



Agenda Item 4: Report on GESEA activities and deliverables and Subgroups

GESEA/SG-1 ACTIVITIES AND DELIVERABLES

(Prepared by the Coordinator of GESEA/SG-1)

SUMMARY

This paper presents the activities and deliverables of GESEA/SG-1 since SAM/IG/33.

References:

- Report of the meeting SAM/IG/33
- Report of the GREPECAS/23 meeting

1. Background

1.1 At the SAM/IG/33 meeting, Subgroup 1 (SG1/PLANESPA) presented the regional airspace planning and optimization initiatives of the SAM Region, aligned with the GANP and GREPECAS. Its activities focused on the implementation of optimized trajectories (FRTO/FRA), harmonization of ATS agreements, management of ATM contingencies and support for the future implementation of reduced longitudinal separations.

1.2 The following SAM/IG actions are valid to be developed by SG1/PLANESPA:

- Action S31/02 - study and plan the possible use of the DASA tool developed by the Brazilian Airspace Control Department (DECEA) to manage UPR routes and airspace analysis.
- Action S33/09 - Review and update the CAO ATS Drafting Guide, incorporating digital signature processes and a regional mechanism for mutual recognition of electronic signatures among SAM States.
- Action S33/12 - Continue feasibility studies on the regional use of the DASA tool and coordinate dissemination activities with NACC.
- Action S33/13 - Reactivate the MCATS update and develop Appendix H for contingencies associated with severe weather events.

1.3 Similarly, Subgroup 1 (SG1) PLANESPA presented its activities at the GESEA/9 meeting, related to the implementation of FRTO, airspace optimization and modernization of ATM operational standards in the SAM Region, in close coordination with Project B-1 (NEOSPACE) of GREPECAS. Likewise, the importance of advancing in the progressive reduction of longitudinal separations, gradually

moving from 40 NM and 20 NM to 10 NM targets in continental airspace, supported by appropriate CNS and ATM capabilities, was highlighted.

1.4 Also during the GESEA/9 meeting, the importance of harmonizing the ATS Contingency Plans and the ATS Operational Letters of Agreement (ATS LOAs) was recognized, guaranteeing operational continuity in the face of contingencies and degradations of ATM services.

1.5 For all the above with respect to Airspace Planning, GESEA/9 adopted the following actions:

- Action GESEA/9/1.- To coordinate with the Secretariat, SG1 PLANESPA and the GREPECAS Project B1 team (NEOSPACE) so that the initiatives for the development of SDRs and UPRs with airlines and ANSPs are reactivated, for example, the trials with DELTA airlines. Likewise, that periodic meetings of the implementation teams of the CAR and SAM Region be promoted within the aforementioned project.
- Action GESEA/9/2.- That SG1 PLANESPA prepare and coordinate the development of an Action Plan, no later than October 2026, to implement digital signature, in the CAO ATS of the SAM Region.
- Action GESEA/9/3.- That the ICAO Secretariats in NACC and SAM coordinate an event for the dissemination of the DASA tool in Brazil with emphasis on the participation of CAR States that could not attend the 2025 Workshop. Coordinate with SG1 PLANESPA.
- Action GESEA/9/4.- That the Secretariat, in coordination with SG1 PLANESPA, carry out an update of the matrix table of longitudinal aircraft separations. Next, disseminate the Table to States to facilitate communication regarding Project B1 and the 30/10 aircraft separation initiative. File in SAM/IG/34.
- Action GESEA/9/5.- That the WG LOA ATS PLAN restart the deliverables of the MCATS Regional Framework and the coordination for harmonization of these Plans, considering that the new global-regional framework (RACF) would be ready by 2028, after approval by the Assembly. Present progress in SAM/IG/34.
- Action GESEA/9/6.- That SG1 PLANESPA form a GADHOC to reorganize activities to comply with Conclusion SAM/IG/31-02 on flexible use of airspace (FUA) within each State.

2. **Análisis**

2.1 **FRTO**

2.1.1 In order to address the conclusions and actions derived from the SAM/IG and GESEA meetings, and to ensure their harmonization with the GREPECAS Project B-1 (NEOSPACE) in the field of FRTO, the Action Plan was prepared and appears as **Appendix A** of this study note. This plan, based on the work programme of the SG1/PLANESPA FRTO WG, is detailed below.

