



**Fifth GREPECAS–RASG-PA Joint Meeting (GREPECAS-RASG-PA/5) and
 Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group
 (GREPECAS/23)**

Virtual Phase (Asynchronous, 19 January to 17 February 2026)

In-Person Phase (Mexico City, Mexico, 4 to 6 March 2026)

Agenda Item 8: CAR/SAM Air Navigation Implementation

ATM – AIRSPACE IMPROVEMENT IN CAR/SAM REGIONS

(Presented by the Secretariat)

EXECUTIVE SUMMARY

This working paper analyses the activities carried out in the CAR/SAM Regions by the SAM/IG and AMCB groups for capacity, efficiency and safety improvements in the Flight Information Regions (FIRs) and Terminal Control Areas (TMAs). The NEOSPACE-1 project integrates these works for both regions and allows the objectives to be achieved in a harmonized way, seeking to adapt to the priorities identified for airspaces of different configurations, level of demand and operability of CNS systems. Working paper NE/7.1 provides additional information on the upgrade of NEOSPACE-1.

Action:	Suggested actions are included in Section 4
<i>Strategic Objectives 2026-2050:</i>	<ul style="list-style-type: none"> • Every flight is safe and secure • Aviation is environmentally sustainable • Aviation delivers seamless, accessible, and reliable mobility for all • No country left behind • The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges • The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All
<i>References:</i>	<ul style="list-style-type: none"> • Doc 9750, Global Air Navigation Plan (GANP) • Reports of GREPECAS Meetings • Reports from the NACC WG and the AMCB. • SAM/IG Implementation Group Reports

1 Introduction

1.1 The GREPECAS/20 Meeting, carried out from 15 to 18 November 2022 in Salvador, Brazil, agreed that the various initiatives for airspace optimization of the CAR and SAM Regions will be assembled under a single GREPECAS Programme, to develop, in a harmonized and interoperable manner, the GANP concepts for airspace optimization. Among these initiatives, elements of the GANP ASBU

FRTO axis are considered¹ (Enhanced Operations through Enhanced En-Route Trajectories) of the GANP, which will lead, in the medium term, to a Free Route Airspace (FRA), as follows:

FRTO B0/1 :	Direct Routing (SDR)
FRTO B0/2 :	Airspace Planning and Flexible Airspace Use (FUA)
FRTO B0/4 :	Pre-validated and Coordinated Preferred User (UPR) and Air Traffic Service (ATS) routes.
FRTO B1/1:	Free Route Airspace (FRA)

1.2 The GREPECAS/21 Meeting (Santo Domingo, Dominican Republic, November 15 - 17, 2023) agreed to collect all CAR and SAM initiatives to develop, together with industry, the concepts for airspace optimization that encompass the axes/elements of the Aviation System Block Improvement (ASBU), mainly Free Route Operations (FRTO) and APTA² (Improve arrival and departure operations). Consequently, Decision GREPECAS/21/07 approved the CAR/SAM Airspace Optimization Program and the NEOSPACE-1 Project, replacing the A-1 CAR and SAM Projects.

1.3 At the GREPECAS/22 Meeting (Lima, Peru, 20 - 22 November 2024), Conclusion GREPECAS/22/6 was approved (See **Appendix**) and the following harmonized CAR/SAM documents were adopted:

- a) Airspace Optimization Program - NEOSPACE-1 Project version 1.0
- b) General document "Harmonized Horizons: Airspace Optimization in the CAR-SAM Regions"
- c) CAR/SAM Guide for Implementing Enhanced Operations Using Enhanced Route Paths (FRTO)

1.4 At the same time, Decision GREPECAS/22/14 (See Appendix), commissioned the revision of the GREPECAS work programme and projects. In line with this Decision, NEOSPACE-1 is integrated into Project B1, Improving Efficiency and Capacity: Implementation of FRTO and Airport Accessibility (APTA), which is contained in Program "B", Implementation of Air Navigation aligned with the GANP, the ASBU Reference Framework and the Performance Reference Framework. Working Paper WP/7.1 presents the work carried out for the structure of the GREPECAS programs, in response to Decision GREPECAS/22/14.

1.5 According to the GREPECAS/22 analysis, the implementation of FRTO requires the complement of other improvement initiatives. By Conclusion GREPECAS/22/20 - Actions related to AN Conf/14³ recommendations 3.1/1, 3.1/4, and 3.2/2 (See Appendix), the study and implementation groups, together with industry, are preparing plans for the optimized implementation of the longitudinal separation minimums between aircraft, stipulated at a minimum of 10 NM in continental space. Likewise, the Conclusion promotes the alignment of the NEOSPACE-1 Project with recommendation 3.1/4 and indicates the priority of initiating the implementation of the FFI-CE⁴, in view of the transition to the new concept of Flight Plan that entails the cessation of the ICAO 2012 FPL format, with a deadline of 2034.

¹ FRTO = Improved operations through enhanced en-route trajectories

² APTA = Improve arrival and departure operations)

³ Paper NE/5.1 of this Meeting sets out ICAO's follow-up actions on the recommendations of AN-Conf/14.

