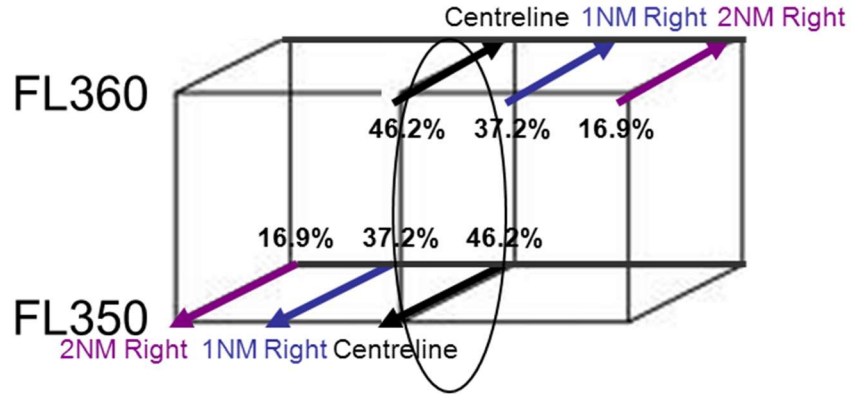
The total probability of pairwise vertical interaction for the same direction case is calculated by combining the proportions of traffic at each of the three options.

$$P_{V \text{ interaction (same)}} = 0.462^2 + 0.372^2 + 0.169^2$$

Figure 2 shows the pairwise vertical interaction for opposite direction traffic, using illustrative flight levels and the SLOP proportions.



**Figure 2: SLOP for same direction pairwise vertical interaction for opposite direction case**



This results in the following estimated probability of pairwise vertical interaction for opposite direction aircraft:

$$P_{V_{interaction}}(opp) = 0.462^2$$

It can be seen that each of equations 1.3 to 1.5 follow a similar format shown in equation 4.

$$N_{az} = \{ \dots \} P_y(0) \frac{\lambda_x}{S_x} \left\{ E_z(same)[same\ direction\ crossing\ speeds] + E_z(opp)[opposite\ direction\ crossing\ speeds] \right\}$$

**Eqn 1**

Since the vertical interactions between aircraft pairs are different for same and opposite direction traffic, the resulting benefit that this has on  $P_y(0)$  is also different for same and opposite direction cases. The kinematic factors for same and opposite direction traffic are also different and as a result of this the benefit of SLOP on  $P_y(0)$  must be considered separately for same and opposite direction traffic. This creates equation 5, which sets out how the benefits of SLOP on the operational vertical risk are calculated.

$$N_{az} = \{ \dots \} \frac{\lambda_x}{S_x} \left\{ P_{V_{interaction}}(same) P_y(0) E_z(same)[same\ direction\ crossing\ speeds] + P_{V_{interaction}}(opp) P_y(0) E_z(opp)[opposite\ direction\ crossing\ speeds] \right\}$$

**Eqn 5**

The collision risk estimate (CRE) assumes a random distribution of SLOP based on the observed SLOP usage for the last quarter of the calendar year being assessed. The maximum contribution to the CRE would occur when there is an equal distribution of usage among the three options (0 nm, 1nm and 2nm).

## APPENDIX O - CRM EUR/SAM 2021

### 1. CRM EUR/SAM 2021

#### 1.1 DATA AVAILABLE

Next table indicates the months for which LHD reports were received. From these LHDs, only those affecting the four main routes were considered.

Months	Canarias UIR	SAL Oceanic UIR	Dakar Oceanic UIR	Atlántico-Recife FIR/UIR
Jan-21				
Feb-21				
Mar-21				
Apr-21				
May-21				
Jun-21				
Jul-21				
Aug-21				
Sep-21				
Oct-21				
Nov-21				
Dec-21				

KEY:  Available     Not available     "No deviation" report received

**Table 1.- Available data (CRM 2021)**

Date	Route	Duration	Coordinated FL	Observed FL	Deviation	Cause	Category
190121	UN866	0.08333 h	FL355	FL360	500 ft	Coordination Error	E
210221	UN873	0.08333 h	FL350	FL350	0	Coordination Error	E
030721	UN873	0.08333 h	FL390	FL390	0	Coordination Error	E
121121	UN873	0.08333 h	FL390	FL370	2000 ft	Coordination Error	E

**Table 2.- Large height deviations reported in the Canaries.**

#### 1.2 TRAFFIC

Not all the data from the rest of the FIR/UIR was available at the end of the year. At the time of starting this study, no SAL traffic data was available, so they had to be extrapolated from the traffic data of the Canary Islands and Dakar. Neither was available traffic data from Dakar since June, so the traffic samples used to perform this analysis are the ones from 1st August 2021 to 31st August 2021. This month has been selected as it was the one with the highest number of flights from the months with all information available. The number of flights and the flight time for the complete year 2021, required for some of the calculations, have been extrapolated.

The traffic outlook for the future was strongly impacted by COVID-19, backing to pre-1990 flight levels. Because of this, the traffic forecast for the next years has been made considering three possible scenarios considering all possible risks and their relative impacts.