2.1.2 The GREPECAS/NEOSPACE FRTO Action Plan establishes a regional roadmap to accelerate the implementation of more efficient trajectorial-based operations in the CAR/SAM Regions, with an emphasis on User Preferred Routes (UPR), Strategic Direct Routing (SDR), Free Route Airspace (FRA) and other associated strategic enablers.

2.1.3 The main efforts are concentrated on the expansion and implementation of UPRs, SDRs and FRA, including regional monitoring of their progress, the development of monitoring tools

(dashboards), the evaluation of new capacities such as DASA, the expansion of cross-border SDR corridors and feasibility studies for the implementation of FRA in selected FIRs. It also incorporates new initiatives aimed at harmonizing safety assessments through a regional methodology and a common FRA safety case template.

2.1.4 In the documentary field, the plan foresees the development of Version 2 of the FRT0 Implementation Guide and the elaboration of a CONOPS FRA CAR/SAM, supported by the RLA 06/901 Project. These activities seek to provide a harmonized methodological basis for the implementation of FRT0 concepts, complemented by national implementation strategies and studies on FPL/AIDC operations in SDR and FRA environments.

2.1.5 In relation to national implementation strategies, the FRT0/20 meeting of SG1/PLANESPA proposed to determine the degree of progress of the implementation of the FRT0 in each State of the SAM Region, based on the discussions of the Working Group and the information provided by the respective state representatives. The resulting status of implementation is presented in **Appendix B** of this study note and should be reviewed and updated by State representatives at each SAM/IG and GESEA meeting. It will also serve as a reference for the formulation and updating of national FRT0 implementation strategies.

2.1.6 Regarding aeronautical publication, it seeks to standardize the publication criteria of UPR, EDE and FRA in the region, aligning national procedures and formats with international models, including references to the approach used by EUROCONTROL for FRA.

2.1.7 The plan also includes the evaluation of the CNS infrastructure needed to support FRT0 operations, considering key capabilities such as ATS surveillance, VHF coverage, MTCD tools, and trajectory monitoring. Similarly, operational tests are planned to verify the processing of flight plans and the exchange of AIDC data in SDR and FRA cross-border environments.

2.1.8 A relevant component of the program corresponds to the definition of metrics and performance indicators (KPIs), with emphasis on operational and environmental benefits. Expected indicators include reduced CO₂ emissions, fuel savings, reduced route extensions, reduced delays, and monitoring of air traffic complexity and ATCO workload. The plan also plans to evaluate the possible regional adoption of methodologies already used in Brazil.

2.1.9 Finally, the plan incorporates actions to harmonize longitudinal separation between aircraft with the goal of moving towards the application of 30/10 NM separations in the region, as well as future lines of work related to Flexible Airspace Use (FUA) and APTA, the details of which are yet to be defined.

2.1.10 El Plan de Acción FRT0 constituye una iniciativa regional integral destinada a modernizar la gestión del espacio aéreo CAR/SAM, promoviendo trayectorias más eficientes, reducción del impacto ambiental, incremento de la capacidad del espacio aéreo y armonización operacional entre los Estados. El éxito de su implementación dependerá de la coordinación regional, la disponibilidad de infraestructura CNS adecuada y la adopción de metodologías comunes de seguridad y desempeño.

2.2 **ATS Operational Agreement Letters (CAO ATS) and SAM Region ATS Contingency Framework (MCATS)**

2.2.1 The modernization of the ATS Operational Letters of Agreement (ATS CAS) and the SAM Region ATS Contingency Framework (MCATS) is one of the main initiatives of the SG-1/PLANESPA to strengthen regional interoperability, support the implementation of AIDC, FRT0, ADS-B and future FF-

ICE concepts, as well as reduce risks associated with coordination between ATS units. The actions approved in SAM/IG/33 include the revision of the regional CAO ATS guide, the incorporation of digital signature mechanisms with mutual recognition among SAM States, and the harmonization of operational coordination procedures, with the aim of streamlining the updating of agreements, reducing administrative burdens and increasing the efficiency of cross-border processes.

2.2.2 In parallel, SG-1 will drive a new update of the MCATS, expanding its scope to address contingencies associated with severe weather events, ATM/CNS outages, operational resilience, and GNSS interference. As a result, a new Appendix on severe weather contingencies will be developed, incorporating good practices, lessons learned and regional coordination mechanisms, aligned with the international ATM resilience initiatives promoted by ICAO. These improvements will provide the SAM Region with a more modern, digital, harmonized and resilient framework for operational and contingency management.

