International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

Fourth GREPECAS–RASG-PA Joint Meeting and

Twenty-second Meeting of the CAR/SAM Regional Planning and Implementation Group

GREPECAS/22

Final Report

Asynchronous Session: 13 September to 18 October 2024
In person Session: Lima, Peru, 20 to 22 November 2024

Prepared by the Secretariat

March 2025

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HISTORICAL

ii.1 Place and Date of the Meeting

ii.1.1 The Twenty-second Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/22) was held in two parts: one as an on-line asynchronous session from 16 September to 18 October 2024; and the second session as an in-person meeting held at ICAO SAM Regional Office premises in Lima, Peru, from 20 to 22 November 2024.

ii.1.2 The Fourth GREPECAS–RASG-PA Joint Meeting, included under Agenda Item 8 of the GREPECAS/22 Meeting, was a joint session of the Plenary meetings of the RASG-PA and the GREPECAS, and was held in person in the afternoon of 20 November 2024 in the same venue of the GREPECAS/22 meeting.

ii.2 Opening Ceremony

ii.2.1 Mr. André Eduardo Jansen, Chairperson of GREPECAS and Mr. Orlando Nevot; Vice chairperson of GREPECAS, provided opening remarks to the on-line asynchronous session of the GREPECAS/22 meeting on 13 September 2024; highlighting the importance of GREPECAS role and the interaction from States and the industry for the success of the Air Navigation Services (ANS) implementation, particularly considering the new agreements and actions to be conducted from the 14th Air Navigation Conference.

ii.2.2 The Fourth GREPECAS–RASG-PA Joint Meeting was opened on 20 November 2024 by Messrs. Andrew Larsen, RASG-PA Co-Chairperson States, and André Eduardo Jansen, Chairperson of GREPECAS, with welcoming remarks by Messrs. Christopher Barks, Regional Director of the North American, Central American and Caribbean (NACC) Regional Office of the ICAO and Secretary of GREPECAS, who emphasized the GREPECAS work programme activities and the need for a greater coordinated work and planning the new operational improvements of ANS, and Fabio Rabbani, Regional Director of the South American (SAM) Regional Office of the International Civil Aviation Organization (ICAO) and Secretary of RASG-PA, who welcomed participants to Lima, and highlighted the importance of the planning and implementation works aligned with the Global Air Navigation Plan, recalling that this matter was included in the round tables of GREPECAS/22.

ii.2.3 A video commemorating the 80th anniversary of the signing of the International Civil Aviation Convention was presented, highlighting the spirit of collaborative work that inspired the founding of ICAO.

ii.3 Officers of the Meeting

ii.3.1 The Fourth GREPECAS–RASG-PA Joint Meeting was chaired by Mr. Andrew Larsen, RASG-PA Co-Chairperson States, and Mr. André Eduardo Jansen, GREPECAS Chairperson. Messrs. Fabio Rabbani, Regional Director of the ICAO SAM Regional Office and Christopher Barks, Regional Director of the ICAO NACC Regional Office served as Secretaries of the meeting, supported by Mr. Julio Siu Deputy Regional

Director of the ICAO NACC Regional Offices, with the assistance of officers from ICAO Headquarters and the NACC and SAM Regional Offices as follows:

Jorge Armoa	Regional Officer, Aeronautical Information Management / Aeronaultical Meteorology and Environment, SAM Regional Office
Fernando Hermoza	Regional Officer, Air Traffic Management and Search and Rescue, SAM Regional Office
Javier Puente	Regional Officer, Regional Officer, Safety Implementation SAM Regional Office
Fernando Camargo	Regional Officer, Technical Assistance
Roberto Sosa	Regional Officer, Air Navigation Services and Safety, SAM Regional Office
Fabiana Todesco	Regional Officer, Aerodromes and Ground Aids
Elie Tanious EL Khoury	Technical Officer, Airspace Management and Optimization
Rodrigo Ribeiro	Aerodromes and Ground Air Specialist, SAM Regional Office
Josué González	Regional Officer, Air Traffic Management and Search and Rescue, NACC Regional Office

ii.3.2 The Twenty-second Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/22) was chaired by Mr. André Eduardo Jansen, GREPECAS Chairperson. Mr. Christopher Barks, Regional Director of the ICAO NACC Regional Office served as Secretary of the Meeting, supported by Mr. Fabio Rabbani, Regional Director of the ICAO SAM Regional Office, and by Mr. Julio Siu, the Deputy Regional Director of the ICAO NACC Regional Office, with the assistance of officers from ICAO Headquarters and the NACC and SAM Regional Offices as follows:

Jorge Armoa	Regional Officer, Aeronautical Information Management / Aeronaultical Meteorology and Environment, SAM Regional Office
Fernando Hermoza	Regional Officer, Air Traffic Management and Search and Rescue, SAM Regional Office
Fernando Camargo	Regional Officer, Technical Assistance
Roberto Sosa	Regional Officer, Air Navigation Services and Safety, SAM Regional Office
Fabiana Todesco	Regional Officer, Aerodromes and Ground Aids
Elie Tanious EL Khoury	Technical Officer, Airspace Management and Optimization
Rodrigo Ribeiro	Aerodromes and Ground Air Specialist, SAM Regional Office
Josué González	Regional Officer, Air Traffic Management and Search and Rescue, NACC Regional Office

ii.4 Working Languages

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

ii.5 Schedule and Working Arrangements

ii.5.1 Asynchronous session: the discussion of the Working Papers was carried out on-line from 13 September to 18 October 2024, through the online platform

ii.5.2 It was agreed that the working hours for the in-person GREPECAS/22 session of the meeting would be from 08:30 to 16:20 hours daily with adequate breaks. Ad hoc Groups were created during the Meeting to do further work on specific items of the Agenda.

ii.6 Agenda

Agenda Item 1: Adoption of the Draft Agenda and Schedule

Agenda Item 2: Updates on GREPECAS-RASG-PA Joint Activities

Agenda Item 3: Follow-up on the Valid GREPECAS Conclusions and Decisions

Agenda Item 4: Air Navigation - Global and Regional Developments

Agenda Item 5: CAR/SAM Air Navigation Services (ANS) Implementation

- **5.1 Air Traffic Management (ATM), Airspace optimization, Air Traffic Flow Management (AFTM) and Search and Rescue (SAR)**
- **5.2 Communications, Navigation and Surveillance (CNS)**
- **5.3 Aeronautical Meteorology (MET) and Environmental Protection (ENV)**
- **5.4 Aeronautical Information Management (AIM)**
- **5.5 Aerodromes and Ground Aids (AGA)**

Agenda Item 6: Initial Review of the Current GREPECAS Work Programme and Projects

Agenda Item 7: **Results the from Virtual Phase**

Agenda Item 8: **Fourth GREPECAS-RASG-PA Joint Meeting**

Agenda Item 9: **Analysis of the Critical ANS Implementation Areas – the Effective Path to implementation**

Agenda Item 10: **Final Review of GREPECAS Work Programme**

Agenda Item 11: **GREPECAS/22 Conclusions and Decisions**

Agenda Item 12: **Other Business**

ii.7 Attendance

The Meeting was attended by 24 States/Territories from the NAM/CAR/SAM Regions, 18 International Organizations/industry, totalling 95 delegates as indicated in the list of participants.

ii.8 Conclusions and Decisions

ii.8.1 GREPECAS records its action in the form of conclusions and decisions as follows:

Conclusions deal with matters, which in accordance with the Group's terms of reference require direct attention of States/Territories and/or International Organizations, or on which further action will be initiated by ICAO in accordance with established procedures.

Decisions deal with matters of concern only to the GREPECAS and its Contributory Bodies organization.

ii.8.2 **List of Conclusions**

ii.8.3 List of Decisions

ii.9 List of Working and Information Papers and Presentations

Refer to the Meeting web page: GREPECAS/22 (icao.int)

Working Papers

Number	Agenda Item	Title and e-mail as alternative means of communication during virtual phase	Date	Prepared and Presented by
WP/01 Rev.	1	Adoption of the Provisional Agenda and Schedule	29/10/2024	Secretariat
WP/02 Rev	2	GREPECAS-RASG-PA Coordination 916181d6.OACI.onmicrosoft.com@ca.teams.ms	04/11/2024	Secretariat
WP/03	3	Follow-Up on the Valid GREPECAS Conclusions and Decisions e7b35a71.OACI.onmicrosoft.com@ca.teams.ms	09/09/2024	Secretariat
WP/04	4	ICAO Fourteenth Air Navigation Conference (AN-Conf/14) d06290af.OACI.onmicrosoft.com@ca.teams.ms	26/08/2024	Secretariat
WP/05	4	Status of the Regional Air Navigation Plan CAR/SAM 4c88a75d.OACI.onmicrosoft.com@ca.teams.ms	28/08/2024	Secretariat
WP/06	9	Analysis of the Critical ANS implementation areas – Priority Identification 695abaea.OACI.onmicrosoft.com@ca.teams.ms	19/09/2024	Secretariat
WP/07	5.1	Progress of PBN and ATFM in the CAR/SAM Regions 075c80a5.OACI.onmicrosoft.com@ca.teams.ms	26/08/2024	Secretariat
WP/08	5.1	Progress Report on Activities to Support Search and Rescue Implementation in the CAR/SAM Regions 7aebd5c6.OACI.onmicrosoft.com@ca.teams.ms	25/08/2024	Secretariat
WP/09	5.2	CNS Programmes and Projects – SAM Region f325e2fd.OACI.onmicrosoft.com@ca.teams.ms	06/09/2024	Secretariat
WP/10	5.3	Severe Meteorological Phenomena and their Impacts on Aviation f8828c21.OACI.onmicrosoft.com@ca.teams.ms	23/08/2024	Secretariat
WP/11	5.3	Environmental Strategy in the NAM/CAR/SAM Regions 3527106b.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Secretariat
WP/12	5.4	Progress in the AIM Programmes and Projects of the CAR/SAM Regions 3e67e460.OACI.onmicrosoft.com@ca.teams.ms	27/08/2024	Secretariat
WP/13	5.5	Aerodromes and Ground Aids (AGA) - CAR/SAM Implementation 9481d49a.OACI.onmicrosoft.com@ca.teams.ms	17/09/2024	Secretariat
WP/14 Rev	6	Review on the GREPECAS Work Programme and Projects e5d92c24.OACI.onmicrosoft.com@ca.teams.ms	10/10/2024	Secretariat
WP/15	6	Update of GREPECAS Procedural Handbook b82c6cea.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Secretariat
WP/16	5.1	ATM Contingency- Crisis Response - CAR/SAM Implementation e1294231.OACI.onmicrosoft.com@ca.teams.ms	29/08/2024	Secretariat

Working Papers

Number	Agenda Item	Title and e-mail as alternative means of communication during virtual phase	Date	Prepared and Presented by
WP/17	6	Report of the 2023 CAR/SAM RVSM Airspace Monitoring Program and Activities 2023-2024 of the GTE de7e1677.OACI.onmicrosoft.com@ca.teams.ms	19/08/2024	Secretariat
WP/18	5.3	Analysis of the Implementation of the Basic Building Blocks (BBB) of the Meteorological Service for International Air Navigation 565a8cd9.OACI.onmicrosoft.com@ca.teams.ms	29/08/2024	Secretariat
WP/19	5.1	Status of Airspace Optimization Programme and the NEOSPACE-1 Project 88119173.OACI.onmicrosoft.com@ca.teams.ms	29/08/2024	Secretariat
WP/20	6	Update of the Guidance Manual for Points of Contact (POC) Accredited to CARSAMMA eb29e19d.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Secretariat
WP/21	12	Civil Aviation: A National and International Pillar of Safety 098e2352.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Chile
WP/22	5.4	Compliance With ICAO SARPS and Adoption of Best International Practices on AIM 94ab05f0.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	IATA
WP/23	5.2	Aeronautical Aspects in the Agenda Items of WRC-27 ec635322.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/24	5.2	Deployment of ADS-B in Brazil and Complementation of the Air Navigation System – Multilateration in Porto Alegre 9bd13f79.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/25	5.4	Information Sharing Using Malware Information Sharing Platform and Its Contribution to Improve Cybersecurity and Information System Resilience 93776d24.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/26	5.2	ATN-BR Flexibility and Its Role in CNS/ATM Resilience: Use Case - Floods in Rio Grande Do Sul b285f827.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/27	4	Regional Development of Advanced Air Mobility (AAM): Integration of EVTOL Aircraft into the Airspace 0537d5f6.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/28	5.4	FF-ICE Development in Brazil d28d2bcb.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/29	5.1	Roadmap for Data Standardization (Input/Outputs) Resulting from Simulations Carried Out by Airlines in ATM Projects 4d2efbee.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/30	5.3	Implementation of a TCAC in Brazil 4fcbd0d5.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil

Working Papers

Number	Agenda Item	Title and e-mail as alternative means of communication during virtual phase	Date	Prepared and Presented by
WP/31	5.1	ATFM Workshop Held in Brazil 419a2411.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
WP/32	5.2	CPDLC Implementation in Brazil 0bf95c91.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Brazil
WP/33	5.1	Digital Airspace System Analysis (DASA) 12428b70.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Brazil
WP/34	4	ATM Key Performance Indicators: Performance-Based Management In SISCEAB 45560c91.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Brazil
WP/35	5.1	Diagnostic of the Central American Airspace 4b92dab8.OACI.onmicrosoft.com@ca.teams.ms	04/09/2024	COCESNA
WP/36	5.2	Strengthening Communications and Aeronautical Surveillance Data Exchange Between COCESNA and SENEAM 31a72e81.OACI.onmicrosoft.com@ca.teams.ms	04/09/2024	COCESNA
WP/37	12	IFIS 2026 Symposium in Central America 19235385.OACI.onmicrosoft.com@ca.teams.ms	04/09/2024	COCESNA
WP/38	12	International Cooperation Flight Inspection f726ab81.OACI.onmicrosoft.com@ca.teams.ms	04/09/2024	COCESNA
WP/39	12	Creating Regulatory Harmonization 380931d9.OACI.onmicrosoft.com@ca.teams.ms	04/09/2024	COCESNA
WP/40	5.2	Preventive and Corrective Measures for GNSS Interference 24fe3169.OACI.onmicrosoft.com@ca.teams.ms	13/09/2024	Argentina
WP/41 Rev	2	Safety Risk Factors in CAR/SAM RVSM 90b81275.OACI.onmicrosoft.com@ca.teams.ms	17/10/2024	Secretariat
WP/42	5.2	PBN Landings Safety Recommendations 30cc7273.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	France
WP/43	5.1	Higher Airspace Operations (HAO) and Space Operation 1e5b7fab.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Brazil
WP/44	5.2	Navigation Infrastructure and Contingency Planning 56141ece.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Brazil
WP/45	12	Update of the National Planning Framework for ICAO Aviation to Facilitate Preparation of Civil Aviation Master Plans (CAMP) 34c88443.OACI.onmicrosoft.com@ca.teams.ms	26/09/2024	Panama
WP/46	5.2	CNS Programs and Projects – CAR Region 26ed2d29.OACI.onmicrosoft.com@ca.teams.ms	30/09/2024	Secretariat
WP/47	7	Results from the Virtual Phase	13/11/24	Secretariat
WP/48	12	GREPECAS Points of Contact (PoC)	14/11/24	Secretariat

Information Papers

Number	Agenda Item	Title and e-mail as alternative means of communication during virtual phase	Date	Prepared and Presented by
IP/01 Rev. 4	---	List of Working, Information Papers and Presentations	14/11/24	Secretariat
IP/02	8	Working Session on the Use Of TCAS Advisories Data for ATS Safety Management	14/11/24	Secretariat
IP/03		Cancelled		
IP/04		Cancelled		
NI/05	5.5	Proyectos y actividades desarrolladas por el comité regional CAR/SAM para la prevención del peligro aviario y de la fauna – CARSAMPAF ***(available in Spanish only)*** d4f7915b.OACI.onmicrosoft.com@ca.teams.ms	07/10/24	CARSAMPAF
IP/06	9	Working Session on Performance Based Planning and Management of GANP KPIs	06/11/24	Secretariat
IP/07	6	GREPECAS Dashboards 813d9043.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	Secretariat
IP/08	5.3	MET Program Progress Report 6e99bdfc.OACI.onmicrosoft.com@ca.teams.ms	28/08/2024	Secretariat
IP/09	5.1	COSPAS-SARSAT Distress Alerts Database – ECCAIRS f489db66.OACI.onmicrosoft.com@ca.teams.ms	13/09/2024	Suriname
IP/10	5.4	Current Status of SWIM Implementation in Brazil a519e970.OACI.onmicrosoft.com@ca.teams.ms	02/09/2024	Brazil
NI/11	5.2	Avances en la modernización de sistemas de vigilancia de tránsito aéreo en Argentina ***(available in Spanish only)*** fed175e1.OACI.onmicrosoft.com@ca.teams.ms	13/09/2024	Argentina
NI/12	5.2	Consideraciones sobre despliegue 5G en Argentina ***(available in Spanish only)*** 9d9cd42d.OACI.onmicrosoft.com@ca.teams.ms	13/09/2024	Argentina
IP/13	5.1	The Difficulties of Predictability and Advance Coordination Related to Random Reentry of Space Debris 43d0cf01.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	United States
IP/14	5.2	Mitigating GNSS Jamming and Spoofing: Enhancing Aviation Safety and Resilience d66fd18a.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	United States
IP/15	4	Definition and Delimitation of Outer Space_USA e849be10.OACI.onmicrosoft.com@ca.teams.ms	20/09/2024	United States
IP/16	5.2	ADS-B Implementation in the CAR Region 5d209a38.OACI.onmicrosoft.com@ca.teams.ms	24/09/2024	Secretariat

Information Papers

Number	Agenda Item	Title and e-mail as alternative means of communication during virtual phase	Date	Prepared and Presented by
IP/17	12	Harmonizing Unmanned Aircraft Operations Over the High Seas e7474639.OACI.onmicrosoft.com@ca.teams.ms	27/09/2024	United States
IP/18	4	Progress of Ecuador on Key Performance Indicators Managing: KPI06 in-Route Airspace Capacity 737d28cc.OACI.onmicrosoft.com@ca.teams.ms	30/09/2024	Ecuador
IP/19	5.5	Activity of the Latin American and Caribbean Association of Airport Pavements – ALACPA d56ac1d8.OACI.onmicrosoft.com@ca.teams.ms	02/10/2024	ALACPA
IP/20	5.1	Coordination for the Issuance of Notices for Space Vehicle Launch and Reentry 2599198f.OACI.onmicrosoft.com@ca.teams.ms	02/10/2024	Secretariat

Presentations

Number	Agenda Item	Title	Presented by
1 Rev.	10	Outcomes of the Fourteenth Air Navigation Conference (AN-Conf/14)	Secretariat
2	10	Review of the action taken by the Air Navigation Commission on the report of GREPECAS/21 and RASG-PA/13 meetings	Secretariat

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Agenda Item 1 Adoption of the Draft Agenda and Schedule

1.1 Under WP/01 Rev., the Secretariat submitted for consideration the Draft Agenda, working method and schedule of the GREPECAS/22 meeting for consideration and approval of the Meeting.

1.2 During the virtual (asynchronous) phase of the meeting, the States and International Organizations approved the agenda and schedule. However, Costa Rica and El Salvador suggested a change in the order of the Aeronautical Information Management (AIM) topic, moving it from 5.4 to 5.2, so that the CNS, MET, and AGA topics remained grouped in consecutive order. The Secretariat appreciated the suggestion and informed that it would implement this comment in the next GREPECAS meetings.

1.3 The Draft Agenda and Schedule were approved by the Meeting as shown in the historical of this report.

Agenda Item 2 Updates on GREPECAS-RASG-PA Joint Activities

2.1 Under WP/02, the Secretariat presented the collaborative efforts between the CAR/SAM Planning and Implementation Regional Group (GREPECAS) and the Regional Aviation Safety Group–Pan America (RASG-PA) to enhance capacity, efficiency and safety in Air Navigation Services (ANS), aligning with ICAO's Global Air Navigation Plan (GANP) and Global Aviation Safety Plan (GASP).

2.2 In 2023, this list of joint activities between GREPECAS and RASG-PA was updated (Decision 21/01 and Conclusion RASG-PA13/C4/2023), and includes the following activities:

a) Collaboration between the Scrutiny Working Group (GTE) and the RASG-PA Mid-Air Collision (MAC) Working Group;
b) CAR and SAM Runway Safety Team (RST) Implementation Project;
c) Implementation of Performance-Based Navigation (PBN) procedures on a Visual Runway – SAM;
d) Implementation of (PBN procedures on a Visual Runway – NACC;
e) Air Traffic Services (ATS) Language Proficiency Project in the CAR and SAM Regions;
f) Pan America Regional Aviation Safety Team (PA-RAST) Controlled Flight into Terrain Working Group Project for the mitigation of CFIT-type accidents;
g) Activities related to Unmanned Aircraft System(s) (UAS)/ Remotely Piloted Aircraft System (RPAS);
h) Aeronautical Information Service (AIS) personnel competency evaluation; and
i) Activities related to the prevention of turbulence related accidents.

2.3 During the virtual (asynchronous) phase meeting, the States, International Organizations and the industry supported this working paper. Moreover, Costa Rica supported the Language proficiency (LPR) initiative for AIM and suggested taking into consideration that the AIM officer currently uses more reading and writing skills rather than speaking. Panama informed that implementing virtual English reinforcement programmes would facilitate staff (AIM, MET, PANOPS, and Telecommunications) participation in said programmes, as well as the continuous monitoring and evaluation of staff's progress.

2.4 Regarding the Project for implementing PBN procedures on a Visual Runway, Mexico reported that it would welcome the opportunity to share experiences to better understand the steps and regulations involved in this implementation. Mexico is currently evaluating the technical guidelines needed to advance to the project's testing phase. Additionally, it would be helpful to have guidance material specifically for implementing PBN procedures on a visual runway.

2.5 United States has recognized the effective collaboration between GREPECAS/GTE and PA-RAST in analysing Traffic Collision Avoidance System Resolution Advisory (TCAS-RA) data. Currently, PA-RAST presents TCAS-RA data to the GTE, which aids in identifying potential aircraft separation issues. To enhance safety risk reduction, United States recommended that GTE also present Large Height Deviation (LHDs) data at the PA-RAST. By integrating both data sets and broadening stakeholder engagement, the GTE and PA-RAST can collaboratively work towards significantly lowering safety risks and achieving the Target Level of Safety (TLS) in the CAR/SAM Regions. The Secretariat noted the comment from United States and will enhance the data analysis process of the GTE to provide more specific data to the PA-RAST.

2.6 Furthermore, Aruba, Brazil, United States, and other States requested revisions to the text of WP/02. In response, the Secretariat addressed these requests by publishing the revised version (WP/02 Rev.).

2.7 The Rapporteur and the Secretariat of the GTE presented WP/41, which provided information on the analysis of data on LHDs during 2023. The WP highlighted two situations that significantly impact the CAR/SAM Reduced Vertical Separation Minimum (RVSM) airspace risk: aircraft without communication and aircraft without information on RVSM approval.

2.8 WP/41 indicated that in the analysis of 2023 LHD events, a contributing risk factor identified was aircraft crossing the receiving Flight Information Region (FIR)'s reporting point without establishing the necessary communication. Delays in communication between the aircraft and the receiving FIR's ATS services may generate LHD events, with risk assessments varying significantly depending on whether the FIR has surveillance coverage.

2.9 Regarding aircraft without RVSM approval information, WP/41 noted that this situation has a significant impact on the Collision Risk Model (CRM) for vertical collision risk, being one of the primary factors contributing to some CAR/SAM FIRs exceeding the Target Level of Safety (TLS). During 2023, the Curaçao, Guayaquil, La Paz, Panama and Port-au-Prince FIRs identified a significant number of aircraft operations without the necessary RVSM approval information. WP/41 noted that, as part of the process, whenever the CAR/SAM Monitoring Agency (CARSAMMA) identifies an aircraft not listed in the RVSM approval database, it contacts the State of registry. However, it is common for some CAR/SAM States do not respond to CARSAMMA's communications.

2.10 WP/41 requested that CAR/SAM States noted the identified factors affecting safety in the CAR/SAM RVSM FIR airspace, particularly aircraft without communication and information on RVSM capabilities. It also urged States to improve communication with CARSAMMA by facilitating the exchange of data on RVSM capabilities of aircraft registered in the CAR/SAM States.

2.11 During the (asynchronous) virtual phase meeting, a significant number of States expressed agreement with the information presented and support for the recommendations in WP/41. Also, some participants emphasized the importance of not including flight numbers, airlines, and other sensitive information when presenting similar information to that in WP/41, a suggestion the Secretariat has noted.

2.12 In order to precisely understand the root cause of these events, the following Decision was adopted:

<table>
<tr><td colspan="2">DECISION GREPECAS/22/1</td><td colspan="2">AD-HOC GROUP TO ASSESS THE COORDINATION OF PA-RAST/MAC – GTE SAFETY ISSUES</td></tr>
<tr><td colspan="3">What:
An Ad-hoc Group is established under the responsibility of PA-RAST/MAC, in coordination with the GREPECAS GTE and the ICAO Secretariat, to assess the root cause of the identified issues, which results will be presented by the ESC/40 meeting.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
To develop targeted mitigation strategies to address the specific categories of LHDs in RVSM airspace within the CAR/SAM Regions.</td></tr>
<tr><td>When:</td><td>Results to be presented by ESC/40</td><td colspan="2">Status: X☐ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☐ ICAO ☒ Other:</td><td colspan="2">PA-RAST</td></tr>
</table>

2.13 Argentina suggested incorporating virtual sessions to facilitate expert participation in GTE meetings.

2.14 Based on this discussion and after two years, GREPECAS and RASG-PA recognized that:

a) certain activities align more specifically with the mandates of either group, such as AIS competency (GREPECAS) and turbulence prevention (RASG-PA);
b) implementation of PBN procedures on a Visual Runway in SAM Region is completed, and the same implementation in the CAR Region on PBN was suggested to be reviewed with Mexico; and
c) all the rest of the joint activities is still in process, such as Collaboration between the GTE and the RASG-PA MAC Working Group), the CAR and SAM Runway Safety Team (RST) Implementation Project, the Air Traffic Services (ATS) Language Proficiency Project, and the PA-RAST Controlled Flight into Terrain Working Group Project for the mitigation of CFIT-type accidents. The progress and achievements include successful workshops, the creation of repositories, and the development of safety measures for each project.

Agenda Item 3 Follow-up on the Valid GREPECAS Conclusions and Decisions

3.1 Under WP/03, the Secretariat presented an executive summary of follow-up actions, which included the Conclusions and Decisions from previous GREPECAS meetings and from joint RASG-PA and GREPECAS meetings.

3.2 During the meeting virtual (asynchronous) and in-person phases, the States and International Organizations agreed on the status of the Conclusions and Decisions, with some adjustments suggested from Argentina, Trinidad and Tobago and IATA.

3.3 Regarding Conclusion GREPECAS/21/21 - *Development of an action plan for the ADS-B implementation*, IATA reported that a new version of the document was submitted to the ICAO NACC and SAM Regional Offices. IATA does not agree with considering this conclusion as completed for the CAR Region, as the review of the Concept of Operations (CONOPS) has not been finalized. IATA and the airlines were not involved in the decision-making process regarding the Automatic dependent surveillance – broadcast (ADS-B) mandate in CAR Region upper airspace. IATA requested a review of this conclusion with the full participation of airspace users. Before implementing a mandate, it is essential to evaluate any necessary changes to navigation systems and the separation minima applicable in an ADS-B environment.

3.4 Considering the observations, the Meeting agreed on the following status of Conclusions and Decisions:

Conclusion / Decision	Estado
DECISION GREPECAS/21/01 LIST OF GREPECAS AND RASG-PA JOINT ACTIVITIES	Completed
DECISION GREPECAS/21/02 PARTICIPATION OF THE GTE IN THE PA-RAST MEETINGS	Completed
DECISION GREPECAS/21/03 TCAS-RA AND LHD REDUCTION	Valid
CONCLUSION GREPECAS/21/04 ACTIONS FOR THE PROGRESS OF VOLUME III OF CAR/SAM REGIONAL AIR NAVIGATION PLAN	Valid
DECISION GREPECAS/21/05 APPROVAL OF VERSION 0.1 OF CAR/SAM RANP VOLUME III	Completed
CONCLUSION GREPECAS/21/06 UPDATE OF THE INFORMATION OF PART III (CNS) OF VOLUME II OF THE AIR NAVIGATION PLAN CAR/SAM	Valid
DECISION GREPECAS/21/07 APPROVAL OF THE CAR/SAM AIRSPACE OPTIMIZATION PROGRAMME AND THE NEOSPACE-1 PROJECT	Valid
CONCLUSION GREPECAS/21/08 OPERATIONAL DEVELOPMENT OF THE ATFM SERVICE IN CAR/SAM REGIONS	Valid

Conclusion / Decision	Estado
CONCLUSION GREPECAS/21/09 ACTIONS TO STRENGTHEN CONTINGENCY PLANNING IN THE CAR/SAM REGIONS	Valid
CONCLUSION GREPECAS/21/10 STRENGTHENING OF FREQUENCY MANAGEMENT FOR THE USE OF AIR NAVIGATION SERVICES	Valid
CONCLUSION GREPECAS/21/11 DEVELOPMENT OF TERMS OF REFERENCE FOR A TOOL FOR THE ASSESSMENT OF SURVEILLANCE DATA FROM THE CAR AND SAM STATES	Valid
CONCLUSION GREPECAS/21/12 USE OF THE FREQUENCY FINDER 2023 APPLICATION AS A MANAGEMENT TOOL FOR VHF NAV AND VHF COM FREQUENCIES USED IN THE AERONAUTICAL CONTEXT	Valid
CONCLUSIÓN GREPECAS/21/13 ACTIONS TO ADVANCE THE IMPLEMENTATION OF THE D-ATIS AND THE DCL	Valid
CONCLUSION GREPECAS/21/14 PROVISION OF COMMENTS AND ENDORSEMENT OF THE GUIDE OF AIRPORT ADVISORY COMMITTEES	Completed
DECISIONGREPECAS/21/15 MODIFICATIONS TO THE CAR/SAM F3 PROJECT	Completed
CONCLUSION GREPECAS/21/16 ADOPTION OF ICAO RECOMMENDATIONS RELATED TO AERODROMES	Completed
CONCLUSION GREPECAS/21/17 STATE IMPLEMENTATION OF NEW ICAO ANNEX 3 STANDARDS AND RECOMMENDED PRACTICES (SARPs) AND RELEVANT MET REQUIREMENTS	Valid
CONCLUSION GREPECAS/21/18 COMPLETION OF PHASE 2 OF THE AIS ROADMAP TO AIM AND AIS AND INCLUSION OF SNOWTAM IN GREPECAS DASHBOARDS	Valid
DECISION GREPECAS/21/19 REVISION OF DOCUMENT 7383 - AERONAUTICAL INFORMATION SERVICE PROVIDED BY THE STATES	Valid
CONCLUSIÓN GREPECAS/21/20 TELECONFERENCES IN PREPARATION FOR THE FOURTEENTH AIR NAVIGATION CONFERENCE AND COORDINATION MECHANISM FOR POTENTIAL ANCONF WORKING PAPERS	Completed
CONCLUSION GREPECAS/21/21 DEVELOPMENT OF AN ACTION PLAN FOR THE ADS-B IMPLEMENTATION	Valid
DECISION GREPECAS/21/22 ACTION TO FOLLOW UP AND IMPROVE THE ACTIVITIES OF THE GREPECAS WORK PROGRAMME	Completed
CONCLUSION GREPECAS/21/23 SUPPORT THE WORK OF THE GREPECAS GTE	Valid
DECISION GREPECAS/21/24 UPDATES TO PROJECT GREPECAS A2 GNSS AUGMENTATION	Valid
DECISION GREPECAS/21/25 AMENDMENTS TO GREPECAS MANAGEMENT FOR ENHANCING ITS EFFICIENCY AND EFFECTIVENESS	Completed

3.5 With respect to the GREPECAS conclusions and decisions currently holding “valid” status, the Secretariat, through WP/03 Appendix A, requested an extension of deadlines for GREPECAS/23. The Meeting expressed its agreement with this request.

3.6 Finally, ECCAA reported that it was collaborating with its Participating States within the Piarco Flight Information Regin (FIR) on implementing ADS-B for surveillance, completing Phase 1 of the roadmap of the transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM), and updating contingency plans to incorporate provisions for managing natural disasters and health emergencies.

Agenda Item 4 Air Navigation - Global and Regional Developments

Fourteenth ICAO Air Navigation Conference (AN-Conf/14) Preparation

4.1 Under WP/04, activities developed by the CAR/SAM States/Territories/Organizations for the Fourteenth ICAO Air Navigation Conference (AN-Conf/14) held in Montreal, Canada, from 26 August to 6 September 2024, were analysed. GREPECAS 21/20 Conclusion – *Preparatory Conferences for the Fourteenth Air Navigation Conference and Coordination Mechanism for Possible ANCONF Working Papers*, encouraged the participation of Administrations through the submission of working papers and/or information papers. This process was assisted by the Secretariat through teleconferences and coordination with the specialists designated to prepare the documentation. The complete information on AN-Conf/14 is presented at the following link:

https://www.icao.int/Meetings/anconf14/Pages/default.aspx

4.2 It was informed that 24 States/Territories/International Organizations individually submitted their papers and, in other cases, supported papers submitted by other Administrations through coordination and consensus. Various mechanisms were used for this purpose, for instance, the Latin American Civil Aviation Commission (LACAC), and support was obtained at the regional and interregional levels for technical documents.

4.3 The importance of safety was stressed for the viability of every air navigation implementation and, therefore, the achievement of sustainability. This relationship is reflected in global GASP and GANP plans, and from there comes the identification of the role of the BBBs forming a framework separate from the ASBU framework and the performance framework of the GANP.

4.4 Item 2 of the agenda of the Conference was highlighted, which addressed the potential safety risks due to the coexistence of aircraft powered by aviation kerosene, including Sustainable Aviation Fuels (SAFs), electricity and hydrogen, and aircraft with modified parameters. Such coexistence will have an impact on airfield and Air Traffic Management (ATM) operations, among other technical disciplines, which may lead to operational and infrastructure changes.

4.5 During the discussion period in the virtual Phase of GREPECAS/22, ICAO published the preliminary results of the AN/Conf/14, in the Yellow Cover Report, as per the following link:

https://www.icao.int/Meetings/anconf14/Pages/Yellow-Cover-Report.aspx

4.6 Regarding Agenda Item 3 of the agenda of the Conference: *Air navigation system Performance improvements*, IATA highlighted "Recommendation 3.1/1 - Project 30/10 - Optimized implementation of longitudinal separation minima ", as well as "Recommendation 3.1/4 - Free route airspace", both of which to be taken as a reference and guidance to promote GREPECAS implementation projects, among them, the NEOSPACE-1, aimed at optimizing CAR/SAM airspace. This matter was discussed furthermore under Agenda Item 5 of this Report under WP/19.

CAR/SAM Regional Air Navigation Plan (RANP)

4.7 Under WP/05, the status of the CAR/SAM Regional Air Navigation Plan (RANP) was analysed, especially the development of Volume III. The commitment derived from GREPECAS Conclusion 21/04 - *Actions for the advancement of Volume III of the CAR SAM Regional Plan for air navigation* and GREPECAS Decision 21/05 -*Approval of version 0.1 of Volume III of the RANP* was highlighted.

4.8 The States and International Organizations agreed that the regional plan focus on safe, efficient air navigation with adequate capacity, so as to promote the growth of the industry, leading to strengthening air connectivity between States and regions for the socioeconomic development of the States. Assistance activities continue through meetings and workshops to strengthen the capacity of administrations on the management of performance indicators. Some States faced difficulties in organizing data collection, ensuring data integrity, and continuing with the calculations of GANP indicators. This difficulty is generated in the coordination processes between stakeholders, airports, airport apron services, Air navigation services providers (ANSP), air transport section of aviation authorities, etc.

4.9 United States expressed concern about the current approach on the development of performance indicators in Vol. III, emphasizing the extensive number of Tables contained in the document. The excessive use of resources by States to develop Key Performance Indicators (KPIs) should be avoided, and progressive work or applying priorities to the development of indicators is suggested. In these activities, the contribution of the working groups that plan and execute air navigation improvements must be strengthened. The Secretariat took note in order to promote activities and collaborative work that ensures a cost-efficient process in the management of the KPIs of the States.

4.10 IATA stressed the need for more integrated engagement of international organizations and airlines in the development of RANP CAR/SAM Vol. III. It was suggested that the arrangements for the harmonized implementation of ASBU elements of the GANP should be extended so that the GREPECAS work programme reflect the Global Air Navigation Plan modules; Airport Accessibility (APTA), Improve Arrival and departure Operations, Free Route Operations (FRTO) – Improved operations through enhanced en-route trajectories, and Network Operations (NOPS) – Network Operations (ATFM).

4.11 The States/Territories/International Organizations ratified their participation in the initiatives promoted by the Regional Offices (workshops, seminars, follow-up meetings, etc.) to generate or strengthen competencies in the management of KPI. It was noted that Administrations were addressing these tasks as part of the development of their National Air Navigation Plans. The collaborative work in progress was highlighted, and the importance of identifying the data providers necessary to calculate indicators, as well as mapping the resources and management capacities in each Administration, was underlined.

4.12 Brazil through WP/34 reported that has been working on the implementation of performance-based management, focusing on the creation and use of indicators in decision-making to make air navigation increasingly safe, efficient and sustainable. Through these initiatives, combined with collaboration with international organizations and other States, DECEA demonstrates a continuous commitment to improving Brazilian airspace management. As a result, since 2021, DECEA and EUROCONTROL publish a benchmarking report on the joint operational performance of the Brazilian and European Air Navigation Systems, providing members of the international ATM community with an initial

analysis associated with indicators related to the operational performance of air navigation systems. The 2024 report and previous ones can be accessed at the following links:

http://performance.decea.mil.br
https://ansperformance.eu/global/brazil/bra-eur/

4.13 IATA highlighted that in Brazil the industry uses the published information on indicators to maintain its contribution to the ATM system, through Collaborative Decision Making (CDM) groups that are promoted by DECEA. IATA urged GREPECAS to follow this model, which can be adapted according to the scenarios of each State.

4.14 The ATM Indicators Course has been taught in Brazil for dozens of specialists, with the aim of teaching the fundamentals, classification and characteristics of ATM performance indicators. In 2023, the first international class was trained, composed by of delegates from the SAM Region. In the last week of October 2024, Brazil supported the implementation of the Workshop on Key Performance Indicators (KPIs) of the Global Air Navigation Plan, held at the NACC Regional Office.

4.15 Brazil announced the organization of the 2025 international course on indicators, on a date to be defined. The Secretariat was tasked to follow up this matter and coordinating the invitation to interested CAR/SAM States.

4.16 The Meeting took note of the IP/18 submitted by Ecuador on studies of KPI 06 – Airspace Capacity.

4.17 In view of the above, the following conclusion was adopted for the continuity and advancement of the development of Volume III of the RANP CAR/SAM:

<table>
<tr><td colspan="2">CONCLUSION GREPECAS/22/2</td><td colspan="2">PROGRESS ON THE DEVELOPMENT OF VOLUME III OF THE RANP CAR/SAM</td></tr>
<tr><td colspan="3">What:
That the CAR/SAM States, in conjunction with ANSP and airports, with the participation of airlines and International Organizations, assisted by the Secretariat, populate the Tables of Volume III of the RANP CAR/SAM with the data of performance indicators - KPIs, prioritizing and harmonizing the management of these indicators according to the progress of the Working Groups for the regional implementation of air navigation by GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Technical/Operational</td></tr>
<tr><td colspan="4">Why:
To ensure a cost-efficient process in the management of KPIs, as well as to strengthen regional planning focused on safe, efficient and adequately capable air navigation, in order to promote the growth of the Industry, based on the performance-based planning methodology by the States.</td></tr>
<tr><td>When:</td><td>Present revised version of RANP Vol III, at GREPECAS 23</td><td>Status:</td><td>☒ Valid / ☐ Not valid / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☒ Others:</td><td colspan="2">ANSP providers, Airports, Airlines, International Organizations, Working Groups.</td></tr>
</table>

Advanced Air Mobility (AAM) Implementation

4.18 Through WP/27, Brazil analysed the development of AAM. The concept of urban air mobility addresses the implementation of Electronic Vertical Take-Off and Landing (eVTOLs). Considering the innovative technology and new services related to eVTOL aircraft, it is challenging to prepare the entire aviation ecosystem to integrate this new entrant, including new airfield infrastructure, operational changes, licensing, customized flight rules, changes in airspace design and airspace management Universal Transverse Mercator grid (UTM).

4.19 It was highlighted that AAM operations will be viable thanks to a range of innovative technologies, including automated traffic management, digital ecosystems and sustainable solutions, as well as new aircraft designs, media and infrastructure types. AAM services will include the transportation of passengers, cargo, goods and mail, as well as other air services that benefit society, and will be carried out in urban, regional and interregional areas, and in international areas.

4.20 Brazil's Department of Airspace Control - DECEA is working on a project to implement UAM using eVTOL aircraft. This project involves collaboration with manufacturers, airlines, industry, academia, and other stakeholders. Brazil has joined the ICAO AAM Study Group, which was formed within the framework of the 41st Assembly.

4.21 It was considered that, to date, the exchange of information on these AAM initiatives is limited to a few civil aviation administrations, due to the small number of markets with the participation of manufacturers (only United States and Brazil, within the scope of GREPECAS). Therefore, it was estimated that, although limited, information sharing is already happening through ICAO's AAM Study Group, and through international certification initiatives. The Meeting stressed the importance of integrating other CAR/SAM States into this exchange of information, in a progressive manner.

4.22 The Meeting noted that, from 9 to 12 September 2024, ICAO held the First Advanced Air Mobility Symposium in Montreal, Canada. Information and presentations of the event are available at the following links:

https://www.icao.int/Meetings/AAM2024/Pages/default.aspx

https://www.icao.tv/videos/aam-2024-day-1-the-world-of-aam-services-and-economics

Agenda Item 5 CAR/SAM Air Navigation Services (ANS) Implementation

5.1 Air Traffic Management (ATM), Airspace optimization, Air Traffic Flow Management (ATFM) and Search and Rescue (SAR)

5.1.1 The Secretariat presented WP/07 to discuss the evolution of the activities in the CAR/SAM Regions referring to the implementation of PBN into the NEOSPACE Project, the Global Navigation Satellite System (GNSS) Projects updates (Projects A2) as well as the projects of the GREPECAS ATFM Programme.

Air Traffic Management (ATM)

5.1.2 In most of the SAM States, the flight procedures design staff has been reduced, due to retirement or reassignment in operational functions. Therefore, training courses for designers at basic and advanced PBN levels are being promoted, as well as refresher courses (recurring) through the RLA/06/901 project and the SAM/IG working groups. Instrumental Flight Procedure Design Services (IFPDS) are focused on reinforcing quality assurance in their deliverables, which involves the proper qualification of the staff and the periodic examination of designs at maximum intervals of 5 years, among other requirements. From this discussion, the following Conclusion was adopted:

<table>
<tr><td>CONCLUSION GREPECAS/22/3</td><td colspan="2">SUPPORT FOR INSTRUMENT FLIGHT PROCEDURES DESIGN IN THE CAR/SAM REGIONS</td></tr>
<tr><td colspan="2">What:
That, to ensure safety of instrument flight operations,

a) Air Navigation Service Providers (ANSP) assign the required resources (personnel, training, procedures, etc.) for their IFPDS, to strengthen the quality assurance of flight procedure designs, particularly the five-year periodic review of designs; and

b) the ICAO NACC and SAM Regional Offices continue supporting the provision of flight procedures design basic, advanced and recurring training and report it to GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To reinforce quality assurance for instrument flight procedures design</td></tr>
<tr><td>When: Report to GREPECAS/23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

5.1.3 As an objective of the Project A2 - *Air Navigation Systems in Support to PBN*, the improved version of the Receiver Autonomous Integrity Monitoring (RAIM) Availability Prediction Service (SATDIS) software was implemented in the Member States of Project RLA/06/901. In April 2024, for the renewal of the annual contract with the provider, consultations have been carried out with the States, resulting in different responses about the renewal of the service. The Project is still coordinating to define the situation. Besides, endorsing the studies presented by Brazil, COCESNA and Thales Alenia Space regarding a (Satellite-based Augmentation System (SBAS) for the CAR/SAM Regions, GREPECAS/21 approved Decision 21/24, tasking the Secretariat to update Project A2 with the available information on GNSS, and to include the CAR Region in this project.

5.1.4 Regarding Project A2, the Secretariat requested an extension of the deadline for another year to be able to meet the Decision GREPECAS/21/24 related to "Updates to Project GREPECAS A2 GNSS Augmentation" to CAR Region. Cuba considered that the one-year deadline extension proposed by the NACC Regional Office for this Project was not sufficient to comply with Decision GREPECAS/21/24, given all that it implies for ANSPs and States that depend on satellite service providers. Additionally, Cuba pointed out the difficulties for the implementation of Ground-Based Augmentation Systems (GBAS) in the CAR Region, such as lack of guidance material and other more specific for the State.