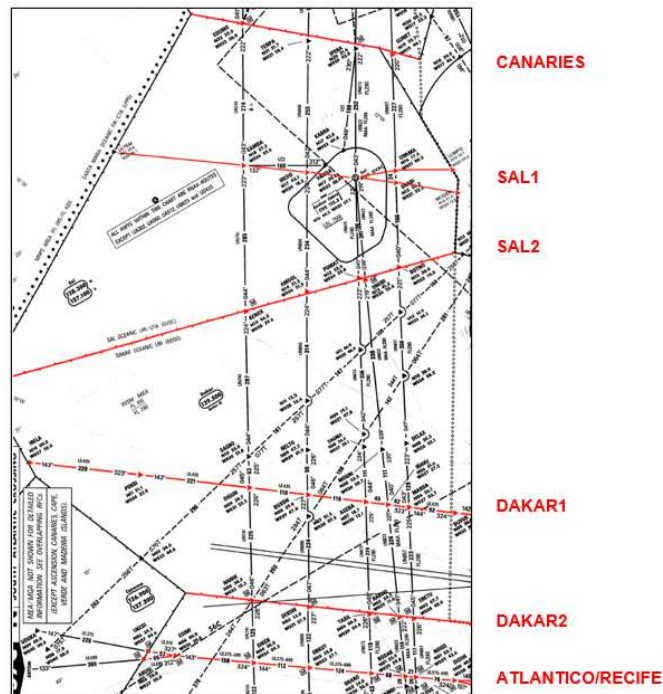
**In this study the most optimistic scenario was chosen (High Scenario), in which the 2019 level is recovered in mid-2023. The next four years was calculated, assuming a traffic growth rate of 57%, 19%, 10% and 3% in 2022, 2023, 2024 and 2025 respectively.**

### 1.3 LOCATION FOR RISK ASSESSMENTS

For the studied scenario, lateral and vertical collision risks are assessed. This assessment was made in six distinct locations along the Corridor, covering the four UIR. These locations are the following (See Picture 1):

- Canaries: FIR/UIR limit
- SAL1: UR-976/UA-602
- SAL2: UIR SAL Oceanic/UIR Dakar Oceanic
- Dakar1: UL-435
- Dakar2: UIR Dakar Oceanic/Atlantic FIR
- Atlantico/Recife: UL-375/UL-695

Traffic on the DCT Area, placed to the west of the current UN-741, has not been considered in the analysis..



Picture 1. Locations for Risk Assessments (2021)

**APPENDIX P – RMA DATA NEEDED FOR EUR SAM MONITORING AND ASSESSMENTS**



**RMA DATA NEEDED FOR EUR/SAM  
MONITORING AND ASSESSMENTS**

**TO BE DELIVERED IN A SEPARATE FILE**

## APPENDIX Q - Coordination LHD (Investigation form)

<b>LHD Date:</b>	<b>Involved FIRs:</b>								
<b>ENTRY/EXIT FIX (LAT/LONG) POINT:</b>		<b>(FLIGHT NUMBER) CALL SIGN:</b>							
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <span style="color: blue;">Active Surveillance</span> </div>		<table style="border: none;"> <tr> <td style="border: none;">Radar</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">ADS</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">None</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		Radar	<input type="checkbox"/>	ADS	<input type="checkbox"/>	None	<input type="checkbox"/>
Radar	<input type="checkbox"/>								
ADS	<input type="checkbox"/>								
None	<input type="checkbox"/>								
<b>TIME</b>		<b>LEVEL</b>							
<b>1. TIME UTC</b>	<b>2. ATC CONTACT TIME</b>	<b>3. COORDINATED FL</b>	<b>4. UNEXPECTED FL</b>						
* ESTIMATED TIME FROM OVERFLYING ENTRY POINT TILL ATC CONTACT									
<ol style="list-style-type: none"> <li>1. Real UTC time at ENTRY/EXIT Point</li> <li>2. Time lapse between field 1 and Aircraft position/level notification</li> <li>3. Last Estimated/Coordinated FL from Exit FIR to Entry FIR (Via Voice/OLDI)</li> <li>4. Real FL at ENTRY point</li> </ol> <p style="text-align: center; margin-top: 10px;">* Only If fields 1 and 2 are not available</p>									
<b>Comments:</b>									
<p>Crew comments (if any):</p>									

When complete please forward the report(s) to:

South Atlantic Monitoring Agency (SATMA) E-Mail: [satma@enaire.es](mailto:satma@enaire.es) / [aariasf@enaire.es](mailto:aariasf@enaire.es)

The information contained in this form is confidential and will be used for statistical safety analysis purposes only.

APPENDIX R – SATMA deviations monitoring report

**SATMA DEVIATIONS MONITORING REPORT**

**AREA CONCERNED:** EUR/SAM CORRIDOR

**ALTITUDE:** From FL 290 up TO FL 410 both included

**ACC / AO :**

**MONTH:**

**YEAR:**

(Number) Deviation Report Form attached (including TCAS RA and Airproxes)

NO Deviations reported (mark with an X)

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The ACC/AO Responsible

Name:

Phone/E-mail:

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Send to

SATMA - E-mail : [satma@enaire.es](mailto:satma@enaire.es)

**PHOTO**