2.2.3

2.2.4 The draft of the new document entitled "Central American, Caribbean and South America Region Air Traffic Management Contingency Framework (CAR/SAM RACF)" and the main findings derived from the comparison made with the current "Framework Plan for ATS Contingencies of the SAM Region (MCATS/SAM)", highlighting the advances, scope and conceptual changes incorporated in this new regional contingency management structure **will be presented in a specific NE**.

3. Suggested actions

3.1 Take note of the information presented in this study note.

3.2 Evaluate the actions included in the FRTTO Action Plan of the NEOSPACE Project of GREPECAS, attached as **Appendix A** of this study note, and submit the comments and proposals for modifications that are considered pertinent.

3.3 To request the States of the SAM Region to evaluate the status of implementation of the FRTTO, presented in Appendix B of this study note, and to communicate to the Secretariat any updates or modifications they deem appropriate.

Appendix A

GREPECAS/NEOSPACE

Action Plan FRT0

Activity	Responsible	Start Date	End Date	Status	Comments
UPR/SDR/FRA Implementation					
Develop a dashboard to make it easier to follow-up the implementation of UPR/SDR/FRA and to assess the implementation status of FRT0 enablers.	NEOSPACE			In progress	
Monitor the implementation status of the UPRs in the SAM Region.	NEOSPACE			In progress	See follow-up table/panel.
Monitor the implementation status of SDR in the SAM Region.	NEOSPACE			In progress	See follow-up table/panel.
Monitor the implementation status of FRA in the SAM Region.	NEOSPACE			In progress	See follow-up table/panel.
Assess the feasibility of implementing DASA for regional UPRs.	NEOSPACE			In progress	Re. GREPECAS/22 Conclusion N.º 8. DASA Workshop: 9-13 June, Lima.
Expand the cross-border SDR airspace, with and without the use of 'floating points'.	NEOSPACE			In progress	Pacific SDR Phase 1 was implemented in November 2024. Phase 2 is planned to include the Lima, Antofagasta, and Santiago FIRs.
Evaluate the feasibility of implementing FRA in selected FIRs.	NEOSPACE			In progress	
Develop a regional methodology for FRT0 safety assessment.	NEOSPACE			New	Guarantees a harmonized safety assessment before implementation.
Develop a regional Safety Case template for the implementation of FRA.	NEOSPACE			New	Common methodology for the States.
Documentation				In progress	
Develop Version 2 of the FRT0 Implementation Guide.	NEOSPACE			In progress	Supported by RLA 06/901. Re. GREPECAS/22 N.º 6 Conclusion.
Develop a FRA CAR/SAM CONOPS.	NEOSPACE			In progress	Supported by RLA 06/901.

Activity	Responsible	Start Date	End Date	Status	Comments
					- Develop a Regional Airspace Assessment Manual. - Develop a Regional Airspace Management Guide.
Set goals for the implementation of EDE and FRA over the next five years.	NEOSPACE			In progress	
Develop and spread a national strategy for FRTO implementation.	CAR/SAM States			In progress	Publish best implementation practices.
Carry out studies on FPL/AIDC operations in SDR and FRA environments.	NEOSPACE			In progress	
FRTO Post					
Review the aeronautical publishing model for the implementation of UPR, SDR, and FRA.	NEOSPACE			In progress	Is part of the FRTO Guide.
Harmonize the UPR, EDE, and FRA publishing.	CAR/SAM States			In progress	SDR publication in AIP ENR 2.2 and UPR in AIP ENR 3.5. FRA based on the EUROCONTROL model.
CNS Infrastructure				In progress	
Assess the implementation status of the FRTO B0/1 and B1/1 requirements (ATS surveillance coverage, VHF coverage, MTCD, and trajectory monitoring).	NEOSPACE			In progress	See follow-up panel.
Carry out FPL processing tests for cross-border SDR and FRA environments, with and without “floating points”. Check for any impact on AIDC.	NEOSPACE			In progress	
Support Metrics and Key Performance Indicators (KPI)					
Set up support metrics.	NEOSPACE			In progress	Environmental Performance - Establish a baseline for environmental. - Monitor CO₂ reduction. - Monitor fuel savings.