Air Traffic Flow Management (ATFM)

5.1.5 In 2024, the CAR Region has achieved notable progress in improving ATFM by working closely with the SAM Region and individual States. The Region is developing a more practical and actionable plan for ATFM improvements, laying the groundwork for more effective ATFM services in 2025 and beyond. The SAM/IG and its contributory bodies have been working since June 2021 on the development of an ATFM Operations Plan (OPSAM) with the aim of adjusting Air Traffic Control (ATC) capacity and airport capacity to the gradual increase in demand and contributing to the post-COVID-19 recovery, and the sustainability of the Air Transport System (ATS) at the regional level. The OPSAM includes a dashboard with a unique database format to allow exchange and analysis of information on the demand for operations and trends in imbalances. The IATA Summer 24 season data dashboard presents the flight schedule for 10 SAM States, each month. As the post-operations information provided is analysed, the management of GANP KPIs referring to punctuality, maximum capacity (performance), etc., is being initiated. Refer to the SAM dashboard at the following link:
https://app.powerbi.com/view?r=eyJrIjoiOTc4YTZhMTQtZmE0YS00ZDUzLWI3NzgtNjIxYWZlYjU2OGI2IiwidCI6IjI2MjI4ZGNhLTcwZDMtNDkxNy04MjMzLTA4M2FjMzY1NWE5MSJ9

5.1.6 One aspect that affects the efficiency of the ATFM service and cross-border coordination is the limitation of Flow Management Position (FMP)/Flow Management Unit (FMU) operating hours. Only Argentina, Brazil and Colombia comply with 24/24.

5.1.7 WP/28, presented by Brazil, summarizes past and ongoing actions to enable its implementation of the Flight and flow - information for a Collaborative Environment (FF-ICE) concept, an important facilitator for Trajectory-Based Operations (TBO) implementation, with a strategic vision of the future ATM system. FF-ICE is a crucial enabler for implementing the Global ATM operational concept (GATMOC) and TBO and was developed to address the limitations and restrictions of Filed Flight Plan (FPL)2012 and the growing need for flight and flow information exchange in a TBO environment.

5.1.8 WP/28 details that Brazil has been carrying out actions and plans to enable the implementation of the FF-ICE concept. It emphasizes the importance of harmonizing FF-ICE implementation among CAR/SAM Regions States and that creating a Regional Plan could help achieve this goal. In 2019, the Airspace Control Department (DECEA) conducted the first Tabletop Exercise (TTEx) regarding FF-ICE Release 1. Additionally, DECEA presented the FF-ICE components, considerations in the implementation process, service descriptions, and information exchange models.

5.1.9 DECEA is currently developing Brazil's FF-ICE concept Guidelines and Implementation Plan. This document intends to include the planned implementation of mandatory services in FF-ICE/Release 1 and, initially, some of the compulsory services revised for FF-ICE/Release 2. Furthermore, an analysis has been initiated on the systems currently used to process flight plans and manage air traffic to identify requirements for implementing the FF-ICE concept, which will be defined in the ongoing implementation plan. Finally, DECEA intends to conduct a TTEx for FF-ICE Version 2 shortly and present the results to the Air Traffic Management Requirements and Performance Panel (ATMRPP).

5.1.10 To fully benefit from FF-ICE services and move closer to the GATMOC vision, Brazil plans to implement some of the services from FF-ICE Releases 1 and 2 as soon as possible, in accordance with ICAO provisions for the discontinuation of FPL2012. WP/28 mentions that based on the results of the TTEx conducted by CAR/SAM Regions States and the content of future national implementation plans, it will be possible to assess the need and feasibility of establishing a Regional Plan to implement the FF-ICE concept.

5.1.11 WP/28 encouraged States, according to their individual needs and priorities, to participate in Brazil's various actions related to the FF-ICE concept and consider the feasibility of establishing a regional FF-ICE implementation schedule.

5.1.12 Bolivia, Costa Rica, Chile, Cuba, Dominican Republic, El Salvador, Guatemala, Mexico United States and Uruguay expressed their gratitude for WP/28 and the information provided by Brazil, emphasizing the importance of establishing regional collaboration for the implementation of FF-ICE. However, Bolivia, Guatemala, and IATA highlighted the need to adhere to ICAO’s plan for the implementation of FF-ICE based on the cessation of the ICAO 2012 Flight Plan globally, starting from 2034.

Search and Rescue Service (SAR)

5.1.13 The Secretariat presented WP/08 to report on the progress of activities to support the implementation of SAR in the CAR/SAM Regions and requested support by States for the organization of SAR Exercises.

5.1.14 GREPECAS/20 (Salvador, Brazil, 15 to 18 November 2022) recognized the need to provide greater support to the implementation of the SAR service, evaluating current challenges and identifying opportunities for improvement. Through Decision GREPECAS/20/02 APPROVAL OF THE PROJECTS ON THE IMPLEMENTATION OF THE SEARCH AND RESCUE SERVICE (SAR) FOR THE CAR AND SAM REGIONS, the project on the implementation of the SAR service for the CAR (SAR-CAR) and SAM (SAR-SAM) Regions was approved. This project seeks to enable greater visibility and support for related activities, communicating to the ICAO Council in a more objective manner the progress of SAR implementation in the CAR/SAM Regions.

5.1.15 The CAR Region continued to work in the project for the implementation of SAR through the North American, Central American and Caribbean Working Group (NACC/WG) SAR Task Force (SAR/TF). The Task Force maintained the provision of SAR services in the Eastern Caribbean, specifically in the Piarco Search and Rescue Region (SRR) as the main priority for the CAR Region. The SAR provision in this SRR was quite complex, as it involved integration between several States and Territories, with several Rescue Coordination Subcentres (RSCs) under the Piarco Rescue Coordination Centre (RCC) which are not functioning according to the requirements of Annex 12 – *Search and Rescue*.

5.1.16 The ICAO Universal Safety Oversight Audit Programme (USOAP) results showed the status of SAR provision in the CAR Region, with an effective implementation of 54%. The results of the latest audits conducted in the Region were indicative of the static or declining trend in the provision of SAR services. The main challenges identified were the following:

a) lack of organization of SAR services according to the requirements of Annex 12

b) lack of trained and experienced SAR personnel

c) lack of SAR operational procedures for RCCs and RSCs

d) lack of SAR agreements

e) lack of SAR Exercises.

5.1.17 A CAR/SAM interregional SAR Exercise (SAREX) hosted by France was conducted from 13 to 16 May 2024, which purpose was to assess SAR operational procedures, Letters of Agreement (LoAs) and SAR response, rehearsing several contingency scenarios involving the SRRs of Cayenne, Paramaribo and Piarco, and the associated RCCs and RSCs of the aforementioned SRRs.

5.1.18 The USOAP results showed the status of SAR provision in the SAM Region, with an effective implementation of 70.67%. It is noted that 6 of 13 States are below 70%. The main challenges identified were the following:

a) Shortage of SAR services availability on a H24 basis.

b) Weakness on training programs for SAR staff, as well, English language proficiency.

c) Outdated SAR agreements.
d) Shortage of SAR Exercises.

5.1.19 From this discussion, the following Conclusion was adopted

<table>
<tr><td colspan="3">CONCLUSION
GREPECAS/22/4 SUPPORT FOR SEARCH AND RESCUE EXERCISES</td></tr>
<tr><td colspan="2">What:
That to assess the status of Search and Rescue Services in the CAR/SAM Regions while discovering additional opportunities for improvements,

a) CAR/SAM States schedule Search and Rescue exercises to assess their coordination and response capabilities, including autonomous distress tracking; and

b) the ICAO NACC and SAM Regional Offices provide support and coordination for the conduction of Regional and Interregional SAREX and report it to GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To promote Regional and Interregional Collaboration to enhance SAR Services.</td></tr>
<tr><td>When: Report by GREPECAS/23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

5.1.20 A virtual workshop on Global Aeronautical Distress and Safety System (GADSS) & Autonomous Distress Tracking (ADT), hosted by Boeing, was delivered on July 17, 2024. The Time-Limited Exemptions (TLEs) matters for Boeing aircraft were exposed. A second regional GADSS webinar, focused on ICAO standards and GANP threads and implementation is planned.

5.1.21 Suriname presented IP/09 to introduce their process of notification of Space System for Search of Vessels in Distress (COSPAS)/Search and Rescue Satellite-Aided Tracking SARSAT distress alerts database, based on European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) platform, implemented in Suriname in order to ensure and promote safety surveillance. Taking advantage that the ECCAIRS platform taxonomy offers the possibility to store COSPAS-SARSAT distress alerts in a standard format, Suriname has designed with the assistance of the ICAO SAM Regional Office, a specific view, for storing the above-mentioned alerts notification.

ATM Contingency Management

5.1.22 The Secretariat presented WP/16 offering an update of the activities related to ATM contingency management and response in the CAR/SAM Regions and requesting support for the harmonization of the CAR/SAM framework with the other ICAO regions.

5.1.23 GREPECAS/21 approved Conclusion GREPECAS/21/09 – ACTIONS TO STRENGTHEN CONTINGENCY PLANNING IN THE CAR/SAM REGIONS. This Conclusion requested the Secretariat to develop and promote a comprehensive strategy to improve contingency planning in the ANS of the CAR/SAM Regions, including guidelines for the establishment of level 1 (internal arrangements) and level 2 (bilateral arrangements among adjacent ATS units) contingency plans by GREPECAS/22.

5.1.24 ICAO is currently working on harmonizing the ATM contingency response framework used across ICAO regions. For this harmonization work, the draft Asia-Pacific (APAC) Region ATM Contingency Framework has been taken as a reference. A global Special Implementation Project (SIP) was approved to improve preparedness for and management of ATM contingency events. With the support of the SIP an ATM coordination meeting was organized, including representation of all ICAO Regional Offices and Headquarters (HQ), to coincide with the ICAO APAC/MID ATM Contingency Planning Workshop and APAC ATM Contingency Tabletop Exercise ICAO Asia and Pacific Regional Office, held in Bangkok, Thailand, 25 - 28 June 2024. The consensus among ICAO Regional Offices and HQ was that the revised APAC ATM Contingency Framework should be used as a reference to promote a global harmonization of the ATM contingency arrangements among States to ensure the continuity of international air traffic. The revised APAC ATM Contingency Framework and the recommendations from the ICAO APAC/MID ATM Contingency Planning Workshop will be presented to the APAC Planning and Implementation Regional Group (PIRG) for approval. The outcomes/results of this workshop are available in the following link:

https://www.icao.int/APAC/Meetings/Pages/2024-ATM-Contingency-WS-TTX.aspx.

5.1.25 In order to support the actions for the harmonization of the CAR/SAM contingency planning framework, the following Conclusions was adopted:

<table>
<tr><td colspan="2">CONCLUSION GREPECAS/22/5</td><td colspan="2">HARMONIZATION OF THE REGIONAL CAR/SAM ATM CONTINGENCY MANAGEMENT FRAMEWORK</td></tr>
<tr><td colspan="3">What:
That, to promote global harmonization of the CAR/SAM ATM contingency management framework, the Secretariat,

a) organize a workshop in 2025 to develop a CAR/SAM ATM Contingency management Framework (RACF). The CAR/SAM RACF should be based on the APAC/MID RACF and presented to GREPECAS/23 for endorsement; and

b) request the CAR/SAM States to take action to harmonize their contingency plans with neighbouring States' adjacent ATS units and report it to GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
To implement global harmonization of the CAR/SAM ATM contingency planning framework in the CAR/SAM Regions</td></tr>
<tr><td>When:</td><td>Report to GREPECAS/23</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☒ ICAO ☐ Other:</td><td colspan="2">NACC and SAM Regional Offices</td></tr>
</table>

Airspace Optimization

5.1.26 WP/19 presented the most relevant results on implementation of the Airspace Optimization Programme for the CAR and SAM Regions, as well as the coordination made between both regions under NEOSPACE-1 Project. A proposal for a common CAR/SAM Guide for implementation was presented. An 'overarching document' titled "Harmonized Horizons: Airspace Optimization in the CAR-SAM Regions" was presented to establish the common collaborative goals and objectives, and the key initiatives agreed by CAR and SAM Regions. The Secretariat offered an update of the activities related to the Airspace Optimization Programme for the CAR and SAM Regions and requested support for the harmonization of the CAR/SAM framework with the other ICAO regions.

5.1.27 WP/19 received support from Bolivia, Costa Rica, Cuba, Guatemala, United States, and Venezuela. Costa Rica noted its ongoing efforts in emissions regulations with the RAC-16 Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and supported harmonization and draft decisions. Cuba expressed gratitude for the paper and emphasized the need for policies and support for alternative fuels and endorsed the draft decision. Guatemala suggested considering Central American States for implementing the NEOSPACE-1 project routes if viable. Bolivia is assessing ATFM needs and implementing a radar system, with limited ability to apply Strategic Direct Routes (SDRs) and Free Route Airspace (FRA). United States backed the draft decision, acknowledging ICAO and international efforts in regional airspace optimization. Venezuela reported progress on FRTO modules and continued SDR implementation. IATA stressed that the NEOSPACE-01 project must be aligned to the recommendation 3.1/4 issued by the AN Conf/14, referred to the implementation of FRA.

5.1.28 From this discussion, the Meeting adopted the following Conclusion:

<table>
<tr><td colspan="2">CONCLUSION
GREPECAS/22/6 NEOSPACE-1 PROJECT HARMONIZED DOCUMENTS</td></tr>
<tr><td>What:
That, States, International Organizations, implementation groups and the industry strengthen their activities and harmonize their action plans based on the following documents and report their progress to GREPECAS/23:
i. the Airspace Optimization Programme - NEOSPACE-1 project VERSION 1.0 (Appendix D to WP/19),
ii. the overarching document ¨Harmonized Horizons: Airspace Optimization in CAR-SAM Regions" (Appendix C to WP/19),
iii. the CAR/SAM Guide for the implementation of improved operations through enhanced en-route trajectories (FRTO) (Appendix A to this report).</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="2">Why:
With the aim of unifying the initiatives of the CAR/SAM Regions on Free Route Airspace (FRTO) under the framework of the NEOSPACE-1 project.</td></tr>
<tr><td>When: GREPECAS/23</td><td>Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
</table>

Who:	☒ CAR/SAM States and Territories ☒ ICAO NACC/SAM ☒ Other:	Industry, Coordinators of the NEOSPACE-1 Project

5.1.29 WP/29 presented improvements in the evaluation process of the new Airspace Concepts, both in the validation phase of the operational scenarios, to confirm if the project could proceed to the implementation phase, and in the post-implementation phase, to verify if the project objectives were achieved. In this sense, it has the aim to share these improvements and propose the implementation of them in the CAR/SAM States. The Secretariat offered an update of the activities related to developing new airspace concepts to optimize air circulation and increase airspace capacity represent important aspects of a country's economy, as it directly affects the aviation industry and air transport in general. The airspace organization and structure must constantly evolve to adapt to the new operational scenarios imposed by increased air traffic, increased air transport, or new systems, concepts, techniques and procedures employed in airspace planning.

5.1.30 WP/29 received strong support from Bolivia, Costa Rica, Cuba, Guatemala, and Venezuela. Costa Rica endorsed a collaborative approach with its ANS Supervision Unit to meet airspace needs, while Cuba expressed appreciation for Brazil's practices and advised its ANSP to connect with DECEA. Guatemala will seek Airspace Structuring Study Group (GESEA) guidance to implement new scenarios, and Bolivia recognized the Sirius Programme's potential to optimize air traffic management through route planning and real-data simulation. Venezuela noted its intention to review these contributions.

5.1.31 From this discussion, the Meeting adopted the following Conclusions:

CONCLUSION GREPECAS/22/7	**EVALUATION PROCESS OF THE NEW AIRSPACE CONCEPTS**
What: That, to enhance the evaluation of new Airspace Concepts, using Brazil as a reference, the Secretariat, in collaboration with the CAR and SAM States, a) refine and implement a standardized methodology to guide stakeholders in evaluating and validating new operational scenarios, ensuring alignment with airspace users' needs; and b) coordinate with SAMIG-GESEA/SG1 (Airspace Planning Group) to analyse and optimize this methodology, drawing insights from various State practices while adapting to the unique needs of each State, recognizing that the goal is not to mimic Brazil but to incorporate and adjust ideas that best serve each state's requirements, and report it to GREPECAS/23.	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Operational/Technical
Why:	

	The Secretariat, in collaboration with the CAR and SAM States, will lead efforts to create a streamlined, user-focused evaluation process for new operational scenarios. This approach will establish a standardized methodology, developed with SAMIG -GESEA/SG1, that adopts best practices to meet each State's unique needs without directly replicating any single model.		
When:	Report to GREPECAS/23	**Status:**	☒ Valid / ☐ Superseded / ☐ Completed
Who:	☒ States ☒ ICAO ☒ Other:	Industry, International Organizations	

5.1.32 Under WP/31, the results of the ATFM Workshop held in April 2024, at the Air Navigation Management Centre - CGNA of Brazil, in Rio de Janeiro, were presented. A theoretical part was developed through a virtual classroom for the review of the concepts of ICAO Doc 9971. Then, a face-to-face part of 2 weeks. The Training Workshop covered the ATFM Phases (strategic, pre-tactical, tactical, post-operational analysis), and a theoretical-practical approach was proposed that included contact with the real processes of the ATFM, the CDM and interaction with users.

5.1.33 The interregional vision of the ATFM must be strengthened and, to this end, the importance of developing more integration activities and exchange of experiences was stressed. Administrations should make every effort to strengthen ATFM units and allocate adequate resources to them. The Meeting commended the information presented and agreed to request the Secretariat to coordinate and promote similar training activities in ATFM, considering that this training is not offered in the training centres of the CAR/SAM Regions.

5.1.34 The Digital Airspace System Analysis (DASA) is an innovative tool developed by the DECEA in Brazil to improve the analysis and management of digital airspace. This tool represented a milestone in the modernization of air control systems, providing a complete and accurate view of the various uses of airspace at both strategic and tactical levels. With advanced data analysis and modelling resources, DASA provided valuable insights to optimize operational efficiency and facilitate coordination among the different actors in the aviation community in a dynamic and complex scenario such as modern air traffic. In summary, DASA represented a significant step towards the digitalization of airspace management, contributing to safer, more efficient, and sustainable aviation.

5.1.35 WP/33 offered an update of the activities related to innovate tool developed by DECEA Brazil to improve the analysis and management of digital airspace. The Brazilian Airspace Control System (SISCEAB), led by the DECEA, aimed to provide the necessary means to manage airspace and air navigation service in a safe and efficient manner, as established in national regulations, and international agreements and treaties to which Brazil is a party. The main objectives of DASA are to increase the capacity for planning the use of airspace, to improve the analysis of requests for the use of airspace, to improve flow identifying possible conflicts between areas and routes analysed, automate the analyses requested and disseminate information among those responsible for different processes. To enhance its analytical capabilities, DASA has been developed with consideration of the latest uses of airspace, such as UTM (Unmanned Traffic Management) and ETM (Upper Class E Traffic Management). The tool has been officially designated as the exclusive channel for requests for User Preferred Routes (UPRs) in Brazil, which are more direct and efficient. The application process now occurs through this system, which has become the only accepted as of April 1, 2024. Its use is integrated to avoid conflicts with Preferred Routes (PREF),

which are mandatory, and seek to facilitate flight planning by reconciling UPR routes with Direct Routes (or DCT routes) already widely used in Brazilian upper airspace.

5.1.36 The FRA concept is an integral part of the ICAO Global Air Navigation Plan (Doc 9750) and is included in the implementation of the Aviation System Block Upgrade (ASBU) Blocks, specifically in the segment of Improved Operations through Enhanced En-Route Trajectories (FRTO B0/B1). This concept showed the need to change the strategy of optimizing airspace in South America, allowing more efficient trajectories, saving fuel and contributing to environmental sustainability.

5.1.37 WP/33 received support from Cuba, Costa Rica, Dominican Republic, Ecuador, Venezuela and IATA. Cuba supported the conclusions and emphasized the need for the Brazilian experiences to be generalized and used to harmonize technological tools in the CAR and SAM Regions, even if we move forward step by step.

5.1.38 In this regard, the Meeting adopted the following Conclusion:

<table>
<tr><td colspan="2">CONCLUSION GREPECAS/22/8</td><td colspan="2">DIGITAL AIRSPACE SYSTEM ANALYSIS (DASA) WORKSHOP IN BRAZIL</td></tr>
<tr><td colspan="2">What:
That, to improve the analysis and management of digital airspace, Brazil host a DASA Workshop for the CAR/SAM Regions, aiming to implement User Preferred Routes (UPR) throughout South American airspace, while encouraging States to leverage the DASA tool for UPR analysis and inform GREPECAS/23 accordingly.</td><td colspan="2">Expected impact:
☒ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
This initiative, part of the DECEA efforts, focuses on reducing flight time and fuel consumption, supporting sustainable development by lowering CO2 emissions. It promotes an integrated approach to SAM airspace management, drawing on the experiences and unique needs of each country to enhance overall operational efficiency and environmental impact.</td></tr>
<tr><td>When:</td><td>Report to GREPECAS/23</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☐ ICAO ☒ Other:</td><td colspan="2">Brazil</td></tr>
</table>

5.1.39 COCESNA presented WP/35, on behalf of Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua, to provide information on a diagnosis of Central American airspace to identify deficiencies and opportunities in its management.

5.1.40 COCESNA's diagnosis included the collection of statistical data using advanced tools to perform a detailed analysis. Feedback from the main airlines is expected and visits will be made to several countries in the region for a direct assessment of the operating environment. Finally, a detailed report will be prepared with recommendations aimed at improving the safety, efficiency and capacity of the regional airspace.

5.1.41 COCESNA requested the support of ICAO, IATA and other interested parties in carrying out the diagnosis of airspace in Central America, in order to guarantee a comprehensive and effective assessment of the conditions and needs of the airspace in the subregion. This support will be conducted through the NACC/WG.

Higher Space Operations (HAO) and Space Operations

5.1.42 Brazil presented WP/43 offering an update of the activities related to highlighting the importance of sharing experiences on HAO operations and space operations. It was emphasized the need to develop harmonized CAR/SAM procedures for HAO and space operations, considering their relevance to the international civil aviation. The paper discussed the importance of sharing experiences related to HAO and space operations and of developing harmonized procedures for the CAR/SAM Regions.

5.1.43 There is a need to clarify the difference between HAO and space operations and better identify their impact on ATM. Furthermore, it is necessary to support ICAO in the construction of the HAO concept that will help States in various issues, such as ANS and personnel licensing. This paper also comments on the recent published Brazilian law to regulate space activities. It points out that it is necessary to define processes that reduce the impacts of these activities on the security and efficiency of the ATM, considering the predicted scalability of HAO. Furthermore, it highlighted the importance of countries in the CAR/SAM Regions sharing experiences and establishing harmonized processes so that operations can scale safely and efficiently in the airspaces of these countries.

5.1.44 Resolution A40-26 of the ICAO Assembly held in 2019, *Commercial Space Transport*, reaffirmed the ICAO's role in developing guidance material to support establishing policies for monitoring commercial space operations where they overlap with international civil aviation activities. This makes it possible to deal with emergency issues without impacting international civil aviation operations. Resolution A41-9, *New Entrants*, recognizes the importance of adopting measures that ensure a harmonized and standardized global approach to HAOs.

5.1.45 The Resolutions mentioned above emerged due to the evolution of the aviation industry, which needs to adapt to integrate new types of operations into ATM systems. This integration is complex since the operation of new entrants is quite peculiar and different from that of other more well-known aircraft. Furthermore, their performances are different, which creates an additional challenge to accommodate traffic in more congested airspaces until they reach their operational environments.

5.1.46 In addition to the increase in HAO due to new entrants like balloons, supersonic/hypersonic aircraft, and suborbital aircraft, space operations have also increased, involving rocket launches and re-entry of space vehicles. Another new entrant in HAO are prototype capsules from Halo Airspace to test and validate space travel for observing the stratosphere. Therefore, a growing

number of aircraft operates above Flight Level (FL) 600 for months and even years, and year by year, new entrants emerge and show an interest in scaling up their activities.

5.1.47 Despite all that above, a clear definition of HAO is still missing. In December 2023, several governments worldwide requested ICAO to develop a holistic vision for the HAO to address several issues required to make these operations viable.

5.1.48 WP/43 received support from Cuba, Costa Rica, Uruguay and Venezuela. Costa Rica is interested in participating in some activity for the development of harmonized procedures for the CAR/SAM Regions with respect to HAO. United States remarked that airspace is a global common resource available for all users and airspace management should be focused on efficiency and maximizing access for all.

5.1.49 Venezuela mentioned that HAO and space operations are the goals that the SAM Region must set itself, since the interest of current companies and users goes beyond daily use. In this case, the vision of HAO and clearly differentiating them from space activities is essential for States. Regional guidelines and harmonized standards could positively contribute to the efficient management of air navigation services.

5.1.50 IP/15 presented United States' position on the definition and delimitation of outer space, offering an update as acknowledged by the 14th Air Navigation Conference in the report from the third agenda item. Space transportation operations and higher airspace operations are distinct. This distinction is not due to the altitude that they operate at, rather it is because of the vehicle type and mission intent that separate these two types of operations because as the Conference also noted that "space vehicles do not meet the definition of "aircraft.

5.1.51 United States continues to hold the view that there is no need to seek a legal definition or delimitation for outer space. Currently, there is no international consensus on where such a boundary would be and no agreed-upon operational or safety benefits to defining such a boundary with respect to airspace integration. Given the lack of international consensus, an attempt to define or delimit outer space would be an unnecessary theoretical exercise that could unintentionally complicate existing activities and that may not be able to adapt to future technological developments. Some States have suggested the Kármán line, 100 kilometres, as the legal delimitation between airspace and outer space. However, there is no basis in aerodynamics or physical significance of a line at the Kármán line or any other altitude.

Other ATM-Related Matters

5.1.52 IP/13 presented United States' position regarding re-entry risk posed by space debris to aircraft and coordination of notification and procedures for such events. The growing number of large satellite constellations in low earth orbit poses an increased risk to airspace due to the risks posed by the re-entry of any debris from deorbiting satellites and the upper stages of space vehicles that are needed to launch such satellites into orbit. A study commissioned by the United States, Federal Aviation Administration in 2021 evaluated the impact that the growing number of large constellations currently being launched may have on re-entry risks in the future. The study found that approximately 85% of the debris that would survive re-entry would come from one major constellation and evaluated what the risk of downing an aircraft from that debris would be approximately 10 years from now and found that the chance of an aircraft downing event in 2035 would be .0007.

5.1.53 Due to the current uncertainty of predictions related to the random re-entry of Space Debris and the difficultly such uncertain predictions cause relating to the worthwhile and practical coordination of related NOTAMS, the United States does not at this time, believe it would be worthwhile for ICAO to evaluate the development of notification protocols or procedures for the management of airspace related to such events.

5.1.54 The Secretariat has informed the Meeting, through IP/20, of the processes that will be implemented for the Coordination for the issuance of notifications for the launch and re-entry of spacecraft. Similarly, the Secretariat reminded the Meeting that this issue had been discussed at GREPECAS/20. In this regard, it also recalled that GREPECAS/20 issued Conclusion 20/15 - ANC NOTAM FOR AEROSPACE OPERATIONS, which contained four items. From which the Meeting recalled that item c of the above-mentioned conclusion requested a List of Contacts of the organizations to coordinate the above-mentioned items. Likewise, paragraph "d" urged the inclusion of the distribution of information on aerospace activity via e-mail as a backup to the distribution systems via AMHS.

5.1.55 The Meeting considered that, due to the increase in space activity and air traffic in recent years, close coordination between space launch managers, those responsible for the airspace management of the FIR, as well as airspace users is necessary to minimize the risks of potential incidents due to space operations.

5.1.56 The Secretariat reported that it would establish bilateral and multilateral meetings between States and organizations to agree on coordination procedures for cases of space activities. The Secretariat also reported that it will follow up on the actions requested in paragraphs c and d of the GREPECAS 20/15 Conclusion through the ATM and Aeronautical Information Management (AIM) programmes.

5.2 Communications, Navigation and Surveillance (CNS)

5.2.1 Under WP/09, the Secretariat presented a summary of the activities carried out by Communications, Navigation and Surveillance (CNS) of the SAM Region in follow-up to the activities of GREPECAS Projects C and D, for the implementation activities on air navigation. Moreover, updates to the conclusions and decisions of the GREPECAS/21 Meeting related to the CNS area and its projects were addressed:

a) Conclusion GREPECAS/21/06 dealt with the “Update of Part III (CNS) of Volume II of the CAR/SAM ANP”, the SAM States have developed a mechanism for updating these tables and the work is already advancing

b) the conclusion aimed at the "Development of a Terms of Reference document for a tool for the evaluation of surveillance data from the CAR and SAM States" has not yet been started

c) Conclusion GREPECAS/21/12 dealt with the "Use of the Frequency Finder 2023 Application as a management tool for VHF NV and VHF COM frequencies used in the aeronautical context", urging CAR and SAM States to nominate Focal Points and use the Frequency Finder 2023 runtime application to update VHF COM and VHF NAV frequency information

d) Conclusion GREPECAS/21/13 – "Actions to advance the implementation of D-ATIS and DCL": the SAM States already have a 2013 document called "Guidelines for the implementation of air-ground data link applications in the SAM Region"

e) Conclusion GREPECAS/21/21 dealt with the "Development of an action plan for the implementation of Automatic dependent surveillance – broadcast (ADS-B)", urging States/Territories to review the existing Operational Concept for the implementation of ADS-B in the CAR and SAM Regions, including its operational objectives and to support the development of model ADS-B regulations

f) the different subgroups carried out tasks in the areas of Air Traffic Services Inter-facility Data Communication (AIDC) implementation and AMHS circuits implementation, and several workshops of interest to the CNS area and the work carried out were held.

Radio Spectrum Management

5.2.2 Under WP/23 presented by Brazil, the importance of radio spectrum management for aviation was addressed and details the key issues to be discussed at the next World Radiocommunication Conference (WRC-27), organized by the International Telecommunication Union (ITU). The most relevant points were highlighted below.

Objectives and Main Issues

Protection of the spectrum used by aviation:

a. Aviation safety depends on access to interference-free frequencies for CNS systems.
b. Possible threats to the aeronautical spectrum are identified due to the expansion of mobile and satellite networks.

Collaboration with the ITU and ICAO

ICAO is committed to defending aviation's interests in the ITU to ensure the compatibility of aeronautical systems with new technologies. The importance of actively participating in technical studies and international regulatory processes to protect critical frequency bands was underlined.

Critical Spectrum Issues for WRC-27:

4.2-4.4 GHz band: Used by radio altimeters and onboard wireless systems.
15.4-15.7 GHz band: Reserved for weather radars and airport surveillance equipment.
New spectrum allocations for international mobile telecommunications (IMT) and satellite networks pose potential conflicts.

Growing Demand for Spectrum

With increasing air traffic and the introduction of new technologies, it will be necessary to optimize spectrum use and seek new allocations for aviation.

Conclusion

The report highlighted the need to defend aviation access to the radio spectrum at WRC-27 to ensure the safety and efficiency of global air traffic. It also called on States and organizations to support ICAO's position in international negotiations and to consider the implications if essential frequency bands are not protected.

ADS-B, Multilateration (MLAT) and Other ATS Surveillance Implementation

5.2.3 Under WP/24, Brazil detailed the implementation of ADS-B in Brazil and plans to complement air surveillance through a MLAT system at the Porto Alegre terminal. Key Points

1. ADS-B Implementation in Brazil
a) ADS-B improves the accuracy and coverage of air surveillance, especially in areas without efficient radar coverage.
b) First phase: Implementation in the Campos Basin, with future expansion to the Santos and Espírito Santo basins (complete by 2026).
c) Continental ADS-B Project: It will extend coverage to all continental Brazilian airspace above FL 245 level, with a mandatory mandate expected by 2030.
d) Brazil is also considering the use of satellite solutions to improve surveillance in oceanic airspace (target: 2027).

2. Multilateration in Porto Alegre (MLAT)
a) Due to flooding in 2024 that affected the radars at Salgado Filho International Airport (SBPA), the installation of new radars in Canoas (SBCO) and Caxias do Sul (SBCX) was adopted.
b) The MLAT system will complement ATS surveillance at low flight levels and provide redundancy for the installed radars.
c) Surveillance will extend from FL035 to FL195, allowing the identification and monitoring of aircraft position, trajectory, and speed in real time.

3. Lessons Learned
a. The need to better position ADS-B antennas to avoid interference and optimize coverage was identified.

b. In future projects, priority will be given to verifying the telecommunications and security infrastructure of the installation sites.

5.2.4 WP/24 underlined Brazil's commitment to modernizing the ATM system through advanced technology, ensuring a high standard of safety. IATA supported the WP and would like to recognize the good coordination made between DECEA and airlines to establish an adequate mandate for ADS-B implementation, without generating extra costs to airspace users. IATA commented that it should be a model to be followed by the CAR/SAM States.

5.2.5 Regarding Space Based ADS-B, IATA would like to recommend that this initiative be done in close coordination with South Atlantic ANSPs, mainly those responsible by European (EUR)/SAM Corridor Operations.

5.2.6 Concerning MLAT implementation in Porto Alegre, IATA recognised that it was a good way to provide a prompt response to the unprecedented flood that destroyed air navigation and airport equipment in the region. IATA suggested that DECEA provide information regarding this implementation in the next GREPECAS and SAM/IG meetings, including cost-benefit analysis, taking into consideration that MLAT might be a solution for airspaces with significative GNSS interference and high level of complexity/volume of traffic. The States noted the information provided and thanked Brazil for sharing this experience.

5.2.7 Under IP/16, the Secretariat presented a summary of the CAR Region's activities to implement the ADS-B system and its role in the development of regional operational objectives. Key points:

a) Implementation Progress: Barbados, Mexico, Trinidad and Tobago, and the Central American States together with COCESNA have almost completed the necessary enablers for ADS-B, except for the national regulation to fully operate it.
b) ADS-B Enablers: Implementation requires ground infrastructure, avionics capacity, personnel training, and national regulations.
c) Regional Collaboration: Mexico has issued an ADS-B regulation, and Central America and COCESNA plan its mandatory implementation by January 2025. Coordination with IATA and airlines facilitates the transition.
d) Expected Benefits: ADS-B will improve safety in areas without radar coverage in the Caribbean, support the reduction of airspace separations, and offer operational benefits to airlines.

5.2.8 It was recommended to continue evaluating the implementation and extend the learning from this phase to other States in the CAR region to ensure efficient and safe deployment of the ADS-B system.

5.2.9 Under NI/11, Argentina presented the progress in the modernization program of air traffic surveillance systems in Argentina, promoted by the air navigation services provider (*Empresa Argentina de Navegación Aérea* - EANA). This programme, developed in collaboration with the national industry, includes the updating of secondary radar systems, with advanced capabilities such as Mode S and ADS-B, and the expansion of coverage through the installation of new systems and autonomous stations. The main objectives of the project are to improve safety and efficiency of air navigation and promote the

economic development of air transport. The following components of the program are highlighted:

a) Renewal of 22 SSR systems in the country and addition of five ADS-B stations.
b) Installation of multi-sensor systems to improve monitoring in terminal areas.
c) Training of technical personnel in the operation and maintenance of these systems.
d) The approval of the new RSMA S/A sensor developed by INVAP has been a collaborative process between the ANSP, the Aeronautical Authority and technical teams, complying with ICAO standards.

5.2.10 Under WP/36, COCESNA reported on strengthening communications and exchanging aeronautical surveillance data between the Central American Corporation of Air Navigation Services (COCESNA) and the Mexican Airspace Navigation Services (SENEAM). This exchange began with a cooperation agreement in 2008 and was expanded in 2023 to include more surveillance sensors and improve voice and data communications. Main points:

- Improve surveillance and automation in the control centres of both countries, covering coverage gaps in airspace controlled by Belize and Guatemala.
- ATS communication channels. The use of communication channels between air traffic control units in Mexico and Central America was formalized, improving efficiency and safety.
- Implementation of the AMHS service: An aeronautical messaging service (AMHS) was implemented that facilitates coordination and system redundancy, improving message distribution and response capacity to failures.

5.2.11 COCESNA highlighted the importance of this type of initiative to maximize resource use, increase operational capacity and efficiency, and improve air safety and suggested continuing to explore cooperation between air navigation service providers in the region. The States thanked COCESNA for the information provided and highlighted the initiative as an experience that should be replicated among States in the region.

5.2.12 IATA supported and welcomed COCESNA and Mexican SENEAM´s initiative on sharing ATS Surveillance. This is an initiative that has been pursued for a long time in GREPECAS and NACC/SAM Implementation Groups with few results. This initiative should be considered as a model for CAR/SAM States, taking into consideration that they result in safer and more efficient operations, as well as in a possible ANPS` savings on implementing extra sensors to cover an area already covered by a neighbouring ATC Facility.

Telecommunication Networks

5.2.13 Under WP/26, Brazil reported on the Brazilian Air Traffic Network (ATN-BR) network, based on IP technology and designed to support air traffic services such as VHF radio communications and radar. The network proved to be fundamental in the resilience of the CNS/ATM system during the floods. The network was used to maintain control of the airspace, even with severe damage to the airport and communications infrastructure in the region. Key points:

- During the floods, satellite links and backup systems were used to ensure the continuity of air traffic control services in affected areas, such as Porto Alegre.

- Satellite stations and mobile radars were installed in nearby cities to replace affected infrastructure and manage humanitarian air traffic.
- The document concluded that the ATN-BR network is flexible and efficient, allowing for the rapid reconfiguration of critical services during natural disasters.

5.2.14 Brazil invited the CAR/SAM States to consider the implementation of a similar software-based network for the CAR/SAM region to meet the planning and safety requirements established by ICAO (WP/26). The States noted Brazil's activities regarding air traffic services and supported the proposal to establish a Defined Network that can be implemented throughout the CAR/SAM Regions.

5.2.15 Under WP/46, the Secretariat summarized the progress in the CNS projects in the Caribbean (CAR) to improve air navigation and radio spectrum management. Information was provided on the status of implementation of the Caribbean Air Navigation Services Network (CANSNET), which will enter into operation in 2026, the execution of the project to develop the States' air navigation plans, and the status of AIDC implementation (46%). It was also reported that work is underway to create an ad hoc group to evaluate the "Frequency Finder" application and develop more advanced software for the management of the aeronautical frequency spectrum and other initiatives such as cybersecurity for air navigation. The States noted the suggested actions and will notify where appropriate to receive the necessary support to be able to actively participate in the different activities of the working groups that must be addressed in the topics of air navigation focused on CNS.

5.2.16 Haiti agreed with the suggested actions of WP/46 and emphasized on the vital role of the Project RLA/09/801 – Multi-Regional Civil Aviation Assistance Programme (MCAAP) mechanism to support States in this process. The issue of frequency management for the aviation service remains a growing concern to deal with, nationally. Therefore, Haiti would welcome any regional approach that could help improving this aspect. Haiti intends also to use more actively the MCAAP Project as the State is currently undertaking a substantial project leading to some transformations in the CNS/ATM field.

Controller Pilot Data Link Communications *(CPDLC)*

5.2.17 Under WP/32, Brazil presented a report on the implementation of the CPDLC system in Brazil's upper airspace. This system allowed for improved communications between pilots and controllers through pre-formatted and standardized messages, partially replacing voice communications.

1. Main objective:

a) CPDLC improves the efficiency of aeronautical communications, reduces congestion in voice channels, and decreases the workload of controllers and pilots.
b) Implementation in Brazil began in 2009 in oceanic airspace and was expanded to continental airspace above FL250 (25,000 feet) in 2021.

2. Benefits and challenges:
   a) Improves safety, coverage and availability of communications, in addition to reducing misunderstandings and frequency congestion.
   b) The system faces challenges related to training, updating of operating manuals, and integration with air traffic automation systems (SAGITARIO).

3. Phased implementation:
   a) The implementation has been carried out in phases to ensure users' gradual adaptation to the system. Tests have been carried out to ensure the correct functioning of the CPDLC.

4. Next steps:
   a) It is planned that the CPDLC will be fully operational throughout the Brazilian upper airspace by December 2024, including new regions such as FIR-Curitiba.
   b) The aim is to promote the modernization of the air fleet and the use of the system among airlines to maximize operational benefits.

5.2.18 Brazil urged ICAO and States to establish standardized indicators to measure the effectiveness of the CPDLC and to work together with airlines to ensure the updating of aircraft and maximize the adoption of the system in the CAR and SAM Regions.

5.2.19 Venezuela observed with great interest the entire process developed by Brazil, as well as the good practices and experiences obtained throughout its implementation. It is also important that the SAM region initiate efforts to establish standardized indicators to measure the effectiveness of the CPDLC implementations in terms of operational benefits.

5.2.20 IATA supported and welcomed DECEA´s initiatives on providing D-ATIS/DCL in 26 airports and Continental/Oceanic CPDLC. This is a model that should be followed by CAR/SAM States, as requested, for example, in the CONCLUSION GREPECAS/21/13 - ACTIONS TO ADVANCE THE IMPLEMENTATION OF THE D-ATIS AND THE DCL. IATA suggest making full use of the continental CPDLC by using the loadable routes functionality to clear an even more direct routing in Brazilian Airspace.

Global Navigation Satellite System (GNSS)

5.2.21 Under WP/40, Argentina addressed the issue of interference in the GNSS, detailing both preventive and corrective measures. In addition, a case study on GNSS interference at Jorge Newbery Airport in Buenos Aires was included. It was noted that the use of GNSS-based navigation continues to increase due to its advantages over conventional systems, such as greater precision and efficiency, however, interference in these signals, whether intentional or not, represents a significant challenge to operational safety.

5.2.22 ICAO and other international organizations have issued resolutions to protect frequencies used by aeronautical systems. These resolutions urge States to mitigate GNSS interference, coordinate with national telecommunications authorities, and maintain and update conventional radio aids as a contingency in the event of GNSS interruptions. Argentina referred to the Jorge Newbery Aeropark Case Study, in which, in 2018, interference was detected in the GNSS signals of aircraft parked at the Jorge Newbery Aeropark, which affected its operation.

5.2.23 Through coordinated work between aeronautical and telecommunications authorities, sources of interference were identified, such as mobile phone stations, tracking devices in vehicles and LED lights at the airport. Corrective measures included technical adjustments to equipment and the removal of problematic devices. It was indicated that guidance material compiling preventive and corrective measures for cases of GNSS interference must be created at a regional level, strict control over airports' sources of electromagnetic radiation must be maintained, periodic preventive assessments must be carried out, and the use of DME navigation as an alternative in cases of GNSS failures must be evaluated.

5.2.24 The importance of a comprehensive strategy to manage and mitigate GNSS interference was mentioned, and a collaborative approach between States and aeronautical organizations was proposed. States noted the information provided, regarding the growing threat of GNSS interference to aviation safety and the need for coordinated actions at regional and international levels to prevent and mitigate this risk.

5.2.25 IATA supported this working paper including implementation of ground navaids to be used of backup of GNSS, based on recommendation of the ICAO 14th Air Navigation Conference and suggested the inclusion of the study and implementation of ground navaids as GNSS back-up in the GREPECAS working programme. COCESNA thanked them for sharing their experiences on this problem. The analysis and conclusions are useful for the study and solution of radio spectrum interferences of a wide nature. They also indicated that GNSS interferences, which, according to the site https://gpsjam.org/, are low-level for the Central American region, but that the Working Paper helped to understand the global panorama to prevent the occurrence of the same.

5.2.26 COCESNA also indicated that "Available Information and References", it is convenient to refer to the recent update of the Radio Regulations by the ITU (see web link below) which will be useful to support the suggested Management before the Spectrum Regulatory entities so that they support the elimination of the sources that originate the interference to the GNSS, as in the case cited for Aeroparque Jorge Newberry, of course protected by the applicable Telecommunications Laws of each country that are consistent with the ITU regulations.

https://www.itu.int/en/mediacentre/Pages/PR-2024-07-04-ITU-Radio-Regulations.aspx?utm_source=ITU+News+Newsletter&utm_campaign=014edf009b-EMAIL_CAMPAIGN_30_07_2024_ITU-NEWSLETTER_COPY_01&utm_medium=email&utm_term=0_-2f420cccc6-%5BLIST_EMAIL_ID%5D&ct=t(EMAIL_CAMPAIGN_30_07_2024_ITU-NEWSLETTER_COPY_01)&mc_cid=014edf009b&mc_eid=2b41b14300

5.2.27 France supported this WP and shared the concerns expressed regarding GNSS jamming and spoofing, which have become a global safety concern, and run against the efforts of the aviation community to improve efficiency through the use of GNSS-based navigation and surveillance. France stands ready to work collaboratively with the aviation community in order to reduce and mitigate GNSS Radio Frequency Interference.

5.2.28 Under WP/42, France addressed safety recommendations for PBN landings with Barometric Vertical Navigation (Baro-VNAV), following a serious incident in May 2022 at Paris-Charles de Gaulle Airport. In May 2022, an Airbus A320 had a serious incident during a PBN Baro-VNAV approach at Paris Airport due to an incorrect altimeter setting (altimeter sub-scale setting to obtain elevation when on the ground -QNH). This led to a near-collision with the ground.

5.2.29 France has vast experience in PBN operations with SBAS and Baro-VNAV but has identified risks related to the incorrect use of QNH. France identified a common error as the incorrect introduction of the barometric adjustment, which can deviate the flight profile by up to 280 feet, putting the safety of the operation at risk, in addition to the threats inherent to Baro-VNAV not being taken into account when introducing Required Navigation Performance (RNP) Approach (APCH) procedures, which could have contributed to the risk of Controlled Flight Into Terrain (CFIT).

5.2.30 The report highlighted that in United States, fewer similar incidents are observed due to factors such as the use of inches of mercury (instead of hectopascals) for altimeter adjustment and a higher transition level for changing the altimeter reference, which reduces the likelihood of errors. The WP recommended a global re-evaluation of the risk of CFIT associated with Baro-VNAV and the updating of ICAO standards and recommended practices to improve the safety of these operations.

5.2.31 States are encouraged to consider SBAS capabilities, which provide a level of safety comparable to Instrument Landing System (ILS), and to improve training and operational procedures to mitigate the risks of incorrect QNH adjustment. Venezuela highlighted the importance of the report of the incident that occurred in France. In this regard, the need to continue documenting the risks of incorrect QNH adjustment will contribute to progressively monitoring operational obstacles that have not been detected. In addition, ANSPs are urged to promote continuous safety, especially in Air traffic controllers (ATCOs).