⁴ FICE (GANP module) = Flight and Flow information for a collaborative Environment.

2. Analysis

2.1 Region CAR

FRTO Implementation

2.1.1 In the CAR Region, airspace optimization is developed considering the high proportion of ocean airspace, the fragmentation of FIR and the limitations of CNS infrastructure in some States. In this context, the implementation of the FRTO is approached progressively, prioritizing Direct Routing (SDR), ATS routes and preferential user routes (UPR), as a basis for a future transition to Free Route Airspace (FRA) operations, in accordance with regional capabilities.

2.1.2 The activities are part of the NEOSPACE-1 Project and are implemented with the support of NACC/WG, in coordination with SAM/IG and industry, ensuring interregional harmonization and interoperability of RAC/SAM operational concepts.

ATM–ATFM Integration

2.1.3 Recognizing that the implementation of the FRTO requires close integration between ATM and ATFM, the CAR Region has prioritized strengthening regional and interregional coordination, with an emphasis on strategic demand management, traffic predictability, and collaborative decision-making. These actions seek to facilitate efficient and safe flows in highly complex corridors, particularly in the North-South and East-West transits that cross the Region.

Regional Implementation Approach

2.1.3 Initiatives in the CAR Region are developed under the principle of "No country left behind", through a phased approach that considers different levels of operational maturity. Priority is given to scalable solutions, targeted technical assistance and training activities, ensuring that States can progressively integrate the benefits of the CAR/SAM Airspace Optimization Program and the NEOSPACE-1 Project.

2.2 SAM Region

FRTO Implementation

2.2.1 As part of the SAM/IG work for the Implementation of the FRTO, preferential route testing has been conducted in several States, and it is expected that these will be published in accordance with the approved regional guidance. To promote the implementation of free routes, it is planned to develop a Regional Guide, with the support of EUROCONTROL in 2026. Key information on airspace capacity, communications and surveillance coverage, and continuous ascent/descent procedures has been received from States as part of a joint initiative under the NEOSPACE-1 project. The application of direct routes in oceanic airspace (Pacific) is studied, and for this, the equipment limitations in some aircraft are analyzed.

2.2.2 Various events have been held to support the work of SAM/IG study groups and contributors, as indicated in the following paragraphs.

2.2.3 The ATS/ATFM Workshop/Meeting for Pacific States (ATS/ATFM/PAC-SAM/1) was held (Lima, Peru, September 8-12, 2025), with the aim of facilitating the work of five States and promoting the improvement of efficiency and operational safety in the supply of ATS in airways, trajectories and ocean sectors. Opportunities for improvement were identified, in technical and operational matters, which

can influence the resilience and optimization of longitudinal separation of aircraft and, therefore, increase the efficient use of flight levels in the ocean sector. Virtual meetings with COCESNA are planned for March 2026, to extend, if feasible, the scope of the initiatives in the Pacific of the CAR Region.

2.2.4 Tests carried out with South Pacific FIRs – SAMs confirmed the proper operation of SDR direct routes, floating points and preferential trajectories. In addition, new scenarios of coordination between FIRs without the use of published airways were explored, which revealed distinct behaviors in AIDC systems, especially in the use of CPL message. The importance of harmonizing configurations in ACCs and training personnel for future phases of the FRTO is highlighted, where the expanded use of AIDC messages will be key to the development of new technologies and more flexible operations.

2.2.5 In reference to Conclusion GREPECAS/22/8 (See **Appendix**), the Workshop/Meeting on Digital System for Airspace Analysis – DASA¹ and implementation of the FRTO was held (Lima, Peru, June 9 to 13, 2025). The objective of the event was to present and study the functionalities of the DASA tool to analyze the feasibility of managing User Preferred Routes (UPRs) and Strategic Direct Routing (SDR) trajectories at a regional and interregional level.

APTA Implementation

2.2.6 The South American Region has identified since the beginning of the implementation of PBN (2010's) the need to address the operational interdependence of the en-route, arrival/departure and approach segments. The implementation of the FRTO is basically developed in the en-route segment, and requires optimization in the other two segments to guarantee the benefit of air operators and the environment. For this reason, work is being done to guarantee continuous descent/ascent operations through new PBN designs in the TMAs. In addition, the Region permanently promotes the implementation of the PBN for 222 runway thresholds of international airports (average regional implementation 93%).

2.2.7 In accordance with Conclusion GREPECAS/22/3 (See **Appendix**), and in response to the challenges identified by the SAM/IG on the implementation of the quality requirements of the PANS OPS (Doc.8168), as well as the shortage of personnel in flight procedure design services, training activities were organized in 2025.

2.2.8 An advanced design course PANS OPS -PBN was taught (Lima, Peru, May 12 - 30, 2025) and the II PANS PAHO - PBN recurrent course was held (Lima, Peru, November 24 - 28, 2025). The Workshop on Airspace Planning (Sao Jose dos Campos, Sao Paulo, October 6 - 17, 2025) was held for specialists from the Region and Industry, for the application of PBN criteria in the improvement and formulation of new airspace concepts (AEC) and the corresponding implementation, including criteria for the CCO and CDO, in addition to advanced topics such as the use of the "*merge point*".