5.2.32 Dominican Republic supported the WP and mentioned that is immersed in a project to restructure Dominican airspace, which includes the design of BARO-VNAV approaches. With French experience as support, it is crucial to prepare CTA personnel in the importance of providing the correct QNH and being attentive to pilot communications during these approaches.

5.2.33 IATA supported the implementation of the mitigation measures to assure the operations safety. The Implementation of SBAS will be affected by ionosphere scintillation in most of the CAR/SAM Regions.

5.2.34 IATA´s suggested a pragmatic approach to propose/study the use of SBAS mitigation of the pilot BaroVNAV errors, taking into consideration the issues previously mentioned, and three general requirements should be considered:

1. SBAS mandates are operationally unjustified.
2. Operational restrictions due to lack of SBAS equipage are unjustified; and
3. SBAS costs should not be imposed directly or indirectly on airlines that do not use the technology.

5.2.35 The Secretariat indicated that SBAS support PBN in all phases of flight with an increased accuracy, integrity and availability compared to ABAS. Increases accuracy and integrity for the vertical guidance. In addition, the Secretariat indicated that it supported all PBN navigation specifications, with a deployment emphasis over RNP APCH down to Localizer Performance with Vertical guidance (LPV) or Localizer Performance (LP) minima at 250 ft / 80 m (Approach Procedure with Vertical guidance (APV) I performance) or 200 ft /60m (Category I performance).

5.2.36 SBAS needs different enables to be implement prior the operational as SBAS: receivers integrated with the aircraft navigation system, SBAS ground Station, GNSS core constellation. In that sense the Secretariat recommended that every State before to do this kind of implementation development an operational and technical analysis, cost benefits according with their operational objectives in conjunction with the different stakeholders, as result of this analysis States and airlines will develop an action plan for success SBAS implementation.

5.2.37 The implementation of any ASBU element needs to satisfy an operational requirement and it is important that all the parts involved must be integrated, since it requires infrastructure on the ground and on board the aircraft, without this set operating, the implementation could not achieve the expected results.

5.2.38 Under WP/44 Brazil addressed the risks of interference in the GNSS, such as jamming and spoofing, and their impact on civil aviation safety. In addition, Brazil's efforts to mitigate these risks by implementing additional ground infrastructure, such as the Distance Measuring Equipment (DME) aids network and a national plan for the maintenance of conventional navigation aids, were highlighted. Brazil indicated that it has experienced interference at Guarulhos Airport, which affected Area navigation (RNAV) procedures and resulted in flight cancellations and delays. DECEA has initiated a project to expand the DME aids network, providing complementary ground infrastructure to support navigation operations, reducing the exclusive reliance on GNSS.

5.2.39 A national plan is also being developed to implement and maintain conventional aids, such as DVOR, ensuring a minimum contingency structure in case of GNSS failures. The need to create regional procedures to report GNSS interference was highlighted, in order to coordinate actions and ensure operational safety, and the creation of an ad hoc forum or group to evaluate GNSS interference and its solutions in the CAR/SAM Regions was proposed.

5.2.40 It was suggested to share experiences of GNSS interference, discuss ways to mitigate the risks derived from interference in GNSS and consider the creation of a regional forum to evaluate the problem in detail.

5.2.41 Costa Rica thanked Brazil for sharing the contingency plan for satellite navigation due to interferences that occur in GNSS and that affect Global Positioning System (GPS) positioning information and supports the proposed actions. In turn, it is recommended that it be part of a comprehensive contingency plan for GNSS-based services. For example: incorporating the contingency into the main source ADS-B surveillance, considering that at the moment that interference occurs in GPS, ADS-B positioning information is affected.

5.2.42 United States supported Brazil's commitment of resources with the objective of expanding its DME systems as a complement to GNSS for air navigation. IATA supported and recommended that all initiatives regarding GNSS interference considers the AN CONF/14 Recommendation 2.2/2 – Addressing global navigation satellite system interference and contingency planning.

5.2.43 Regarding the DME/DME back-up, IATA supports such initiative and recommends a regional harmonization and that a cost-benefit analysis be performed, taking into consideration, among other aspects, the actual occurrences of GNSS interference and the complexity/volume of traffic in the airspace.

5.2.44 Under NI/12, Argentina presented considerations on the deployment of 5G technology in Argentina, focusing on its impact on air navigation and possible interference with aircraft radio altimeters due to the proximity of frequencies. 5G implementation, regulated since 2022, requires coordination measures to avoid interference in adjacent bands, especially near airports during critical flight phases. Key aspects:

- national regulation requires 5G operators to take synchronization measures to avoid harmful interference in nearby frequencies
- the aeronautical authority will participate in the coordination of these actions and in studies to protect the aeronautical spectrum.

5.2.45 Under IP/14, United States addressed mitigation of jamming and spoofing of Global Navigation Satellite System (GNSS) signals in aviation, issues that affect the safety and efficiency of air transportation. These interferences can cause signal loss or false data in critical navigation systems, complicating air operations. Key points:

- Jamming blocks GNSS signals, preventing proper navigation.
- Spoofing introduces false signals, fooling GNSS receivers.

5.2.46 Timely detection and reporting of GNSS interference events is crucial to ensure successful mitigation efforts. An accessible reporting platform should be maintained by the Civil Aviation Authorities (CAAs) and/or the ANSPs to facilitate event reporting, integration with reports provided by other CAAs and/or ANSPs. See as a reference the FAA platform in the following link:

https://www.faa.gov/air_traffic/nas/gps_reports

5.2.47 Mitigation measures were recommended, such as cooperation between aviation authorities, manufacturers, and operators, along with detection and reporting mechanisms. Boeing is working on avionics solutions to address these threats and improve post-event recovery.

5.3 Aeronautical Meteorology (MET) and Environmental Protection (ENV)

Implementation of the MET Requirements for the CAR and SAM Regions

5.3.1 Under IP/08, the Secretariat presented the most relevant results in the implementation of the MET requirements for the CAR and SAM Regions, achieved since GREPECAS/21. Similarly, reported on cooperation with States and other organizations such as the World Meteorological Organization, for the implementation of the Standards and Recommended Practices (SARPs) contained in ICAO Annex 3.

5.3.2 Despite efforts in training and dissemination of new and pending provisions, the adoption by Member States continues to progress slowly. The complexity of the requirements, lack of resources in meteorological authorities, and training of aeronautical meteorological personnel are the most significant challenges. The discussion considered it essential to strengthen efforts to accelerate the implementation of:

a) quality management system in MET processes;
b) exchange of Operational meteorological (OPMET) message information in ICAO Weather Information Exchange Model (IWXXM) format; and
c) provision of harmonized Significant Meteorological information (SIGMET) messages

5.3.3 The discussion also emphasized the need to continue disseminating the following topics in accordance with the documents in Appendices of IP/08:

a) The changes introduced in the World Area Forecast System (WAFS), that will take effect from November 2024, and
b) The Information on Quantitative Volcanic Ash (QVA) that will come into operation from November 2025.

Adverse Meteorological Phenomena Impacting Aviation Safety

5.3.4 Under WP/10, the Secretariat expressed growing concern over the increasing frequency and intensity of adverse meteorological phenomena impacting aviation safety. Events such as severe thunderstorms, turbulence, heavy rain, and even droughts (affecting the availability of electrical power) have become more common, as has their association with aviation incidents and disruptions to airport operations. Scientific evidence suggests a correlation between these phenomena and climate change, indicating that global warming may be intensifying and making these extreme events more frequent.

5.3.5 The Secretariat has proposed a set of proactive actions to address the risks associated with climate change and climate variability in aviation. These actions include the systematic collection of meteorological data, analysis to improve forecasting systems, and the promotion of international cooperation to develop mitigation and adaptation strategies. Various States in the region have

concurred with this concern, highlighting the observed changes in climate, synoptic and mesoscale patterns and the need to analyse how these phenomena affect the provision of air navigation services, airport operations, and airspace management.

5.3.6 The exchanges on the platform resulted in interesting perspectives as inputs for GREPECAS activities:

a) collecting data on the impact of severe weather phenomena to identify new risks and develop mitigation procedures

b) promoting dissemination and training activities to better understand the impact of severe weather phenomena on aviation

c) participating in Aircraft-Based Observations (ABO) programmes such as AMDAR, Automatic Dependent Surveillance – Contract (ADS-C), and ADS-B to improve the accuracy of numerical prediction models and weather forecasts

d) intensifying work with groups such as PA-RAST and GTE to identify and address risks, such as LHD and air traffic conflicts

e) encouraging collaboration with adjacent ACCs to establish specific traffic flows and reduce workload

f) promoting the development of flow control procedures for high-demand situations.

5.3.7 After evaluating the information and based on the exchanges, the following conclusion was approved:

CONCLUSION GREPECAS/22/9	**DISSEMINATION OF THE IMPACTS OF SEVERE WEATHER PHENOMENA ON THE SAFETY OF AIR OPERATIONS**
What: That, a) States, International Organizations, and service providers collect information on the impact of severe meteorological phenomena on the safety of air operations and airport operability; b) the Secretariat work in coordination with International Organizations, States, and service providers to organize dissemination activities on severe phenomena, and their impact on aviation;	**Expected impact:** ☒ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Operational/Technical

c) the Secretariat work in coordination with International Organizations, States, and service providers to analyse severe phenomena that have impacted air operations and airport operability to assess the emergence of new risks associated with these phenomena by GREPECAS/23; and d) the Secretariat work in coordination with International Organizations, States, and service providers to establish mitigation procedures for these new risks, if determined.	

Why: States parties are required to ensure the operational safety of air operations by providing services and information that ensure a real situational awareness of the environment in which the air operation will take place.			
When:	GREPECAS/23	**Status:**	☒ Valid / ☐ Superseded / ☐ Completed
Who:	☒ States ☒ ICAO ☒ Other:		International Organizations and Service Providers

Implementation of Essential Meteorological (MET) Services

5.3.8 Under WP/18 and in alignment with GREPECAS Conclusions 19/02 and 19/09 and discussions from GREPECAS/20, the Secretariat proposed a standardized framework to monitor and verify the implementation of essential meteorological (MET) services for international air navigation in the CAR/SAM Regions. This framework is crucial to promote safety and efficiency.

5.3.9 The proposed framework incorporates various elements, including the BBB structure, GANP and electronic Air Navigation Plan (eANP) guidance, national regulatory context, and national methods. It also emphasizes the importance of a regional dashboard to track implementation progress and support informed decision-making.

5.3.10 The Secretariat highlighted the need for effective collaboration between CAAs, MET Authorities, and service providers as crucial for the successful implementation of the verification process and to facilitate data collection, analysis, and reporting, ensuring the timely and accurate delivery of essential meteorological services in accordance with ICAO Annex 3 provisions.

5.3.11 After evaluating the information referred to MET services, the Meeting considered the adoption of a Conclusion that fosters the periodical verification of the BBB defined by the GANP for the MET. In addition, the Meeting identified the need of applicating the said verification to the AIM, SAR, ATM, and Aerodrome Operation (AO) services, as included in the BBB framework. In that sense, the following Conclusion was approved:

<table>
<tr><td colspan="2">CONCLUSION GREPECAS/22/10</td><td colspan="2">PERIODICAL VERIFICATION OF THE BASIC BUILDING BLOCKS OF MET, AIM, SAR, ATM AND AGA SERVICES</td></tr>
<tr><td colspan="3">What:
That,

a) the NACC and SAM Regional Offices develop the dashboard associated with the Basic Building Blocks (BBB) enunciated in the GANP for MET, AIM, SAR, ATM, and AGA services in coordination with the States, Territories and International Organizations in line with the CAR/SAM RANP work plan and report it to GREPECAS/23;

b) the States, Territories and International Organizations support the work of the Regional Offices to continue the development of the mentioned BBB verification process; and

c) the States, Territories and International Organizations strengthen the surveillance and oversight processes, as well as quality control, to generate synergy with the verification process presented, combine national efforts and feed the dashboard.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
In accordance with the provisions of GREPECAS, it is necessary for States to establish and monitor the implementation status of the MET, AIM, SAR, ATM, AGA services through the verification of the BBB and represent the results in a dashboard.</td></tr>
<tr><td>When:</td><td>GREPECAS/23</td><td>Status:</td><td>☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☐ Other:</td><td colspan="2">Secretariat, States</td></tr>
</table>

Western South Atlantic Tropical Cyclone Advisory Centre (TCAC)

5.3.12 Brazil, through WP/30, informed the meeting of the interest, as States, to establish a Tropical Cyclone Advisory Centre (TCAC) in the coverage area of the western South Atlantic to be defined in the requirement, to support international air navigation as part of the CAR/SAM Regional Air Navigation Plan (Doc 9750).

5.3.13 Brazil informed the Meeting of the background on the likely determination of the requirement to establish a TCAC for the Western South Atlantic. Brazil reminded GREPECAS about the various meetings, at the ICAO level and at the level of the World Meteorological Organization (WMO), in which the possibility of establishing the requirement of a CAGR for the Western South Atlantic has been evaluated.

5.3.14 Brazil reminded the meeting that WMO initiated a study of the need to establish a TCAC for the Western South Atlantic due to the occurrence of Hurricane “Katarina” in 2004. However, Brazil highlighted in its note that no other hurricanes have developed subsequently, but deep extratropical cyclones have developed, prior to a hurricane.

5.3.15 The Meeting agreed that international collaboration in cyclone monitoring and reporting is very important as it is crucial to mitigate the impacts of these severe events and minimize their effects on operations and safety.

5.3.16 Brazil informed the Meeting that, in the State, there are several agencies that collaborate in meteorological monitoring. In addition, there are institutions dedicated to the scientific research of meteorological events, as well as to the development of software and technologies for the monitoring of meteorological systems and their prediction.

5.3.17 Brazil reported that the implementation of the TCAC will be a shared task among all these agencies and institutions, but it is clarified that the Integrated Centre for Aeronautical Meteorology (CIMAER) would be responsible for the TCAC, in this proposal.

5.3.18 The Meeting supported Brazil's proposal, and once the requirement to establish a TCAC for the Western South Atlantic is assigned to the State of Brazil, in the CAR/SAM Regional Air Navigation Plan.

5.3.19 The Meeting has considered that a TCAC is a meteorological centre that must be designated under a regional air navigation agreement.

5.3.20 The Meeting also noted that the WP presented by Brazil, requesting support to implement a TCAC of Brazil for the South Atlantic has been endorsed by the virtual phase of the GREPECAS/22 Meeting.

5.3.21 The Secretariat clarified that GREPECAS can provide the agreement but that the establishment is subject to technical and administrative evaluations that must be conducted by ICAO Headquarters and other multilateral organizations.

5.3.22 The Secretariat also recalled that the implementation of the TCAC, once the processes are completed, implies the amendment of Vol. I of the CAR/SAM Regional Air Navigation Plan.

5.3.23 The Meeting, after considerations, has issued the following Decision:

<table>
<tr><td colspan="2">DECISION GREPECAS/22/11</td><td colspan="2">REGIONAL AGREEMENT FOR THE IMPLEMENTATION OF A TROPICAL CYCLONE ADVISORY CENTRE (TCAC)</td></tr>
<tr><td colspan="3">What:
That,
a) GREPECAS/22 decides to support the regional air navigation agreement for the establishment of a TCAC for the South Atlantic;
b) the Secretariat communicate to the Air Navigation Commission the decision to support the establishment of the TCAC;
c) the Secretariat coordinate administrative and technical arrangements, with Headquarters and other multilateral organizations, for the implementation of the TCAC for the South Atlantic;
d) Brazil implement the TCAC once the technical processes with the Headquarters and the multilateral organizations involved have been completed; and
e) the Secretariat manage the amendment to Vol. I of the CAR/SAM Regional Air Navigation Plan, once the process of establishing the TCAC has been completed.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
Due to tropical and extratropical cyclone events that have occurred in the South Atlantic whose area is not under the coverage of any of the currently existing TCACs</td></tr>
<tr><td>When:</td><td>By GREPECAS/23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ State: Brazil ☒ ICAO ☒ Other:</td><td colspan="2">ANC, HQ and WMO</td></tr>
</table>

Environmental Protection (ENV)

5.3.24 The Secretariat, through WP/11, informed the Meeting of ICAO's environmental protection initiatives. the Meeting noted that the main tool for monitoring States' actions to support ICAO's environmental protection initiatives are the State Action Plans (SAP) for the Reduction of CO2 Emissions from International Civil Aviation. The Secretariat reported on the status of SAPs at the global level.

5.3.25 The Meeting noted that, within the basket of measures suggested by ICAO, for the reduction of CO_2 emissions are operational improvements. The Secretariat urged the Meeting to actively participate in the development and implementation of SAPs. The Meeting realized that the key step in developing a plan of action is to ensure the commitment of all stakeholders involved in civil aviation matters in the State. Air operators, airport authorities and air navigation service providers (ANSPs), among others, are essential parts of this Plan.

5.3.26 The Secretariat stressed that quantifying the information contained in an action plan allows ICAO to compile global progress towards meeting global aspirational goals and for States to demonstrate their contribution.

5.3.27 The Meeting noted that, for ANSPs, there is a need to consider the adoption of the ASBU that facilitates the implementation of improvements in air traffic management. This methodology allows States to improve their air navigation capabilities in accordance with their specific operational requirements, as well as enabling aviation to achieve global harmonization, greater capacity and improved environmental efficiency.

5.3.28 The Meeting considered that GREPECAS should establish a link between the objectives of capacity and efficiency and that of environmental protection, through CO2 emission savings data derived from the operational improvements implemented. States indicated that it is important to have indicators on the contribution of operational improvements to CO2 emission savings and positive impact on the environment.

5.3.29 The Meeting also stressed that coordination with other working groups, such as the CAEP, is necessary so as not to duplicate efforts in the task of preparing indicators, for environment issues. It has also been highlighted that, in addition to Doc 9988 – "Guidance on the development of action plans by States for CO2 emission reduction activities", the CANSO Green ATM Accreditation Programme guide is another reference that can be used by States and ANSP to plan activities that lead to a reduction in their aviation-related CO2 emissions.

5.3.30 From this discussion, the Meeting adopted the following conclusion:

CONCLUSION GREPECAS/22/12	**ENVIRONMENTAL STRATEGY IN THE NAM/CAR/SAM REGIONS**
What: That, a) States support their counterparts in charge of the States' Action Plans on CO_2 emissions reduction in their corresponding States, to complete the development or update of this plan to emphasize the benefits derived from the operational improvements implemented by integrating quantified data, b) GREPECAS establish a link between the capacity and efficiency objectives and environmental protection objectives, through data on CO_2 emission savings derived from operational improvements implemented through the Aviation System Block Upgrade (ASBUs) by GREPECAS/23.	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Operational/Technical
Why:	

Following ICAO Assembly resolutions, States agreed to support the aviation industry's transition to cleaner energy sources and achieve the net-zero 2050 global aspirational goal.		
When:	GREPECAS/23	**Status:** ☒ Valid / ☐ Superseded / ☐ Completed
Who:	☒ States ☒ ICAO ☐ Other:	Secretariat, States

5.4 Aeronautical Information Management (AIM)

AIM Transition/Implementation

5.4.1 The Secretariat presented WP/12 with updates on activities, projects, and priority topics related to implementing AIM for the CAR/SAM Region. WP/12 details how the Secretariat continues supporting the implementation of AIM, including the implementation of Digital Data Sets (DDS), the electronic Aeronautical information Publication (e-AIP), Standard Information Exchange Model, the update of World Geodetic System - 1984 (WGS-84) data, and Electronic Terrain and Obstacle Data (e-TOD). WP/12 also reported follow-up by State of the electronic Air Navigation Plan (eANP) Table and the requests for AIM transition assistance made by the NACC/WG AIM/TF, the Seventeenth SAM Regional Multilateral Workshop/Meeting for the Transition from AIS to AIM (SAM/AIM/17), held from 27 to 31 May 2024 as well as the NACC/WG AIM/TF 7th face-to-face meeting held from 30 July to 2 August 2024.

5.4.2 WP/12 discussed the establishment of AIM Subgroups within the ICAO NACC/WG/AIM/TF considering the new 7th edition of the GANP, the eANP, the ASBU and the BBBs related to AIM and its KPI's. These Subgroups are designed to be more efficient in completing assigned tasks and discussions per their set Action Plan to mitigate, assist States, and realize the set targets within the set and/or agreed-upon trajectory.

5.4.3 Regarding the CAR Region, WP/12 emphasized the ongoing collaboration among member states to support the AIM transition, AIM proper training curriculum, English Language deficiencies regarding AIM personnel, etc. It highlights the importance of the AIM Task Force's role in assisting States with the DDS Workshop and the updated Roadmap for the AIS to AIM Transition. Several key workshops have been held, including those focusing on the electronic Air Navigation Plan (eANP), Global Reporting Format for Runway Surface Conditions (GRF) Implementation, NOTAM Campaign, FPL duplication, and addressing specific needs for AIM transition assistance.

5.4.4 The report outlined significant progress in areas such as developing the e-AIP and improving data quality through a robust Quality Management System (QMS) in AIS/AIM. The efforts to standardize processes and share information across borders are essential for effective data management. Additionally, ongoing training for AIS personnel is crucial to ensure that all team members are well-equipped to handle the challenges of the Transition. The right competencies needed to execute the required tasks is illustrated that it need to be defined and maintained uniform.

5.4.5 Overall, the CAR Region is making strides in AIM implementation, with a clear focus on collaboration and shared resources among States and other NACC/WG Task Forces needing the input from the AIM/TF (such as the Airspace Optimization – ATM/TF, MET/TF, etc.), to facilitate a smooth transition.

5.4.6 Regarding the SAM Region, WP/12 highlights the support received from Brazil in regional tasks for the AIM transition, focusing on the Digital Data Sets Workshop and Phase 2 of the AIS to AIM Transition Roadmap and the workshop held in Panama City. Progress regarding DDS has been detailed, including the Exchange Model, implementation of Data Catalogues, SNOWTAM, the establishment of a Quality Management System in AIS/AIM, Phase 2 of the AIS to AIM Transition, and preparation for SWIM, including the e-AIP, and AIS Personnel Training. It also identifies the challenges facing the region and calls on States to provide support and importance to AIM as an essential process of the ATM concept.

5.4.7 Venezuela noted the information presented in WP12, emphasizing the importance of English proficiency in AIM, as did the Dominican Republic and Haiti. ECCAA stated that the member States of this organization continue to face significant challenges in the implementation of Phase I. Bolivia reported that it has identified some challenges, such as the need to update aeronautical information, implement new technologies, train personnel, and strengthen regional collaboration, and that it will take the necessary actions to overcome the identified challenges. Argentina, Brazil and Peru, and noted the information, and IATA urged reinforcement of the actions related to AIM as indicated in WP12.

NOTAM Publication

5.4.8 IATA presented WP/22, emphasizing the need to comply with ICAO SARPs and international best practices related to Aeronautical Information Management as an essential requirement for the Safety and Efficiency of Air Navigation in the CAR/SAM Regions. WP/22 highlights three current issues in the CAR/SAM Regions that must be considered essential for AIM service provision:

a) the lack of publication of trigger NOTAMs for AIP Supplements
b) the absence of an English version of the AIP
c) the availability of digital aeronautical information products

5.4.9 Regarding the lack of publication of trigger NOTAMs for AIP Supplements, WP/22 stresses that these NOTAMs contain essential information to feed automated systems supporting air operations, making their publication essential for aviation safety and regularity.

5.4.10 Concerning the absence of the English version of the AIP, WP/22 points out that the lack of essential operational information for airlines and pilots in the English version complicates the ability of flight planning service providers to incorporate relevant information into automated systems and products, such as Airport Briefings, which contain essential information for pilots. It is common for Briefings not to be available due to the lack of the English version of the AIP and correlated aeronautical information.

5.4.11 WP/22 notes that the availability of digital aeronautical information products is an essential step toward a global, integrated, and responsive air traffic management (ATM) system. The availability of digital aeronautical information products free of charge is foundational for safe and efficient air navigation in the CAR/SAM Regions.

5.4.12 As part of the suggested actions in WP/22, IATA urges States to comply with ICAO SARPs, PANS, and Guidance Material related to trigger NOTAMs and the English version of Aeronautical Information products. It also suggests making digital Aeronautical Information products available online without requiring a subscription or payment. The Meeting considered that the achievement of ICAO provisions and the AIM services reinforcement, should be fostered by the periodical verification of the AIM service's BBB, as stated in Conclusion GREPECAS/22/10.

5.4.13 Bolivia, Costa Rica, Cuba, El Salvador, Guatemala, Mexico, Suriname, Trinidad and Tobago, United States, Uruguay, and Venezuela, expressed their support for WP/22 presented by IATA and its recommendations, emphasizing the importance of publishing trigger NOTAMs, the availability of aeronautical information in English, and in a digital, easily accessible format. They also stressed the need to enhance the performance of AIM personnel in handling the English language.

5.4.14 Chile reported maintaining its practices and commitment regarding issuing trigger NOTAMs. Concerning the English version of the AIP, the amendment to be published on November 28, 2024, will have 70% of the text available in both languages and by 2025 (the first amendment date), it expects to complete the translation of 100% of its content. Dominican Republic expressed its support for WP/22, indicating that while digital media do not alter the timelines set by the Aeronautical information regulation and control (AIRAC) system, it should certainly be reviewed and updated in line with new technologies.

Other AIM Matters

5.4.15 Costa Rica and Dominican Republic highlighted the need to improve English proficiency among AIM personnel. The Secretariat reminded States that it is essential for AIM personnel to be competent in the use of the English language, but this should be within a framework aligned with the specific needs and functions of AIM rather than applying the "Linguistic Competence" requirements of ICAO Annex 1, which are intended for other operational needs.

5.4.16 Brazil presented WP/25, highlighting its efforts in aviation cybersecurity related to information sharing through the Malware Information Sharing Platform (MISP), in line with the proposals of the ICAO Cybersecurity Panel (CYSECP). Brazil emphasized that to ensure flight operation safety and continuity, air navigation and surveillance systems must be protected in their global information exchanges.

5.4.17 WP/25 describes the MISP as a crucial cybersecurity tool for sharing threat information, facilitating collaboration among organizations, enabling information centralization and sharing, being highly customizable and extensible, connecting users with global cybersecurity communities, and incorporating advanced access control and privacy features, ensuring organizations can share information selectively and securely. In summary, MISP is crucial for managing cyber threats and providing an effective platform for cybersecurity information exchange.

5.4.18 In WP/25, Brazil reports that DECEA began implementing MISP in 2021 and has been using and enhancing this tool since then. The threat indicators and alerts received through MISP are processed and serve as a basis for compiling blocklists or creating firewall rules. Currently, MISP assists in receiving and/or notifying any confirmed or suspected adverse event related to the security of computer systems or networks, contributing to information security in SISCEAB.

5.4.19 In conclusion, WP/25 reaffirms that DECEA's use of MISP significantly improves aviation cybersecurity in Brazil with a proactive approach aligned with international standards, such as ICAO's Cybersecurity Action Plan (CyAP). WP/25 states that Brazil intends to encourage the use of MISP among CAR/SAM region members (Caribbean and South America), with DECEA committed to supporting MISP implementation by offering assistance to Member States wishing to adopt this platform, ensuring a more cohesive and secure approach to cybersecurity in the region.

5.4.20 WP/25 encourages Member States to adopt MISP as a platform for sharing cybersecurity information and work in a collaborative frame to foster the potential use of the MISP platform by Member States.

5.4.21 Bolivia, Cuba, Costa Rica, ECCAA, El Salvador, Guatemala, Mexico and Trinidad and Tobago took note of the information presented by Brazil in WP/25, expressing gratitude for it and supporting Brazil's suggested actions in the document. United States recalled that this topic was discussed at the AN Conf/14 and the Conference agreed to send it to the attention of the CYSEP. As well, IATA suggested that the recommendation to adopt specific technologies (MISP) should be analysed in detail due to the frequent changes in these technologies and coincided that the matters presented are being addressed by the corresponding panel.

5.4.22 Brazil presented IP/10 on the progress in implementing SWIM, highlighting that since 2019, DECEA has published the "SWIM IN THE NATIONAL ATM" guide, which applies to all organizations and members of the Aeronautical Community interested in providing or using information through a national SWIM structure. Additionally, in 2023, a prototype version of the SWIM Registry was published.

5.4.23 As the next steps in the implementation of SWIM, IP/10 highlights that by the end of 2024, DECEA intends to develop the CONOPS for the SWIM office, which will be responsible for governance and overseeing the Registry and certain SWIM services. Additionally, a new version of the Registry will be made available and populated with more services to test processes and gather feedback for the prototype, as well as to increase efforts related to cooperation in registry interoperability initiatives. Costa Rica and Uruguay took note of the information presented and thanked Brazil for the update.

5.5. Aerodromes and Ground Aids (AGA)

Updates on AGA Projects

5.5.1 Under WP/13, the Secretariat presented updates on Aerodrome Programme F projects in the CAR and SAM Regions. It includes information on the certification and operational safety of aerodromes (Project F1), aerodrome planning (Project F2), and the implementation of Airport Collaborative Decision Making (A-CDM) under Project F3.

5.5.2 Regarding Certification and Aerodrome Safety (F1):

- CAR Region: There is a decrease in certified aerodromes, with 97 certified international aerodromes (65%). A 4-year project is being structured with a view to supporting States in the certification of international aerodromes in the region.
- SAM Region: Out of 104 international aerodromes, 60 (57.69%) are certified, reflecting progress since the Bogota Declaration in 2013. Two new certifications have been registered, one in Venezuela and another in Argentina.

5.5.3 Concerning Aerodrome Planning (F2), the Secretariat informed the approved of the "Guidance Material — Airport Consultative Committees"1 by GREPECAS/21 and encourages the States assess its incorporation into national procedures.

5.5.4 Lastly, regarding the A-CDM Implementation (F3), the Secretariat proposed a shift in focus from A-CDM to Surface Movement Guidance Control Systems (SMGCS), addressing safety and efficiency at airports. The Secretariat proposed to update the F3 project.

5.5.5 Bolivia, Costa Rica, Chile, Cuba, ECCAA, El Salvador, Guatemala, Panamá and Uruguay, supported and reiterated their commitments to certify international aerodromes, as well as to establish RSTs (Runway Safety Teams). In addition, Cuba expressed concern about the challenges States face in the aerodrome certification process, as well as the transition with emerging technologies and new airspace users, and therefore airport facilities.

5.5.6 Argentina requested an update of the AGA Dashboard, to which the Secretariat responded by informing that ICAO are currently updating and developing new dashboards for AGA in the CAR and SAM regions through iSTARS2.

5.5.7 IATA proposed omitting certain indicators from the project proposal to avoid potential misunderstandings. In response, the Secretariat revised the proposal to align with this recommendation.

[1] AGA - Aerodromes and Ground Aids (icao.int)
[2] iSTARS 4.0

5.5.8 The Meeting adopted the following Conclusion:

<table>
<tr><td colspan="3">CONCLUSION
GREPECAS/22/13 MODIFICATIONS APPROVAL TO CAR/SAM F3 PROJECT</td></tr>
<tr><td colspan="2">What:
That, to implement Surface Movement Guidance Control System (SMGCS) as part of the F3 Project:

a) the States approve the revised version (modifications) of the CAR/SAM F3 Project at Appendix B to this report.

b) Member States and International Organizations review the proposed modifications to Project F3 and indicate their comments to the Secretariat by than 31 January 2025, and

c) F3 Project Members prepare a detailed action plan, in conjunction with the Secretariat, to carry out such activities, with the identification of priority international aerodromes.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:
To date, the F3 project has focused efforts on promoting the A-CDM concept and prepared an implementation guide accepted by the GREPECAS States. However, the Secretariat proposes new approach of the F3 project, based on the implementation of Surface Movement Guidance Control System (SMGCS) reflected in the revised version of the F3 Project.</td></tr>
<tr><td>When: 1 December 2024</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

Prevention of Wildlife Hazards

5.5.9 Under NI/05, the CAR/SAM Regional Committee for the Prevention of Wildlife Hazards (CARSAMPAF) reported on its activities and projects developed. It highlights the risks posed by wildlife to aviation safety and the importance of managing these risks effectively. CARSAMPAF, established in 2003, works across Central America, the Caribbean, and South America to coordinate efforts aimed at reducing aviation incidents involving wildlife. The committee conducts seminars, provides technical support to States, and helps in the creation of national wildlife hazard prevention committees. It also publishes the CARSAMPAF journal, offering insights into wildlife management in aviation. Key initiatives include updating a regional wildlife hazard survey and launching an Early Bird Migration Alert Program. The committee continues to promote knowledge exchange and operational safety through annual conferences and collaborative efforts with international organizations such as the World Birdstrike Association.

Airport Pavement

5.5.10 Under IP/19, the Latin American and Caribbean Association of Airport Pavements (ALACPA) presented an update on its activities. Since its establishment in 2002, ALACPA has consistently organized seminars and technical forums in collaboration with ICAO's regional offices and other international organizations. These events focus on various aspects of airport pavements, including design, construction, maintenance, and safety.

5.5.11 The association has held annual technical seminars since 2003, with the most recent in-person event taking place in Buenos Aires in 2023. ALACPA has also collaborated with ACI-LAC to update the Aerodrome Pavement Maintenance Guide, ensuring alignment with ICAO standards. In addition, ALACPA remains committed to supporting GREPECAS through its technical expertise and works closely with the FAA and other industry stakeholders to promote operational safety and efficiency. Looking ahead, ALACPA informed that plan to continue organizing in-person seminars, online courses, and technical meetings.

Agenda Item 6 Initial Review of the Current GREPECAS Work Programme and Projects

R*evised GREPECAS Work Programme and Projects*

6.1 Under WP/14 Rev., the Secretariat presented a review of the current GREPECAS Work Programme and Projects. The Secretariat proposes a restructuring of specific activities into three key programmes:

A) Programme for Strengthening the CAR/SAM Regional Plan (RANP) and National Plans (NANP)

Project A1 – Update of Vols. I and II of the CAR/SAM RANP and Regional Supplementary Procedures (SUPPS) Doc 7030 – Development of Vol. III of the CAR/SAM RANP, including State capabilities for performance-based planning.
Project A2 – National Air Navigation Plans (NANP).

B) Air Navigation Implementation Programme aligned with the GANP, ASBU Framework, and Performance Framework

Project B1 – Improvement of Efficiency and Capacity: Implementation of FRTO and Airport Accessibility (APTA) (currently NEOSPACE-1).
Project B2 – Demand/Capacity Balance: Implementation of ATFM, including reinforcement of CDM.
Project B3 – Improvement of CNS (facilities), considering the GANP roadmap.
Project B4 – Improvement of MET: Implementation of Advanced Meteorological Information (AMET).
Project B5 – Improvement of AIM: Implementation of Digital Aeronautical Information Management (DAIM) and evolution to SWIM.
Project B6- Enhanced Navigation infrastructure: GNSS implementation

C) Air Navigation Safety Improvement Programme

Project C1 – Improvement of airspace and ATS services safety (contributions from the GTE, LHD reduction, monitoring, Performance-Based Communications and Surveillance (PBCS). (PBCS) with emphasis on oceanic areas, etc.).
Project C2 – Aerodrome certification.
Project C3 – Cybersecurity guidance

6.2 In addition, the Secretariat proposed a List for the GREPECAS Work Programmes and Projects (Appendix B to WP/14 Rev.), as well as a corresponding Template for the GREPECAS Projects (Appendix C to WP/14 Rev.) that are part of each of the programmes described above.

6.3 During the virtual (asynchronous) phase of the meeting, States and International Organizations supported the proposals in the working paper, with some suggestions for improvements, which the Secretariat carried out by reviewing the working paper.

6.4 Therefore, the meeting approved these actions and adjustments to enhance GREPECAS' effectiveness in the implementation of air navigation services and adopted the following decision:

<table>
<tr><td colspan="2">DECISION GREPECAS/22/14</td><td colspan="2">REVIEW OF THE CURRENT GREPECAS WORK PROGRAMME AND PROJECTS</td></tr>
<tr><td colspan="2">What:
That,

a) the List of Work Programmes and Projects submitted under WP/14 and the Project Description Template (Appendices B and C to WP/14 Rev.) is approved;

b) the Secretariat complete the templates for each project, and that they be submitted for the analysis and approval of GREPECAS/23; and

c) the Secretariat formulate a management and responsibilities mechanism for better monitoring and follow-up of these GREPECAS Programmes and Projects and presents them for the analysis and approval of GREPECAS/23.</td><td colspan="2">Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
A review of Programmes and Projects is formulated to a) update the list of GREPECAS Programmes and Projects available on the GREPECAS webpage h, including its objectives and goals to comply with current priorities and needs; b) align the indicators and targets on the GREPECAS Dashboards with the GREPECAS Programmes and Projects; and c) enhance integration of projects of the SAM and CAR Regions.</td></tr>
<tr><td>When:</td><td>a) Immediate
b) GREPECAS/23
c) GREPECAS/23</td><td>Status:</td><td>x☐ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

6.5 Cuba highlighted the importance of what is outlined in item c) of the Decision, due to its importance for effective control of implementation.

Review of GREPECAS Procedural Handbook

6.6 Under WP/15, the Secretariat presented an updated version of the GREPECAS Procedural Handbook for approval by GREPECAS Member States. This update, stemming from Decision GREPECAS/21/25, aimed at formalizing enhancements in GREPECAS management, including adjustments to the plenary methodology combining asynchronous and in-person phase of meeting. The asynchronous (virtual) phase proved beneficial, allowing broader expert participation and deeper documentation analysis, though the duration was noted as potentially needing review. The in-person phase of meeting is also effective, fostering dynamic discussions and productive exchanges on implementation actions.

6.7 During the (asynchronous) virtual and in-person phases meeting, the States and International Organizations agreed on an updated version of the GREPECAS Procedural Handbook.

6.8 Argentina highlighted that the initiative of asynchronous sessions was very valuable. Regarding the follow-up on GREPECAS Air Navigation Deficiencies Database (GANDD) differences, the modifications included in the Handbook are considered appropriate and asked whether the current database system will continue or if an update is planned. The Secretariat informed that the deficiencies database was still valid, but future enhancements are foreseen for the whole deficiencies procedure.

6.9 Finally, Brazil submitted suggestions for improvements to the Handbook's text, which were accepted by the Secretariat and approved by in-person phase meeting.

6.10 The Meeting approved the following Decision:

<table>
<tr><td colspan="3">DECISION
GREPECAS/22/15 APPROVAL OF THE UPDATE OF THE GREPECAS PROCEDURAL HANDBOOK</td></tr>
<tr><td colspan="2">What:
That, the updated GREPECAS Procedural Handbook is approved as presented in Appendix D to this report.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why: Decision GREPECAS/21/22 and Decision GREPECAS/21/25 mandated that the GREPECAS Procedural Handbook be updated in line with the actions outlined in these decisions and submitted for review and approved during GREPECAS/22.</td></tr>
<tr><td>When: Immediately</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

GREPECAS Scrutiny Working Group (GTE)

6.11 The Secretariat presented WP/17 to provide a detailed overview of the activities carried out by the GREPECAS Scrutiny Working Group (GTE) during 2023 and the first semester of 2024.

6.12 The result of the CAR/SAM Regions' Collision Risk Model (CRM) assessment for 2023 was 2.371×10^{-9}, indicating the risk remained within the acceptable safety level of 5 x 10−9 fatal accidents per flight or loss of the standard vertical separation of 1,000 ft. However, it was identified that the Port-au-Prince (MTEG), La Paz (SLLF), Guayaquil (SEFG), Curacao (TNCF), Panama (MPZL), and Santo Domingo (MDCS) FIRs presented a risk level above the TLS. Regarding LHDs in 2023, 624 valid events were included in the CRM study. As in previous years, LHDs with Code "E" (error/failure/no coordination between ATC units) were the most frequent, with 561 events, followed by Code "L" (non-RVSM approved aircraft), with 94 events.

6.13 As part of the agreements from GTE/24 Meeting, CARSAMMA, with the Secretariat, will organize a seminar for the CAR/SAM States to train Contact Points on the actions necessary for reporting approvals of Performance-Based Communications and Surveillance (PBCS). The GTE/24 Meeting approved the update of the Manual of Accredited Contact Points to CARSAMMA. The GTE/24 acknowledged the good work of coordination and harmonization of procedures being carried out by CARSAMMA and the North American Approvals Registry and Monitoring Organization (NAARMO), which has led to an improvement in data exchange and in the performance analysis of the CAR Region's RVSM airspace.

6.14 The effectiveness of monitoring RVSM airspace depends on the quality and quantity of the data received by CARSAMMA. States must collaborate proactively to ensure that the data provided is accurate and complete, enabling proper risk assessment and timely corrective actions. The analysis conducted shows that certain events, particularly those related to lack of or erroneous coordination between FIRs and the operation in the RVSM airspace by non-approved aircraft, pose a significant safety risk. States and service providers must implement immediate actions to mitigate this risk and prevent future events.

6.15 Cooperation among States and active participation in data updating and validation are essential to maintaining a high level of safety in RVSM airspace. Implementing seminars and training, as proposed during the GTE/24 meeting, will facilitate a deeper understanding of the processes and contribute to the continuous improvement of the system. The lack of response to CARSAMMA's communications from some States is a concern that must be addressed urgently. Updating the RVSM aircraft capability database and implementing GTE recommendations are necessary to ensure that all aircraft operating in RVSM airspace are authorized and that the vertical collision risk remains acceptable.

6.16 From this discussion, the following Conclusion was adopted:

<table>
<tr><td colspan="3">CONCLUSION
GREPECAS/22/16 ENHANCE CAR/SAM REGIONS RVSM AIRSPACE SAFETY</td></tr>
<tr><td colspan="2">What:

That, to promote actions that allow maintaining operational safety in RVSM airspace,

a) States of FIRs that reported in 2023 a TLS above the acceptable level to work with their respective ICAO Regional Office to develop an action plan to mitigate the main occurrences identified in this period;

b) States take necessary measures to ensure that LHDs, in particular Categories A, B, C, D, E, H, J and K, as applicable, be reported in timely manner to CARSAMMA; and

c) the ICAO NACC and SAM Regional Offices reiterate the States the importance of keeping the regional monitoring agencies' database on RVSM approvals up to date and report progress to GREPECAS/23.</td><td>Expected impact:

☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:

To ensure target level of safety is achieved in CAR/SAM Regions RVSM airspace</td></tr>
<tr><td>When: Report by GREPECAS/23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

6.17 The GTE Rapporteur, in coordination with the Secretariat, presented WP/20 on the update of the Accredited Focal Points Manual for CARSAMMA. The note describes the update process, which included the formation of an Ad Hoc Group that thoroughly reviewed the manual. The changes incorporated into the manual will enhance clarity and consistency, standardize terminology, correct identified errors, update functions and responsibilities, among other improvements made to the text.

6.18 The States and stakeholders took note of the proposed changes to the manual, with supportive comments received from Argentina, Bolivia, Chile, Costa Rica, Cuba, El Salvador, Mexico, the Dominican Republic, Trinidad and Tobago, Suriname, Venezuela, and IATA.

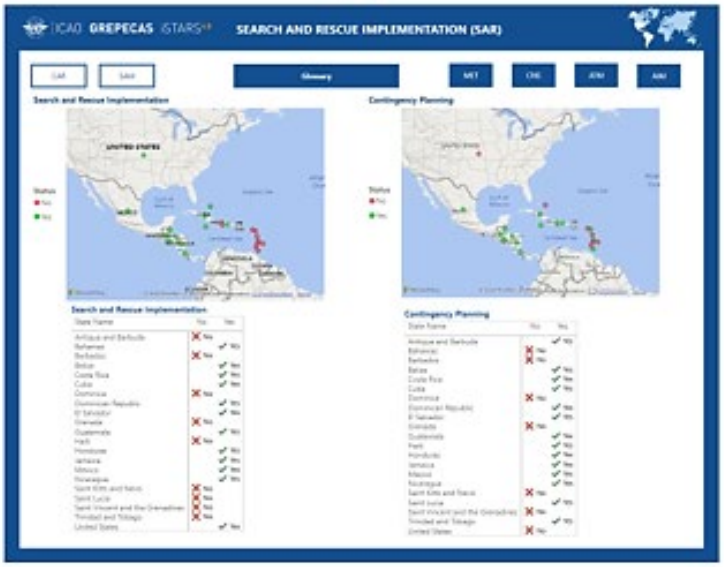
6.19 Brazil expressed the need for additional discussion on some of the proposed changes to the Manual. Therefore, the Secretariat coordinated during the in-person session, additional review resulting in the version of Appendix B, and therefore the Meeting approved the following decision:

DECISION GREPECAS/22/17	**UPDATE OF THE GUIDANCE MANUAL FOR CONTACT POINTS ACCREDITED TO CARSAMMA**
What: That the update to the Manual for Accredited Focal Points to CARSAMMA, aimed at improving the RVSM airspace monitoring process in the Caribbean and South American (CAR/SAM) regions, increasing efficiency and accuracy in data collection for RVSM airspace safety analysis, as presented in Appendix B to WP/20 of this meeting is accepted.	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☐ Economic ☐ Environmental ☒ Operational/Technical
Why: Efficiency in collecting, analysing, and validating significant altitude deviations in the RVSM airspace of the CAR/SAM regions is essential to maintaining operational safety within the expected level. The update of the functions and responsibilities of the Focal Points and CARSAMMA is essential to improve the efficiency of the RVSM airspace monitoring process	
When: Immediately	**Status:** ☒ Valid / ☐ Superseded / ☐ Completed
Who: ☒ States ☒ ICAO ☐ Other:	ANSP, airports and airlines

GREPECAS Dashboards

6.20 Under IP/07, the Secretariat reported on the progress of the GREPECAS Dashboards, which are designed to report, monitor, and track the implementation of various ANS programmes across the CAR and SAM Regions. Hosted on ICAO's iSTARS 4.0 platform, these dashboards enable States to evaluate their current implementation levels and set targets in critical areas such as:

- Air Traffic Management;
- Communications, Navigation and Surveillance;
- Aeronautical Information Management;
- Aeronautical Meteorology;
- Search and Rescue; and
- Aerodrome and Ground Aids (AGA).


ICAO GREPECAS iSTARS+
SEARCH AND RESCUE IMPLEMENTATION (SAR)
Search and Rescue Implementation
Contingency Planning

Agenda Item 7 Results from the Virtual Phase

7.1 Under WP/47, the Secretariat presented the results from the virtual phase of the meeting (Agenda Items 1 to 6 refer) for consideration during the in-person phase meeting.

7.2 States and International Organizations submitted observations and requested amendments to the text during the in-person phase. The Secretariat reviewed these inputs and incorporated the requested changes into this report.

Agenda Item 8 Fourth GREPECAS-RASG-PA Joint Meeting

8.1 Through IP/02, the Secretariat presented the topic for the first working table scheduled to analyse the use of Traffic Alert and Collision Avoidance System (TCAS) Advisories Data ATS Safety Management.

8.2 Nine teams were formed to discuss and develop proposals to address the following challenges:

a) How can ATS access more effective and comprehensive information on TCAS alerts and related events to manage risks adequately and effectively contribute to reducing these types of events?
b) What might be the root cause(s) of the discrepancy between the number of TCAS events in the data systems of air operators and ATS providers?
c) Could analysing all TCAS events, including Traffic Advisories (TAs) and Resolution advisories (RAs), improve ATS's hazard identification and risk management?
d) What other measures would you propose to improve risk management in ATS related to TCAS events and data collection for these?

8.3 The nine teams presented the following main challenges identified:

- A lack of a strong, non-punitive culture for reporting TCAS events among pilots, ATC personnel, and airlines.
- Absence of a harmonized legal framework to facilitate data sharing and collaboration between ANSPs and air operators.
- Variability in classification and documentation of TCAS events by different stakeholders.
- Limited system compatibility and automation for collecting and analyzing TCAS-related data.
- Lack of cooperative agreements and structured working groups among stakeholders, including the Safety Management system (SMS) of ANSP.
- Inadequate understanding of TCAS operations among ATS personnel and flight crews.
- Concerns about public opinion, legal ramifications, and insurance issues discouraging transparent reporting.
- Managing and analyzing TAs along with RAs without filtering can create excessive and non-actionable data noise.

8.4 The nine teams presented the following main recommendations identified:

- Promote a just, non-punitive culture and enforce laws that encourage safety data sharing.
- Promote standardized reporting and collaborative risk management.

- Establish Collaborative Safety Teams (CSTs) involving SMS entities of ANSPs, airlines, and States' SSPs.
- Implement automated systems (i.e. ECCAIRS) for centralized and consistent data management.
- Provide targeted training on TCAS systems and promote workshops to foster better understanding and cooperation.
- Prioritize the analysis of Resolution Advisories to identify hotspots and mitigate risks effectively on a based data approach
- Develop clear procedures for ATC reporting and expand the scope of reportable events.
- Leverage advanced technologies, including Artificial Intelligence and ADS-B data, for analysis and prediction of TCAS-related risks.
- Establish mechanisms to filter and categorize TCAS events to focus on actionable insights.
- Facilitate information exchange through ICAO and standardize TCAS reporting formats across States.
-

8.4 Accordingly, the Meeting adopted the following Conclusion:

<table>
<tr><td>CONCLUSION
GREPECAS/22/18</td><td colspan="2">TCAS/RA EVENTS REDUCTION AND MITIGATION STRATEGY IN CAR/SAM FIRs</td></tr>
<tr><td colspan="2">What:
That, Considering the risk represented by the TCAS/RA events in the airspace, and its implication for the safety and efficiency of aviation, Air Traffic Service Providers (ATSP); the industry, CAAs and the Pan America Regional Aviation Safety Team PA RAST implemented a strategy to enhance the collection, analysis and reduction measures on a data based-drive approach which results will be presented to GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="3">Why:

The RASGPA/GREPECAS meeting emphasized the need to improve data collection related to TCAS RA events and implement strategic, data-driven reduction measures in FIRs across the CAR/SAM regions, including reporting, training, collaborative work, and the involvement of the SMS ATS.</td></tr>
<tr><td>When:</td><td>Results to be presented by GREPECAS 23</td><td>Status: X☐ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☐ States ☐ ICAO ☒ Other:</td><td>ATSPs; the industry, CAAs and PA RAST.</td></tr>
</table>

Agenda Item 9 **Analysis of the Critical ANS Implementation Areas – the Effective Path to implementation**

9.1 Through IP/06, the Secretariat presented the topic for the second working table scheduled to analyze the effective implementation of "Performance-based planning and KPI management of the Global Air Navigation Plan."

9.2 Six teams were formed to discuss and develop proposals to address the following challenges:

a) How can effective communication channels be established or strengthened with all stakeholders in the projects for the implementation and improvement of air navigation, as well as the development of the RANP CAR/SAM?
b) How can the joint work of regional implementation groups with the industry, airlines, and users be strengthened and, simultaneously, improve the use of KPI indicators in a progressive and harmonized way by these groups?
c) Considering the new commitments that the application of the eighth edition of the GANP will entail. What actions or mechanisms should GREPECAS and its members activate or implement for the period 2025 -2031?
d) How can the implementation of the CNS technology platform be accelerated and the interoperability of air navigation systems and facilities in the CAR/SAM Region strengthened?

9.3 The Meeting agreed with the following diagnosis of the working groups:

a) The provision of Regional Technical Guides that complement the information presented in the ICAO GANP portal is required, in order to have a harmonized methodology for developing KPIs. These guides should be the basis for the preparation of instruction manuals on this subject.
b) The formation of an Ad hoc group within GREPECAS is required to consolidate the efforts of the administrations and to assist in processes for data collection, KPI calculations and management of air navigation performance.
c) The group should identify regional priorities, aligned with the ongoing air navigation rollout, and the resources required for harmonized progress on these tasks. At the same time, it must strengthen the integrated work of the industry, users, States, and ANSPs.
d) It was identified that benchmarking activities between administrations and/or ANSPs (on a voluntary basis), carried out at regional and interregional level, can boost the management of KPIs of CAR/SAM States.
e) The dissemination of the enacted KPIs must be improved, through appropriate tools (dashboards, etc.). Likewise, it is necessary to develop a Communications Plan.

9.4 The following members expressed interest in joining the proposed group: Bahamas, Brazil, Colombia, Chile, Cuba, Dominican Republic, Ecuador, Panama, Peru, Trinidad and Tobago, United States, as well as IATA.

9.5 Accordingly, the Meeting adopted the following Decision:

<table>
<tr><td colspan="2">DECISION GREPECAS/22/19</td><td colspan="2">ACTIVATION OF AN AD-HOC GROUP FOR THE DEVELOPMENT OF KPIS OF GANP (KAHG)</td></tr>
<tr><td colspan="3">What:
Under the framework of GREPECAS Programme for the Strengthening of the Regional Plan (RANP) and National Plans (NANP) of the CAR/SAM, Project A1, and to work jointly with the regional implementation groups, the industry and stakeholders, an Ad-hoc Group is activated, which members are Bahamas, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Panama, Peru, Trinidad and Tobago, United States, IATA and IFATCA, for the development of Key Performance Indicators KPI of the GANP (KPI Ad-hoc Group - KAHG) in order to strengthen the implementation of Volume III of the RANP CAR SAM, which results are to be presented at GREPECAS/23 with the following tasks:

1. prepare a regional CAR/SAM guidelines and standardized training material on the methodology of performance indicators, data collection and management and calculations;
2. formulate an Action Plan for the progressive implementation of KPIs, identifying priorities and resources required, harmonized with the progress of the implementation groups;
3. implement a Communications Plan and adequate means of dissemination (dashboards, etc.) of the KPIs; and
4. Formulate a regional and/or interregional initiative for KPIs benchmarking activities.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why: To promote performance-based planning aligned to the GANP, strengthen Volume III of the RANP CAR/SAM, and foster collaborative work with the implementation groups, Industry and stakeholders, to improve skills of States on the management of KPIs, so as to be prepared for the application of new indicators of the GANP 8th edition and the NANP template, starting in 2026.</td></tr>
<tr><td>When:</td><td>Results to be presented at GREPECAS 23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☒ Others:</td><td colspan="2">International organizations, users, stakeholders.</td></tr>
</table>

Agenda Item 10 Final Review of GREPECAS Work Programme

10.1 Under P/01 Rev., the Secretariat presented the main outcomes of the Fourteenth Air Navigation Conference (AN-Conf/14) that was held in Montréal, Canada from 26 August to 6 September 2024. 205 papers were submitted, and 22 recommendations were approved by AN-Conf/14. Its agenda focused on ICAO's strategic priorities, the integration of new technologies, air navigation performance improvements, and hyper-connectivity of air navigation system.

10.2 The 22 AN-Conf/14 Recommendations are:

Agenda Item 1: Update on the ICAO 2023-2025 Business Plan and long-term strategic planning:

- Recommendation 1.1/1 – Support to ICAO's programmatic business planning approach initiated by the Business Plan 2023-2025 priority focus areas.
- Recommendation 1.1/2 – Resilience of the air navigation system.
- Recommendation 1.2/1 – Work towards enhanced alignment of the Global Aviation Safety Plan and the Global Air Navigation Plan Under the sub-item.
- Recommendation 1.3/1 – Evolution of the ICAO Assembly Technical Commission

Agenda Item 2: Timely and safe use of new technologies:

- Recommendation 2.1/1 – Evolving aircraft technologies contributing to the Long Term Aspirational Goal.
- Recommendation 2.2/1 – Addressing safety risks related to new and evolving aviation technologies and concepts.
- Recommendation 2.2/2 – Addressing global navigation satellite system interference and contingency planning.
- Recommendation 2.3/1 – Draft 2026-2028 edition of the Global Aviation Safety Plan (GASP, Doc 10004).
- Recommendation 2.3/2 – Turbulence encounters as a global operational safety risk.

Agenda Item 3: Air navigation system performance improvement:

- Recommendation 3.1/1 – Project 30/10 - Optimized implementation of longitudinal separation minima.
- Recommendation 3.1/2 – Study into the feasibility of establishing an ICAO air navigation efficiency programme.

- Recommendation 3.1/3 – Enabling successful deployment of trajectory-based operations.
- Recommendation 3.1/4 – Free route airspace.
- Recommendation 3.1/5 – Delegation of responsibility for provision of air traffic services.
- Recommendation 3.1/6 – Addressing the safe integration of space transport operations into the airspace system.
- Recommendation 3.1/7 – Higher airspace operations
- Recommendation 3.2/1 – Phasing out and/or optimizing the use of legacy systems.
- Recommendation 3.2/2 – Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034.
- Recommendation 3.3/1 — Update to the global strategic level of the seventh edition of the Global Air Navigation Plan (GANP, Doc 9750).
- Recommendation 3.3/2 — Update to the global technical level of the seventh edition of the Global Air Navigation Plan and its regional and national levels.

Agenda Item 4: Hyper-connectivity of air navigation system:

- Recommendation 4.1/1 –Validation, standardization and implementation of the connected aircraft concept and air-ground connectivity strategy.
- Recommendation 4.2/1 – Aviation cybersecurity.

10.3 According the Secretariat, the next steps of AN-Conf/14 are:

- preparation of business plan and the regular budget proposal(s) for 2026-2027-2028, taking into account the Conference results and their prioritization, subject to Council decision on the recommendations;
- preparation of proposals for amendment to the contents of the 5th Edition of the GASP and 8th edition of the GANP; and
- promotion of recommendations through ICAO initiatives and State engagement.

10.4 Additionally, under P/01 Rev., the Secretariat presented the action items specifically assigned to Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs). These actions, proposed by the Secretariat through DP/01, outlined GREPECAS' response to the AN-Conf/14 Recommendations. The Meeting reviewed and approved the document

10.5 Subsequently, the Meeting adopted the following conclusion:

<table>
<tr><td colspan="2">CONCLUSION GREPECAS/22/20</td><td colspan="2">ACTION ITEMS RELATED AN-CONF/14 RECOMMENDATIONS 3.1/1, 3.1/4 AND 3.2/2</td></tr>
<tr><td colspan="3">What:
That, the Secretariat, in collaboration with the CAR and SAM States,

a) develop a CAR/SAM Implementation Plan for improved longitudinal separation minima per AN-CONF/14 Recommendation 3.1/1 Project 30/10 - Optimized implementation of longitudinal separation minima for endorsement by GREPECAS/23;

b) align the NEOSPACE-1 project to the AN-Conf/14 Recommendation 3.1/4 – Free route airspace; and

c) develop an initial CAR/SAM Transition Plan to Flight and flow - information for a collaborative environment (FF-ICE) as per AN-Conf/14 Recommendation 3.2/2 – Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034, with the support of experts from States and International Organizations, to be presented to GREPECAS/23.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
To promote enhanced alignment of the GREPECAS programs/projects to the GANP and the AN-Conf/14 recommendations, leaded to increase efficiency and obtain environmental benefits. An implementation plan for Project 30/10 and initial transition plan to FF-ICE will be developed for presentation to GREPECAS/23 meeting.</td></tr>
<tr><td colspan="2">When: GREPECAS/23</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td colspan="2">Who: ☒ States ☒ ICAO ☐ Other:</td><td colspan="2"></td></tr>
</table>

10.6 P/02 presented the outcome of the Air Navigation Commission (ANC) review of the reports of the GREPECAS/21 and RASG-PA/13 meetings and an overview of the consolidated report to Council on PIRGs and RASGs for 2023-2024.

10.7 Based on P/02, the Secretariat developed DP/02 on review of GREPECAS related data of Tables “Identified PIRG and RASG global challenge” and “Previously identified challenges faced at global level”. The Meeting validated and approved the Tables shown in DP/02.

10.8 Finally, the Meeting adopted the following conclusion:

<table>
<tr><td colspan="4">CONCLUSION
GREPECAS/22/21 GLOBAL CHALLENGES AND GREPECAS MEETINGS' REPORT</td></tr>
<tr><td colspan="3">What:
That, in coordination with the GREPECAS Chairperson, the Secretariat improve the report of the GREPECAS meetings for better visibility of the regional challenges and the actions recommended by ICAO Headquarters (Air Navigation Bureau (ANB), Air Navigation Commission (ANC) or Council) by March 2025.
Note: feedback on the global challenges from the CAR/SAM Regions is in DP/02.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☐ Economic
☐ Environmental
☒ Operational/Technical</td></tr>
<tr><td colspan="4">Why:
To improve the reporting mechanism and the visibility for the CAR/SAM activities, achievements and challenges with the proposed associated actions to address those reported challenges.</td></tr>
<tr><td colspan="2">When: March 2025</td><td colspan="2">Status: ☒ Valid / ☐ Superseded / ☐ Completed</td></tr>
<tr><td colspan="2">Who: ☐ States ☒ ICAO ☒ Other:</td><td colspan="2">GREPECAS Chairperson</td></tr>
</table>

Agenda Item 11 GREPECAS/22 Conclusions and Decisions

11.1 Under Discussion Paper (DP)/03, the Secretariat presented the Conclusions and Decisions resulting from the virtual phase of GREPECAS/22. It was noted that these Conclusions and Decisions had also been exposed under the WP/47 by the Secretariat, one week before the in-person meeting. Improvements were included, considering the comments received during the virtual phase.

11.2 Moreover, the Meeting reviewed and adopted various Conclusions and Decisions because of expositions and deliberations of the sessions held in 20, 21 and 22 November 2024.

11.3 Consequently, every Conclusion and Decision adopted by GREPECAS/22 meeting are presented in the corresponding Agenda Item of the present report, following the analysis of the related topic.

Agenda Item 12 Other Business

Cybersecurity

12.1 Chile presented WP/21, highlighting the role of the aviation system in preventing acts that threaten national and international security. It noted that various issues that go beyond the traditional concept of threats are shaping a complex national and international security landscape and posing significant challenges. Elements such as ATM automation, SWIM, Artificial Intelligence (AI), Cybersecurity, and Unmanned Aircraft Systems (UAS) with little or no capacity to be detected could become risk factors for the security, defense, and comprehensive development of countries in our region.

12.2 WP/21 highlights the lack of specific guidelines on how breaches of this security can affect national and international security, identifying this as a critical gap in the context of emerging threats that carry far-reaching strategic consequences for States. It points out the need for CAAs to have the guidance and recommendations of the ICAO, promoting a culture of security concerning the threats underlying air transport that could compromise the integrity of States in order to achieve and maintain the commitment of the responsible authorities and the cooperation of all stakeholders involved in these objectives.

12.3 Including aspects related to national and international security will enhance aviation's global resilience against threats that transcend operational concerns and ensure that civil aviation does not become a vulnerable element in state security. In conclusion, WP/21 emphasizes the importance of ICAO expanding its guidance framework to address the intersections between civil aviation and national and international security and taking necessary additional action. Several participating States expressed their support for WP/21, emphasizing the importance of establishing a comprehensive aviation safety approach and supporting the suggested conclusions and actions.

Flight Inspection

12.4 The Central American States, through the Central American Corporation for Air Navigation Services (COCESNA), presented WP/38, which reports on the laboratory aircraft for flight inspection of radio navigation aids and visual aids (lighting systems) that is equipped with an Airfield AT-940 Flight Inspection System or Verification Console, as well as a Garmin 1000 NXi avionics system.

12.5 This service provided by COCESNA ensures that navigation systems are correctly and promptly calibrated and operational, reducing the risk of navigation errors. It complies with the standards and procedures of ICAO Doc 8071 and the FAA's Manual on Testing of Radio Navigation Aids 8200.1D, as well as ICAO Annexes10 and 14. Several States expressed their appreciation for the information presented by COCESNA in NE/38.

Regulatory Harmonization

12.6 The Central American States, through COCESNA, presented WP/39. This document provides a perspective on implementing regulatory harmonization, allowing the aviation community to achieve the real benefits that such harmonization seeks but, in some cases, is limited to a theoretical level.

12.7 WP/39 points out that regulatory harmonization in the air transport sector is essential for the efficient and competitive global development of the industry. The implementation of these policies not only benefits civil aviation authorities by reducing administrative burdens and improving operational efficiency but also optimizes the resources of air operators and service providers by avoiding duplication and redundant procedures. However, despite the robust theoretical framework supporting regulatory harmonization, tangible benefits still need to be significantly realized in practice. The effective implementation of regulatory harmonization also requires States to establish and/or optimize the necessary mechanisms for proper risk management and performance measurement in operational safety to ensure appropriate safeguards and controls that guarantee acceptable safety standards for all stakeholders.

12.8 WP/39 references the proposal presented at the Air Navigation Conference on the amendment proposal to Annex 6 in support of harmonization to ensure that the Standards and Recommended Practices (SARPs) reflect current practices and the collaborative processes of Regional Safety Oversight Organizations (RSOOs), thus fostering the development of new and efficient business models in the aviation industry. Several States expressed their appreciation for the WP and voiced their support for the information contained therein.

Civil Aviation Master Plan (CAMP)

12.9 Panama presented WP/45, highlighting the benefits of developing, implementing, and monitoring a Civil Aviation Master Plan (CAMP) based on ICAO recommendations and best practices. In the context of air navigation capacity and efficiency, it is essential to ensure adequate investments for both domestic and international aviation services, with each State having a vision and strategy with clear objectives to guide these investments. This national aviation planning framework includes both national aviation policies and civil aviation master planning.

12.10 WP/45 recalled that since the last RAAC/17 Civil Aviation Directors Meeting, SAM States were urged to exchange experiences on preparing CAMPs and related policies to understand the different approaches and mechanisms needed for their development. NE45 points out that although many States have prioritized in recent years the preparation of plans to address operational safety, aviation security, environmental aspects, and air navigation issues, several States do not have a national civil aviation planning framework aligning these efforts with a common State goal.

12.11 Finally, WP/45 recommends that ICAO Regional Offices, within the framework of the "No Country Left Behind" (NCLB) initiative, promote the preparation and/or revision of CAMPs in States based on updated ICAO guidelines. Several participating States at the meeting expressed their support for NE45 presented by Panama, emphasizing the importance of developing CAMPs and ICAO's support for those States that require it.

Unmanned Aircraft Operations Over the High Seas

12.12 Under IP/17, United States informed and recognized the impact of the evolving use of UAS in operations over the high seas. Evolving concepts since 2018 include new UAS flight operations, such as inspections of offshore platforms, finding fish, monitoring the environment, and conducting search and rescue operations.

12.13 United States emphasized the need for ICAO, States, and RSOOs to collaborate with industry to ensure safe and harmonized UAS operations. The approach includes a two-step plan: drafting a resolution for the ICAO Assembly's 42nd Session to address risk mitigations, followed by adapting ICAO SARPs and guidance materials to incorporate these risk frameworks. As UAS high seas operations present unique legal and safety challenges, ICAO's role in supporting States through shared best practices, legal advice, and cooperative mechanisms is crucial. States are encouraged to leverage these tools and initial conservative risk mitigation strategies to ensure compliance with the Convention on International Civil Aviation and to facilitate innovation in this emerging field.

GREPECAS survey on new working methodology

12.14 Following IATA's suggestion to conduct an assessment after the meeting to determine whether the method employed by GREPECAS, combining virtual and in-person phases, was working effectively. The Secretariat carry out a virtual questionnaire to evaluate the new working methodologies of GREPECAS.

12.15 This initiative was implemented by Secretariat during the in-person meeting, where a QR code (see **Appendix D** to this report) was shared with participants to facilitate the completion of a survey by 29 November 2024.

12.16 At the close of the survey period, a total of 18 responses was received, with approximately 61% to 83% of responders selected options c) and d), reflecting that the working method was considered efficient and effective (Appendix D to this report refers).

12.17 During the in-person meeting, States requested read-only access to the comments made during the virtual phase of the meeting on the GREPECAS Teams platform. The Secretariat confirmed that access would be provided, which was subsequently made available through ICAO's iSTARS platform via the link below:

https://istars.icao.int/Sites/PBIEmbedApplication/PublicEmbedReport?embedAppId=61

GREPECAS Points of Contac (PoC)

12.18 Under WP/48, the Meeting updated the GREPECAS Points of Contac (PoC) list as per **Appendix E** to this report.

Venue and date of the next meeting

12.19 Concerning the next plenary meetings of GREPECAS and RASG-PA, they will take place in November 2025 (tentatively during the week of 10 November). The Secretariat will coordinate the venue of these meetings with the CAR States and International Organizations.

Change of the Secretariat

12.20 In line with GREPECAS Procedural Handbook (Ref. para. 9.2.1 the GREPECAS Secretariat will be provided by ICAO (NACC or SAM Regional Director), the ICAO Regional Director with more seniority will assume the GREPECAS Secretariat), in 2025 the ICAO SAM Regional Director will lead the GREPECAS Secretariat, with the Co-secretariat of the NACC Regional Office.

CAR/SAM GUIDE FOR THE IMPLEMENTATION OF IMPROVED OPERATIONS THROUGH ENHANCED EN-ROUTE TRAJECTORIES (FRTO)

Original version 1.0 – November 2024

CAR/SAM GUIDE FOR THE IMPLEMENTATION OF IMPROVED OPERATIONS THROUGH ENHANCED EN-ROUTE TRAJECTORIES (FRTO)

RECORD OF CHANGES

Version	Date	Change	Pages
Initial DRAFT 0.0	9 February 2024 Prepared by Robson Batista	Original – Spanish Draft	All
Initial DRAFT 0.1	29 February 2024 Following FRTO/5	Original – Spanish Draft	All
Initial DRAFT 1.0	8 March Following GESEA/7	Original – Spanish Draft	All
Initial DRAFT 1.1	15 March Following WEBINAR	Original – Spanish Draft	All
DRAFT 2.0	8 July 2024, Harmonization to English version	Original - English Draft	All
DRAFT 2.5	Proposal for adoption by GREPECAS22	Original - English Draft	All
Original ver 1.0	22 November 2024	Final text approved by GEPECAS 22 - Conclusion 22/6	All

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1 FOREWORD

The implementation of the ATS SAM route network *versioning* concept was approved at the SAM/IG/3 meeting (Lima, Peru, 20-24 April 2009). The objective was to achieve integrated development, conducting a broader route network analysis based on data on air traffic flow and fleet navigation capacity, with a view to eliminating unused routes and excluding or reducing "*conventional*" routes, in order to make way for RNAV-5 navigation in regional airspace above FL245.

Building on the concept of route network versions over the last decade, the SAM/IG and ATS/RO forums were responsible for the complete restructuring of the SAM ATS route network, which involved the implementation, realignment (less distance flown = less CO2 emissions) and elimination of hundreds of conventional ATS routes. The initiative also facilitated the implementation of the flexible use of airspace (FUA) concept.

At present, the use of fixed ATS routes alone can no longer provide the efficiency required for airspace users to achieve fuel savings and reduce CO2 emissions. The natural evolution of airspace optimisation involves the implementation, in the short and medium term, of improved operations through enhanced en-route trajectories (FRTO)[1], as defined in the Global Air Navigation Plan (GANP).

The GANP represents the strategy to achieve a global interoperable air navigation system that provides safe, secure and efficient air transport, while limiting the impact of aviation on the environment. The GANP promotes performance-based planning, using the six-step approach. The implementation of this global methodology is set forth in Volume III of the Regional Air Navigation Plan (CAR/SAM RANP). Volume III was approved by GREPECAS in 2022, but CAR and SAM States still need to endeavour to insert their data in the planning tables and strengthen the performance-based planning processes.

Since 2020 (beginning of the pandemic), the SAM region has focused on the South American airspace optimisation strategy through the application of the GANP FRTO B0/B1 - DCT module, implementing strategic direct routing (SDR), as an initial step in a broader implementation and evolution towards free-route airspace (FRA). At the same time, it has been noted that the implementation of FRTO can help close gaps in ATM and CNS in the Region, as well as strengthen and ensure safety.

This Guide meets the objective of integrating FRTO theoretical concepts into the framework of airspace optimisation developments in the Region, in order to strengthen and broaden them. At the same time, it seeks to facilitate interoperability between the SAM Region and the NAM/CAR Region, recognising that this implementation covers, in general, flight flows that originate from, and/or cross, the three Regions.

The Guide aims to bring together the efforts and collaborative and trans-regional work of air navigation planners, States, providers and industry.

[1] *The ICAO GANP is published in English only. Regarding the free translation (into Spanish) of the term FRTO, it is considered that '**improvement**' refers to the end result, while '**enhancement**' focuses on the process and resources used.*

2 INTRODUCTION

*Note. - The list of acronyms, abbreviations and definitions can be found in **Appendix G** to this Guide. Reference documents are listed in **Appendix H**.*

2.1.1 The air transport industry plays a key role in global and regional connectivity, the economy, employment and business opportunities, trade, technological development, tourism and cultural exchange, emergency response, humanitarian aid, and regional development. However, despite its many benefits, the air transport industry faces major challenges, as well as environmental commitments, in the midst of a complicated international political and economic setting.

2.1.2 To overcome these challenges, ICAO Regions have adopted a number of initiatives and programmes aimed at improving air operations in terms of capacity, efficiency, safety and environmental sustainability. The GANP contemplates the development of the aviation industry through Aviation System Block Upgrades (ASBU), among which improved operations through enhanced en-route trajectories (FRTO)* allow for airspace optimisation.

2.1.3 To achieve airspace optimisation in the CAR/SAM Regions, the CAR/SAM Regional Planning and Implementation Group (GREPECAS), through Volume III of the Regional Air Navigation Plan (CAR/SAM RANP), provides guidance to the aviation community in the application of the performance management process and in the identification of relevant and timely operational improvements to the air navigation system.

2.1.4 At its twenty-first meeting held in Santo Domingo in 2023, the aforementioned Group presented the NEOSPACE-1 project as a driver of the airspace optimisation process, with a view to promoting airspace infrastructure optimisation in the CAR/SAM Regions, strengthening the implementation of Volume III of the ANP in the CAR/SAM Regions, and generating environmental benefits, including fuel savings and reduction of CO2 emissions, with enhancement goals established on the basis of a defined baseline.

2.2 ICAO strategic objectives

2.2.1 This Guide is directly related to ICAO strategic objectives, as described below:

a) Safety: Enhance global civil aviation safety.

b) Air navigation capacity and efficiency: Increase capacity and improve efficiency of the global civil aviation system.

c) Economic development of air transport: Foster the development of a sound and economically-viable civil aviation system.

d) Environmental protection: Minimise the adverse environmental effects of civil aviation activities.

2.3 Global and regional trend

2.3.1 The COVID-19 health emergency generated a new scenario in global aviation. According to IATA publications, in 2023, air transport almost fully recovered its pre-pandemic pace of activity, and is seen as a year of renewed financial profitability for the industry. Industry-wide passenger traffic, measured in revenue passenger-kilometres (RPKs), grew by 40.1% year-on-year until September 2023 and reached 92.9% of pre-pandemic levels. In the long term, global passenger traffic is projected to double by 2040.

2.3.2 In the SAM Region, the number of take-offs in 2020 decreased by 58.4% compared to the previous year, which represented a strong economic impact for the whole industry, and affected ANSPs due to the significant reduction in the number of aircraft operations. In 2023, the number of take-offs recovered, reaching 1.45% more compared to 2019. Despite the adverse economic environment in 2023, air transport in the SAM Region showed resilience, even achieving a slight growth compared to other Regions.

2.3.3 Significant challenges will persist in the SAM Region in 2024. There is a need to promote a competitive and sustainable aviation industry. This calls for work on efficient policies regarding air navigation and airport charges, reducing fuel costs, and expanding airport infrastructure. A simpler and more reliable regulatory environment for new market entrants should be encouraged in order to increase competition, expand air connectivity and benefit the user.

2.3.4 Recognising these challenges, the ATM community in the SAM Region is focused on supporting the growth and sustainability of air transport. This requires the promotion of a seamless, high-performance, as well as safer and more robust and resilient regional air navigation system.

2.4 Gaps and ambitions for improvement

2.4.1 In the continental airspace of the SAM Region, above FL245, en-route trajectories are mostly defined by a **network of fixed routes** with RNAV-5 specification, implemented between 2011 and 2020. In addition, around 10% of regional routes are still conventional (theoretically for radio aid-based navigation). Several States maintain a combination of RNAV-5 routes and conventional routes in their domestic airspace.

2.4.2 Regarding lower airspace in the Region, below FL245, in general, conventional routes still remain, including regional routes. However, several States are replacing them with RNAV-5 routes (for example: Brazil, Chile, and Peru).

2.4.3 There are different levels of implementation of strategic direct routing (SDR) in the SAM Region. It has already been implemented in all of the Amazonica, Cayenne, Guayaquil, Georgetown and Paramaribo FIRs, as well as in most of the Brasilia, Curitiba, Maiquetia and Recife FIRs. SDR has also been implemented to some extent in the Antofagasta, Lima and Santiago FIRs. There is an opportunity to expand SDR area in some FIRs, as well as to standardise existing aeronautical publications. The main objective is to achieve a uniform and cross-border implementation of SDR in all the FIRs of the CAR/SAM Regions.

2.4.4 There are various initiatives to implement user-preferred routes (UPRs), but there is a need to standardise their publication in the respective AIPs, and to establish a mechanism to facilitate access by aircraft operators to the entire route, by updating and publishing them on an appropriate website. It is important to note that UPRs must be used as an option in airspaces that lack the necessary conditions for SDR or FRA implementation, be they operational or infrastructural, such as, lack of adequate ATC sectorisation or gaps in ATS surveillance or VHF communications.

2.4.5 Progress has been made in the application of the “flexible use of airspace” (FUA) concept during the regional implementation of RNAV-5, which was supplemented by flight path optimisation involving a

reduction of flight distances. However, permanently segregated areas, allocated to military activity, persist in several States.

2.4.6 Air traffic control centres (ACCs) in the Region have varying levels of automation. In some ACCs, conflict detection is a manual task performed by the air traffic controller (ATCO), based on paper or electronic flight strips.

2.4.7 On the other hand, the environmental impact from aviation emissions is significant. It affects different areas and varies depending on factors such as geographic location, the specific characteristics of the industry in each region, and economic and environmental conditions. The aviation industry and States have taken steps to address such impact through more efficient technologies, the development of aviation biofuels, the implementation of sustainable operating procedures, and efforts to improve air traffic efficiency.

2.4.8 ICAO has established the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to supplement efforts to offset the amount of unabated CO2 emissions, through operational and technological measures and sustainable fuels. The implementation of CORSIA, which is a market-based measure, is being implemented in three phases, and entry into the programme will be mandatory as of 2027 for all States that have a 0.5% share of the world's revenue tonne-kilometres (RTKs) or that contribute to 90% of global cumulative RTKs, except least-developed countries, small island developing States and landlocked developing countries, unless they volunteer to participate. The expectation is that this programme will last until 2035, when the production of alternative fuels will increase and be used ostensibly in aviation.

2.4.9 The operational measures proposed by ICAO are related to the optimisation of operational procedures and air traffic management (ATM) measures to reduce greenhouse gas emissions. The Global Air Navigation Plan (GANP) contains most of the existing operational measures and will be available soon, including FRTO. The operational implementations foreseen in the GANP aim at an interoperable global air navigation system that guarantees acceptable levels of safety and ensures more environmentally sustainable and cost-effective operations. ICAO estimates that GANP implementation will reduce CO2 emissions by millions of tonnes.

2.4.10 The implementation of technological measures is also crucial for reducing CO2 emissions from aviation. Significant progress has been made over the last decades. Around 80% of aircraft in operation are more fuel-efficient per passenger-kilometre than aircraft in operation in the 1960s. Ongoing developments include engines that improve the bypass ratio and lighter, more heat-resistant materials for airframe construction.

2.4.11 Furthermore, advances in electric and hybrid aircraft technology will lead to lower consumption of fossil fuel and thus lower CO2 emissions. While technological measures significantly reduce emissions, their cost is high and incorporating these technologies into aircraft fleets can take time. At the same time, ICAO promotes the use of sustainable aviation fuels (SAF) among other initiatives. See **Appendix A** to this guide.

2.4.12 The evolution described in the GANP for FRTO (Blocks 0 and 1) is as follows:

- **Block 0:** En-route trajectories are improved through the use of more direct routes and collaborative airspace management processes and tools. ATCOs are assisted by tools for conflict detection and conformance monitoring.

- **Block 1:** Initial steps towards trajectory-based operations are presented through the improvement of Block 0 processes and system support or the deployment of new processes and system support where necessary.

2.4.13 In continental airspace, the main operational improvement is related to free-route airspace (FRA), as a continuation of direct routing introduced in Block 0.

2.4.14 The implementation of RNP routes may be considered for airspace where SDR or FRA cannot be deployed, or for connectivity between SDR or FRA and TMAs. It is also envisaged to apply these RNP routes in airspace requiring more complex processes that result in delays in the implementation of SDR or FRA.

2.4.15 As part of TMA optimisation, it is expected that A-RNP departure and approach procedures will be applied -- as already done in Chile -- considering that A-RNP approval of aircraft and operators includes the RNP-2 specification, which can be used for fixed-route airspace optimisation in airspaces of greater complexity and air traffic volume, mostly in the vicinity of the main TMAs of the Region, such as Bogotá, Buenos Aires, Panama, Lima, Santiago and Sao Paulo.

2.4.16 Collaborative airspace management will be enhanced with new functions, such as real-time airspace management (ASM) data exchange. Additional system capabilities, such as dynamic sectorisation, seek to align traffic demand with available capacity.

*Note. - The implementation of the APTA module is foreseen as a supplement in the NEOSPACE-1 project to increase performance in the **capacity KPA**, in the capacity, throughput and utilisation focus areas.*

2.5 ICAO-driven FRTO planning. Ongoing activities

2.5.1 The Global Air Navigation Plan (seventh edition) encourages aviation community members to participate together to achieve an agile, safe, secure, sustainable, high-performing and interoperable global air navigation system.

2.5.2 At the same time, new demands on the aviation system, emerging technologies, innovative ways of doing business and the changing human role present challenges and also opportunities that require urgent transformation of the air navigation system for aviation to continue to drive social well-being in the South American Region.

2.5.3 The GANP emphasises performance-based air navigation planning in accordance with the six-step approach to performance-based planning set forth in Doc 9883. This methodology is also presented in Volume III of the CAR/SAM RANP. For reference, see the "Instructions for use of the template for Volume III of the Regional Air Navigation Plan - CAR/SAM RANP", approved in October 2021 by GREPECAS Conclusion 19/05, which sets out the six-step method, at the following links:

https://www.icao.int/GREPECAS/Documents/eCRPP03-Minute_1.pdf

https://www.icao.int/NACC/Documents/Meetings/2021/GRP19/GREPECAS19-InformeFinal.pdf

2.5.4 FRTO in the SAM Region is enabled by the implementation of several initiatives, such as: user-preferred routes (UPR), strategic direct routing (SDR) and free-route airspace (FRA).

2.5.5 Both SDR and FRA are part of the ICAO Global Air Navigation Plan and are included in the Aviation System Block Upgrades (ASBU) under the FRTO thread, blocks FRTO B0 and FRTO B1. The strategy proposed in this guidance material **is limited only to Blocks 0 and 1**, which are achievable within a **5-year time horizon (initial perspective)**.

> *Note. - The proposed strategy may evolve in the future to include the remaining parts of FRTO, such as Dynamic Airspace Configuration and large-scale cross-border Free-Route Airspace (FRA), FRTO B2/2 and FRTO B2/3 respectively.*

2.5.6 At the regional level, ICAO will lead FRTO planning and implementation in the CAR/SAM Regions, through the CAR/SAM Regional Planning and Implementation Group (GREPECAS). Within the framework of the Airspace Optimisation Programme and the NEOSPACE-1 Project, it is expected that comprehensive guidance material on FRTO implementation will be provided to States, air navigation service providers and airspace users.

NEOSPACE-1 Project

2.5.7 The purpose of the NEOSPACE-1 Project is to support and reorient the optimisation of the CAR/SAM airspace structure in a harmonised and consistent manner, by strengthening ongoing implementations, furthering the activities of CAR/SAM States and organisations for the effective implementation of Volume III of the CAR/SAM RANP and generating environmental benefits through fuel savings and CO2 emission reductions.

2.5.8 According to project planning, FRTO and APTA elements and the respective KPIs will be selected (GANP performance-based planning process and Doc 9883). Performance improvement targets require the definition of a baseline for KPIs. With that baseline, it is possible to set performance improvement ambitions for a given KPI, within a defined timeframe. However, States/organisations can calculate/monitor other GANP KPIs or develop their own indicators according to their needs.

2.5.9 The execution of project activities will be coordinated through communication among project members, project coordinators and the programme coordinator through meetings of the CAR and SAM implementation groups. The project recognises the need to continue supporting the recovery of air connectivity in the CAR and SAM Regions, through efficiency and capacity optimisation. Strengthening of inter- and intra-regional harmonisation for FRTO and APTA implementation is envisaged.

2.5.10 Regarding the actual implementation of FRTO, close collaboration between the NACC/WG Airspace Optimisation Task Force and the SAM/IG Airspace Study and Implementation Group (GESEA) is essential to harmonise and expedite FRTO implementation in the CAR/SAM Regions, in order to generate flight efficiency and improve aviation in both Regions.

2.5.11 In order to meet the need for early benefits when States are unable to implement strategic direct routing (SDR) and to expedite coordination between ANSPs and airlines, a joint CANSO-IATA- ICAO Free Route Airspace working group, called **CIIFRA**, was established in 2021 to support the implementation of UPRs. It should be noted that SDR implementation is also part of CIIFRA's strategy, as well as its transition to FRA.

3 IMPLEMENTATION IN KEY PERFORMANCE AREAS (KPAs)

*Note. - The tables in **Appendix B (in English)** show the linkage of the GANP to the KPIs for each selected KPA, allowing for the identification of FRTO elements that contribute to the expected performance improvement.*

3.1.1 Key performance areas (KPAs) describe the priority areas where specific improvements and developments are needed to achieve the overall objectives of ASBU. Each KPA addresses a specific dimension of air navigation system operations and provides guidance on areas requiring special attention. FRTO implementation impacts several KPAs, as described below.

3.2 Efficiency KPA

3.2.1 The implementation of FRTO modules is aimed at improving performance in the **Efficiency** area, in focus areas: flight time, distance and vertical flight, impacting on fuel savings and CO2 emissions. Efficiency refers to the operational effectiveness and economic profitability of flight operations between city pairs, from a single flight perspective. In all flight phases, airspace users want to depart and arrive at the time they have selected and fly along the path they consider optimal. See examples taken from **Appendix B**:

KPA	Focus Areas	Most specific performance objective(s) supported	KPI	ASBU Operational Element	DESCRIPTION
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	KPI04: Filed flight plan en-route extension	FRTO-B0/1	Direct routing (DCT)
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route & airspace availability as known at the flight planning stage	KPI04: Filed flight plan en-route extension	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	KPI04: Filed flight plan en-route extension	FRTO-B1/1	Free-route airspace (FRA)

3.3 Capacity KPA

3.3.1 The FRTO-B1/2 "RNP routes" element impinges more specifically on an increase in the **capacity** of the en-route segment. The global air navigation system must maintain inherent capacity to meet the demand of airspace users at peak times and in locations with maximum occupancy, while minimising traffic flow restrictions.

3.3.2 In order to address future growth, capacity must be increased, together with efficiency, flexibility and predictability, to ensure that there are no adverse safety impacts, taking into account the environment. The air navigation system shall be resilient to service disruption and the resulting temporary loss of capacity. Examples:

Capacity	Capacity, throughput & utilization	Reduce ATCO workload (enroute)	KPI06: En-route airspace capacity	FRTO-B0/4	Basic conflict detection and conformance monitoring
Capacity	Capacity, throughput & utilization	Overcome capacity limitations attributable to route network design	KPI06: En-route airspace capacity	FRTO-B1/2	Required navigation performance (RNP) routes

3.4 Safety KPA

3.4.1 The implementation of FRTO modules allows for increased performance in the **safety** area, under the specific objective of avoiding lateral/horizontal navigation deviations, and improving early detection of conflicting ATC clearances.

3.4.2 Resolution A40-1 "ICAO global planning for safety and air navigation" endorsed the third edition of the Global Aviation Safety Plan (GASP) and the sixth edition of the GANP to serve as global strategic guidance for safety and air navigation, respectively.

3.4.3 The resolution also states that the GASP and the GANP must be implemented and kept up-to-date in close cooperation and coordination with all stakeholders, and that these plans will serve as a framework for the development and implementation of regional, sub-regional and national plans, thereby ensuring consistency, harmonisation and coordination of efforts to enhance the safety, capacity and efficiency of international civil aviation. The full content of the Resolution and its appendices on GASP and GANP matters, respectively, can be found at:

https://www.icao.int/Meetings/a40/Documents/Resolutions/a40_res_prov_es.pdf

GASP and GANP indicators

3.4.4 The seventh edition of the GANP has included new KPIs for the safety area. GREPECAS has started joint activities with the Regional Aviation Safety Group – Pan America (RASG-PA), in order to optimise the management of these indicators and avoid supplication of efforts in the capture and analysis of these

data. For example, KPI20 "Number of aircraft accidents" has been monitored by RASG-PA for several years as part of its activities. See examples for KPI20 and KPI23:

Safety	TBD	Improve early detection of conflicting ATC Clearances (CATC) (en-route / departure / approach)	**KPI20: Number of aircraft accidents**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve early detection of conflicting ATC Clearances (CATC) (en-route / departure / approach)	**KPI23: Number of airprox/TCAS alert/loss of separation/near mid-air collisions/mid-air collisions (MAC)**	FRTO-B0/4	Basic conflict detection and conformance monitoring

3.4.5 The GASP sets out its goals, targets and indicators in relation to the safety objective of "zero fatalities by 2030". In this regard, the GASP has identified Goal 6, related to the availability of appropriate infrastructure for safe air operations (see **Appendix C**), whose targets and indicators are shown in the following table:

Goal 6: Ensure the appropriate infrastructure is available to support safe operations	**6.1**	By 2025, maintain an increasing trend of States with air navigation and aerodrome infrastructure that meet relevant ICAO Standards.	• Number or percentage of infrastructure-related air navigation deficiencies by State, against the regional air navigation plans • Number or percentage of States having implemented infrastructure-related PQs linked to the basic building blocks

Goal 6: Ensure the appropriate infrastructure is available to support safe operations

3.5 Environment KPA

3.5.1 The performance goal for the environment KPA set forth in the GANP is "to maintain or improve environmental sustainability of aviation". The seventh edition of the GANP has neither defined the specific FRTO element nor developed indicators for this KPA, that is, there is not yet a harmonised definition of common environmental metrics. See **Appendix B.**

3.5.2 However, the contribution of ASBU module/element implementation to environmental protection is recognised, especially where it allows for a reduction in flight distance/time and vertical profiles through FRTO implementation, allowing aircraft to follow more direct trajectories.

3.5.3 By reducing flight distance, fuel savings can be estimated (for each flight and for all flights on the segment) compared to the previous trajectory configuration. Consequently, the amount of CO2 associated to fuel saved can be estimated.

Note. - For ease of calculation, the CO2 emitted is considered to be approximately 3.16 times the fuel consumed, expressed in kilogrammes.