3 Conclusions

3.1 The work carried out in the CAR Region demonstrates concrete progress towards a more integrated, efficient and collaborative air traffic management, aligned with ICAO's regional and global objectives. Continued coordination between States, ANSPs and regional partners will continue to be essential to maintain momentum and address existing operational and capacity challenges. This work directly supports the principles of the GANP and the "Leave No Country Behind" initiative, providing a practical basis for upcoming actions at the regional level.

3.2 The SAM Region continues to make solid progress in the implementation of FRTO and APTA, strengthening the efficiency and flexibility of airspace through new operational capabilities, technical improvements and close coordination between States. The tests carried out in Routes Preferential

routes, direct trajectories, and floating points demonstrate that the region is ready to expand the use of free routes, including Pacific ocean airspace, although challenges remain Related with the harmonization of AIDC systems, aircraft equipment and configuration of the ACCs.

3.3 Collaborative work with industry – in the form of workshops, technical meetings and projects such as NEOSPACE1 or analysis with DASA – has made it possible to identify opportunities for improvement to optimise separation, increase operational resilience and strengthen air traffic management at regional and interregional levels. In parallel, the APTA implementation is advancing with a comprehensive approach that recognizes the interdependence between the en-route, arrival/departure and approach segments, promoting new PBN solutions in TMAs and improving operational continuity through CDO/CCO.

3.4 The SAM region works to strengthen its technical capacities through specialized training activities in PANSOPS and PBN, helping to overcome human resource constraints and facilitating the introduction of advanced concepts, including the use of *Merge Point* and new airspace models with integral PBN design. Together, these efforts put the South American Region for an efficient transition to an interoperable environment with the CAR and NAM Regions.

4 Suggested Actions

4.1 The Meeting is invited to:

- a) Take note of the information contained herein;
- b) support the actions indicated in section 3, promoting collaboration between administrations and Industry and the exchange of knowledge; and
- c) propose other actions as needed.

APPENDIX

GREPECAS conclusions regarding the implementation of airspace improvements

CONCLUSION GREPECAS/22/6		NEOSPACE-1 PROJECT HARMONIZED DOCUMENTS	
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).		Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input checked="" type="checkbox"/> Environmental <input checked="" type="checkbox"/> Operational/Technical	
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.			
When: GREPECAS/23		Status : <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed	

DECISION GREPECAS/22/14		REVIEW OF THE CURRENT GREPECAS WORK PROGRAMME AND PROJECTS	
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.		Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input checked="" type="checkbox"/> Environmental <input checked="" type="checkbox"/> Operational/Technical	
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.			
When: a) Immediate b) GREPECAS/23 c) GREPECAS/23		Status: <input type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed	
Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> Other:			

CONCLUSION GREPECAS/22/20	ACTION ITEMS RELATED AN-CONF/14 RECOMMENDATIONS 3.1/1, 3.1/4 AND 3.2/2
<p>What:</p> <p>That, the Secretariat, in collaboration with the CAR and SAM States,</p> <p>a) develop a CAR/SAM Implementation Plan for improved longitudinal separation minima per AN-CONF/14 Recommendation 3.1/1 Project 30/10 - <i>Optimized implementation of longitudinal separation minima</i> for endorsement by GREPECAS/23;</p> <p>b) align the NEOSPACE-1 project to the AN-Conf/14 Recommendation 3.1/4 – <i>Free route airspace</i>; and</p> <p>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.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input checked="" type="checkbox"/> Inter-regional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Operational/Technical</p>
<p>Why:</p> <p>To promote enhanced alignment of the GREPECAS programs/projects to the GANP and the AN-Conf/14 recommendations, led 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.</p>	
<p>When: GREPECAS/23</p>	<p>Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed</p>
<p>Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> Other:</p>	

CONCLUSION GREPECAS/22/8	DIGITAL AIRSPACE SYSTEM ANALYSIS (DASA) WORKSHOP IN BRAZIL
<p>What:</p> <p>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.</p>	<p>Expected impact:</p> <p><input checked="" type="checkbox"/> Political / Global</p> <p><input checked="" type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Operational/Technical</p>
<p>Why:</p> <p>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.</p>	
<p>When: Report to GREPECAS/23</p>	<p>Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed</p>
<p>Who: <input type="checkbox"/> States <input type="checkbox"/> ICAO <input checked="" type="checkbox"/> Other:</p>	Brazil

CONCLUSION GREPECAS/22/3	SUPPORT FOR INSTRUMENT FLIGHT PROCEDURES DESIGN IN THE CAR/SAM REGIONS	
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.	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Operational/Technical	
Why: To reinforce quality assurance for instrument flight procedures design		
When: Report to GREPECAS/23	Status: <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed	
Who: <input checked="" type="checkbox"/> States <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> Other:		

—END—

ⁱ Note. - Conclusion GREPECAS/22/8 proposed the participation of the CAR and SAM States in the DASA Workshop, which was not feasible due to administrative issues. The Secretariat will continue to coordinate to carry out an integrated RAC/SAM event on Brazil's DASA tool, in the second half of 2026.