3.6 Cost-effectiveness, access and equity, and flexibility KPAs

3.6.1 The ICAO GANP is in the process of completing or defining KPIs for these KPAs. The FRTO implementation approach may consider the development for these KPAs, based on GANP evolution in subsequent editions. See **Appendix** B**.**

4 FRTO IMPLEMENTATION ASSUMPTIONS

4.1.1 Taking as operational scenario the CAR/SAM airspace, and identifying the aforementioned performance improvement ambitions, this Guide makes the following assumptions:

a) Airlines will continue making efforts to modernise their aircraft fleets in order to accomplish performance-based navigation (PBN), supported mainly by GNSS. The *"best equipped, best served"* concept will apply.

b) ATFM shall be strengthened in the Regions, evolving towards an integrated cross-border service, in order to be prepared to manage the capacity-demand mismatch, with a strong emphasis on achieving the least impact of flow measures on operators.

c) FRTO implementation helps ATM system capacity absorb the growth in air traffic demand.

d) The States of the Regions, depending on the financial situation, will continue to make efforts to modernise their air traffic control systems in accordance with their operational needs and new developments in the industry.

e) The States of the Regions will continue to make efforts to increase ATC capacity as necessary to meet air traffic demand, primarily through appropriate ATC sectorisation.

f) The States of the Regions will continue to take action as needed to reduce the environmental impact that may result from civil aviation activities.

g) The implementation of the FRTO concept must meet safety criteria, be compatible with existing operations and future systems, and expand and connect to adjacent airspace.

h) The application of the FRTO concept must consider the defence and security requirements of military bodies. The implementation of FUA, based on ICAO Doc 10088, establishes an appropriate framework for civil-military cooperation.

i) The vertical and horizontal boundaries of the regions in which FRTO is applied must preferably be based on operational requirements, not necessarily on FIR geographical boundaries, in order to take full advantage of its applicability. A study must be undertaken to align sectorisation with the implementation of FRTO airspace.

j) SDR and FRA will be implemented in a harmonised and standardised manner in the States of the Regions, facilitating the evolution to cross-border application. The implementation should involve

the support of States and ANSPs to conduct trials to assess feasibility, efficiency, positive environmental impact and safety aspects.

5 FRTO IMPLEMENTATION ENABLERS

5.1 Communication, navigation, surveillance

Communication

5.1.1 VHF coverage is essential for FRTO implementation in continental airspace, while other means of communication such as HF or CPDLC may be used in remote and oceanic airspace. However, it will be up to each State to assess the implementation of FRTO in areas that have coverage gaps, provided that an operational risk analysis is carried out and other safety measures, such as a LoA between the ACCs involved, are taken as necessary.

In the short term, it is expected that SDR and/or FRA will be implemented in oceanic airspaces with low complexity and/or low air traffic volume. However, the option of implementing UPRs should be mainly considered in oceanic airspaces, taking into account that pre-coordination with ATC and/or ATFM reduces the need for ATCO intervention.

5.1.2 In the medium and long term, among the proposed solutions for bridging communication coverage gaps without the need for avionics upgrades, the VOICE project offers very satisfactory results as to the technical feasibility of VHF systems based on low earth orbiting (LEO) satellites.

5.1.3 With this new communication technology, traffic in oceanic and remote airspaces would be handled in a similar way to continental airspace, allowing for FRTO implementation and a reduction of separation minima without compromising safety. Likewise, the VOICE project will conduct some cross-border operations between adjacent flight information regions (FIRs) belonging to different countries and under the responsibility of different air navigation service providers (ANSPs).

5.1.4 The VOICE project would therefore produce a viable technical solution for VHF voice and data link communication in ground metric waves. Gap-free VHF communication between continental and oceanic/remote airspaces will allow users to overcome the current coverage limitations of ground systems, while reducing aviation-related CO2 emissions through the use of more efficient trajectories.

Navigation

5.1.5 Performance-based navigation (PBN) is an indispensable tool for optimising airspace using FRTO, responding to the increasing complexity of aviation operations. By enabling more direct and efficient trajectories, PBN reduces the distance flown, saves fuel and contributes to environmental sustainability. Its adaptive flexibility is crucial to cope with changing operational conditions, optimise the use of airspace and promote efficient traffic management.

5.1.6 The precise departure and arrival procedures offered by PBN, such as RNAV and RNP, not only increase safety, but also help aircraft to circumvent airspace restrictions and respond to unexpected events, making operations more resilient. More efficient trajectories not only reduce flight time, benefiting airlines economically, but also contribute to more sustainable and safer aviation.

5.1.7 In summary, airspace optimisation using PBN is vital to address contemporary operational challenges while promoting efficiency, safety and sustainability in the global aerospace landscape.

Collaboration among stakeholders is essential to ensure the continued success of this innovative approach to aviation.

5.1.8 At present, RNAV routes have an RNAV-5 navigation specification. However, States should consider applying a more robust RNP specification, for example RNP2, to accommodate a greater number of aircraft in a safe and sustainable manner.

ATS surveillance

5.1.9 ATS surveillance coverage is important for FRTO deployment in continental airspace, while surveillance in oceanic airspace could be based on other means, such as ADS-C/CPDLC and space-based ADS-B. In the case of space-based ADS-B, it would be important to identify the means of communication used, taking into account that ATCOs would have similar surveillance to that in continental airspace, but would not have a communication system that would allow the same intervention capability as VHF voice communication.

5.1.10 It is important to highlight that it is essential that States consider the installation of communication and surveillance equipment that would reduce or eliminate coverage gaps that could prevent or hinder FRTO implementation, as well as longitudinal separation optimisation.

5.1.11 UPRs may be more appropriate for use in airspaces that lack ATS surveillance or have more significant coverage deficiencies, taking into account that these are routes previously coordinated with the ANSP, where a more accurate assessment of the impact on operations could be made.

5.1.12 In those remote airspaces where, due to their geographical location, optimal ATS surveillance is not possible, States must consider the feasibility of developing appropriate procedures to enable FRTO with the least possible impact on separation in surrounding airspaces with ATS surveillance.

5.2 ATS services and automation

5.2.1 There is a need to use automated tools to indicate the status of upcoming airspace reservation and restriction activities because all stakeholders must have the same information on the intended profile and route of a flight, both in the initial flight plan and in any subsequent updates of that information.

5.2.2 Special attention must be paid to ATS service continuity, especially in transition areas between an airspace where SDR or FRA is applied and another using the ATS fixed route system (and *vice versa*). Additional procedures must be agreed to ensure continuity in the provision of the structured ATS service.

5.2.3 Where appropriate, consensus should be reached in the medium term among States on the minimum (lateral/longitudinal) separation to be applied between aircraft in the FRA. For UPR or SDR routes, minimum separation requirements in accordance with the required navigation specification on the respective route must be applied.

5.2.4 In the medium/long term, it will be necessary to implement automated tools to indicate the status of upcoming airspace reservation and restriction activities, because all stakeholders must have the same information on the intended profile and route of a flight, both in the initial flight plan and in any subsequent updates of that information. In the absence of such automated tools, it is the responsibility of the aircraft operator to plan flights avoiding airspace reservation and restriction areas, as set out in aeronautical publications or information provided by the ATFM or ATC unit.

5.3 AIDC system – Data communication between ATS units

5.3.1 The AIDC system seeks to improve the efficiency of coordination and transfer of control between ATS units -- in this case area control centres -- by replacing voice communication (ATS voice channel) with an automatic exchange of messages. This element represents a first automation step in the evolution of coordination and transfer of control between neighbouring ATS units to ensure that all associated and necessary flight information is available to the other unit as agreed.

5.3.2 In the SAM Region, the implementation of AIDC (referred to in the GANP under FICE B0/1 element), seeks to promote the optimisation of ATS coordination and the efficient management of aircraft flow data. At the same time, AIDC has been identified as an element that mitigates ATS coordination errors, called LHDs. These events are being handled and reduced in number, after showing more incidence at some transfer points, between ACCs in the Region. It is estimated that 20% of 102 (bilateral) connections have been implemented between control centres in the SAM Region. There is a subgroup in the Region driving this implementation, which is studying a broader application of AIDC functions.

5.3.3 Notwithstanding the above, it is important to note that the AIDC is not a basic requirement for SDR implementation in the short term, taking into account that cross-border SDR implementation is not expected in the short term, that is, the transfer of aircraft between ACC units will take place at a significant point published and agreed in ATS letters of agreement.

5.4 MTCD tools – Flight data processing (FDP)

5.4.1 The medium-term conflict detection (MTCD) tool (defined in ASBU as FRTO-B0/4*) is required for the FRTO-B1/1 FRA element, as it enables safety maintenance and reduces ATCO workload through early and systematic conflict detection and conformance monitoring.

5.4.2 MTCD assists the ATCO in conflict identification and planning tasks by providing automated early detection of potential conflicts; facilitates the identification of flexible routing paths and absence of conflicts; assists with the identification of aircraft that constrain conflict resolution or occupy a flight level requested by another aircraft.

5.4.3 The monitoring aids (MONA) function provides the controller with warnings if the aircraft deviates from free airspace or planned trajectories, and reminders of ATCO instructions to be issued. MONA may include monitoring of flight progress, as well as of lateral, longitudinal, vertical and **cleared** flight level (CFL) deviations.

**Note. - The Guide proposes to consider it as an enabler of FRTO implementation.*

5.5 Aeronautical information management (AIM)

5.5.1 Aeronautical information management (AIM) is a crucial part of the safe and efficient operation of the civil aviation system, involving the collection, organisation, processing, dissemination and use of aeronautical information relevant to pilots, air traffic controllers, airlines and other aviation stakeholders. The AIM unit shall assess and adopt processes to facilitate implementation and ensure safety.

5.5.2 ATS reporting functions are typically placed under AIM management in the Region. Similarly, aeronautical charts are often managed by AIM.

5.5.3 Flight planning (initial perspective)

Short term (up to 5 years)

5.5.3.1 Flight plans will be distributed to ATS providers, relevant military organisations and other stakeholders (may vary according to State requirements). The improvement of FPL messaging shall be addressed and some deficiencies corrected. The flight plan management system will ensure appropriate flight profile calculation.

5.5.3.2 Current flight plan systems are expected to be able to support SDR implementation, taking into account that cross-border SDR implementation is not expected in the short term.

Medium term (5-10 years) and long term (10 years or more)

5.5.3.3 The automatic exchange of flight data between ACCs must consider the possibility of transfer at random points, enabling cross-border SDR or FRA implementation. The possibility of flight planning across two or more FIR boundaries will be provided. This will require the flight plan processing system to calculate and communicate with all ACCs belonging to the same airspace where FRTO is applied.

5.5.3.4 Real-time updates of airspace availability must lead to a recalculation of the flight profile sent by the flight plan processing system prior to FPL distribution. To ensure that subsequent en-route corrections can be provided to the affected flights, it will be necessary to define an appropriate distribution time parameter. Once this parameter has been exceeded and FPL has been distributed, no further route updates shall be processed.

5.5.3.5 It is recommended that the flight plan processing system may propose routes based on shortest distance and/or alternative FLs above or below airspace reservation or restriction areas. In areas where coordination procedures and airspace conditions permit, users may plan to fly through segregated or reserved airspace and await tactical rerouting in the event that no areas are available.

5.5.3.6 The user will need to be aware of all relevant reservation or restriction activities in FRA or SDR airspace to permit the selection of routes to avoid them. In the event that FRA or SDR airspace is transient, the route selected will be based on intermediate points published to this end, in order to avoid inadvertent entry into segregated or reserved airspace.

5.5.3.7 The flight plan processing system will enable the correct processing of the flight plan and the verification of the transition from ATS fixed route network airspace to FRA or SDR airspace and *vice versa*, especially when the latter is applied during limited periods, for example, only at night. In such cases, the flight plan processing system will verify the flight plan to ensure compliance with the duration parameters of the respective SDR or FRA airspace.

5.5.3.8 In the case of large-scale FRA applications, flight plan distribution to the appropriate ATC unit and ATC sectors must be ensured, hence the importance of having up-to-date information on active sector configurations. Furthermore, ATC units, airspace users and other units involved shall have access to exactly the same information for both the initial flight plan and subsequent updates.

5.5.3.9 In addition to the normal flight plan validation rules in the flight plan processing system, the planned route in FRA airspace will be considered invalid if:

a) it does not comply with the FRA-published horizontal entries/exits, the FRA departure/arrival connection points, and any other use of airspace; and

b) crosses a reserved or restricted area whose coordination procedures and airspace conditions do not permit entry.

5.5.4 Publications and aeronautical charts

5.5.4.1 Lateral and vertical limits, duration, conditions and requirements for FRA and SDR application will be published in the aeronautical information publication (AIP). UPRs must be included in the route playbook.

5.5.4.2 SDR/FRA entry and exit points will be published in the AIP, with a clear reference to the SDR/FRA and the nature of the point (entry, exit or entry/exit point).

NOTE: The publication of extended SID/STAR procedures or the connection of ATS routes are also operationally-recommended options.

5.5.4.3 In the case of FRA, in order to benefit from the best operational conditions, airspace users may use any unpublished waypoint for flight planning defined by geographical coordinates. But this possibility must be clearly disclosed in the AIP. In cases where it is not possible to use coordinates, the publication of FRA reference points must be arranged.

5.5.4.4 Flight plan completion limitations must be published for areas where FRA is structurally limited, that is, where only limited combinations of entry and exit points are permitted.

5.5.4.5 Whenever a fixed ATS route network is maintained within the FRA, details will be provided in the aeronautical information products.

5.5.5 In the FRA and, exceptionally, in SDR airspace with low volume/complexity, airspace users may use any significant point, published or unpublished, defined by geographic coordinates, to indicate changes in cruising FL.

5.6 Flexible use of airspace (FUA)*

5.6.1 Aviation covers a wide range of users, from commercial aviation to military and recreational operations, each with its own mission or business objectives.

5.6.2 Flexible use of airspace (FUA), defined as element **FRTO-B0/2** in the GANP, is an airspace management concept based on the principle of accommodating all airspace users inasmuch as possible, considering effective communication, cooperation, and the necessary coordination to ensure safety, efficiency and environmental sustainability.

5.6.3 The application of the FUA concept is intrinsically linked to FRTO, as the effective sharing of airspace and its efficient use by civil and military users through the harmonisation of strategic planning, pre-tactical allocation of airspace and its tactical use, create an environment conducive to FRTO implementation.

5.6.4 The implementation group (SAMIG) developed a "Guidance for the Implementation of the Flexible Use of Airspace (FUA) Concept in the South American Region", which considers the SAM airspace as a single resource shared by all airspace users, with diverse and sometimes conflicting interests and requirements, which must be taken into account and addressed as far as possible.

5.6.5 Where required by the operational scenario, standard arrival and departure procedures, and 'non-permanent' or conditional routes will be implemented for a more efficient use of airspace.

**Note. - The Guide proposes to consider it as an enabler of FRTO implementation.*

5.7 Air traffic flow management (ATFM)

5.7.1 Air traffic flow management (ATFM) is a system and a set of procedures aimed at managing and optimising air traffic flow, especially at times of high demand or when events occur that may affect normal airspace capacity.

5.7.2 ATFM is implemented to avoid congestion, minimise delays and optimise the use of airspace and airports. It is often used in situations such as adverse weather conditions, unexpected events or during busy periods, such as holidays.

5.7.3 This management is carried out by air traffic control authorities and involves constant monitoring of traffic, demand forecasting, implementation of measures to adjust flight schedules, and coordination with airlines and other stakeholders to maintain the operational efficiency of the air traffic system. The objective is to ensure the safety, efficiency and smooth flow of air traffic in times of capacity-demand imbalances.

5.7.4 Depending on the way FRTO is implemented, it is possible that airspace capacity will be reduced, mainly if there is no proper sectorisation, there are gaps in ATS surveillance, and the necessary ATM tools are not available. This possible reduction in capacity is closely related to the complexity and volume of air traffic. When planning FRTO implementation, the available ATC capacity and airspace complexity must be taken into account so that the benefits that can be obtained from such implementation are not lost by routine adoption of ATFM measures. However, consideration must be given to possible ATFM measures to be adopted on a non-routine basis when planning the establishment of UPR or DCT routes and also FRA.

5.8 PBN and PBCS certification of air operators

5.8.1 Performance-based navigation (PBN) and performance-based communication and surveillance (PBCS) are concepts related to the modernisation and standardisation of aviation navigation, communication and surveillance systems. Both are key to improving operational efficiency, reducing airspace complexity and increasing air traffic system capacity.

5.8.2 PBN certification is a process by which aircraft and navigation procedures are assessed and certified based on their performance. Rather than relying on ground infrastructure, PBN uses on-board systems, such as the global positioning system (GPS), to determine aircraft position and trajectory. PBN certification enables the implementation of more flexible navigation procedures, such as area navigation (RNAV) and required navigation performance (RNP), improving the efficiency of air operations.

5.8.3 PBCS certification relates to aircraft communication and surveillance performance for application in oceanic airspace. It sets performance standards for communication systems, such as satellite communications (for example, controller-pilot data link communications - CPDLC), and for surveillance systems, such as automatic dependent surveillance-contract (ADS-C). PBCS certification is essential to ensure that aircraft meet the performance requirements for operation in specific areas of airspace, especially on long-haul routes or in oceanic regions, where operational benefits are expected and air traffic complexity/volume warrant it.

5.8.4 PBCS certification is not essential for the successful implementation of FRTO concepts and for most of the oceanic airspaces of the Region, with the exception of the EUR/SAM corridor in the South Atlantic.

5.8.5 It is expected that, given the post-COVID scenario, the older and more inefficient fleet will be withdrawn from service and users lacking PBN/PBCS certification will be significantly reduced. The benefits derived from the operational concept are based on the modern navigation capabilities of most of the commercial air fleet operating in the Region.

5.9 Human factors and training

5.9.1 As progress is made towards the Global ATM operational concept and the development of the GANP, an increasing level of automation will be required. However, the human being will at all times continue managing automation. In basic terms, this means that humans will decide what is to be done, will delegate the execution of tasks to automation, and will be able to intervene when necessary.

5.9.2 People with the appropriate skills and competencies, properly certified and trained, will continue to be the pillars of ATM/CNS operation and support services. With the expected recovery and growth of aviation, it is critically important to have sufficiently qualified and competent personnel to ensure a safe and efficient aviation system.

5.9.3 States must incorporate human performance in the planning and implementation phases of new systems and technologies within the framework of the GANP and the regional and national plans. Early involvement of operational staff is also essential.

5.9.4 In relation to the above, it is necessary to emphasise the importance of incorporating human performance in the programmes and courses taught in the aeronautical training centres in the States of the Region. The training of aeronautical personnel is fundamental for the purposes of this document.

5.9.5 Each airspace has its own challenges and complexities. Accordingly, properly planned training is required, based on the agreed roadmap and activities and, where possible, using simulators to recreate scenarios as close as possible to working environments, with dynamic situations that contemplate possible contingencies.

5.9.6 Furthermore, ATC sector capacity studies should be conducted based on the analysis of ATCO´s workload, which may lead to the identification of improvements in the static and dynamic sectorisation of the ACC. Within this context, possible ATC staff limitations that could affect implementation (for example, by constraining training activities) should be addressed.

5.9.7 The implementation of FRTO is not expected to increase ATCO's workload. However, it will be very important to reinforce operational oversight at ACCs. Likewise, the SMS of ATC units shall adopt the new FRTO operational framework in its processes and manuals.

5.9.8 The training needs of crew, airline flight dispatchers, AIS, MET and CNS personnel, as well as subject matter experts concerned with FRTO implementation, must be identified and addressed.

6 IMPLEMENTATION ISSUES

6.1 Performance measurement. Application of KPIs and data management

Note.- See tables in Appendix B.

6.1.1 The GANP sets forth 24 key performance indicators, as shown in the following link:

https://www4.icao.int/ganpportal/ASBU/KPI

6.1.2 In each of the 24 formats presented, the following KPI components are explained:

- Definition
- Measurement units

- Operations to be measured
- KPI variants
- Characterised objects
- Usefulness of the KPI
- Parameters
- Data requirements
- Data providers
- Formula/algorithm

6.1.3 It is noted that the management of KPIs and their use to measure the extent to which the expected performance has been achieved as part of the enhancement for the ASBU element requires collaborative action by various actors in the system, such as airports, ATFM services, ANS providers, airlines, itinerary databases, ADS-B providers, etc.

FOQA and Big data

6.1.4 Data available at airline level, such as flight distance/time and fuel consumption, as well as trajectories actually flown before and after FRTO implementation, can be used for the design of procedures, routes and mainly for post-implementation assessment of an optimised airspace concept because it provides real information on the benefits obtained from implementation.

6.1.5 The information provided by the Big Data Project on air traffic movement is a valuable input for airspace planning tasks. This information is derived from the analysis of data provided by aircraft ADS equipment and transmitted to a network of receivers on the ground and then analysed to produce safety or statistical indicators that can be used for measurement and airspace planning. The information can be updated every three hours, providing constant, accurate and low-cost information.

6.1.6 In the FRTO operational concept, airspace planning involves the use of several key indicators to ensure an efficient and safe operation. These indicators are designed to assess the effectiveness of FRTO planning and implementation. Some indicators/metrics that may be developed and applied are listed below:

a) Route efficiency: Assesses the efficiency of planned routes compared to traditional routes. It can be measured by flight distance and flight time compared to historical routes.

b) Airspace utilisation: Measures how efficiently airspace is used in the free-route area, considering the flexibility provided by the FRTO concept.

c) Reduction of flight distance and flight time: Assesses the reduction in flight distance and flight time as a result of more direct and efficient route planning.

d) Flight plan compliance: Analyses how well aircraft follow their flight plans, ensuring compliance with planned routes.

e) Congestion reduction: Measures the reduction of airspace congestion due to the implementation of more flexible and direct routes.

f) Runway and airport usage optimisation: Evaluates the efficiency of runway allocation and airport management, since FRTO may have an impact on arrival and departure distribution.

g) Safety: Considers safety indicators, such as the rate of compliance with altitudes and separation procedures, to ensure that FRTO implementation does not compromise safety.

h) Fuel consumption reduction: Evaluates the reduction in fuel consumption due to more efficient routes and reduced flight times.

i) User satisfaction (airlines and passengers): Measures airline and passenger satisfaction with respect to route flexibility, punctuality and overall efficiency of operations.

j) Improved airspace capacity: Evaluates how FRTO implementation contributes to improving airspace capacity, allowing for more operations.

6.1.7 These indicators/metrics are essential to measure the success and benefits of the FRTO concept, providing valuable information to continuously adjust and improve operations and airspace planning.

6.1.8 It is important to note that, during FRTO implementation, CO2 reduction data will be collected to the extent possible, although this is not a requirement for its implementation. This data may not be available from airlines or may be very difficult for States to obtain, depending on each reality. It is estimated that, by promoting improved airspace capacity and efficiency, there will be a natural reduction in CO2 emissions from aviation.

6.1.9 Likewise, the information captured by Big Data can be used to determine aircraft movement flows for input into airspace design, which is very useful for noise segregation procedures or other purposes.

6.1.10 The aforementioned indicators are just some of those that will be available to users of the Big Data project to directly support airspace planning tasks.

6.2 Pre-operational analysis and airport accessibility

6.2.1 It should be noted that, within route optimisation, there are factors for airlines and air operators such as: aeronautical charges, routes in case of depressurisation (escape routes), distance to alternate aerodromes, weather conditions, etc., which may determine that the shortest distance between two points is not necessarily the optimum trajectory in a given circumstance. Implementation shall involve specific studies when these factors impact any area or segment of the FIR.

6.2.2 Consideration must also be given to the effect of publishing meteorological minima for alternate aerodromes that are higher than the published instrument approach procedure minima for the same aerodrome, in order to ensure airport accessibility.

6.3 Safety assessment

6.3.1 Safety must be guaranteed in any airspace design or procedure modification contemplated for its optimisation. This includes compliance with ICAO SARPs and relevant State regulations.

6.3.2 After airspace changes are made, the system should be monitored and operational data collected to ensure that safety is preserved, to determine whether strategic objectives have been achieved, and to identify opportunities for improvement.

6.3.3 **Appendix D** presents a safety assessment model developed for SDR implementation in the SAM Region.

6.4 Communications plan for the Project

TBD

6.5 Cost-benefit analysis

6.5.1 States in the Regions should conduct a cost-benefit analysis of airspace modifications and of planned infrastructure and modernisation investments. In the AN-SPA tool and in the fourth layer of the NANP, GANP/6 presents some basic considerations and a checklist for conducting this analysis (CBA checklist).

6.6 Air navigation – System performance assessment (AN-SPA)

6.6.1 To support air navigation planners, the GANP portal has included--in the second layer, "Global technical"--an air navigation system performance assessment tool. The objective of this tool is to promote a performance-based approach to cost-effective modernisation of the air navigation system. This tool is presented in the form of a "survey" and guides the aviation community in the application of a six-step performance management process and in the selection of relevant operational improvements within the ASBU framework.

6.6.2 It is strongly recommended to conduct several trials, for one or more of the KPAs involved. In the case of FRTO, it will be very illustrative to conduct an exercise for a continental airspace scenario in the CAR/SAM Regions. Similarly, operational scenarios in TMAs and aerodromes can be assessed.

6.6.3 Collaborative decision-making is key to a cost-effective modernisation of the air navigation system and, therefore, all relevant aviation stakeholders must be involved. The link is shown below. The user must first register (log in in the top right corner of the portal). A personal email address can be used:

https://www4.icao.int/ganpportal/ANSPA/Reports

7 PLANNING PRINCIPLES

7.1.1 It is essential to set clear objectives for FRTO implementation, such as reducing flight times, saving fuel, increasing airspace capacity or improving operational efficiency. Regulations, coordination mechanisms and pre-existing CNS infrastructure must be taken into account, together with airspace structure, complexity and capacity, as well as meteorological characteristics and, if necessary, ATFM requirements.

7.1.2 FRTO involves coordination and collaboration amongst various stakeholders, including civil aviation authorities, air navigation service providers, airlines and airport operators, from the outset of the implementation project. Integrated planning is essential to ensure that all aspects of FRTO implementation are effectively considered and coordinated.

7.1.3 Relevant stakeholders must be involved from the beginning of the FRTO implementation process. This includes listening to the concerns and perspectives of airlines, air traffic controllers, airport operators and other stakeholders, thus ensuring a more collaborative and inclusive implementation process.

7.1.4 Successful implementation of FRTO requires adequate capacity-building and training for all parties involved. This may include training air traffic controllers on new procedures and tools, training pilots on how to operate on flexible routes, and training flight planning teams on the use of trajectory optimisation tools.

7.1.5 FRTO implementation must take place throughout the CAR/SAM Regions. Given the size of the airspace and the specificity of each State, implementation must start in scenarios with low complexity and/or better ATM/CNS infrastructure, and evolve to create blocks of homogeneous areas in which the concept is applied.

7.1.6 FRTO must be applied in airspace with a defined lower limit, and not affect adjacent areas where it is not yet being fully applied. Climb and descent profiles in the underlying areas must be taken into account for the establishment of transition points to provide a structured transition, which will not necessarily be at the FIR boundary and which will preferably be aligned with the ATS fixed route network.

7.1.7 It is recommended that the reconfiguration of airspace reservations and restrictions be coordinated with the respective responsible parties. Likewise, studies must be conducted to review sectorisation, if needed, in order to harmonise the FRTO implementation area and ensure capacity-demand balancing in the respective sectors.

The criteria for defining ATC sectors will take into account, at least:

a) the main traffic flows and directions;

b) avoiding short crossings through ATC sectors;

c) avoiding re-entry into the sector or FIR;

d) location and activation modes of airspace reservations and restrictions; and

e) consistency with adjacent ATS fixed route sectors and connection of ATS routes to SID/STAR procedures.

7.1.8 Prior to FRTO implementation, it is important to conduct a thorough assessment of potential risks and impacts associated with the change. This may include safety, air traffic impact, system interoperability, regulatory compliance and environmental impact assessments.

7.1.9 After FRTO implementation, it is important to continuously monitor system performance and assess whether planned objectives are being achieved. This may involve collecting and analysing operational data, feedback from stakeholders, and conducting periodic reviews to identify areas for improvement and opportunities for optimisation.

8 PROJECT RISKS

Note. - This section presents an initial identification of project risks. In a later version of this Guide, GESEA SG1 shall validate them and develop a matrix proposing a mitigation action for each risk, and applying a risk rating of 8-10 for highest risk, 6-7 for medium risk, 1-5 for low risk.

Airspace optimisation based on the FRTO concept may entail several risks, challenges and interdependencies. It is crucial to identify and manage them to ensure successful implementation. The following are some potential risks associated with this project:

a) Regulatory resistance: There may be resistance or challenges from civil aviation authorities when significant airspace changes are introduced. Therefore, proactive engagement with regulators, transparent communication, and collaboration in the planning and implementation phases will be required.

b) Operational resistance: The implementation of new systems and procedures to support FRTO may face resistance from technicians and operators. Therefore, it will be necessary to conduct simulations, involve experts in the process, and conduct a gradual implementation to minimise impacts.

c) Technological challenges: There may be technical problems, such as CNS system failures, as well as failures in the integration of ATM systems between States. Therefore, there is a need for a back-up system, rigorous testing, and close cooperation with technology providers, as well as dialogue and collaboration with aviation authorities in other countries to harmonise standards and procedures.

d) Adoption by industry: Resistance or lack of certainty on the part of airlines in adopting new FRTO routes and procedures. There must be active engagement with airlines, demonstration of benefits, and incentives for adoption.

e) Insufficient training: Lack of adequate training for pilots, air traffic controllers and other professionals involved in new FRTO practices. Comprehensive training programmes, periodic training sessions and educational materials must be developed.

f) Safety: The introduction of new routes and procedures may affect control capacity, aircraft separation, and/or ATCO workload. Therefore, there must be a pre-implementation risk analysis, constant safety monitoring, and immediate adjustments in case of problems.

g) Impact on existing operations: Significant changes can adversely affect existing operations, resulting in delays and disruptions. Therefore, careful planning, effective communication with stakeholders and phased implementation must take place to minimise disruption.

h) Weather challenges: Adverse weather conditions may affect FRTO efficiency, especially in the case of more direct trajectories, such as SDR. Therefore, contingency protocols, weather monitoring and real-time route updates must be applied.

i) Communication failures: Failures in internal and external communication can lead to misunderstandings and resistance. Therefore, there must be clear communication channels, regular updates and active engagement with all stakeholders.

j) Lack of CNS infrastructure: Lack of communication and/or surveillance coverage may affect the safety of air operations. Likewise, lack of the required navigation certification is an obstacle to FRTO implementation. Therefore, States and airlines must establish procedures and means to prevent this situation, as FRTO implementation will quickly benefit them.

k) Lack of financial resources: Lack of resources can hinder or even prevent FRTO implementation. Both States and airlines must strive to allocate resources for system development and personnel training.

l) Lack of human resources: Pilots and air traffic controllers are professionals who require very specific qualifications, which involves time for training and skills development. While it is not a specific item of this project, although automation is increasingly taking place in the airline industry, there is a need for States to manage personnel to support the growing demand from the airline industry.

m) Lack of airport infrastructure: Statistics show that the number of aircraft operations will soon exceed the number of aircraft movements prior to the COVID-19 pandemic. Therefore, investments in airport infrastructure will be necessary so that this does not create a domino effect on airspace management and jeopardise FRTO implementation.

n) Implementation delays: Difficulties in executing changes as planned can lead to delays in implementation. There is a need for constant monitoring of progress, proactive identification of obstacles, and timetable adjustments as appropriate.

IMPLEMENTATION SOLUTIONS AND ELEMENTS

9 PRE-VALIDATED AND COORDINATED ATS ROUTES TO SUPPORT FLIGHT AND FLOW (FRTO-B0/3)

This element consists of a collection of routes that have been pre-validated and coordinated with ACCs and airspace users concerned. There are three main options for these routes: preferred routes, Playbook routes and coded departure routes (CDRs).

According to the GANP definition, there are many cases where ATC needs to *move air traffic away from or closer* to a particular area of airspace. When this happens, the ATS usually implements diversions, a common route, or a set of routes, that they want aircraft to use in a particular area.

These routes are predetermined and apply to a given sector/airport accordingly. The routes are available through the ANSP database and are published in appropriate media (AIP, AIC, websites, etc.) for access by airspace users.

- Preferred routes are the normal, everyday routes that ATC wants operators to submit. These routes were developed to increase system efficiency and capacity by having balanced traffic flows between high-density airports, and to eliminate conflicting traffic flows where possible. Preferred routes are those that operators normally submit.

- Playbook routes are a set of standard routes that ATC can use to adapt to a particular set of circumstances, when preferred routes are not available. These routes were created to allow for fast implementation when so required.

- CDRs are a combination of coded air traffic routes and refined coordination procedures designed to reduce the amount of information to be exchanged between ATC and flight crews.

Operational and dependent relationship with other ASBU elements:

- FRTO-B0/1 – Direct routing (DCT)
- FRTO-B0/2 – Airspace planning and flexible use of airspace
- AMET-B0/1 – Meteorological observation products
- AMET-B0/2 – Meteorological forecast and warning products
- AMET-B0/3 – Dissemination of meteorological products

NOTE

By way of reference, the following paragraphs 9.1, 9.2 and 9.3 describe enhanced route applications being implemented in the Region, even as part of trans-regional FRTO trials within CIIFRA. Some differences or variations with respect to the GANP text are identified. GESEA will further study this issue to define the most appropriate alignment with the GANP, recognising regional needs.

9.1 User-preferred routes (UPR)

9.1.1 User-preferred routes (UPRs) are routes requested by airlines that optimise routing between a specific city pair. UPRs must be approved by all ANSPs, through their flow management units, area control centre managers, or civil aviation authorities, as appropriate, affected by any segment of the route. The UPR may be approved for a trial period, if necessary.

9.1.2 Once a UPR is approved for testing, it will be available for a specific period (that is, for a trial period) and for a specific airline. The purpose of route trials is to determine the operational viability of routes. Once the operational viability of the route has been verified, whether or not a trial period is required, it will be published in accordance with the standards and procedures set out in the AIP of each State involved. Upon publication of the route segments by the States, all airlines will be able to use these segments for any city pair until further notice.

9.1.3 The CANSO-IATA-ICAO Free Route Airspace (CIIFRA) team developed a UPR catalogue, containing airline proposals, which are being coordinated with ANSPs in order to start a trial period, if necessary, and then proceed to their full implementation. The publication of UPRs in the route catalogue and other proposals to be made by airlines have the potential to significantly increase savings and contribute to the evolution towards strategic direct routing (SDR) and free-route airspace (FRA).

9.1.4 By nature, UPRs are flexible, and "conventional" publications such as the AIC, AIP supplement or AIP amendment may not be flexible enough to provide a good quality of service to airlines, and to assure ANSPs that the routes being flown are exactly what they expect and are prepared for. In this regard, the best way to provide information to both pilots and ATCOs and, at the same time, give the necessary flexibility to ANSPs to implement and cancel UPRs without a complicated aeronautical publication process, is to make a generic publication of UPRs in the AIP, in the ENR section, and include a link to the ANSP website where UPRs can be found. If the ANSP does not have a website or if there is no way of publishing UPRs on the ANSP website, a link to a specific Excel file or other more suitable format can be used.

> *Note. – By way of reference, Brazil´s AIP includes the definition of UPR route in section ENR 3.3 - Other routes.*

9.1.5 For airspace users, it is important to get a complete picture of the entire UPR, especially those involving several ANSPs. Thus, it is highly recommended that a complete route catalogue be published on the ICAO SAM Office website or on the future SAM Portal with inter-regional projection.

9.1.6 A model for UPR publication in the AIP is shown in **Appendix E.**

9.1.7 For the implementation of the UPRs proposed by airlines, it is important that States keep their contact points up to date and that they are capable to give a quick response to such proposals.

9.1.8 Efficiency of analysis and implementation is expected to be achieved through the use of an electronic tool that connects airlines, the State/ANSP experts responsible for analysis and the sector responsible for publication, such as, for example, Brazil's Digital Airspace System Analysis (DASA) tool. It is important to note that the point of contact will also be necessary with the use of the electronic tool, because it will require that States/ANSPs designate those responsible for analysis and publication.

9.2 Playbook routes

9.2.1 Playbook routes are a set of standard routes that the ATC can use to adapt to a specific set of circumstances when preferred routes are not available. These routes are designed for rapid deployment as

needed and provide standard guidelines and procedures for all stages of the routing process, contributing to an efficient and coordinated operation.

9.3 Coded departure routes (CDR)

9.3.1 CDRs are a combination of coded air traffic routes and detailed coordination procedures designed to reduce the amount of information to be exchanged between the ATC and flight crews. They are routes that overfly airspace with low potential for temporary reserved use (TRA or TSA) in order to conduct specific activities or that meet specific ATC conditions, such as air traffic restrictions or sectorisation.

9.3.2 CDRs are generally established and used as part of pre-planned rerouting scenarios, allowing for the definition of more direct and alternate routes.

9.3.3 CDRs are divided into three categories:

a) CDR1 – category applicable to those routes that may be included in the flight plan at any time or at specific periods of time:

- they are defined in the airspace planning phase and the impact of potential disruptions of a CDR1 must also be assessed and managed at the pre-tactical level, just like the availability of CDR2;
- in case a CDR1 is not available at the pre-tactical level, operators must consider the implications of a possible rerouting and the use of alternate routes published for each CDR1;
- in case of unavailability of a CDR1 at the tactical level, ACCs must provide diversions to users; and
- interruptions must be published via NOTAM.

b) CDR2 – category applicable to those routes that can only be included in the flight plan under certain conditions:

- they are defined in the airspace planning phase with the objective of pre-establishing route changes to better distribute traffic; and
- a CDR2 can only be used when it is available after analysing the AMC at the tactical level.

c) CDR3 – category applicable to those routes that cannot be included in the flight plan, but that may be used by the ACC at the tactical level.

- availability is defined at the tactical level; and
- following coordination with the concession holder responsible for the associated TRA, TSA, R or D area, the controller may offer an aircraft a CDR3 through the area.

10 DIRECT ROUTING (FRTO-B0/1)

10.1 SDR allows users to plan a route using any designated fix within a specific airspace volume provided the route meets the parameters set by the State. Parameters may include restrictions, such as periods during which SDR rules apply, altitude requirements above or below a reference value, and the maximum distance between fixes. Users must submit flights along authorised (that is, published) routes to the point of entry/exit at the boundary of the SDR airspace volume. That is, the SDR system only applies within the defined airspace volume. SDR is a transition to the implementation of the free-route airspace (FRA) concept.

10.2 The implementation of strategic direct routing (SDR) must be based on the Global Air Navigation Plan - ASBU FRTO B0/1, so as to give airspace users additional flight planning options, with larger-scale routing options in all FIRs, so that planned distances can be reduced overall, compared to the fixed route network. SDR must be established at national and regional level and be available for flight planning (with published conditions of use). SDR allows airspace users to optimise flight and fuel use planning.

10.3 If necessary, SDR could be applied in a limited manner, for example:

- Time restriction (fixed or subject to traffic/availability);
- Traffic restriction (based on traffic flow and/or level);
- Flight level;
- Lateral restrictions; and
- Entry/exit points.

10.4 The following procedures and processes may need to be considered:

- Identify the volume of SDR airspace (lateral and vertical) and the applicable schedule;
- Direct routes can coexist with the ATS route structure;
- Adapt airspace design to ensure horizontal and vertical connectivity with SDR;
- ATFM procedures for SDR;
- Review LoAs with adjacent ATS units;
- Publish SDR-relevant data in the AIP;
- Airspace management procedure for the implementation of direct routes; and
- ATC procedures for SDR coordination, including transfer, direct routing path changes, conflict detection, etc.

10.5 Operational and dependent relationship with other ASBU elements:

- NOPS-B0/1- Initial integration of collaborative airspace management with air traffic flow management – Integration of airspace management with air traffic flow management is a desirable requirement, with a view to optimising SDR implementation.
- FRTO-B0/2 – Airspace planning and flexible use of airspace: FUA implementation could optimise SDR implementation, considering that DCT routes could enter special-use airspace in accordance with pre-established procedures.
- FRTO-B0/4 – Basic conflict detection and conformance monitoring: Medium-term conflict detection (MTCD) and conformance monitoring tools are considered as requirements to reduce the workload of air traffic controllers in high-volume air traffic environments. Consequently, they can be considered as desirable requirements and must be taken into account when upgrading ATM systems.

- FICE-B0/1 – Automated basic inter-facility data exchange: AIDC is considered to be a desirable tool for SDR implementation, with a view to reducing ATCO workload, especially in high-volume air traffic operational environments, particularly when there is transfer of SDR flights in both FIRs.

10.6 Regarding enablers, FRTO BO/1 of the Global Air Navigation Plan lists a number of EUROCONTROL documents that could be used as guidance material. However, it should be noted that SDR implementation in the CAR/SAM Regions considers airspace characteristics and a significantly lower level of air traffic demand compared to Europe.

10.7 It is expected that SDR will be initially implemented on a State-by-State basis, within the boundaries of their airspaces, using the published boundary fix as the entry/exit point from one SDR system to the next, based on specific rules established by each State. However, an evolution towards cross-border SDR is also expected, based on harmonised regulations and standard procedures in the CAR/SAM Regions. This will allow for even greater efficiency by using more fixes at FIR boundaries and making more direct routing options available. A specific goal in starting cross-border SDR in the CAR/SAM regions is to use SDR airspace already implemented to encourage adjacent FIRs to join SDR implementation in a harmonised manner.

10.8 SDR implementation started in Brazil in the Amazonica and Recife flight information regions (FIRs), on 16 April 2020, during the COVID-19 pandemic, considering the significant decrease in flight demand.

10.9 Similarly, in the South American Implementation Group (SAM/IG), States started implementation in several FIRs of South American States (Brazil, Chile, Ecuador, Guyana, Peru, Colombia*, Suriname and Venezuela), using procedures published through AIP amendment or AIP SUP, based on an aeronautical publication model developed by the South American Airspace Study and Implementation Group (GESEA).

** Note.- Colombia implemented SDR in 2020, in accordance with the initiative promoted by SAM/IG. Subsequently, with the recovery of air operations in 2021, priority was given to routing for arrivals at the Bogota international airport.*

10.11 The active involvement of States, air navigation service providers, and airlines is essential for the implementation of strategic direct routing as an initial step to meet the goal of implementing free-route airspace (FRA). It is important to note that strategic direct routing is the most appropriate way to move towards FRA, in accordance with the Global Air Navigation Plan (GANP), and its implementation by some States in the Region has already demonstrated its feasibility and corresponding benefits.

10.12 A model for SDR publication in the AIP is shown in **Appendix F**. It is advisable that States using UPR and SDR reach consensus on the publication of standards and procedures, by defining a particular location in the AIP section*, in order to make it easier for each State to understand airspace management.

**Note: The most appropriate AIP section shall be defined by consensus.*

11 FREE-ROUTE AIRSPACE (FRTO-B1/1)

11.1 FRA is a specific volume of airspace within which users may freely plan a route between a defined point of entry and a defined point of exit, with the possibility of routing through intermediate points (published or unpublished), without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control. FRA allows airspace users to fly as close as

possible to what they consider to be the optimum path, without the constraints of a fixed route network structure.

11.2 FRA implementation can be customised, for example:

- horizontally and vertically;
- during specific periods;
- with a set of entry/exit conditions;
- with initial system updates.

11.3 The extension of FRA within and across FIR boundaries also requires improvements to the ATM network function system and the ground system of air navigation service providers for purposes of airspace management and flight data processing.

11.4 The following procedures and processes are expected to be taken into account:

- FRA airspace volume (lateral and vertical) and applicable time (H24 7/7 is not necessary);
- FRA entry and exit points, arrival and departure transition points, and intermediate points;
- adapting airspace design and ensuring horizontal and vertical connectivity of FRA;
- ATFM procedures in FRA;
- adapting LoAs with adjacent ATS and military units;
- publishing FRA-relevant data in the AIP;
- aeronautical charts for FRA operations;
- airspace management procedure for the implementation of free-route operations;
- ATC procedures for free-route coordination and transfer of control, change of trajectory in a free-route environment, conflict detection.

11.5 Improvements to ATM systems for flight data processing and controller work position, if needed, are related to:

- ATC clearances beyond their area of responsibility (AoR);
- distinction between different types of traffic;
- 4D trajectory calculation using aircraft operational information (AoI);
- editing function for 4D trajectories;
- management of coordination points for FRA;
- coordination with military bodies;
- improving conflict management and HMI functions of the controller to support conflict detection and resolution.

11.6 Operational and dependent relationship with other ASBU elements:

- NOPS-B1/5 – Full integration of airspace management with air traffic flow management. it is desirable for FRA to ensure a continuous, seamless and iterative approach to airspace and air traffic flow management based on airspace requests at any time during the strategic, pre-tactical and tactical stages of ASM.
- FRTO-B1/4 – Dynamic sectorisation. It is recommended to dynamically adapt ATC sectorisation to respond to traffic demand without increasing the number of controllers/work positions being used for FRA. The sectorisation function will allow for dynamic management of a large number of possible sector configurations, where the automated system is continuously assessing future traffic demand and complexity and proposing optimal sectorisation solutions.
- FRTO-B1/3 – Advanced flexible use of airspace (FUA) and management of real-time airspace data. FUA procedures must be enhanced by ASM data sharing between the ATM network function, ASM actors, airspace users and ATC. ASM data regarding the planning and tactical management of airspace reservations need to be continuously exchanged and integrated in real time between the ATM systems. Continuous exchange of ASM data between civil and military national actors will be enhanced. Automated ASM systems to ensure uninterrupted data flow between ATM Network functions and the neighbouring ASM systems from the pre-tactical planning to the real time airspace status are needed
- FICE-B0/1 – Automated basic inter-facility data exchange (AIDC). For FRA, it is necessary to improve the effectiveness of coordination and transfer of control between ATS units to ensure that all related and required flight information will be available to the other unit as agreed.
- FRTO-B1/5 – Enhanced conflict detection tools and conformance monitoring. Improvements need to be made to the basic medium-term conflict detection (MTCD)/monitoring alert (MONA) functions to further improve ATCO productivity and reduce the workload for FRA.
- DAIM-B2/2 – Daily airspace management information to support flight and flow. It is essential to establish common practices and data formats for daily airspace management initiatives that are continuously updated as events occur, for the planning and execution of flights and flows in FRA. Information related to the status of airspace configuration (corrections, FIR boundaries, static zones, etc.) and on airspace evolution (rerouting, sector configurations, airspace usage plan and updated airspace usage plan, airspace reservations, restrictions and route availability, dynamic zones, etc.) will be available in formats compatible with NOPS and FICE automation.
- FRTO-B0/1 – Direct routing (DCT). Direct routes are established with the purpose of providing airspace users with additional flight route planning options on a larger scale, across FIRs, so that total planned segment distances are reduced compared to the fixed route network. SDR is a transition to the implementation of the free-route airspace (FRA) concept.

11.7 Specific performance indicators need to be developed for FRA in order to quantify the variation in ATC workload, sector capacity and the increase in potential traffic conflicts, which will be re-assessed on a seasonal basis.

11.8 Similarly, with SDR, FRA is expected to be implemented first within State boundaries, using their specific procedures and limitations, evolving to cross-border FRA, as provided for the medium term in ASBU FRTO B2/3 – Large-Scale Cross-Border Free-Route Airspace.

12 RNP ROUTES (FRTO-B1/2)

Note. - This solution requires further studies to define the implementation of RNP routes in defined areas of the SAM Region. Progress has been made in Chile with RNP-2. The following paragraphs include a description extracted from the GANP.

12.1 RNP routes must be deployed in en-route airspace where free-route airspace (FRA) is not planned or, if FRA is deployed, RNP routes must ensure connectivity between FRA and the TMA.

12.2 The aim is to provide consistent navigation using the most appropriate PBN type, infrastructure and navigation applications.

12.3 Performance-based navigation (PBN) specifications allow aircraft to fly a specific path between two 3D-defined points in space. The new capability refers to the implementation of PBN/RNP routes within en-route airspace. The FRTO-B1/2 element is described as follows:

- With the introduction of an RNP navigation specification, the benefits gained from RNAV will be enhanced by on-board performance monitoring and alerts and a more predictable aircraft behaviour.

- Optimised route design that may include closely-spaced parallel routes, fixed-radius transition (FRT), and en-route tactical parallel offset (TPO) functionality, supported by infrastructure and system enhancements to accept PBN routes.

- An adequate navigation infrastructure is required. GNSS or DME ground infrastructure must be optimised to support RNP operations and primary fallback capability in case of GNSS failure.

- PBN requires a complete digital chain, at critical data quality levels, for aeronautical data provided to airborne systems. System enhancements for controller support tools that may be required are covered by other FRTO elements (MTCD, MONA - monitoring aids) or other threads (SNET-safety nets).

13 FIVE-YEAR OBJECTIVES

Short term (2024 - 2025)

- Implement the UPRs of the route catalogue
- Create a process to expedite the publication of UPRs
- Develop regional guidance material for SDR and UPR implementation, including operational/technical requirements
- Develop a regional FRA CONOPS, including operational/technical requirements
- Start FRA testing in at least 1 CAR/SAM State

Medium term (2026-2028)

- Implement SDR in 80%+ of SAM FIRs
- Implement cross-border SDR in at least 4 adjacent SAM FIRs
- Implement FRA in 20%+ of CAR/SAM FIRs

It is important to note that the establishment of an FRTO implementation strategy for each SAM State is fundamental for the establishment of a CAR/SAM FRTO roadmap. This strategy will also enable the achievement of the aforementioned regional FRTO implementation targets.

APPENDICES

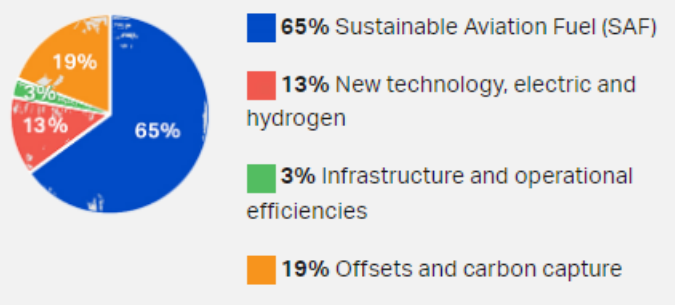
Appendix A. Sustainable aviation fuel (SAF)

Sustainable Aviation Fuel (SAF) is identified as one of the most important initiatives to reduce CO2 emissions from aviation. However, although technologies to produce these fuels already exist, they are produced in small quantities and production costs still need to be reduced. Large-scale production of SAF can mitigate environmental issues and alleviate social and economic problems in developing countries, as long as this production does not affect food security. On a conservative but optimistic view, about 5.7% of all arable land in 2050 will be available for biofuel production worldwide, which will be sufficient to supply about 92% of the estimated demand by 2100. However, to promote increased SAF production, it is necessary to promote its use and regulation through policies and legislation, and to have the financial and technical support from governments for the production and certification of these fuels.

At the 41st Assembly of the International Civil Aviation Organization (ICAO), the ICAO Council approved the feasibility of developing a long-term aspirational goal (LTAG) for international aviation to achieve zero net CO2 emissions by 2050. In the analysis, an assessment was made of the proposed targets, including the impact on national growth and the cost of implementation for States. This work helped to identify and assess existing, planned and innovative operational, technological and SAF utilisation measures for international air transport that could contribute to reduce CO2 emissions. Based on the collected information, ICAO experts created scenarios combining technological, operational and SAF utilisation measures in order to analyse the data and forecast future demand, considering the goal of increasing energy efficiency by 2% per year and increasing carbon neutrons from 2020 onwards. The experts will also estimate the cost and economic impact of the aforementioned measures on the growth of the air transport sector, especially for developing countries.

In the SAM Region, States have implemented some operational concepts and measures, including direct routing, which precedes the implementation of the FRA concept. These routes offer airspace users trajectory options during route planning that provide shorter distances compared to those of the fixed route structure.

Although it is estimated that "only" 3% of FLY NET ZERO will come from infrastructure and operational efficiencies (see figure below), it is important to note that all efforts are valid and necessary to achieve the proposed CO2 emission reduction goals. Moreover, in some airspaces, this percentage could be higher, which is significant for the operational efficiency of airlines and ANSPs.



There is a constant challenge to balance the growth of aviation with the need to mitigate its environmental impact. Continuous research and innovation are crucial to move towards a more sustainable aviation while promoting social well-being.

For more information, visit the following ICAO links:

https://www.icao.int/environmental-protection/pages/SAF.aspx

https://www.icao.int/environmental-protection/Pages/default.aspx

Appendix B. KPA module-focus area-KPI-FRTO element relationship

(FRTO Blocks 0 and 1 taken from the GANP portal; the Spanish version is a free translation)

* TBD = to be defined

KPA	Focus Areas	Most specific performance objective(s) supported	KPI	ASBU operational element	DESCRIPTION
					<<<
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	KPI04: Filed flight plan en-route extension	FRTO-B0/1	Direct routing (DCT)
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route & airspace availability as known at the flight planning stage	KPI04: Filed flight plan en-route extension	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Flight time & distance	Reduce need to avoid airspace because of lack of confirmation that it will be open	KPI04: Filed flight plan en-route extension	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Flight time & distance	Facilitate direct routing of portions of the flight (if this does not cause network problems)	KPI05: Actual en-route extension	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Flight time & distance	Reduce need for tactical ATFM rerouting to circumnavigate airspace closed at short notice	KPI05: Actual en-route extension	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during climb to avoid Special Use Airspace	KPI17: Level-off during climb	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)

Efficiency	Vertical flight efficiency	Reduce altitude restrictions during cruise to avoid Special Use Airspace	KPI18: Level capping during cruise	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during cruise to avoid Special Use Airspace	KPI19: Level-off during descent	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	KPI04: Filed flight plan en-route extension	FRTO-B1/1	Free-route airspace (FRA)
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route & airspace availability as known at the flight planning stage	KPI04: Filed flight plan en-route extension	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data
Efficiency	Flight time & distance	Reduce need to avoid airspace because of lack of confirmation that it will be open	KPI04: Filed flight plan en-route extension	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data
Efficiency	Flight time & distance	Facilitate direct routing of portions of the flight (if this does not cause network problems)	KPI05: Actual en-route extension	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data
Efficiency	Flight time & distance	Reduce need for tactical ATFM rerouting to circumnavigate airspace closed at short notice	KPI05: Actual en-route extension	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during climb to avoid Special Use Airspace	KPI17: Level-off during climb	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data

Efficiency	Vertical flight efficiency	Reduce altitude restrictions during cruise to avoid Special Use Airspace	KPI18: Level capping during cruise	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data
Efficiency	Vertical flight efficiency	Reduce altitude restrictions during cruise to avoid Special Use Airspace	KPI19: Level-off during descent	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data

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Capacity	Capacity shortfall & associated delay	Establish/update/publish the catalogue of strategic ATFM measures designed to respond to a variety of possible/typical/recurring events degrading the airspace system (e.g. predefined action plans)	TBD	FRTO-B0/3	Pre-validated and coordinated ATS routes to support flight and flow
Capacity	Capacity, throughput & utilisation	Reduce ATCO workload (en-route)	KPI06: En-route airspace capacity	FRTO-B0/4	Basic conflict detection and conformance monitoring
Capacity	Capacity, throughput & utilisation	Overcome capacity limitations attributable to route network design	KPI06: En-route airspace capacity	FRTO-B1/2	Required navigation performance (RNP) routes
Capacity	Capacity, throughput & utilisation	Take advantage of increased navigation precision (airspace with PBN operations) to implement route networks and airspace structures with smaller lateral and vertical safety buffers	KPI06: En-route airspace capacity	FRTO-B1/2	Required navigation performance (RNP) routes
Capacity	Capacity, throughput & utilisation	Improve flexibility of sector configuration management	TBD	FRTO-B1/4	Dynamic sectorisation
Capacity	Capacity, throughput & utilisation	Improve flexibility to modify sector configuration at short notice to cope with traffic pattern variations	TBD	FRTO-B1/4	Dynamic sectorisation

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Safety	TBD	Avoid vertical & lateral navigation errors during flight (cases of non-conformance with clearance)	**KPI20: Number of aircraft accidents**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve early detection of conflicting ATC clearances (CATC) (en-route / departure / approach)	**KPI20: Number of aircraft accidents**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve early detection of conflicting ATC clearances (CATC) (en-route / departure / approach)	**KPI23: Number of airprox/TCAS alert/loss of separation/near mid-air collisions/mid-air collisions (MAC)**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve separation provision (at a planning horizon > 2 minutes)	**KPI20: Number of aircraft accidents**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve separation provision (at a planning horizon > 2 minutes)	**KPI23: Number of airprox/TCAS alert/loss of separation/near mid-air collisions/mid-air collisions (MAC)**	FRTO-B0/4	Basic conflict detection and conformance monitoring
Safety	TBD	Improve early detection of conflicting ATC clearances (CATC) (en-route / departure / approach)	TBD	FRTO-B1/5	Enhanced conflict detection tools and conformance monitoring
Safety	TBD	Reduce number of vertical & lateral navigation errors during flight (cases of non-conformance with clearance)	TBD	FRTO-B1/5	Enhanced conflict detection tools and conformance monitoring

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Enviroment	Maintain or improve enviromental sustainibility of aviation	TBD	TBD	**FRTO (TBD)**	TBD

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Cost effectiveness	Improve cost-effectiveness of ANS	Reduce costs in the air navigation system	TBD	FRTO-B1/6	Multi-sector planning

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Access and equity	Improve access and equity	Improve airspace reservation management	TBD	FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)
Access and equity	Improve access and equity	Improve airspace reservation management	TBD	FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data

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Flexibility	Improve flexibility of the air navigation system	Improve flexibility of the air navigation system	TBD	FRTO-B0/3	Pre-validated and coordinated ATS routes to support flight and flow

List of FRTO module elements, Blocks 0, 1

See original text at the ICAO GANP PORTAL:

https://www4.icao.int/ganpportal/

FRTO	Improved operations through enhanced en-route trajectories	Operational
FRTO-B0/1	Direct routing (DCT)	
FRTO-B0/2	Airspace planning and flexible use of airspace (FUA)	
FRTO-B0/3	Pre-validated and coordinated ATS routes to support flight and flow	
FRTO-B0/4	Basic conflict detection and conformance monitoring	
FRTO-B1/1	Free-route airspace (FRA)	
FRTO-B1/2	Required navigation performance (RNP) routes	
FRTO-B1/3	Advanced flexible use of airspace (FUA) and management of real-time airspace data	
FRTO-B1/4	Dynamic sectorisation	
FRTO-B1/5	Enhanced conflict detection tools and conformance monitoring	
FRTO-B1/6	Multi-sector planning	
FRTO-B1/7	Trajectory options set (TOS)	

Appendix C. Appropriate infrastructure to support safe operations

Safety is a top priority for aviation. The Global Aviation Safety Plan (GASP) presents the global strategy for continuous improvement of aviation safety. The purpose of the GASP is to continuously reduce the number of fatalities and the risk of their occurrence, by seeking to guide the development of a harmonised safety strategy.

A safe, resilient and sustainable aviation system contributes to the economic development of States and their industries. The GASP promotes the effective implementation of a State safety programme, including a State safety oversight system, a risk-based approach to managing safety, and a coordinated approach to collaboration amongst States, regions (that is, a group of States and/or entities working together to strengthen safety within a geographic area) and industry. It provides a framework for the development and implementation of national and regional aviation safety plans (NASP and RASP).

The Global Aviation Safety Plan - GASP (Doc 10004) and the GANP are mutually supportive in recognising the need for appropriate infrastructure to support safe aircraft operations. Coordination of RASG-PA and GREPECAS activities is considered essential for the successful implementation of both global plans, as **increasing air navigation capacity and improving efficiency** must be done in a safe manner and appropriate safety nets are required to prevent accidents.

The basic building blocks (BBB) framework set forth in the second layer of the GANP, independently of the ASBU framework, describes the core structure of any robust air navigation system, defining the essential air navigation services to be provided for international civil aviation in accordance with ICAO SARPs and the Procedures for Air Navigation Services (PANS). These are essential services for aerodrome operations, air traffic management, search and rescue, meteorology, and aeronautical information.

BBBs do not represent an evolutionary step, but a reference defined by the basic services agreed by States under the Convention on International Civil Aviation to enable international civil aviation to develop in a safe and orderly manner.

The ASBU framework defines a set of operational improvements in certain areas of the air navigation system that the aviation community agreed to work on in order to maintain or improve the performance of the system (ASBU threads). An ASBU element is a specific change in operations aimed at improving the performance of the air navigation system under specific operational conditions.

In planning for improvements to air navigation systems, the following should be taken into account for the different stages of the pandemic:

a) risk assessment and prioritisation based on the data collected and analysed;

b) application of safety management principles for risk-based decision-making; and

c) management and oversight of approvals granted by CAAs, taking into account the flexibility required throughout the aviation system to continue operations under safe conditions.

Appendix D. Safety Assessment Model

EXAMPLE OF RISK ANALYSIS AND MANAGEMENT MATRIX APPLICABLE TO STRATEGIC DIRECT ROUTING (SDR)

Note: The following example of a matrix is considered valid for the period July-December 2020, with flight/overflight flow reduced to 10% - 40% of operations registered in December 2019, for the respective ACC.

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
• **Oceanic** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Data link failure affects CPDLC and simultaneous HF failure (or HF not available) on the aircraft prevent position reporting to ATC. Absence of aircraft position reports impairs ATC situational awareness.	This results in loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (ADS-C) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Procedures (and/or SUPPS) applicable to oceanic airspace, in case of communications failure. 5. Tables of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board. 7. Automated ATC systems with MTCD (medium-	**2D Acceptable** **Improbable: 2** **Minor: D**	The operational requirements for SDR implementation are shown in AIP SUP xx/20 of [State]

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
				term conflict detection) and/or STCA (short-term conflict alert) 8. Communication via satellite phone.		
• **<u>Continental</u>** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Aircraft radio transmitter failure prevents position reporting to ATC. Absence of aircraft position reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (radar or ADS-B) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Transponder code 7600 5. Tables of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board 7. Automated ATC systems with MTCD (medium-term conflict detection) and/or STCA (short-term conflict alert)	**2D Acceptable** **Improbable: 2** **Minor: D**	The operational requirements for SDR implementation are shown in AIP SUP xx/20 of [State]

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
				8. The aircraft communications addressing and reporting system (ACARS) would allow the position to be received via the aircraft operator.		
• **Oceanic or continental** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Severe communication failure in the responsible ACC prevents ATCO from receiving aircraft position reports. The absence of reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. The State ATS contingency plan provides for the temporary suspension of SDR during a contingency.	**1E Acceptable** **Extremely Improbable: 1** **Negligible: E**	The operational requirements for SDR application are shown in the AIP SUP xx/20 of [State]
• **Oceanic or continental** upper airspace • Aircraft transferred and under control and	Presence of bad weather conditions that require the pilot to ask to divert from the	This results in a loss of separation between aircraft.	**1C Acceptable** **Extremely Improbable: 1**	N/A	N/A	

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
responsibility of the (sector) ACC	planned route (path). The diversion authorised by ATC causes an overlap with the path of another aircraft.		**Major: C**			

Examples of tables and matrices for the analysis of risks and mitigations

Figure 1: Example of risk likelihood table

Probability	Meaning	Value
Frequent	— Likely to occur many times (has occurred frequently)	5
Occasional	— Likely to occur sometimes (has occurred infrequently)	4
Remote	— Unlikely to occur, but possible (has occurred rarely)	3
Improbable	— Very unlikely to occur (not known to have occurred)	2
Extremely improbable	— Almost inconceivable that the event will occur	1

Figure 2: Example of severity table

Severity	Meaning	Value
Catastrophic	— Aircraft or equipment destroyed — Several fatalities	A
Hazardous	— Greatly reduced safety margins, physical stress or a workload such that operations personnel can no longer be relied upon to perform their tasks accurately or completely — Severe injuries — Significant damage to equipment	B
Major	— Significant reduction in safety margins, reduced ability of operations personnel to tolerate adverse operating conditions, as a result of increased workload or as a result of conditions affecting their efficiency — Serious incident — Injuries to people	C
Minor	— Operational limitations — Use of emergency procedures — Minor incident	D
Negligible	— Few consequences	E

Figure 3: Examples of risk assessment matrices

Probability of risk	Severity of risk				
	Catastropic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

Risk index range	Description of risk	Recommended action
5A, 5B, 5C, 4A, 4B, 3A	Intolerable	Take immediate action to mitigate risk or suspend the activity. Carry out priority safety risk mitigation to ensure that preventive or additional or enhanced controls are in place to reduce the risk index to the tolerable range.
5D, 5E, 4C, 4D 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Tolerable	May be tolerated based on safety risk mitigation. May require a management decision to accept the risk.

3E, 2D, 2E, 1B, 1C, 1D, 1E	**Acceptable**	Acceptable as is. No further risk mitigation required.

Appendix E. Publication model – UPR

User-preferred routes

User-preferred routes (UPR) are routes requested by airlines that optimise routing between specific city pairs. UPRs must be approved by all air navigation service providers (ANSPs), through their flow management units, area control centre managers, or civil aviation authorities, as appropriate, responsible for the provision of air traffic services on any segment of the UPR. Upon publication, airlines will be able to use these segments for any city pair until their cancellation or modification.

UPRs may undergo a trial period, in which case they will be available for a specific period of time (that is, a trial period) and for a specific airline. Route trials are intended to determine the operational viability of routes and once operational viability has been verified, the routes will be published following the process described below.

Aircraft shall use the UPR starting from one of the following waypoints:
a) published ATS route; or
b) last waypoint of a published departure procedure (SID); or
c) boundary of an area where strategic direct routing (SDR) is applied.

UPRs are published on the website of the air navigation service provider at: xxxxxxxxxxxxxxxxxxxx

The complete UPRs, which go beyond the boundaries of national FIRs, can be found on the ICAO SAM Office portal/website: XXXXXXXXXXXXXXXXXXXXXXXXXX

Appendix F. Publication model - SDR

IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE UPPER AIRSPACE OF THE XXXX FIR

1. PURPOSE

1.1. The purpose of this AIP Supplement is to inform users of the upper airspace of the XXXX FIR about the implementation of ASBU element FRTO B0/1 - Direct Routing (DCT) set forth in the sixth edition of the Global Air Navigation Plan of the International Civil Aviation Organization (ICAO), known as Strategic Direct Routing (SDR) in Spanish, under the procedures described below.

2. INTRODUCTION

2.1. Over the last 10 years, a complete restructuring of the South American (SAM) ATS route network has taken place, involving the realignment and/or elimination of inefficient paths, as well as the implementation of new routes, resulting in a more direct and optimised fixed route structure.

2.2. The use of fixed ATS routes can no longer provide the efficiency required by airspace users. SDR implementation has been established in order to offer users additional options when selecting more efficient paths/routes, and to optimise flight planning and fuel consumption, through the filing of flight plans (FPLs) with direct routes.

2.3. SDR implementation is a natural evolution in airspace use optimisation and a transition to the use of the free-route airspace (FRA) concept, as envisaged in the Global Air Navigation Plan (GANP).

3. OPERATIONAL PROCEDURES

3.1. Area of application

3.1.1. Strategic Direct Routing (SDR) will be applied in the upper airspace, in the area between the following points/coordinates and time schedules:

(on a State-by-State basis)

3.2. Flight plans

3.2.1. Flight plans will be filed in accordance with the tables of cruising level contained in Appendix 3 to ICAO Annex 2.

3.2.2. The flight plan must be based on published significant points (waypoints) or radio navigation aids and the distance must not exceed xxx NM.

3.2.3. The flight plan shall contain a significant point (waypoint) or reporting point (LAT/LONG) at FIR boundaries.

3.3. Contingency

3.3.1. SDRs may be temporarily suspended in that part of airspace subject to:

a) partial or full activation of contingency plans;

b) impairment of ATS surveillance service;

c) degradation of VHF communications; or

d) degradation of the flight plan system.

4. ADDITIONAL INFORMATION

4.1.1. Additional information can be obtained through the following VHF contact:

(on a State-by-State basis)

Note 1: It will be up to each State to adapt this model to meet local specificities.

Note 2: A chart representing the area of SDR application may be attached if the State does not have a DASA-equivalent system.

Appendix G. Acronyms, abbreviations and definitions

Acronyms

ADAP - Automated Downlink of Airborne Parameters
ADS-B – Automatic Dependent Surveillance - Broadcast
ADS-C - Automatic Dependent Surveillance - Contract
AIDC - ATS Interfacility Data Communications
ANP – Air Navigation Plan
ANSP – Air Navigation Service Provider
APTA - Improved Arrival and Departure Operations
ASBU - Aviation System Block Upgrades
ATFM - Air Traffic Flow Management
ATM – Air Traffic Management
CAA – Civil Aviation Authority
CANSO – Civil Air Navigation Services Organisation
CDR – Coded Departure Routes
CPDLC - Controller-Pilot Data Link Communications
DASA – Digital Airspace System Analysis
FRA – Free-Route Airspace
FICE - Flight and Flow Information for a Collaborative Environment
FUA – Flexible Use of Airspace
GANP – Global Air Navigation Plan
GASP - ICAO Global Aviation Safety Plan
KPA – Key Performance Area
KPI – Key Performance Indicator
LoA – Letter of Agreement
LTAG - Landing and Take-off Green Procedures/ Long-Term Aspirational Goal
MONA – Monitoring Aids
MTCD – Medium-Term Conflict Detection
ICAO – International Civil Aviation Organization
PBCS - Performance-Based Communication and Surveillance
PBN – Performance-Based Navigation
RTK - Revenue Tonne-Kilometre
SAF - Sustainable Aviation Fuel
SARPs - Standards and Recommended Practices
SDR Strategic Direct Routing
TRA – Temporary Reserved Area
TSA – Temporary Segregated Area
UPR - User-Preferred Route

Abbreviations

TBD

Definitions

TBD

Appendix H. Reference documents

The following documents are related to the Guidance for Implementation of Improved Operations through Enhanced En-Route Trajectories (FRTO):

- Annex 2 – Rules of the Air, twelfth edition, 2006
- Concept of operations for efficiency and capacity in SAM airspace, 2022
- Concept for free-route airspace (FRA) implementation in the AFI Region, Appendix 3E – First edition
- Doc 9750 - Global Air Navigation Plan (GANP), seventh edition, 2022
- Doc 9854 - Global air traffic management operational concept, 2005
- Doc 9883 Manual on global performance of the air navigation system, 2009
- Doc 10004 Global aviation safety plan, 2022
- Doc 10088 Manual on Civil-Military Cooperation in Air Traffic Management, 2021.
- Specification for the application of the flexible use of airspace, EUROCONTROL, 2009
- Performance-based optimisation of SAM airspace, CONOPS and Roadmap, 2022
- CAR/SAM air navigation plan - Volume III, Appendix B, 2014
- Resolutions adopted by GREPECAS – Working paper 15 (Santo Domingo – Dominican Republic, 15-17 November 2023)

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APPENDIX B
GREPECAS PROJECTS F3

F3	PROJECT DESCRIPTION (PD)	PROGRAMME	
ICAO Coordinator: ROs AGA	**Project Title**	**Start date**	**End date**
Project Leader (State): ***Joel Cordero - PERÚ***	**Paving the future A-CDM through the implementation of Platform Management and SMGCS**	Nov 2024	Nov 2028
Objective	Support the implementation of appropriate Apron Management and Surface Movement Guidance and Control Systems (SMGCS) services at selected aerodromes in the CAR/SAM regions, as a critical basis for improving the apron operations safety, increasing airport capacity, and prepare the terrain for future implementations of advanced collaboration concepts, such as the A-CDM and other operational efficiency improvements.		
Scope	Selected aerodromes in the SAM Region		
Justification	The A-CDM Project was approved by the Fifth Meeting of the Programmes and Projects Review Committee (PPRC/5) (2019) so the planning and actions of the project were just beginning with seminars in both regions. However, due to COVID-19, many of the congested airports (those where the full implementation of A-CDM would be applicable) have been affected in their traffic volume. The restructuring of this project, approved in GREPECAS/21, is based on a comprehensive assessment of the regional context and the real needs of the aerodromes in the CAR/SAM regions: 1. A survey presented during GREPECAS/21 revealed the need to re-evaluate the approach to implementing A-CDM in the region. 2. Investigations by the ICAO NACC and SAM Regional Offices concluded that the implementation of A-CDM, according to its original European definition, is not directly applicable to the CAR/SAM region, as it was designed to mitigate the effects of airspace management policies and take-off delays not implemented in our region. 3. A significant lack of apron management and systems to improve situational awareness on the ground at airfields in the region was identified, a prerequisite for more advanced collaborative approaches in selected airports. 4. Although capacity is an issue at some airports in the region, the implementation of A-CDM is not the direct solution to this challenge. 5. It is recognized that the basis for an improvement in airport capacity is the implementation of appropriate platform management services and advanced SMGCS systems. 6. This restructuring aligns with the correct implementation of the provisions contained in sections 9.5 and 9.8 of Annex 14, Volume I, Chapters 1, 7 and 9, Part II of PANS-Aerodromes (Doc 9981), and the guidance provided by Doc 9137, Part 8 (Platform Management), Doc 9476 (SMGCS) and Doc 9430 (A-SMGCS). Therefore, this restructuring seeks to address the specific needs of the CAR/SAM region, focusing on the implementation of Apron Management and SMGCS and/or A-SMGCS at selected airports and based on a cost-benefit analysis as a fundamental basis for future improvements in airport safety, efficiency, and capacity.		

F3	PROJECT DESCRIPTION (PD)	PROGRAMME	
ICAO Coordinator: ROs AGA	**Project Title**	**Start date**	**End date**
Project Leader (State): *Joel Cordero - PERÚ*	**Paving the future A-CDM through the implementation of Platform Management and SMGCS**	Nov 2024	Nov 2028
Indicators	• Percentage of international aerodromes that have implemented Apron Management services, among the ones that the necessity was determined. • Percentage of selected aerodromes that have implemented or improved their SMGCS. • Reduction in apron safety incidents. • Improved break-in times and reduced surface delays. • Increase in the operational capacity of the apron and manoeuvering areas. • GANP KPI01, KPI02, KPI 09, KPI10, KPI 11, KPI13, KPI14, KPI21		
Required Resources	• High-level engagement of participating States, airport operators and air navigation service providers. • Appointment of experts in airport management and SMGCS systems. • Resources for evaluation, implementation and updating of systems and procedures. • Training programmes for airport and air traffic control personnel. • Training programs for airport and air traffic control personnel.		

Activity/Action	Deliverables	Deadline	Implementation Status (SAM)	Implementation Status (CAR)	Remarks
Initial assessment of the current apron management situation and SMGCS at selected aerodromes.	Evaluation report in the CAR and SAM Region	2025	0%	0%	
Determination of aerodromes where implementation of Apron Management is necessary and priority of implementation	1. Methodology for determining necessity for Apron Management 2. List of aerodromes where Apron Management is necessary, in order of priority	2025	0%	0%	

Activity/Action	Deliverables	Deadline	Implementation Status (SAM)	Implementation Status (CAR)	Remarks
Determination of aerodromes where implementation of A-SMGCS is necessary and priority of implementation	1. Methodology for determining necessity for A-SMGCS 2. List of aerodromes where A-SGMCS is necessary, in order of priority	2025	0%	0%	
Development of regional guides for the implementation of Platform Management services and improvement of SMGCS.	SMGCS Regional Guides	2026	0%	0%	
Pilot implementation of Apron Management services at selected airfields	1.List of priority aerodromes. 2. Report on the pilot case	2027	0%	0%	
Implementation or improvement of SMGCS in selected aerodromes.	1.Technical assistance missions. 2. Reports on results.	2028	0%	0%	
Development and realization of knowledge dissemination events	Taller Webinario	2026	0%	0%	

GREPECAS PROCEDURAL HANDBOOK

ICAO | OACI

GREPECAS Procedural Handbook

Manual de Procedimientos del GREPECAS

Eighth Edition | Octava Edición
Version 1 | Versión 1
2024

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The issue of amendments is communicated regularly by the GREPECAS Secretary through regular correspondence with the States and the GREPECAS web portal https://www.icao.int/GREPECAS/Pages/ES/default_ES.aspx, which is available for consultation by the GREPECAS Members.

The following Tables allow having a record of such amendments and corrections.

La emisión de enmiendas es comunicada regularmente por el/la Secretario/a del GREPECAS a través de la información regular a los Estados y del portal web del GREPECAS https://www.icao.int/GREPECAS/Pages/ES/default_ES.aspx el cual está disponible para consulta por los Miembros del GREPECAS:

Las Tablas a continuación permiten tener un registro de dichas enmiendas y correcciones.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS / ENMIENDAS			
No.	**Date applicable** **Fecha de emisión**	**Date entered** **Fecha de anotación**	**Entered by** **Anotada por**

REGISTRO DE ENMIENDAS Y CORRECCIONES

CORRIGENDA / CORRECCIONES			
No.	**Date applicable** **Fecha de emisión**	**Date entered** **Fecha de anotación**	**Entered by** **Anotada por**

INTRODUCTION

The CAR/SAM Planning and Implementation Regional Group (GREPECAS) is responsible for the development and maintenance of air navigation plans and provides for the planning and implementation of air navigation systems within specific areas, in accordance with the planning frameworks agreed at the global and regional levels.

GREPECAS was established by the ICAO Council in 1990 as recommended by the Second CAR/SAM Regional Air Navigation Meeting in 1989 (action by Council on Recommendation 14/6 of the CAR/SAM/2 RAN Meeting, Santiago de Chile).

The Procedural Handbook contains information on the role, organization and operation of GREPECAS as well as its different programmes, processes and projects in support of implementation of the facilities and procedures of the air navigation system in the CAR/SAM Regions. The Handbook will serve States and International Organizations when planning and managing necessary resources for their participation in the Group.

This Procedural Handbook provides general guidelines and is approved by GREPECAS in accordance with ICAO Council guidelines for Planning and Implementation Regional Groups (PIRG).

The Secretary of this body may develop specific procedures and forms permitting the effective management of the GREPECAS mechanism. These procedures should not contradict this Handbook in any way.

The Handbook shall be updated periodically to accommodate relevant changes and developments, and according to the requirements of the Global Air Navigation Plan (GANP). The update is a constant objective due to the dynamics of the content of each of the elements that make up the Procedural Handbook, both the normative aspects of ICAO and the technical and technological aspects in the Air Navigation Services (ANS).

Therefore, the record of updates and modifications will be carried out through the use of track changes applied to the Procedural Handbook text, and will be notified and presented for approval at GREPECAS meetings.

INTRODUCCIÓN

El Grupo Regional de Planificación y Ejecución CAR/SAM (GREPECAS) es responsable del desarrollo y mantenimiento de los planes de navegación aérea y proporciona la planificación e implementación de los sistemas de navegación aérea dentro de áreas específicas, de acuerdo con los marcos de planificación acordados a nivel global y regional.

El GREPECAS fue creado por el Consejo de la OACI en 1990, por recomendación de la Segunda Reunión Regional de Navegación Aérea de las Regiones CAR/SAM, realizada en 1989 (acción por parte del Consejo en relación con la Recomendación 14/6 de la Reunión RAN CAR/SAM/2, Santiago de Chile).

El Manual de Procedimientos contiene información sobre el rol, la organización y el funcionamiento del GREPECAS, así como de sus distintos programas, procesos y proyectos en apoyo a la implementación de las instalaciones, servicios y procedimientos del sistema de navegación aérea en las regiones CAR/SAM. El Manual servirá a los Estados y las Organizaciones Internacionales para planificar y gestionar los recursos necesarios para su participación en el Grupo.

El Manual de Procedimientos brinda lineamientos generales y es aprobado por el GREPECAS de acuerdo a los lineamientos del Consejo de la OACI para los Grupos Regionales de Planificación y Ejecución (PIRG).

El/La Secretario/a de este órgano puede desarrollar procedimientos y formularios específicos que permitan una gestión efectiva del mecanismo del GREPECAS. Dichos procedimientos no deberían estar en conflicto en forma alguna con este Manual.

El Manual debe ser actualizado periódicamente, de acuerdo con los cambios y acontecimientos pertinentes y en función de los requerimientos del Plan Mundial de Navegación Aérea (GANP). La actualización es un objetivo constante debido a la dinámica del contenido de cada uno de los elementos que conforman el Manual de Procedimientos, tanto de los aspectos normativos de la OACI como de los aspectos técnicos y tecnológicos en los Servicios de Navegación Aérea (ANS).

Por lo tanto, el registro de las actualizaciones y modificaciones se llevará a cabo mediante el uso de control de cambios aplicados al texto del Manual de Procedimientos, notificándose y presentándose para aprobación en las reuniones del GREPECAS.

The Procedural Handbook will be distributed to GREPECAS Members, the ICAO Secretariat and other States, Territories and International Organizations participating in meetings, contributing or having an interest in the work of GREPECAS and/or its working groups and contributory bodies

El Manual de Procedimientos se distribuirá a los Miembros del GREPECAS, la Secretaría de la OACI y a otros Estados, Territorios y Organizaciones Internacionales que participen en reuniones, contribuyan o tengan interés en el trabajo del GREPECAS y/o sus Grupos de Trabajo y órganos auxiliares.

CAR/SAM PLANNING AND IMPLEMENTATION REGIONAL GROUP (GREPECAS)

1. Terms of Reference (ToRs)

1.1 This Section sets out the GREPECAS Terms of Reference and its position within ICAO. These guidelines shall govern the working arrangements of GREPECAS, including the relationship with States, International Organizations and Specialized Regional Organizations of ICAO, the Rules of Procedure for the conduct of its meetings and those of its working groups and contributory bodies.

1.2 In accordance with C-WP/13135, Council Decisions C-DEC 183/9 dated 18 March 2008, and C-DEC 190/4 dated 28 May 2010 and ICAO Council — 217th Session, Summary Minutes of the Sixth Meeting, 31 May 2019, the objectives of GREPECAS are as follows:

a) serve as a regional cooperative forum that promotes regional priorities, develops and maintains CAR/SAM Regional Air Navigation Plan (Doc 8733), as well as the work programme aimed at the adoption of the GANP (Doc 9750) which, at its Global Technical level, defines the Aviation System Block Upgrade (ASBU) drivers and modules, as well as its Performance Framework. These activities are aligned with the relevant ICAO provisions

b) facilitate the development and implementation by States of the air navigation systems and services identified in the Doc 8733 - CAR/SAM Regional Air Navigation Plan and Doc 7030 - Regional Supplementary Procedures;

c) monitor and report on the status of implementation by States of the required air navigation facilities, services and procedures in the CAR/SAM Regions, and identify associated difficulties and deficiencies to be brought to the attention of the Council;

d) facilitate the development and implementation of corrective action plans by States to address identified deficiencies, where necessary;

GRUPO REGIONAL DE PLANIFICACIÓN Y EJECUCIÓN CAR/SAM (GREPECAS)

1. Términos de Referencia (ToR)

1.1 Esta Sección establece los Términos de Referencia del GREPECAS y su posición en la OACI. Estas directrices regirán los arreglos de trabajo del GREPECAS, incluida la relación con los Estados, las Organizaciones Internacionales y los Organismos Regionales especializados de la OACI, las Reglas de Procedimiento para la realización de sus reuniones y las de sus Grupos de Trabajo y órganos auxiliares.

1.2 De conformidad con las Decisiones del Consejo de la OACI, C-DEC 183/9 de fecha 18 de marzo de 2008, C-DEC 190/4 de fecha 28 de mayo de 2010, y el 217º período de sesiones, acta resumida de la sexta reunión del Consejo de la OACI, 31 de mayo de 2019, los objetivos del GREPECAS son los siguientes:

a) servir como un foro cooperativo regional que impulsa las prioridades regionales, desarrolla y mantiene el Plan Regional de Navegación Aérea para las Regiones CAR/SAM (Doc 8733), así como el programa de trabajo dirigido a la adopción del GANP (Doc 9750) el cual, en su nivel técnico mundial, define los conductores y módulos de las Mejoras por bloques del sistema de aviación (ASBU), así como su Marco de Performance. Estas actividades se alinean con las disposiciones pertinentes de la OACI;

b) facilitar el desarrollo y la implementación por parte de los Estados de los sistemas y servicios de navegación aérea identificados en el Doc 8733 - Plan Regional de Navegación Aérea CAR/SAM y el Doc 7030 - Procedimientos Suplementarios Regionales;

c) monitorear e informar sobre el estado de implementación por parte de los Estados de las instalaciones, los servicios y los procedimientos de navegación aérea requeridos en las Regiones CAR/SAM, e identificar las dificultades y deficiencias asociadas que deben señalarse a la atención del Consejo;

d) facilitar el desarrollo y la implementación de planes de acción correctiva por parte de los Estados para resolver las deficiencias identificadas, cuando sea necesario;

e) identify and report on regional and emerging air navigation challenges experienced that affect the implementation of ICAO global provisions by States and the measures adopted or recommended to effectively address them;

f) facilitate the development and implementation of regional and national air navigation plans by CAR/SAM States;

g) facilitate, in accordance to the Global Aviation Safety Plan (GASP), the conduct of any necessary system performance monitoring, identify specific air navigation deficiencies, especially in the context of safety, and propose corrective measures, facilitating the development and implementation of action plans by States to resolve identified deficiencies, where necessary; and

h) assist Member States with guidance for the implementation of emerging and complex aviation systems.

1.3 The ICAO Council, during the review of Resolutions and Decisions at the 40th session of the ICAO Assembly, decided to align the calendar of meetings of the Planning and Implementation Regional Groups (PIRG) and Regional Aviation Safety Groups (RASGs) with the requirement for annual reports to the Council. The Council in its C-DEC 219/7, during the review of the Resolutions and Decisions of the Assembly (C-WP / 14983, Rev.2), implemented the decision of the Assembly and on 7 August 2020, the President of the ICAO Council approved the modification of the Terms of Reference of the PIRG and RASG to include annual meetings.

1.4 In order to meet the Terms of Reference the Group shall:

a) review and propose, when necessary, the target dates for implementation of facilities, services and procedures to ensure the coordinated development of the Air Navigation System in the CAR/SAM Regions;

e) identificar e informar sobre los desafíos regionales y emergentes de navegación aérea experimentados que afectan la implementación de las disposiciones globales de la OACI por parte de los Estados y las medidas adoptadas o recomendadas para abordarlos de manera efectiva;

f) facilitar el desarrollo y la implementación de planes regionales y nacionales de navegación aérea por parte de los Estados CAR/SAM;

g) facilitar, de acuerdo con el Plan Global para la Seguridad Operacional de la Aviación (GASP), la realización de cualquier monitoreo del desempeño de los sistemas necesarios, identificar deficiencias específicas en el campo de navegación aérea, especialmente en el contexto de la seguridad operacional, y proponer medidas correctivas, facilitando el desarrollo y la implementación de planes de acción por parte de los Estados para resolver las deficiencias identificadas, cuando sea necesario; y

h) asistir a los Estados Miembros con orientación para implementar sistemas de aviación emergentes y complejos.

1.3 El Consejo de la OACI, durante la revisión de las Resoluciones y Decisiones en el 40° período de sesiones de la Asamblea de la OACI, decidió alinear el calendario de reuniones de los Grupos regionales de planificación y ejecución (PIRG) y los Grupos regionales de seguridad operacional de la aviación (RASG) con el requisito de informes anuales al Consejo. El Consejo en su C-DEC 219/7, durante la revisión de las Resoluciones y Decisiones de la Asamblea (C-WP / 14983, Rev.2), implementó la decisión de la Asamblea y el 7 de agosto de 2020, el Presidente del Consejo de la OACI aprobó la modificación de los Términos de Referencia de los PIRG y RASG para incluir reuniones anuales.

1.4 A fin de dar cumplimiento a los Términos de Referencia, el Grupo deberá:

a) revisar y, de ser el caso, proponer las fechas para la implantación de las instalaciones, servicios y procedimientos que garanticen el desarrollo coordinado del sistema de navegación aérea en las Regiones CAR/SAM;

b) assist the ICAO Regional Offices with providing services in the CAR/SAM Regions with their assigned task of fostering implementation of the CAR/SAM Regional Air Navigation Plan;

c) ensure, in accordance with Doc 10004 - Global Aviation Safety Plan (GASP), the monitoring of the performance of the systems, as necessary;

d) prepare amendment proposals for updating the CAR/SAM Air Navigation Plan (ANP), as necessary, to meet any changes in requirements;

e) monitor the implementation of air navigation facilities and services and, if necessary, facilitate inter-regional harmonization, taking into account cost-benefit analyses, the preparation of economic studies, environmental benefits and financial issues;

f) analyze issues related to human resources planning and provide recommendations to support that the development of human resources capacities in the regions are compatible with the CAR/SAM regions ANP

g) invite financial institutions, as necessary and when deemed appropriate during the planning process, in order to participate in this work as sources of consultation and advice;

h) ensure close cooperation with relevant International Organizations and States in order to optimize the use of available expertise and resources;

i) carry out the above activities in the most efficient manner, with a minimum of formality and documentation; and

j) coordinate with the Regional Aviation Safety Group – Pan America (RASG-PA) to avoid duplication of efforts and work, as well as to develop joint activities if necessary.

b) ayudar a las Oficinas Regionales de la OACI que brindan servicios en las Regiones CAR/SAM en su tarea de fomentar la implantación del Plan Regional de Navegación Aérea de las Regiones CAR/SAM;

c) asegurar, de conformidad con el Doc 10004 - Plan Global para la Seguridad Operacional de la Aviación (GASP), el monitoreo de la performance de los sistemas, según sea necesario;

d) elaborar propuestas de enmienda para la actualización del Plan de Navegación Aérea (ANP) de las Regiones CAR/SAM, según sea necesario, para satisfacer cualquier cambio en los requerimientos;

e) monitorear la implantación de instalaciones y servicios de navegación aérea y, en caso de ser necesario, facilitar la armonización interregional, tomando en cuenta los análisis de costo-beneficio, la elaboración de los estudios económicos, los beneficios ambientales y las cuestiones financieras;

f) analizar los temas relacionados con la planificación de los recursos humanos y proporcionar recomendaciones para apoyar que el desarrollo de las capacidades de los recursos humanos en las regiones sean compatibles con el Plan de Navegación Aérea de las Regiones CAR/SAM;

g) invitar a instituciones financieras, según sea necesario y en el momento que se considere apropiado durante el proceso de planificación, para que participen en este trabajo como fuentes de consulta y asesoramiento;

h) asegurar una estrecha cooperación con las Organizaciones Internacionales pertinentes y los Estados a fin de optimizar el uso de los conocimientos técnicos y recursos disponibles;

i) llevar a cabo las actividades arriba indicadas de la manera más eficiente posible, con un mínimo de formalidad y documentación; y

j) coordinar con el Grupo Regional sobre Seguridad Operacional de la Aviación - Panamérica (RASG-PA) para evitar duplicación de esfuerzos y trabajos, así como desarrollar actividades conjuntas de ser necesario.

2. Position in ICAO

2.1 GREPECAS is the guiding and coordinating body for all activities conducted within ICAO concerning the air navigation system for the CAR/SAM Regions but does not assume authority vested in other ICAO bodies, except where such bodies specifically delegate their authority. The activities of GREPECAS shall be subject to review by the ICAO Council.

2.2 To verify the effectiveness and implementation rate of operational improvements, ICAO provides data and tools to support performance monitoring and implementation and facilitates the exchange of relevant information and best practices in the CAR/SAM Regions.

3. GREPECAS Membership and Organization

3.1 GREPECAS includes all ICAO Contracting States and Territories, which provide air navigation services in the CAR/SAM Regions. In addition, a group of ICAO contracting States and Territories may choose to have a common representation.

3.2 States should ensure that their designated representatives as members of GREPECAS have the knowledge and experience in the provision of international air navigation systems and are maintained for a sufficiently long period to maintain continuity in the activities of the GREPECAS. The designated representative may be assisted by technical advisors during the meetings of the Group.

3.3 States geographically located in the CAR/SAM Regions, States having dependent territories in those regions and States having aircrafts with their registry operating in those regions should be kept fully informed of the activities of GREPECAS. To achieve this objective, States should receive regularly:

- the proposed agenda of the Group's meetings; and
- the reports of the Group's meetings, as appropriate.

2. Posición dentro de la OACI

2.1 El GREPECAS es el organismo de orientación y coordinación para todas las actividades llevadas a cabo por la OACI en relación con el sistema de navegación aérea para las Regiones CAR/SAM, pero no asume las facultades otorgadas a otros organismos de la OACI, excepto cuando tales organismos le deleguen específicamente sus facultades. Las actividades del GREPECAS deberán estar sujetas a revisión por parte del Consejo de la OACI.

2.2 Para verificar la efectividad y la tasa de implementación de mejoras operativas, la OACI proporciona datos y herramientas para apoyar el monitoreo del desempeño y la implementación y facilita el intercambio de información relevante y mejores prácticas en las Regiones CAR/SAM.

3. Membresía y organización del GREPECAS

3.1 El GREPECAS incluye todos los Estados contratantes y Territorios de la OACI, que brindan servicios de navegación aérea en las Regiones CAR/SAM. Adicionalmente, un grupo de Estados contratantes y Territorios de la OACI puede optar por tener una representación común.

3.2 Los Estados deben asegurarse de que sus representantes designados/as como miembros del GREPECAS tengan el conocimiento y la experiencia en prestación de sistemas internacionales de navegación aérea y se mantengan durante un período suficientemente largo para mantener la continuidad en las actividades del GREPECAS. El/la representante designado/a puede ser asistido/a por asesores/as técnicos/as durante las reuniones del Grupo.

3.3 Los Estados ubicados geográficamente en las Regiones de CAR/SAM, los Estados que tienen Territorios dependientes en dichas regiones y los Estados que tienen aeronaves en su registro que operan en dichas regiones, deberán mantenerse plenamente informados de las actividades del GREPECAS. Para lograr este objetivo, los Estados deberían recibir, regularmente:

- el orden del día propuesto de las reuniones del Grupo; y
- los informes de las reuniones del Grupo.

3.4 GREPECAS will normally invite international organizations recognized by the ICAO Council as representing important civil aviation interests to participate in the work of GREPECAS on a "Consultative" basis. Among international organizations, ACI-LAC, CANSO, IBAC, IATA, IFALPA, and IFATCA should be invited on a regular basis. Other international organizations and/or entities and organizations of the CAR/SAM Regions may participate when specifically invited by the Group.

3.5 GREPECAS may invite as "Observers" representatives from other entities and international institutions of the CAR/SAM Regions, as well as representatives from recognized organizations in the industry with interests in civil aviation.

3.6 The following link indicates the International Organizations recognized by ICAO that may be invited to participate in the relevant GREPECAS meetings. ICAO does not officially qualify them as "Observers":

https://www.icao.int/about-icao/Pages/Invited-Organizations.aspx

3.7 The Group shall appoint a Chairperson and a Vice-Chairperson. Candidates for these positions are nominated indistinctly by a CAR or SAM State. The Chairperson, in close coordination with the Regional Directors of the ICAO NACC and SAM Regional Offices, should make the necessary arrangements for the work of the Group to be efficient.

3.8 In order to ensure the necessary continuity in the work of GREPECAS, the Chairperson and the Vice-Chairperson of GREPECAS should assume their functions at the end of the meeting at which they are elected, for a period of three years. They may also be re-elected only once, for a period of three years, if the group deems it appropriate to do so. The Chair shall:

a) attend, to the extent possible, all meetings of GREPECAS under his/her chairpersonship;

b) participate with the Secretariat in the development of GREPECAS meeting reports; and

c) present the GREPECAS meeting reports under his/her chairpersonship.

3.4 El GREPECAS invitará normalmente a las organizaciones internacionales reconocidas por el Consejo de OACI como representantes de intereses importantes de la aviación civil a participar en la labor del GREPECAS con carácter "Consultivo". Entre las organizaciones internacionales, se debería invitar periódicamente a ACI-LAC, CANSO, IBAC, IATA, IFALPA e IFATCA. Otras organizaciones internacionales y/o entidades y organizaciones de las Regiones CAR/SAM podrán participar cuando el Grupo las invite específicamente.

3.5 El GREPECAS podrá invitar a participar como "Observadoras" a representantes de otras entidades e instituciones internacionales de las Regiones CAR/SAM, así como a representantes de organismos reconocidos de la industria con intereses en la aviación civil.

3.6 En el siguiente enlace se indican las Organizaciones Internacionales reconocidas por la OACI que pueden ser invitadas a participar en las reuniones pertinentes del GREPECAS. La OACI no las califica oficialmente como "Observadoras":

https://www.icao.int/about-icao/Pages/Invited-Organizations.aspx

3.7 El GREPECAS deberá designar a un/a Presidente y a un/a Vice-Presidente. Las/los candidatas/os a estos puestos son personas nominadas, indistintamente, por un Estado CAR o un Estado SAM. El/la Presidente, en estrecha coordinación con los/as Directores/as Regionales de las Oficinas Regionales NACC y SAM de la OACI, deberá hacer los arreglos necesarios para que el trabajo del grupo se haga eficientemente.

3.8 A fin de garantizar la necesaria continuidad en el trabajo del GREPECAS, el/la Presidente y el/la Vice-Presidente del GREPECAS deberán asumir sus funciones al final de la reunión en la cual son elegidos/as, cumpliendo un período de tres años. También pueden ser re-elegidos/as por un período de tres años una única vez, si el grupo lo considera apropiado. El/la Presidente deberá:

a) asistir, en la medida de lo posible, a todas las reuniones del GREPECAS bajo su presidencia;

b) participar, con la Secretaría, en la elaboración de los informes de las reuniones del GREPECAS; y

c) presentar los informes de las reuniones del GREPECAS bajo su presidencia.

3.9 In case that special circumstances prevent the Chairperson or Vice-Chairperson from completing his/her term, the same State that nominated him/her shall designate a person to replace him/her to complete the remaining term. This appointment will be formally consulted with GREPECAS Members to validate and confirm the new Chairperson or Vice-Chairperson.

3.10 **Appendix A** to this document presents the Organization of GREPECAS.

3.11 The North America, Central America, and Caribbean Working Group (NACC/WG) and the SAM Implementation Group (SAM(IG) and other regional implementation groups will support the implementation process of GREPECAS Conclusions and Decisions and planning and implementation work in the corresponding regions, as well as providing relevant information and data for both regions at GREPECAS meetings.

4. Contributory Bodies and Collaborative Arrangements with Regional Associations or Committees

4.1 Creation and dissolution of Contributory Bodies

4.1.1 To assist in its planning and implementation work, GREPECAS may create contributory bodies (subgroups, working groups, steering groups, coordination groups, task forces, etc.), in charge of preparatory work on specific and defined problems requiring expert advice for their resolution To facilitate the Contributory Bodies' coordination and reports elaboration, a group in charge can be appointed to coordinate with other contributory bodies working in the same technical area of expertise for GREPECAS. Representation in GREPECAS contributory bodies shall be made up by specialists in the subjects concerned and familiar with the area under consideration. The establishment of the contributory bodies shall be governed by the following considerations:

a) a contributory body will be formed when the need to make a substantial contribution to the resolution of the problem or problems in question is clearly established;

b) it shall be granted clear and concise terms of reference describing not only the tasks but also a target date for completion;

c) its composition shall be such that, while being kept as small as possible, all States and international organizations which can make valid contributions are given the opportunity to participate in it;

3.9 En caso de que circunstancias especiales impidan que la/el Presidente o Vicepresidente complete su mandato, el mismo Estado que lo nominó designará una persona en su reemplazo para completar el periodo restante. Esta designación será consultada formalmente a los Miembros del GREPECAS para validar y ratificar al nuevo Presidente o Vicepresidente.

3.10 El **Apéndice A** de este documento muestra la Organización del GREPECAS.

3.11 El Grupo de Trabajo de Norteamérica, Centroamérica y Caribe (NACC/WG) y el Grupo de Implementación SAM (SAM/IG) y demás grupos regionales de implementación apoyarán el proceso de implementación de las Conclusiones y Decisiones y trabajo de planificación e implementación del GREPECAS en las respectivas regiones, además de proporcionar información y datos relevantes para ambas regiones en las reuniones del GREPECAS.

4. Órganos auxiliares y Arreglos colaborativos con Asociaciones o Comités Regionales.

4.1 Creación y disolución de órganos auxiliares

4.1.1 Para ayudar en su trabajo de planificación e implementación, el GREPECAS puede crear órganos auxiliares (subgrupos, grupos de trabajo, grupos directivos, grupos de coordinación, grupos de tarea, etc.), encargados del trabajo preparatorio sobre problemas específicos y definidos que requieren la asesoría de expertos para su resolución. Para facilitar la coordinación y la elaboración de informes de los órganos auxiliares, se puede designar un grupo encargado que coordine con otros órganos auxiliares que trabajan en la misma área de experiencia técnica para el GREPECAS. La representación en los órganos auxiliares del GREPECAS debe estar conformada por especialistas en los temas en cuestión y familiarizados con el área bajo consideración. El establecimiento de los órganos auxiliares se regirá por las siguientes consideraciones:

a) se formará un órgano auxiliar cuando se establezca claramente la necesidad de apoyar con una contribución sustancial a la resolución del problema o problemas en cuestión;

b) se le proporcionará términos de referencia claros y concisos que describan no solo las tareas a realizar sino también una fecha prevista para su finalización;

c) su composición será tal que, aunque se mantenga lo más pequeño posible, todos los Estados y organizaciones internacionales que puedan hacer contribuciones válidas tengan la oportunidad de participar en ella;

d) its work progress and co-ordination requirements shall be subject to review by GREPECAS to avoid duplication of effort in fields already covered by other activities;

e) contributory bodies must nominate "rapporteurs" to avoid conflicts of status with the GREPECAS chairperson, and they must not nominate "chairpersons" to preserve the necessary hierarchical organization; and

f) a contributory body will be dissolved when it has completed the assigned tasks or when it has clearly demonstrated the work carried out.

4.1.2 The structure of the contributory bodies created by the GREPECAS, including its terms of reference, shall be kept under regular revision by GREPECAS to optimize its organization.

4.1.3 When appropriate, the contributory bodies should adopt a project-management-based approach to regional air navigation planning and implementation, in accordance to agreed regional priorities, latest GANP edition.

4.1.4 Each contributory body shall nominate a rapporteur to serve as contact with the GREPECAS Secretariat. These contributory bodies may carry out, in coordination with the GREPECAS, specific activities such as the organization of seminars and workshops. The GREPECAS Secretariat may request the support of the ICAO Regional Offices for the management of the contributory bodies.

4.1.5 The rapporteur of the contributory body shall be familiar with ICAO Policy on interactions with third parties and the activities of the group shall be aligned with the GREPECAS procedures. And their actions will be agreed with the ICAO Regional Officer in charge and the contributory body will not take any action without the consensus of the ICAO Regional Officer in charge.

4.1.6. Each contributory body shall report its activities annually to GREPECAS, provide an update on current activities and guide the continuous work to ensure alignment with the GREPECAS work programme.

d) su progreso en el trabajo y los requisitos de coordinación estarán sujetos a revisión por parte del GREPECAS para evitar la duplicación de esfuerzos en campos que ya están cubiertos por otras actividades;

e) los órganos auxiliares deberán nominar "relatores/as" para evitar conflictos de estatus con el presidente/a del GREPECAS y no debe nominar "presidentes/as" para preservar la organización jerárquica necesaria; y

f) un órgano auxiliar se disolverá cuando haya completado las tareas asignadas o haya dejado en claro el trabajo realizado.

4.1.2 La estructura de los órganos auxiliares creados por el GREPECAS, incluyendo sus términos de referencia, se mantendrán bajo revisión periódica por el GREPECAS para optimizar su organización.

4.1.3 Según corresponda, los órganos auxiliares deberían adoptar un enfoque basado en la gestión de proyectos para la planificación e implementación de la navegación aérea regional, que esté alineado con las prioridades regionales acordadas, la última edición del GANP.

4.1.4 Cada órgano auxiliar nominará un/a relator/a para que sirva de contacto con la Secretaria del GREPECAS. Estos órganos auxiliares podrán ejecutar, en coordinación con el GREPECAS, actividades específicas tales como la organización de seminarios y talleres. La Secretaría del GREPECAS podrá pedir el apoyo de las Oficinas Regionales para la gestión de los órganos auxiliares.

4.1.5 El/la relator/a del órgano auxiliar deberá estar familiarizado/a con la Política de la OACI sobre las interacciones con partes externas y las actividades del grupo se alinearán con los procedimientos del GREPECAS, y sus acciones se acordarán con el Especialista Regional de la OACI a cargo y el órgano auxiliar no tomará ninguna medida sin el consenso del Especialista Regional de la OACI a cargo.

4.1.6 Cada órgano auxiliar deberá reportar sus actividades anualmente al GREPECAS, proporcionar una actualización sobre las actividades actuales y orientar el trabajo continuo para asegurar la alineación con el programa de trabajo del GREPECAS.

4.1.7 The GREPECAS Contributory Body is the Scrutiny Working Group (GTE) and its Terms of Reference (ToRs) are shown in **Appendix B**.

4.2 Collaborative arrangements with Associations or Regional Committees.

4.2.1 In order to support the GREPECAS activities, collaborative arrangements may be held with regional associations or committees in support of the objectives of the Regional Air Navigation Plan and other GREPECAS objectives. The procedure for these arrangements is described in **Appendix C** of this manual.

5. Working methodology

5.1 The GREPECAS meetings will be held annually in a mixed manner, with a Virtual Phase (or Asynchronous phase) and a Face-to-Face Phase according to the following:

- The Virtual Phase (or Asynchronous Phase): will be conducted through a collaboration and communication platform (to be defined by the Secretariat), during which all Working Papers (WPs) and Information Papers (IPs) are made available to participants in order they can analyse and comment on these documents, allowing consensus to be generated on the necessary proposals or measures, as well as proposals for decisions and conclusions, with a view to guide the GREPECAS tasks. This Phase facilitates the preparation of a preliminary Report, weeks before the face-to-face Phase.

- The Face-to-Face Phase: will focus on decision-making and conclusions based on the Preliminary Report and will favour the exchange and dialogue among meeting participants to ensure the GREPECAS objectives, including several working tables on matters of interest related to safety and air navigation.

5.2 The GREPECAS work programme shall be developed through:

- permanent activities corresponding to the primary functions of a PIRG: management and maintenance of the Air Navigation Plan (ANP), deficiencies, etc. as well as ensuring that the implementation of Air Navigation Systems in the CAR/SAM regions is consistent and compatible with developments in adjacent regions, and is in line with the ATM Operational Concept (Doc 9854), GANP, and the CAR/SAM Regional Air Navigation Plan.

- Specific activities to be carried out through programmes and projects

4.1.7 El órgano auxiliar del GREPECAS es el Grupo de Trabajo de Escrutinio (GTE)y sus Términos de referencia (ToR) se muestran en el **Apéndice B**.

4.2 Arreglos colaborativos con Asociaciones o Comités Regionales.

4.2.1 Para apoyar las actividades del GREPECAS, se podrán celebrar arreglos colaborativos con asociaciones o comités regionales en apoyo a los objetivos del Plan Regional de Navegación Aérea y demás objetivos del GREPECAS. El procedimiento para estos arreglos se describe en el **Apéndice C** de este manual.

5. Metodología de trabajo

5.1 Las reuniones de GREPECAS se desarrollarán, anualmente, de manera mixta, con una Fase Virtual (o fase Asincrónica) y una Fase Presencial según lo siguiente:

- La Fase Virtual (o Fase Asincrónica): se conducirá a través de una plataforma de colaboración y comunicación (a ser definida por la Secretaría), durante la cual todas las Notas de Estudio (NE) y las Notas de Información (NI) se ponen a disposición de los participantes para que puedan analizar y emitir comentarios sobre estos documentos, permitiendo generar consenso sobre las propuestas o medidas necesarias, así como propuestas de decisiones y conclusiones, con miras a orientar las tareas del GREPECAS. Esta Fase facilita la preparación de un Informe preliminar, semanas antes de la Fase presencial.

- La Fase Presencial: se enfocará en la toma de decisiones y conclusiones en base al Informe Preliminar, y se favorecerá el intercambio y diálogo entre los participantes de la reunión para asegurar los objetivos del GREPECAS, incluyendo varias mesas de trabajo de asuntos de interés relacionados con la seguridad operacional y la navegación aérea.

5.2 El programa de trabajo del GREPECAS será desarrollado a través de:

- actividades permanentes que corresponden a las funciones primarias de un PIRG: gestión y mantenimiento del Plan de Navegación Aérea (ANP), deficiencias, etc. así como asegurar que la implantación de los Sistemas de Navegación Aérea en las regiones CAR/SAM sea coherente y compatible con los desarrollos en las regiones adyacentes, y esté en consonancia con el Concepto Operacional ATM (Doc 9854), GANP y el Plan Regional de Navegación Aérea de las Regiones CAR/SAM.

- actividades específicas que se realizaran a través de programas y proyectos

5.3 The permanent activities of GREPECAS will be carried out by the Secretariat in coordination with the Chairmanship and the members of GREPECAS, through electronic communications and specific work sessions, maximizing the electronic means for their fulfilment, for which techniques will be used to manage the activities for their timely compliance.

5.4 One of these permanent tasks is the management of the CAR/SAM Regional Air Navigation Plan. GREPECAS is key to the successful adoption of the GANP, as it provides the medium-term planning and implementation horizon for States and other stakeholders. The global technical level of the GANP contains the development of the ASBU methodology and incorporates a Performance Framework that allows measuring the performance of the implementation of the modules and elements, ensuring that the identified needs are met and allowing the management of performance indicators aimed at obtaining scalable upgrade goals. GREPECAS is responsible for the regional level of the GANP. Based on regional performance and operational needs, differences, constraints and opportunities, GREPECAS is responsible for studying and defining regional planning and implementation priorities, aligned with the GANP, through Volumes I, II and III of the CAR/SAM ANP. It is also responsible for the identification of air navigation deficiencies, taking into account the air navigation plans.

5.5 Following the improvements management process, GREPECAS can contribute to the development of the GANP by proposing amendments to the Aviation System Block Upgrade (ASBU) framework based on the lessons learned from its implementation challenges and experience.

5.6 The specific activities of GREPECAS will be carried out through the project and programmes management methodology. Every project must be clearly identified with an operational benefit/improvement and justified under a Cost Benefit Analysis (CBA).

5.7 The programmes will be coordinated by the Regional Officers and the projects will be coordinated by experts from the States. The programmes cover the areas of air navigation, based on the GANP, the Global ATM Operational Concept and in accordance with ICAO programmes under the Strategic Objectives of Safety and Environmental Protection and Sustainable Development of Air Transport; i.e. AGA, AIM, ATM, CNS, MET and SAR. Projects in their conception are expected to be CAR/SAM except in particular cases where it is duly justified that they are only CAR or only SAM.

5.3 Las actividades permanentes del GREPECAS se realizarán por parte de la Secretaría en coordinación con la Presidencia y los miembros del GREPECAS, a través de comunicaciones electrónicas y sesiones específicas de trabajo maximizando los medios electrónicos para su cumplimiento, para lo cual se hará uso de técnicas de gestión de las actividades para su oportuno cumplimiento

5.4 Una de estas tareas permanentes es la gestión del Plan Regional de Navegación Aérea para las Regiones CAR/SAM. El GREPECAS es clave para la adopción exitosa del GANP, ya que proporciona el horizonte de planificación estratégica e implementación a mediano y largo plazo para los Estados y otras partes interesadas. El nivel técnico mundial del GANP contiene el desarrollo de la metodología ASBU e incorpora un Marco de Performance que permite medir el desempeño de la implantación de los módulos y elementos, asegurando que se atiende las necesidades identificadas y permitiendo gestionar indicadores de performance orientados a obtener metas de mejora escalables. El GREPECAS es responsable del nivel regional del GANP. Con base en el desempeño regional y las necesidades operacionales, diferencias, limitaciones y oportunidades, el GREPECAS es responsable de estudiar y definir las prioridades regionales de implementación, alineadas con el GANP, a través de los Volúmenes I, II y III del ANP CAR/SAM. También es responsable de la identificación de las deficiencias de navegación aérea, teniendo en cuenta los planes de navegación aérea.

5.5 Siguiendo el proceso de gestión de mejoras, GREPECAS puede contribuir a la mejora del desarrollo del GANP al proponer enmiendas al marco de mejora del sistema de aviación (ASBU), basadas en las lecciones aprendidas de sus desafíos y experiencia de implementación.

5.6 Las actividades específicas del GREPECAS se realizarán a través de la metodología de gestión de programas y proyectos. Todo proyecto debe estar claramente identificado con un beneficio/mejora operacional y justificada bajo un Análisis de Costo-Beneficio (CBA).

5.7 Los programas serán coordinados por los/as Especialistas Regionales y los proyectos serán coordinados por expertos/as de los Estados. Los programas abarcan las áreas de la navegación aérea, con base en el GANP, el Concepto Operacional Mundial ATM y de acuerdo con los programas de la OACI bajo los Objetivos Estratégicos Seguridad Operacional y Protección del medio ambiente y desarrollo sostenible del transporte aéreo; es decir, AGA, AIM, ATM, CNS, MET y SAR. Los Proyecto**s** en su concepción se espera que sean CAR/SAM, salvo en los casos particulares en los cuales se justifiquen debidamente que sean solamente CAR o solamente SAM.

5.8 The respective CAR or SAM Regional Office shall designate programmes coordinators. To assist in the design, monitoring and achievement of the objectives of each project, the programmes coordinator of the Regional Office shall be supported by project coordinators designated by the States. Each Regional Office will use its own implementation methodology to meet the objectives of the programmes and projects in the regions. If necessary, CAR/SAM meetings may be convened to coordinate interregional aspects and existing forums will be used in order to avoid the proliferation of meetings and minimize costs.

5.9 GREPECAS projects have the following components, which must be included in a document for each project, containing the following points:

a) Objectives

b) Goals description

c) Activities

d) Responsibilities

e) Human Resources – experts and budget

f) Outcome –deliverables

g) Schedule – Programme, milestones, terms

h) Dependencies

i) Metrics and Indicators

j) Risk Analysis

5.10 To achieve the results of a given project resource allocation for its implementation is necessary. States/ International Organizations, upon designating their coordinators and experts, must ensure that the designees are provided with the time necessary and resources to conduct appropriate coordination and participate in the various activities of the project.

5.8 La respectiva Oficina Regional CAR o SAM designará coordinadores/as de programas. Para asistir el diseño, seguimiento y logro de los objetivos de cada proyecto, el/la coordinador/a de programa de la Oficina Regional contará con el apoyo de coordinadores/as de proyecto designados/as por los Estados. Cada Oficina Regional utilizará su propia metodología de implementación para cumplir con los objetivos de los programas y proyectos de las regiones. En caso de ser necesario, se podrán convocar reuniones CAR/SAM para coordinar aspectos interregionales y, se utilizarán los foros existentes con el propósito de evitar la proliferación de reuniones y minimizar costos.

5.9 Los proyectos del GREPECAS tienen los siguientes componentes, los cuales deberán estar incluidos en un documento por cada proyecto, que contenga los siguientes puntos:

a) Objetivos

b) Descripción de metas

c) Actividades

d) Responsabilidades

e) Recursos humanos (expertos/as) y presupuesto

f) Resultados - entregables

g) Cronograma - programación, hitos, plazos

h) Dependencias

i) Métricas e indicadores

j) Análisis de riesgos

5.10 Para lograr alcanzar los resultados de un proyecto, es necesario disponer de recursos para su implementación. Los Estados/Organizaciones Internacionales, al designar a sus coordinadores/as y expertos/as, deberán asegurarse que puedan disponer del tiempo necesario y demás recursos para una adecuada participación en las distintas actividades del proyecto.

6. Projects Meetings and Interregional Coordination

6.1 GREPECAS will need to ensure coordination with informal groups, such as the South Atlantic Group (SAT), the South Pacific Informal ATS Coordinating Group (ISPACG) and the e Informal Pacific Air Traffic Control (ATC) Coordinating Group (IPACG) and others to guarantee harmonized planning and smooth transition across regional interface areas.

6.2 With the aim of coordinating and exchanging information, it is possible that the various projects will require regional meetings. Priority will be given to teleconference meetings; however, in-person meetings may also be necessary. In this case, the Regional Offices will make use of existing fora in order to minimize costs, and preferably hold meetings at the Regional Offices.

7. Regional Coordination

7.1 The Chairperson and the GREPECAS Secretary, in coordination with the Co-Secretary, shall take all necessary steps to establish and maintain a close relationship with relevant international and sub-regional organizations in all pertinent fields of aviation activity to ensure optimization of capacity and efficient development of procedures.

8. GREPECAS Meetings

8.1 Languages

8.1.1 The languages of the meetings of the GREPECAS shall be English and Spanish. The meeting reports and supporting documentation for GREPECAS meetings will be prepared in both languages.

8.2 Secretariat support of GREPECAS meetings

8.2.1 The GREPECAS Secretariat will be provided by ICAO (NACC or SAM Regional Director). The ICAO Regional Director with more seniority will assume the GREPECAS Secretary.

8.2.2 The Regional Director who acts as Secretary of GREPECAS will not simultaneously perform functions of Secretary of Regional Aviation Safety Group-Pan America (RASG-PA), assuming these functions the Regional Director of the other Region.

6. Reuniones para los proyectos y coordinación Interregional

6.1 GREPECAS deberá asegurar la coordinación con grupos informales, como el Grupo del Atlántico Sur (SAT), el Grupo Informal de Coordinación de ATS del Pacífico Sur (ISPACG) y el Grupo Informal de Coordinación de ATC del Pacífico (IPACG), y otros, para asegurar una planificación armonizada y una transición fluida a través de las áreas de interfaz regional.

6.2 Con el objetivo de coordinar e intercambiar información, es posible que los distintos proyectos requieran reuniones regionales. Se dará prioridad a reuniones por medio de teleconferencias; sin embargo, la reunión presencial puede también ser necesaria. En este último caso, las Oficinas Regionales, en la medida de lo posible, harán uso de los foros ya existentes a fin de minimizar costos y de preferencia las reuniones serán realizadas en las Oficinas Regionales.

7. Coordinación regional

7.1 El/la Presidente y el/la Secretario/a del GREPECAS, en coordinación con el/la Co-Secretario/a, deberán tomar todas las medidas necesarias para establecer y mantener una estrecha relación con las organizaciones internacionales y sub-regionales pertinentes en todos los campos relacionados con la actividad aeronáutica, a fin de garantizar la optimización de la capacidad y el eficiente desarrollo de los procedimientos.

8 Reuniones del GREPECAS

8.1 Idiomas

8.1.1 Los idiomas de las reuniones del GREPECAS deberán ser el inglés y el español. Los informes de las reuniones y los documentos de apoyo para las reuniones del GREPECAS serán elaborados en ambos idiomas.

8.2 Apoyo de la Secretaría a las reuniones del GREPECAS

8.2.1 La Secretaría del GREPECAS será provista por la OACI (Director/a Regional NACC o SAM). El/la Director/a Regional de la OACI con más antigüedad asumirá la Secretaría del GREPECAS.

8.2.2 El/la Director/a Regional que actúa como Secretario/a del GREPECAS no puede asumir el rol de Secretario/a del Grupo Regional de Seguridad Operacional de la Aviación Pan-América (RASG-PA) al mismo tiempo. El/la Director/a Regional de la otra Región actuará como Secretario/a del RASG-PA.

8.2.3. GREPECAS meetings are open to all Members. Each State/Territory Member should be represented by a high-level Delegate appointed by the State/Territory, preferably from the Civil Aviation Authority (CAA) to support the formulation of related policies within the State. A delegate can be supported by an alternative delegate and/or advisers with the required technical knowledge on the issues under consideration.

8.2.4 The GREPECAS Secretary, supported by the GREPECAS Co-Secretary, shall provide necessary secretarial assistance to the Group and serve as its communication link with all interested parties. In order to achieve this, the following actions will be taken:

a) the meeting agenda shall be limited to those items that are sufficiently mature for a GREPECAS decision or conclusion;

b) documentation submitted by States, international organizations, and GREPECAS Programmes for action by GREPECAS shall always include a concrete and substantiated proposal for a conclusion or a decision for GREPECAS consideration for endorsement, amendment or rejection, if applicable;

c) working papers from the States should be sent electronically to the Secretariat at least 60 days before the start of the in-person phase of the meeting to permit timely processing by the corresponding Regional Office accredited to that State. All documentation should be prepared in two languages, English and Spanish, to be submitted before the start of the asynchronous phase of the meeting, at the latest, for proper publishing and distribution. Working papers received in only one language or after the start of the asynchronous (virtual) phase may not be accepted by the Secretariat, however, they may be adapted by the originator to be presented as information papers. Information papers will be prepared in the language(s) defined by the originator (Spanish and/or English) and should be sent at least 30 days the start of the in-person phase of the Meeting All Meeting documentation will be available on the web at least 10 days prior to the asynchronous (virtual) phase of the meeting;

8.2.3 Las reuniones del GREPECAS están abiertas a todos los Miembros. Cada Miembro del Estado/Territorio debería estar representado por un/a Delegado/a de alto nivel designado/a por el Estado/Territorio, preferiblemente de la Autoridad de Aviación Civil (AAC) para apoyar la formulación de políticas relacionadas dentro del Estado. Un/a delegado/a puede ser apoyado/a por un/a delegado/a alterno/a y/o asesores/as con el conocimiento técnico requerido de los temas bajo consideración.

8.2.4 El/la Secretario/a del GREPECAS, con el apoyo del/de la Co-Secretario/a del GREPECAS, brindará la asistencia secretarial necesaria al Grupo y servirá de enlace de comunicación con todas las partes interesadas. Con este fin, se tomarán las siguientes acciones:

a) el Orden del Día deberá limitarse a aquellos temas que estén suficientemente maduros para una decisión o conclusión por parte del GREPECAS;

b) la documentación presentada para fines de una acción por parte del GREPECAS, de los Estados, las Organizaciones Internacionales y los Programas del GREPECAS, debería siempre incluir una propuesta de Conclusión o Decisión concreta y fundamentada para la aprobación, enmienda o rechazo, según corresponda, del GREPECAS;

c) las notas de estudio de los Estados deberían ser enviadas electrónicamente a la Secretaría por lo menos 60 días antes del inicio de la fase presencial de la reunión, a fin de permitir su procesamiento oportuno por parte de la Oficina Regional acreditada a ese Estado. Toda la documentación debería ser elaborada en dos idiomas, Español e Inglés, para ser presentada a la Secretaría antes del inicio de la fase asincrónica de la reunión para su debida publicación y distribución. Las notas de estudio recibidas en un sólo idioma o aquellas que sean recibidas después del inicio de la fase asincrónica (virtual) podrían no ser aceptadas por la Secretaría; sin embargo, pueden ser adaptadas por el originador para ser presentadas como notas de información. Las notas de información serán elaboradas en el/los idiomas que defina el originador (español y/o inglés) y deberían ser enviadas por lo menos 30 días antes del inicio de la fase presencial de la Reunión. Toda la documentación de la reunión estará disponible en la página web por lo menos 10 días antes de la fase asincrónica (virtual) de la reunión;

d) GREPECAS plenary sessions will approve conclusions and decisions, which shall include brief lead-in text for better understanding and a reference to which earlier Conclusion(s)/Decision(s) are being superseded, as well as noting when they can be deleted from the GREPECAS List of Valid Conclusions and Decisions;

e) the full report will be completed by the Secretary and approved by the Chairperson for transmission within four weeks (working days) after the end of the meeting;

f) upon completion of the meeting, the Secretariat will present a draft containing the meeting Conclusions and Decisions a one-page summary describing the outcome will be prepared and disseminated to all Air Navigation Bureau (ANB) sections as well as relevant sections of Air Transport Bureau (ATB) and Technical Co-operation Bureau (TCB), including a detailed action plan for the implementation of the conclusions and decisions adopted by the Group; and

g) GREPECAS relations with States and International Organizations, as well as relations with CAR or SAM bodies and organizations, will normally be conducted through the ICAO Regional Director of the Office of accreditation.

9. Meeting Documentation

9.1 Distribution of the supporting documentation of GREPECAS and its Programmes, as well as the reports of the meetings, will be posted on the GREPECAS website.

9.2 Documentation may be presented by States, International Organizations or the Secretariat, in the following formats:

a) Working Papers (WP) contain material with a draft decision, conclusion or invitation for the meeting to take a certain action. The content of the topics must be focused on air navigation subjects (AGA, AIM, ATM, CNS, MET and SAR), coordination aspects with RASG-PA, or GREPECAS administrative matters.

d) las reuniones plenarias de GREPECAS aprobarán las conclusiones y decisiones, las cuales incluirán un corto texto de introducción para su mejor comprensión, así como una referencia a la(s) conclusión(es)/ decisión(es) anteriores que está(n) siendo reemplazada (s), y notando cuándo ésta(s) puede(n) ser eliminada(s) de la lista de conclusiones y decisiones válidas del GREPECAS;

e) el informe completo será redactado por el/la Secretario/a y aprobado por el/la Presidente, para su envío dentro de las cuatro semanas (laborables) después de finalizada la reunión;

f) al finalizar la reunión, la Secretaría presentará un borrador con las Conclusiones y Decisiones de la reunión se elaborará un resumen de una página para describir el resultado, el cual será difundido a todas las secciones de la Dirección de Navegación Aérea (ANB), así como a las secciones pertinentes de la Dirección de Transporte Aéreo (ATB) y la Dirección de Cooperación Técnica (TCB), incluyendo un plan de acción detallado para la implantación de las conclusiones y decisiones adoptadas por el grupo; y

g) las relaciones del GREPECAS con los Estados y las Organizaciones Internacionales, así como con los organismos y organizaciones de las Regiones CAR o SAM, serán normalmente canalizadas a través del/ de la Director/a Regional de la Oficina de acreditación de la OACI.

9. Documentación de la reunión

9.1 La distribución de la documentación de apoyo del GREPECAS y sus Programas, así como los informes de las reuniones, aparecerán publicados en el sitio web del GREPECAS.

9.2 Los Estados, Organizaciones Internacionales o la Secretaría podrán presentar la documentación en los siguientes formatos:

a) las notas de estudio (NE) contienen material con un proyecto de decisión, conclusión o invitando a la reunión a tomar una determinada acción. El contenido de los asuntos debe estar enfocado a temas de navegación aérea (AGA, AIM, ATM, CNS, MET y SAR), los aspectos de coordinación con el RASG-PA o sobre asuntos administrativos del GREPECAS;

b) Information Papers (IP) are submitted to provide the meeting with information for which no action is required and will normally not be discussed at the meeting.

c) "Flimsies" are documentation prepared on an Ad hoc basis in the course of a meeting to assist the meeting with discussion on a specific matter or in the drafting of a text for a conclusion or decision.

d) Discussion papers (DP) are originated and distributed during the meeting.

10. Meeting Results

10.1 Conclusions deal with matters, which in accordance with the Group's terms of reference, directly merit the attention of States or require further action to be initiated by ICAO in accordance with established procedures.

10.2 Decisions deal with matters of concern only to the internal functioning of GREPECAS.

10.3 The formulation of conclusions/decisions should comply with the following format:

CONCLUSION/DECISION ACRONYM	**TITLE**
What:	**Expected Impact**
That, XX a) b)	[ ] Political/Global [ ] Inter-regional [ ] Economic [ ] Environmental [ ] Operational/Technical
Why:	
XX	

When:	XX	**Status:**	[ ] Valid [ ] Superseded [ ] Completed
Who:	[ ] States [ ] ICAO [ ] Other:		XX

Note: in order to qualify as such, a decision or conclusion shall be able to respond clearly to the "3W" criterion (What, Who and When).

b) las notas de información (NI) son presentadas con el fin de brindar a la reunión información sobre la cual no se requiere acción alguna, y normalmente, no serán discutidas durante la reunión;

c) los "flimsy" son documentos elaborados con carácter Ad hoc en el transcurso de una reunión, con el fin de ayudar con las discusiones sobre un tema específico o en la redacción de un texto para una conclusión o decisión; y

d) las notas de discusión (ND) son generadas y distribuidas durante la reunión.

10. Resultados de la reunión

10.1 Las Conclusiones se refieren a temas que, de conformidad con los términos de referencia del Grupo, merecen la atención directa de los Estados o requieren acción posterior a ser iniciada por la OACI de acuerdo con los procedimientos establecidos.

10.2 Las Decisiones se refieren a temas que conciernen únicamente al funcionamiento interno del GREPECAS.

10.3 La formulación de las conclusiones/decisiones deberán cumplir el formato siguiente:

CONCLUSIÓN/DECISIÓN ACRÓNIMO	**TÍTULO**
Qué:	**Expected Impact**
Que, XX a) b)	[ ] Político/Global [ ] Inter-regional [ ] Económico [ ] Ambiental [ ] Operacional/Técnico
Por qué:	
XX	

Cuándo:	XX	**Estado**	[ ] Válida [ ] Invalidada [ ] Finalizada
Quién	[ ] Estados [ ] OACI [ ] Otros:		XX

Nota: A fin de calificar como tal, una Decisión o Conclusión, deberá poder responder claramente al criterio de qué, quién y cuándo.

11. Schedule and Venue of GREPECAS Meetings

12.1 GREPECAS will meet every year; its duration will be determined by the scope of the agenda, however, a three-day standard will be endeavoured, if possible. Meetings shall normally be convened at locations within the CAR and SAM Regions, alternatively. A meeting convening letter shall be sent by the Regional Offices 90 days prior to the meeting, including the draft agenda together with explanatory notes. Although the meetings are planned to be in-person, if that is not possible, they will be held virtually.

11.2 The Air Navigation Commission (ANC) noted that, due to relevant analysis and challenges related to the effectiveness and efficiency, the GREPECAS plenary meeting is held consecutively or jointly with plenary meetings of the Regional Aviation Safety Group - Pan America (RASG- PA), in order to facilitate coordination and achieve efficient use of resources.

11.3 GREPECAS will forward to the ICAO Council through the ANC, the report in each plenary meeting period, including the results of the consecutive meeting held with RASG-PA.

12. Fast-track Procedure

12.1 To enable greater efficiency for the work of GREPECAS, draft Conclusions and Decisions can be approved through electronic mail. Unless the Secretariat considers otherwise, the usual procedure shall apply in that the absence of a response indicates acceptance of the draft Conclusion or Decision.

13. Reporting Deficiencies

13.1 In order to enable GREPECAS to make detailed assessments of deficiencies, States and appropriate International Organizations, including IATA and IFALPA, are expected to provide information they have to the corresponding ICAO Regional Office for the identification of differences and appropriate actions, including action at PIRG meetings. The information should include, at a minimum:

a) description of the deficiency

b) requirement

c) risk assessment

d) solution and/or mitigating measures

11. Programación y lugar de las reuniones del GREPECAS

11.1 El GREPECAS se reunirá anualmente; la duración de la reunión será determinada por el alcance del orden del día; sin embargo, se intentará mantener un estándar de tres días de duración en la medida de lo posible. El lugar de las reuniones normalmente se alternará entre las Regiones CAR/SAM. Las Oficinas Regionales enviarán una carta de convocatoria para la reunión 90 días antes de la misma, incluyendo el orden del día provisional, junto con las notas aclaratorias. A pesar de que las reuniones se estiman presenciales, en caso de no ser posible, se realizaran de forma virtual.

11.2 La Comisión de Aeronavegación (ANC) señaló que, debido a los análisis relevantes y desafíos relacionados con la eficacia y la eficiencia, las reuniones plenarias de GREPECAS se celebren de forma consecutiva o conjunta con las reuniones plenarias del Grupo Regional sobre Seguridad Operacional de la Aviación-Panamérica (RASG-PA), con el fin de facilitar la coordinación y lograr un uso eficiente de los recursos.

11.3 El GREPECAS remitirá al Consejo de la OACI por medio de la ANC, el informe en cada periodo de reunión plenaria, incluyendo los resultados de la reunión consecutiva llevada a cabo con RASG-PA.

12. Procedimiento expreso

12.1 A fin de permitir mayor eficiencia al trabajo del GREPECAS, los proyectos de Conclusión y de Decisión podrán ser aprobados por correo electrónico. A menos que la Secretaría considere lo contrario, se aplicará el procedimiento usual en el sentido que la ausencia de respuesta indica aceptación del proyecto de Conclusión o Decisión.

13. Notificación de deficiencias

13.1 A fin de permitir al GREPECAS hacer una evaluación detallada de las deficiencias, se espera que los Estados y las Organizaciones Internacionales apropiados, incluyendo IATA e IFALPA, proporcionen la información que dispongan a la Oficina Regional correspondiente de la OACI para la identificación de deficiencias y de las acciones pertinentes, incluyendo las acciones a ser adoptadas en las reuniones de los PIRG. La información debería incluir, por lo menos:

a) descripción de la deficiencia

b) requerimiento

c) evaluación del riesgo

d) propuesta de solución y/o medidas de mitigación

e) timelines

f) responsible party

g) agreed action to be taken

h) action already taken

13.2 On 30 November 2001, the ICAO Council approved the Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies, which is presented as **Appendix D** to this Procedural Handbook.

13.3 A detailed description of the methodology is found in the document on Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies published on the Regional Offices websites under the GREPECAS section.

14. Coordination with RASG-PA

14.1 In the special case of GREPECAS' coordination with the Regional Aviation Safety Group - Pan-America (RASG-PA), GREPECAS will present with the RASG-PA mechanism, during consecutive and joint meetings, a working paper containing statistical information on the processes and/or projects that generate valuable information on air navigation systems safety, taking into consideration the following aspects:

a) GREPECAS and RASG-PA shall coordinate and provide mutual support with respect to the fulfilment of the objectives related to the regional priorities and the implementation plans supported by each group;

b) the coordination activities of GREPECAS and RASG-PA will be reported both to the respective plenary meetings and to the key contributory bodies of the groups, as necessary;

c) the work programmes of GREPECAS and RASG-PA will be specifically coordinated to avoid duplication of efforts and gap presence, as well as to ensure alignment and harmonization of the priorities, plans and activities of both groups. As a rule, and when required, the fast-track approval procedure will be used;

e) cronograma

f) parte responsable

g) acciones acordadas a ser adoptadas

h) acciones adoptadas

13.2 El 30 de noviembre de 2001, el Consejo de la OACI aprobó la Metodología Uniforme para la Identificación, Evaluación y Notificación de Deficiencias en la Navegación Aérea, la cual aparece en el **Apéndice D** de este Manual de Procedimientos.

13.3 La descripción detallada de la metodología se encuentra en el Documento de Metodología Uniforme para la Identificación, Evaluación y Notificación de Deficiencias en la Navegación Aérea que se encuentra publicado en los sitios web de las Oficinas Regionales bajo la sección GREPECAS.

14. Coordinación con el RASG-PA

14.1 En el caso especial de la coordinación del GREPECAS con el Grupo Regional sobre Seguridad Operacional de la Aviación - Panamérica (RASG-PA), el GREPECAS presentará con el mecanismo del RASG-PA, durante las reuniones plenarias consecutivas o conjuntas, una nota de estudio conteniendo información estadística de los procesos y/o proyectos que generan información valiosa sobre la seguridad operacional de los sistemas de navegación aérea, tomando en consideración los siguientes aspectos:

a) GREPECAS y RASG-PA coordinarán y brindarán apoyo mutuo con respecto al cumplimiento de los objetivos relacionados con las prioridades regionales y los planes de implementación respaldados por cada grupo;

b) las actividades de coordinación del GREPECAS y del RASG-PA se informarán tanto a las reuniones plenarias respectivas, como a los órganos auxiliares clave de los grupos, si es necesario;

c) los programas de trabajo del GREPECAS y del RASG-PA se coordinarán específicamente para evitar la duplicación de esfuerzos y la presencia de brechas, así como para garantizar la alineación y la armonización de las prioridades, planes y actividades de ambos grupos. Como regla, y cuando se requiera, se utilizará el procedimiento expreso de aprobación;

d) coordination meetings between GREPECAS and RASG-PA should be held annually by both Chairs with complementary teleconference meetings if necessary. The coordinated working activities shall be reviewed and recorded at the GREPECAS and RASG-PA coordination meetings and jointly reported to the respective plenary meetings of each group;

e) It will be possible to designate a GREPECAS focal point to participate in RASG-PA meetings, in order to provide an adequate link or interface that is required to address the efficient follow-up of matters, as well as the harmonization of projects where there is mutual participation etc.

f) GREPECAS and RASG-PA will be mutually responsible for allocating work in each of the coordinated activities of the groups and for ensuring that it is effectively coordinated, share information and cross-reports with the other group, taking special care to identify and highlight any implications of the work on the other group activities; and

g) In order to protect shared information, both GREPECAS and RASG-PA must collaborate by observing data confidentiality agreements at all times, taking into account an effective process to share and protect sensitive data.

15. Terminology

15.1 The applicable terminology to GREPECAS is included in **Appendix E**.

d) las reuniones de coordinación entre el GREPECAS y RASG-PA deben ser realizadas anualmente por ambos/as Presidentes con reuniones complementarias de teleconferencias si es necesario. Las actividades de trabajo coordinadas se revisarán y registrarán en las reuniones de coordinación GREPECAS y RASG-PA y se informarán de manera conjunta a las respectivas reuniones plenarias de cada grupo;

e) será posible designar un punto focal de coordinación del GREPECAS que participe en las reuniones del RASG-PA, con el fin de brindar un enlace o interfaz adecuado que se requiera para abordar el seguimiento eficiente de los asuntos, así como la armonización de los proyectos donde exista participación mutua etc.

f) GREPECAS y RASG-PA serán mutuamente responsables de asignar el trabajo en cada una de las actividades coordinadas de los grupos y de garantizar que se coordine efectivamente, comparta información e informes cruzados con el otro grupo teniendo especial cuidado para identificar y resaltar cualquier implicación del trabajo en las actividades del otro grupo; y

g) Con el fin de proteger la información compartida, tanto el GREPECAS como el RASG-PA deben colaborar observando los acuerdos de confidencialidad de los datos en todo momento, teniendo en cuenta un proceso efectivo para compartir y proteger los datos confidenciales.

15. Terminología

15.1 La terminología aplicable al GREPECAS aparece en el **Apéndice E**.

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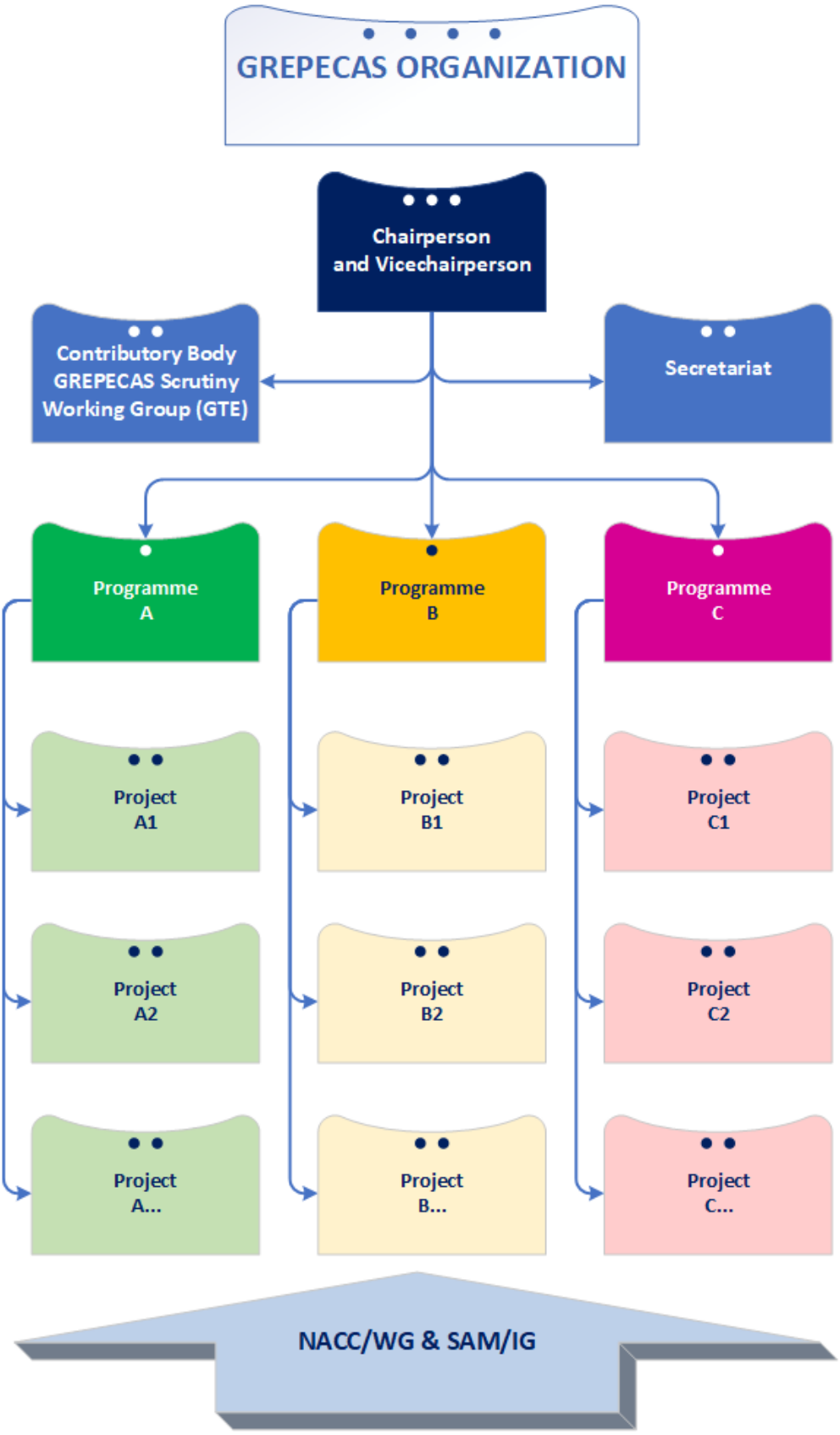
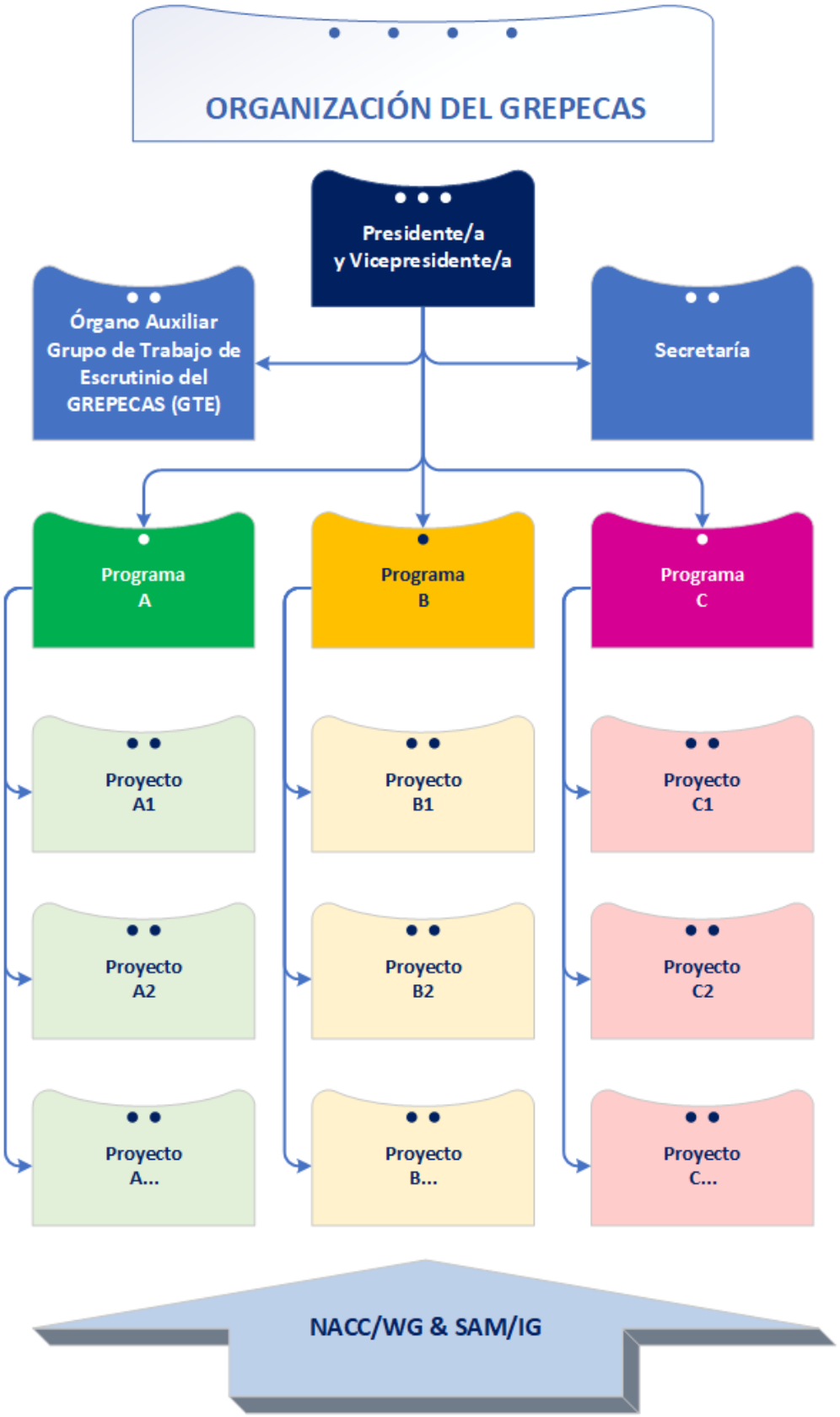
APPENDIX A


GREPECAS ORGANIZATION
Chairperson and Vicechairperson
Contributory Body GREPECAS Scrutiny Working Group (GTE)
Secretariat
Programme A
Programme B
Programme C
Project A1
Project B1
Project C1
Project A2
Project B2
Project C2
Project A...
Project B...
Project C...
NACC/WG & SAM/IG

APÉNDICE A


ORGANIZACIÓN DEL GREPECAS
Presidente/a y Vicepresidente/a
Órgano Auxiliar Grupo de Trabajo de Escrutinio del GREPECAS (GTE)
Secretaría
Programa A
Programa B
Programa C
Proyecto A1
Proyecto B1
Proyecto C1
Proyecto A2
Proyecto B2
Proyecto C2
Proyecto A...
Proyecto B...
Proyecto C...
NACC/WG & SAM/IG

APPENDIX B
SCRUTINY WORKING GROUP (GTE)
Terms of Reference (ToRs)

1. Introduction

The Terms of Reference (ToRs) of the Regional RVSM CAR/SAM Scrutiny Working Group (known as GTE) were established with the purpose to review the problems affecting the TLS based on the Large Height Deviation (LHD) information provided by States and International Organizations

2. Terms of Reference of the GTE

a) Gather safety experts in safety management, air traffic control, aircraft flight operations, regulation and certification, data and risk models analysis;

b) Analyse and review the large height deviations of 300 feet or more, as defined in ICAO Doc 9574, Manual on a 300 m (1 000 ft.) Vertical Separation Minimum between FL 290 and FL 410 Inclusive;

c) Coordinate with CARSAMMA the collection and review of data on LHDs;

d) Determine and validate an estimate of the flight time out of the cleared flight level used to calculate the collision risk model (CRM) by CARSAMMA;

e) Identify the safety trends based on the reports of the LHDs and recommend mitigation actions associated with the LHDs in accordance with the ICAO SMS provisions. Send annual reports on the results of safety assessments to GREPECAS to improve safety in the CAR/SAM Regions RVSM space; and

f) Perform other duties as indicated by GREPECAS.

3. Composition:

CAR and SAM States, CARSAMMA, COCESNA, IATA, IFALPA, IFATCA, and Rapporteur

APENDICE B
GRUPO DE TRABAJO DE ESCRUTINIO (GTE)
Términos de Referencia (ToR)

1. Introducción

Los Términos de Referencia (TOR) del Grupo de Trabajo de Escrutinio Regional RVSM (RVSM/SG) CAR/SAM, (conocido como GTE) se establecieron con el propósito de revisar los problemas que afectan el TLS basado en la información sobre desviaciones de altitud importantes (LHD) proporcionada por los Estados y las Organizaciones Internacionales.

2. Términos de referencia del GTE

a) Reunir a expertos de aspectos de gestión de la seguridad operacional, en control de tránsito aéreo, operaciones de vuelo de aeronaves, regulación y certificación, análisis de datos y modelos de riesgo;

b) Analizar y evaluar las desviaciones de altitud importantes de 300 pies o más, tal como se define en el Documento 9574 de la OACI, Manual de implantación de una separación vertical mínima de 300 m (1 000 ft) entre FL 290 y FL 410 inclusive;

c) Coordinar con la CARSAMMA la recopilación y revisión de datos LHD;

d) Determinar y validar un estimado del tiempo de vuelo fuera del nivel de vuelo autorizado utilizado para calcular el modelo de riesgo de colisión (CRM) por la CARSAMMA;

e) Identificar tendencias de seguridad operacional basadas en los reportes de LHD y recomendar acciones de mitigación asociadas a los LHD de acuerdo a las provisiones SMS de la OACI. Enviar informes anuales sobre los resultados de evaluaciones de seguridad operacional al GREPECAS a fin de mejorar la seguridad operacional en el espacio RVSM de las Regiones CAR/SAM; y

f) Realizar otras tareas indicadas por el GREPECAS.

3. Composición:

Estados CAR y SAM, CARSAMMA, COCESNA, IATA, IFALPA, IFATCA y Relator

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APPENDIX C
COLLABORATIVE ARRANGEMENTS WITH REGIONAL ASSOCIATIONS OR COMMITTEES

1. Introduction

1.1 The GREPECAS Secretariat may coordinate collaborative arrangements with regional associations or committees with common interests in the objectives established in the Regional Air Navigation Plan and to resolve matters in the mutual interest of GREPECAS Member States.

1.2 The interaction should be consistent with the mandate and institutional values of ICAO and GREPECAS and should improve the effectiveness of their work programme. The interaction will provide clear and reciprocal added value, in the form of relevant results against common values and principles, considered in relation to costs and impediments.

1.3 The interaction between the GREPECAS Secretariat and these regional associations or committees, as well as the use of the ICAO name, logo/emblem in its modified form for the promotion of joint events or any other promotion (including web pages, documentation, etc.) must have prior authorization from ICAO following the ICAO Policy on Interactions with Third Parties.

2. Interaction with the GREPECAS Secretariat

2.1 The events that ICAO in its capacity as GREPECAS Secretariat can promote with these regional associations and committees will allow Civil Aviation Authorities and government air navigation service providers to participate free of charge.

2.2 The designations and presentation of material by these regional associations or committees do not imply the expression of any opinion on behalf of ICAO on the legal status of any State, Territory, city or area of its jurisdiction, or on the delimitation of its boundaries or limits.

2.3 The activities that the Associations or Regional Committees carry out in conjunction with GREPECAS must be aligned with its procedures and actions which must be agreed with the designated Secretariat representative (ICAO Regional Officer).

APENDICE C
ARREGLOS COLABORATIVOS CON ASOCIACIONES O COMITÉS REGIONALES

1. Introducción

1.1 La Secretaría del GREPECAS podrá coordinar arreglos colaborativos con asociaciones o comités regionales con intereses comunes en los objetivos establecidos en el Plan Regional de Navegación Aérea y para resolver asuntos en el interés mutuo de los Estados Miembros de GREPECAS.

1.2 La interacción debería ser consistente con el mandato y los valores institucionales de la OACI y del GREPECAS y debería mejorar la efectividad de su programa de trabajo. La interacción aportará un valor añadido claro y recíproco, en forma de resultados pertinentes con respecto a los valores y principios comunes, considerados en relación con los costos e impedimentos.

1.3 La interacción entre la Secretaría del GREPECAS y estas asociaciones o comités regionales, así como el uso del nombre, logo/emblema de la OACI en su forma modificada para la promoción de eventos conjuntos o cualquier otra promoción (incluyendo páginas web, documentación, etc.) debe contar con autorización previa de la OACI siguiendo la Política OACI sobre interacciones con partes externas.

2. Interacción con la Secretaría del GREPECAS

2.1 Los eventos que la OACI en su calidad de Secretaría del GREPECAS pueda promover con estas asociaciones y comités regionales permitirán la participación sin costo a las Autoridades de Aviación Civil y proveedores de servicios de navegación aérea gubernamentales.

2.2 Las designaciones y la presentación de material por parte estas asociaciones o comités regionales no implican la expresión de ninguna opinión por parte de la OACI sobre el estado legal de cualquier Estado, Territorio, ciudad o área de su jurisdicción, o sobre la delimitación de sus fronteras o límites.

2.3 Las actividades que las Asociaciones o Comités Regionales realicen en conjunto con el GREPECAS deberán estar alineadas con sus procedimientos y sus acciones las cuales deberán ser acordadas con el/la representante designado/a de la Secretaría (Especialista Regional de la OACI).

2.4 The information of ICAO or its Member States to which these Associations or Committees can access in the framework of this collaborative work may only be shared with the explicit authorization of ICAO and will be subject to intellectual property rights, copyright and the confidentiality of the information.

2.5 Each Association or Regional Committee will nominate a representative who is duly familiar with the ICAO Policy on Interactions with Third Parties and with GREPECAS Programmes, to serve as a contact with the designated regional officer to agree on support for the GREPECAS programmes and projects with the organization of activities.

2.6 Prior to any joint activity, effective communication with the Secretariat must be ensured to define the details of the activities, the proposed place for the event, coordination with local authorities, follow-up actions on previous events, development of the agenda or programme of work and any other activity that is related to the tasks or the planned event.

2.7 The GREPECAS Secretariat will coordinate annually with the Association or Regional Committee, the preparation of a Working Paper on the activities carried out collaboratively for the GREPECAS, including the products, results, performance indicators, financial report and generated impact from this collaboration.

2.4 La información de la OACI o de sus Estados Miembros a la que estas Asociaciones o Comités puedan acceder en el marco de este trabajo colaborativo solo podrá compartirse con la autorización explícita de la OACI y estará sujetas a derechos de propiedad intelectual, derechos de autor y la confidencialidad de la información.

2.5 Cada Asociación o Comité Regional nominará un/a representante que esté debidamente familiarizado/a con la Política de la OACI sobre las Interacciones con Partes Externas y con los Programas del GREPECAS, para que sirva como contacto con el/la especialista regional designado/a para acordar el apoyo a los programas y proyectos del GREPECAS con la organización de actividades.

2.6 Previo a cualquier actividad conjunta, se deberá asegurar una comunicación efectiva con la Secretaría para definir los detalles de las actividades, el lugar propuesto para el evento, coordinaciones con autoridades locales, acciones de seguimiento de eventos previos, desarrollo del orden del día o programa de trabajo y cualquier otra actividad que esté relacionada con las tareas o el evento planificado.

2.7 La Secretaría del GREPECAS coordinará anualmente con la Asociación o Comité Regional, la preparación de una Nota de Estudio sobre las actividades realizadas de forma colaborativa para el GREPECAS, incluyendo los productos, resultados, indicadores de desempeño, informe financiero e impacto generado de esta colaboración.

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APPENDIX D
UNIFORM METHODOLOGY FOR THE IDENTIFICATION, ASSESSMENT AND REPORTING OF AIR NAVIGATION DEFICIENCIES

(Approved by the Council on 30 November 2001)

1. Introduction

1.1 Based on the information resulting from the assessment carried out by ICAO on the input received from various regions regarding deficiencies in the air navigation field, it became evident that improvements were necessary in the following areas:

a) collection of information;

b) safety assessment of reported problems;

c) identification of suitable corrective actions (technical / operational / financial / organizational), both short-term and long-term; and

d) method of reporting in the reports of ICAO planning and implementation regional groups (PIRGs).

1.2 This methodology is therefore prepared with the assistance of ICAO PIRGs and is approved by the ICAO Council for the efficient identification, assessment and clear reporting of air navigation deficiencies. It may be further updated by the Air Navigation Commission in the light of the experience gained in its utilization.

1.3 For the purpose of this methodology, the definition of deficiency is as follows:

A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

2. Collection of Information

2.1 Regional office sources

2.1.1 As a routine function, the Regional Offices should maintain a list of specific deficiencies, if any, in their regions. To ensure that this list is as clear and as complete as possible, it is understood that the regional offices take the following steps:

APÉNDICE D
METODOLOGÍA UNIFORME PARA LA IDENTIFICACIÓN, EVALUACIÓN Y NOTIFICACIÓN DE DEFICIENCIAS EN LA NAVEGACIÓN AÉREA

(Aprobada por el Consejo el 30 de noviembre de 2001)

1. Introducción

1.1 Como resultado de la evaluación realizada por la OACI de la información recibida de diversas regiones en materia de deficiencias en el campo de la navegación aérea, se hizo patente que era necesario incorporar mejoras en las siguientes esferas:

a) recopilación de información;

b) evaluación de la seguridad operacional en los problemas notificados;

c) identificación de medidas correctivas adecuadas (técnicas / operacionales financieras/de organización), a corto y a largo plazo; y

d) método de notificación en los informes de los grupos regionales de planificación y ejecución (PIRG) de la OACI.

1.2 Por consiguiente, se ha preparado esta metodología con la ayuda de los PIRG de la OACI y el Consejo de la OACI la aprueba para identificar y evaluar eficazmente, así como para notificar claramente las deficiencias en la navegación aérea. La Comisión de Aeronavegación podrá actualizarla ulteriormente teniendo en cuenta la experiencia adquirida en su utilización.

1.3 En la presente metodología la definición de deficiencia es la siguiente:

Una deficiencia es una situación en que una instalación, servicio o procedimiento no se ajusta a un plan regional de navegación aérea aprobado por el Consejo, o con las correspondientes normas y métodos recomendados de la OACI, y que repercute negativamente en la seguridad operacional, regularidad o eficiencia de la aviación civil internacional.

2. Recopilación de información

2.1 Fuentes de las oficinas regionales

2.1.1 Las Oficinas Regionales deberían mantener como función ordinaria, una lista de las deficiencias concretas que hubiera en sus regiones. Para asegurar que esta lista sea lo más completa y clara posible, quedó entendido que las oficinas regionales adoptarían las siguientes medidas:

a) a) compare the status of implementation of the air navigation facilities and services with the regional air navigation plan documents and identify facilities, services and procedures not implemented;

b) review mission reports with a view to detecting deficiencies that affect safety, regularity and efficiency of international civil aviation;

c) make a systematic analysis of the differences with ICAO Standards and Recommended Practices filed by States to determine the reason for their existence and their impact, if any, on safety, regularity and efficiency of international civil aviation;

d) review aircraft accident and incident reports with a view to detect possible systems or procedures deficiencies;

e) review inputs, provided to the regional office by the users of air navigation services on the basis of Assembly Resolution A33-14, Appendix M;

f) assess and prioritize the result of a) to e) according to paragraph 4;

g) report the outcome to the State(s) concerned for resolution; and

h) report the result of g) above to the related PIRG for further examination, advice and report to the ICAO Council, as appropriate through PIRG reports.

2.2 States' sources

2.2.1 To collect information from all sources, States should, in addition to complying with the Assembly Resolution A31-10, establish reporting systems in accordance with the requirements in Annex 13, Chapter 7. These reporting systems should be non-punitive in order to capture the maximum number of deficiencies.

a) a) comparar la situación de implantación de las instalaciones y servicios de navegación aérea con los documentos del plan regional de navegación aérea e identificar las instalaciones, servicios y procedimientos que no hayan sido implantados;

b) examinar informes de misiones con miras a detectar deficiencias que afecten a la seguridad operacional, regularidad y eficiencia de la aviación civil internacional;

c) realizar un análisis sistemático de las diferencias con las normas y métodos recomendados de la OACI presentadas por los Estados para determinar el motivo de que existan y sus repercusiones, de haberlas, en la seguridad operacional, regularidad y eficiencia de la aviación civil internacional;

d) examinar informes de accidentes e incidentes de aeronaves con miras a detectar deficiencias posibles en los sistemas o procedimientos;

e) examinar los datos proporcionados a las oficinas regionales por los usuarios de los servicios de navegación aérea en base a la Resolución A33-14 de la Asamblea, Apéndice M;

f) evaluar y asignar una prioridad a los resultados de a) a e) según el párrafo 4;

g) notificar los resultados al Estado o Estados de que se trate para que se adopten soluciones; e

h) informar de los resultados indicados en g) al PIRG pertinente para que los examine más a fondo, asesore y notifique sus conclusiones al Consejo de la OACI, según corresponda, mediante los informes del PIRG.

2.2 Fuentes de los Estados

2.2.1 Los Estados, para recopilar la información que proceda de toda clase de fuentes, deberán, además de aplicar la Resolución A31-10 de la Asamblea, establecer sistemas de notificación de conformidad con los requisitos del Anexo 13, Capitulo 7. Dichos sistemas de notificación no deberían tener carácter punitivo a fin de permitir que se determine el mayor número de deficiencias

2.3 Users' sources

2.3.1 Appropriate International organizations, including the International Air Transport Association (IATA) and the International Federation of Air Line Pilots' Associations (IFALPA), are valuable sources of information on deficiencies, especially those that are safety related. In their capacity as users of air navigation facilities they should identify facilities, services and procedures that are not implemented or are unserviceable for prolonged periods or are not fully operational. In this context it should be noted that Assembly Resolution A33-14, Appendix M and several decisions of the Council obligate users of air navigation facilities and services to report any serious problems encountered due to the lack of implementation of air navigation facilities or services required by regional plans. It is emphasized that this procedure, together with the terms of reference of the PIRGs should form a solid basis for the identification, reporting and assisting in the resolution of non-implementation matters.

3. Reporting of Information on Deficiencies

3.1 In order to enable the ICAO PIRGs to make detailed assessments of deficiencies, States and appropriate International organizations including IATA and IFALPA, are expected to provide the information they have to the ICAO regional office for action as appropriate, including action at PIRG meetings.

3.2 The information should at least include: description of the deficiency, risk assessment, possible solution, time-lines, responsible party, agreed action to be taken and action already taken.

3.3 The agenda of each PIRG meeting should include an item on air navigation deficiencies, including information reported by States, IATA and IFALPA in addition to those identified by the regional office according to paragraph 2.1 above. Review of the deficiencies should be a top priority for each meeting. The PIRGs, in reviewing lists of deficiencies, should make an assessment of the safety impact for subsequent review by the ICAO Air Navigation Commission.

2.3 Fuentes de los usuarios

2.3.1 Las Organizaciones Internacionales apropiadas, incluidas la Asociación del Transporte Aéreo Internacional (IATA) y la Federación Internacional de Asociaciones de Pilotos de Línea Aérea (IFALPA), son fuentes valiosas de información sobre deficiencias, especialmente aquellas que están relacionadas con la seguridad operacional. A título de usuarios de las instalaciones y servicios de navegación aérea, estas organizaciones deberían identificar las instalaciones, servicios y procedimientos que no hayan sido implantados o que estén fuera de servicio por períodos prolongados o que no estén plenamente en funcionamiento. En este contexto, debe señalarse que la Resolución A33-14 de la Asamblea, Apéndice M y varias decisiones del Consejo imponen a los usuarios de las instalaciones y servicios de navegación aérea la obligación de notificar problemas graves que encuentren debido a la falta de implantación de instalaciones o servicios de navegación aérea requeridos por los planes regionales. Ha de destacarse que este procedimiento, junto con las atribuciones de los PIRG debería constituir una base firme para la identificación, notificación y asesoramiento en la resolución de asuntos relativos a la falta de implantación.

3. Notificación de información sobre deficiencias

3.1 Para que los PIRG de la OACI puedan evaluar con detalle las deficiencias, se espera que los Estados y Organizaciones Internacionales apropiadas, incluidas IATA e IFALPA, proporcionen la información que tengan a la Oficina regional de la OACI para que se adopten las medidas apropiadas, incluidas las medidas adoptadas en las reuniones de los PIRG.

3.2 En la información debería incluirse por lo menos: la descripción de las deficiencias, la evaluación de riesgos, soluciones posibles, fechas, parte responsable, medidas que se haya convenido adoptar y medidas que se hayan adoptado.

3.3 En el orden del día de cada reunión de los PIRG debería incluirse una cuestión sobre deficiencias en la navegación aérea, incluida la información notificada por los Estados, IATA e IFALPA además de las identificadas por la oficina regional, de conformidad con el párrafo 2.1. El examen de las deficiencias debería ser un tema de alta prioridad en cada reunión. Los PIRG, al examinar las listas de deficiencias deberían evaluar el impacto en la seguridad operacional para que este asunto sea nuevamente examinado por la Comisión de Aeronavegación de la OACI.

3.4 In line with the above, and keeping in mind the need to eventually make use of this information in the planning and implementation process, it is necessary that once a deficiency has been identified and validated, the following fields of information should be provided in the reports on deficiencies in the air navigation systems. These fields are as follows and are set out in the reporting form attached hereto.

a) Identification of the requirements

As per ICAO procedures, Regional Air Navigation Plans detail inter alia air navigation requirements including facilities, services and procedures required to support international civil aviation operations in a given region. Therefore, deficiencies would relate to a requirement identified in the regional air navigation plan documents. As a first item in the deficiency list, the requirements along with the name of the meeting and the related recommendation number should be included. In addition, the name of the State or States involved and/or the name of the facilities such as name of airport, FIR, ACC, TWR, etc. should be included.

b) Identification of the deficiency

This item identifies the deficiency and would be composed of the following elements:

i. a brief description of the deficiency;

ii. date deficiency was first reported; and

iii. appropriate important references (meetings, reports, missions, etc).

c) Identification of the corrective actions

In the identification of the corrective actions, this item would be composed of:

3.4 En consonancia con lo que antecede, y teniendo en cuenta la necesidad de que tarde o temprano se utilice esta información en el proceso de planificación e implantación, es necesario que una vez identificada y evaluada una deficiencia, se proporcionen los siguientes campos de información en los informes sobre deficiencias de los sistemas de navegación aérea. Los campos de información por notificar son los siguientes y se incluyen en el formulario de notificación adjunto.

a) Identificación de los requisitos

De conformidad con los procedimientos de la OACI, en los planes regionales de navegación aérea se indican, entre otras cosas, los detalles de los requisitos de navegación aérea incluidas las instalaciones, servicios y procedimientos requeridos en apoyo de las operaciones de la aviación civil internacional en una determinada región. Por consiguiente, las deficiencias estarían en relación con un requisito identificado en los documentos del plan regional de navegación aérea. Como primer rubro en la lista de deficiencias, deberían incluirse los requisitos junto con el nombre de la reunión y el número correspondiente de la recomendación. Además, debería incluirse el nombre del Estado o Estados implicados y el nombre de las instalaciones, tales como el nombre del aeropuerto, FIR, ACC, TWR, etc.

b) Identificación de las deficiencias

En este rubro se identifica la deficiencia y estaría constituido por los siguientes elementos:

i. una breve descripción de la deficiencia;

ii. fecha de la primera notificación de la deficiencia; y

iii. referencias importantes apropiadas (reuniones, informes, misiones, etc.).

c) Identificación de medidas correctivas

Para la identificación de medidas correctivas, este rubro debería estar constituido por:

i. a brief description of the corrective actions to be undertaken;

ii. identification of the executing body;

iii. expected completion date of the corrective action[1]; and

iv. when appropriate or available, an indication of the cost involved.

4. Assessment and Prioritization

4.1 A general guideline would be to have three levels of priority organized on the basis of safety, regularity and efficiency assessment as follows:

"U" priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

"A" priority = Top priority requirements necessary for air navigation safety.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

"B" priority = Intermediate requirements necessary for air navigation regularity and efficiency.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

1 It should be noted that a longer implementation period could be assigned in those cases in which the expansion or development of a facility/service is intended to provide services to sporadic operations which incurs excessive expenses.

i. una breve descripción de las medidas correctivas por tomar;

ii. identificación del órgano que aplicará las medidas correctivas;

iii. fecha prevista de terminación de la medida correctiva[1]; y

iv. una indicación del costo implicado, cuando corresponda, o se disponga de estos datos.

4. Evaluación y asignación de prioridades

4.1 Como orientación general podrían establecerse tres niveles de prioridad desglosados con base en la evaluación siguiente de la seguridad operacional, regularidad y eficiencia:

Prioridad "U" = requisitos urgentes que tienen un impacto directo en la seguridad operacional y que requieren medidas correctivas inmediatas.

El requisito urgente está constituido por cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se requiere urgentemente para la seguridad operacional de la navegación aérea.

Prioridad "A" = requisitos de alta prioridad necesarios para la seguridad operacional de la navegación aérea.

Requisito de alta prioridad que consiste en cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se considera necesaria para la seguridad operacional de la navegación aérea.

Prioridad "B" = requisitos intermedios, necesarios para la regularidad y eficiencia de la navegación aérea.

Requisito de prioridad intermedia que consiste en cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se considera necesaria para la regularidad y eficiencia de la navegación aérea.

1 Se debería notar que un período de implementación más largo podría ser asignado en aquellos casos en los cuales la ampliación o el desarrollo de una instalación/servicio se destine a prestar servicios a operaciones esporádicas lo cual incurra en gastos excesivos.

5. Model Reporting Table for Use in the Reports of PIRGS

5.1 Taking the foregoing into account, the model table at the Appendix is for use by PIRGs for the identification, assessment, prioritization, etc., of deficiencies. It might be preferred that a different table would be produced for each of the different topics i.e. AGA, ATM, SAR, CNS, AIM, MET. However, all tables should be uniform.

6. Action by the Regional Offices

6.1 Before each PIRG meeting, the regional office concerned will provide advance documentation concerning the latest status of deficiencies.

6.2 It is noted that the regional offices should document serious cases of deficiencies to the Air Navigation Commission (through ICAO Headquarters) as a matter of priority, rather than waiting to report the matter to the next PIRG meeting, and that the Air Navigation Commission will report to the Council.

5. Modelo de Tabla de Notificación que ha de ser utilizado en los informes de los PIRG

5.1 Teniendo en cuenta los aspectos mencionados, se presenta en el apéndice el modelo de tabla que han de utilizar los PIRG para la identificación, evaluación, asignación de prioridades, etc., respecto a las deficiencias. Pudiera ser preferible que se preparara una tabla distinta para cada uno de los distintos temas, es decir, AGA, ATM, SAR, CNS, AIM, MET. Sin embargo, el formato de todas las tablas debe ser uniforme.

6. Medidas por parte de las Oficinas Regionales

6.1 Antes de cada reunión del PIRG, la oficina regional interesada proporcionará documentación por adelantado relativa a la situación última de las deficiencias.

6.2 Se señala que las oficinas regionales deberían documentar los casos de deficiencias graves a la Comisión de Aeronavegación (por mediación de la Sede de la OACI), a título de asunto prioritario, en lugar de esperar a notificar el asunto a la reunión siguiente del PIRG, y que la Comisión de Aeronavegación informará al Consejo.

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE …. FIELD IN THE ….. REGION

Identification		Deficiencies			Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Date of completion**	**Priority for action***
Requirement of Part.., paragraph (table)… of the air navigation plan	Terra X Terra Y	Speech circuits not implemented Villa X - Villa Y	12 Dec. 2..X	Coordination meeting between Terra X and Terra Y on 16 July 2..X to finalize arrangements to implementation circuit via satellite	Implementation of direct speech circuit via satellite	Terra X	20 Aug. 2..X	A

* Priority for action to remedy a deficiency is based on the following safety assessments:

"U" priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

"A" priority = Top priority requirements necessary for air navigation safety.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

"B" priority = Intermediate requirements necessary for air navigation regularity and efficiency.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

FORMULARIO DE NOTIFICACIÓN DE DEFICIENCIAS DE LA NAVEGACIÓN AÉREA EN LA ESFERA DE... EN LA REGIÓN....

Identificación		Deficiencias			Medidas correctivas			
Requisitos	**Estado/ instalaciones**	**Descripción**	**Primera fecha notificada**	**Observaciones**	**Descripción**	**Órgano ejecutor**	**Fecha de terminación**	**Prioridad de la medida***
Requisito de la Parte ..., párrafo (tabla)... del plan de navegación aérea	Tierra X Tierra Y	Circuitos orales no implantados Ciudad X - Ciudad Y	12/02/2..X	Reunión de coordinación entre Tierra X y Tierra Y el 16/07/2..X para completar los arreglos de implantación del circuito por satélite	Implantación del circuito oral directo por satélite	Tierra X	Agosto de 20..X	A

*La prioridad para tomar medidas correctivas de una deficiencia se basa en las siguientes evaluaciones de la seguridad operacional:

Prioridad "U" = requisitos urgentes que tienen un impacto directo en la seguridad operacional y que requieren medidas correctivas inmediatas.

El requisito urgente está constituido por cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se requiere urgentemente para la seguridad operacional de la navegación aérea.

Prioridad "A" = requisitos de alta prioridad necesarios para la seguridad operacional de la navegación aérea.

Requisito de alta prioridad que consiste en cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se considera necesaria para la seguridad operacional de la navegación aérea.

Prioridad "B" = requisitos intermedios, necesarios para la regularidad y eficiencia de la navegación aérea.

Requisito de prioridad intermedia que consiste en cualquier especificación física, de configuración, de materiales, de performance, de personal o de procedimientos cuya aplicación se considera necesaria para la regularidad y eficiencia de la navegación aérea.

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APPENDIX E
TERMINOLOGY

The following is a terminology guide (in English and Spanish) to be used when preparing documentation to be presented for the review of the GREPECAS meetings, working groups, task forces and contributory bodies:

Note for the Secretariat in the preparation of Documentation:

Appendices are sorted in alphabetical order:

A, B, C, D...

In the event of surpassing the alphabet the following criteria will be used also in alphabetical order:

AA, BB, CC, DD...

The Attachments to an Appendix will be sorted in numerical order:

1, 2, 3, 4 ...

APÉNDICE E
TERMINOLOGÍA

La siguiente terminología es una guía (en inglés y español) a ser utilizada en la elaboración de la documentación a ser presentada para su revisión en las reuniones del GREPECAS de sus grupos de trabajo, grupos de tarea y órganos auxiliares:

Nota para la Secretaría en la elaboración de la documentación:

Los apéndices se ordenarán en orden alfabético:

A, B, C, D...

En caso de exceder las letras del alfabeto, se aplicará el siguiente criterio, también en orden alfabético:

AA, BB, CC, DD...

Los adjuntos de un apéndice se ordenarán en orden numérico:

1, 2, 3, 4...

English Terminology
Addendum
Ad hoc
Agenda Item #
Agenda
Appendix
Attachment (of an Appendix)
Contributory Body
Corrigendum
Discussion Paper (DP)
Draft Agenda
Draft Conclusion
Draft Decision
Draft Report
Explanatory Notes
Final Report
Flimsy
Historical
Information Paper (IP)

Terminología en español
Addenda
Ad hoc
Cuestión # del Orden del Día
Orden del Día
Apéndice
Adjunto (de un Apéndice)
Órgano Auxiliar
Corrigendo
Nota de Discusión (ND)
Orden del Día Provisional
Proyecto de Conclusión
Proyecto de Decisión
Informe Provisional
Notas aclaratorias
Informe Final
Flimsy
Reseña
Nota de Información (NI)

English Terminology
International Organizations
Implementation
Order of Business (OB)
Revised
Supplement
Task Force
Working Paper (WP)
Working Group
Terms of Reference (ToRs)

Terminología en español
Organizaciones Internacionales
Implantación
Orden del Día (OD)
Revisado
Suplemento
Grupo de Tarea
Nota de Estudio (NE)
Grupo de Trabajo
Términos de Referencia (ToR)

Classification of the Status of GREPECAS Conclusions and Decisions
Valid
Completed
Superseded

Clasificación del Estado de las Conclusiones y Decisiones del GREPECAS
Válida
Finalizada
Invalidada

— END/FIN —


South American (CAR/SAM) Regional Planning and Implementation Group
Grupo Regional de Planificación y Ejecución Caribe / Sudamérica (CAR/SAM)
Caribbean /
GREPECAS

GREPECAS/22 SURVEY RESULTS ON THE PHASES MEETING

With the objective of evaluating the new working methodologies for GREPECAS meetings (based on document discussions in a virtual phase via the TEAMS platform, followed by an in-person phase with working sessions focused on discussion, decision-making, and conclusions on relevant Air Navigation Services (ANS) topics), the Secretariat requested that participants of the GREPECAS/22 in-person meeting, through the QR code below, respond to the 05 questions during the period from 20 to 29 November, 2024:

At the closing of the response period, a total of 18 responses were received, below are the results.

“1) During the virtual phase of the meeting, did you encounter any difficulties in accessing the GREPECAS TEAMS platform?

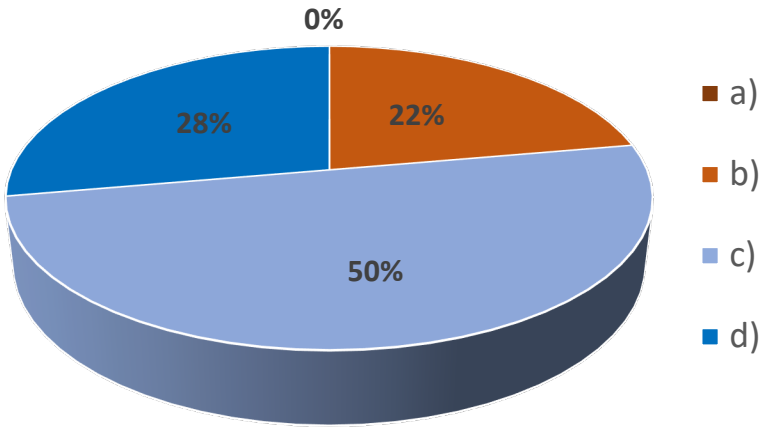
a) There was no possibility of accessing the GREPECAS TEAMS Platform.

b) It was possible to access the GREPECAS TEAMS Platform, but only after much effort and attempts at solutions with the Information Technology (IT) area.

c) It was possible to access the GREPECAS TEAMS Platform.

d) It was very easy to access the GREPECAS TEAMS Platform.”

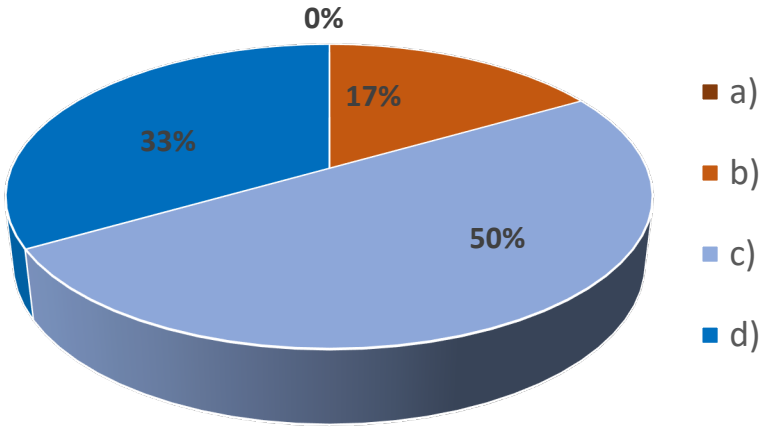
The results of the responses were:



"2) During the virtual phase of the meeting, how was your experience of **participating** in the discussions and obtaining information through the GREPECAS TEAMS platform?

a) There was no possibility of participating in or posting the State or International Organization's position on the GREPECAS TEAMS Platform.
b) It was possible to participate on the GREPECAS TEAMS Platform, but with difficulties in identifying the correct information and in expressing opinions on the meeting documents.
c) It was possible to participate in and discuss the GREPECAS TEAMS Platform.
d) It was easier to participate and identify the information needed to post the position of the State or International Organization on the GREPECAS TEAMS Platform."

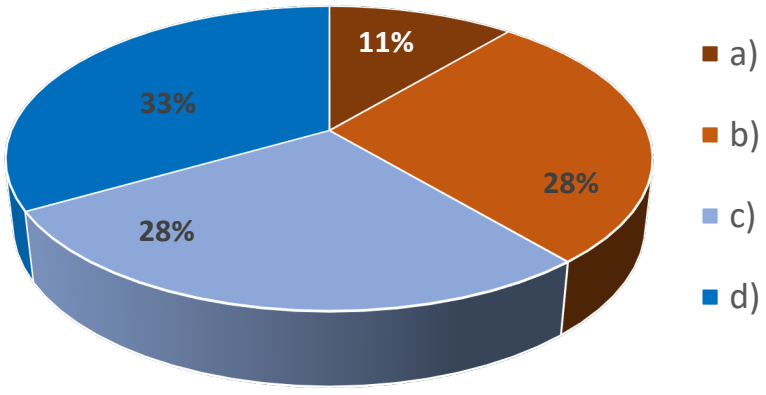
The results of the responses were:



"3) For the virtual phase of the meeting, was there sufficient **time** to disseminate the information among the technical team of the State and International Organization, and to subsequently position for postings and express opinions on the GREPECAS/22 documents?

a) There was not enough time.
b) It was identified that more time was needed.
c) There was sufficient and adequate time (1 month).
d) There was sufficient time without the need for the extension."

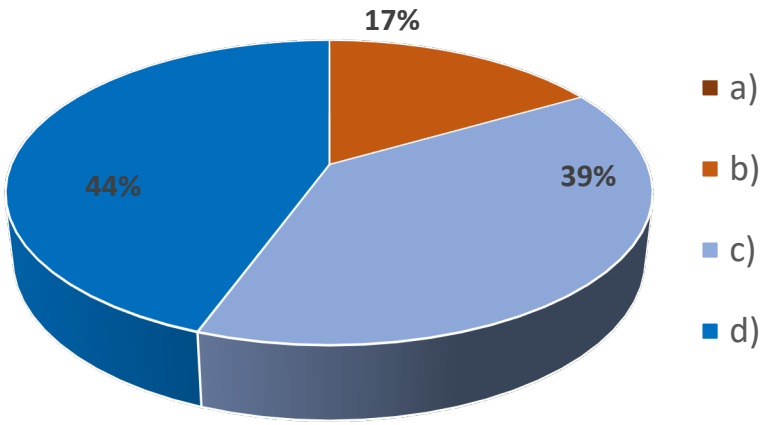
The results of the responses were:



"4) Do you consider the use of a virtual phase followed by an in-person phase to be **efficient** for discussions and the progress of GREPECAS work?

a) I do not consider it efficient.
b) I consider it efficient, but with the need for improvements in the working method.
c) I consider this working method efficient.
d) I consider this working method efficient and recommend it for other ICAO meetings."

The results of the responses were:



"5) If you identify any improvements to the GREPECAS working method, please describe your proposal:"

The key suggestions and comments for improvement were as follows:

- Encourage periodic interaction among participants rather than waiting until the end to engage.
- Provide more feedback from the Secretariat on comments submitted by States to ensure proper discussion and resolution.
- Maintain the current methodology as it is deemed suitable for meeting needs.
- Improve access to the Teams platform to ensure a smoother user experience.
- Limit the number of working papers allowed for discussion to focus efforts more effectively.
- Ensure that workgroup participants share a common language or have access to translators during in-person sessions to enhance inclusivity.
- Make the Teams platform more user-friendly, as it was functional but not intuitive for some users.

- Conduct at least two virtual follow-up meetings during the working period to track progress and provide timely support to States.
- Establish a continuous communication channel among participants to maintain momentum and follow up on discussions and conclusions.
- Ensure accessibility of working and information papers (WPs and IPs) on the CAR/SAM website for reference.
- Align working sessions with the agenda to ensure all planned topics are covered within the meeting timeframe.
- Encourage clear and concise written communication during virtual phases to avoid misunderstandings.
- Translate original comments in Teams into both English and Spanish to enhance accessibility for non-bilingual users.
- Provide read-only access to the Teams platform after the virtual phase ends and until the in-person phase concludes, to allow for continued reference to discussions and materials.

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