Activity	Responsible	Start Date	End Date	Status	Comments
					• Monitor the reduction in route lengths. • Publish annual environmental performance reports.
Set key performance indicators	NEOSPACE			In progress	
Assess the feasibility of implementing the methodology used in Brazil.	NEOSPACE			In progress	Re. GREPECAS/22 N.º 7 Conclusion. Operational Performance Monitoring Suggested Activities: Monitoring of Operational Performance. Suggested activities: • Develop operational performance dashboards. • Monitor the ATCO workload. • Monitor traffic complexity. • Monitor conflict rates. • Monitor delay reductions. • Conduct annual performance reviews.
Longitudinal Separation Between Aircraft					
Develop/update the longitudinal separation tables applied in the CAR/SAM FIRs, with an emphasis on the separations applied at the international FIR boundaries.	NEOSPACE			In progress	
Monitor the implementation status of longitudinal separation with the goal of reaching 30/10 NM separations.	NEOSPACE			In progress	
Flexible Use of Airspace (FUA)	TBD	TBD	TBD	TBD	TBD
APTA	TBD	TBD	TBD	TBD	TBD

Appendix B

Implementation Status of FRTO in the South American Region

1. Argentina

Argentina is immersed in a process of ATM system change and technological modernization, as well as in the implementation of the BUE TMA redesign. Currently, there are some UPRs already in use (mainly by Delta), and a progressive evolution path is envisioned: UPR/SDR/FRA. It is expected that initially the routes mostly used by Delta will be formalized for all airspace users.

2. Bolivia

There are some limitations regarding radar surveillance. However, it was highlighted that one of the reasons for creating the UPRs was precisely to allow implementation in non-surveilled airspace, provided there is prior coordination with ATC and adequate VHF coverage. In this context, UPR could constitute the natural first step toward a future evolution of airspace.

Direct flight paths approved by Bolivia are being used, which shows an operational openness to these concepts, even though the State faces surveillance limitations. They are expected to be published for use by all airspace users.

3. Brazil

At the FRTO/19 meeting, Brazil gave a presentation on the status of ASBU FRTO block implementation, as well as engaged in a strategic discussion on flexible use of airspace (FUA), Free Route Airspace (FRA/FRTO), regulatory and technological enablers, and the need for regional harmonization and benchmarking among States.

Brazil has a large SDR airspace, with a significant percentage of its FIRs under this concept. The main challenge continues to be implementation in high-volume and complex areas, such as São Paulo and Rio de Janeiro, which are environments with complex TMAs and high air traffic volume.

Additional opportunities for targeted SDR expansion in Brazil were identified, for example, in the FIR Curitiba, while the clearly defined strategic direction for Brazil is FRA.

The potential of the FIR Amazonica for FRA implementation was especially highlighted, characterized by its large area, low number of takeoffs/landings, and predominance of overflights. In this regard, Brazil has emphasized in some FRTO GT meetings that the goal is to ensure a gradual and safe transition to Free Route Airspace, maintaining operational efficiency, predictability, and sustainability.

Regarding regulatory evolution and technological enablers, Brazil has indicated that the transition to FRTO in Brazil is based on the publication PCA-351-6, which defines the National Operational Concept for FRA.

Regarding the management of dynamic demand and flexible use of airspace, Brazil has pointed out that the initial airspace design is often impacted by dynamic demands such as: Military operations, Sports activities, UAS operations, and Aeronautical sports activity.

To reduce airspace fragmentation, Brazil implemented Instruction 100-36, which: standardizes the procedures for requesting special use of airspace, centralizes the processes through the DASA system, and clearly defines deadlines, responsibilities, and competencies. This framework allows for a more predictable, transparent, and harmonized management of temporary and segregated airspace use.

With the goal of technical training and standardizing criteria, Brazil established the ATM 049 Course – Technical Analysis of Airspace, which objective is: to standardize the design of segregated areas, apply mitigation measures (such as conditional routes), and ensure the predictability of air traffic flows. The course covers separation criteria between segregated volumes and: ATS routes, Aerodromes, SIDs, STARs, and other airspace structures. The DASA system supports these analyses through information layers and measurement tools, contributing to greater safety and efficiency in airspace design.

Regarding FUA, the necessary technological updates are underway in systems such as: SAGITARIO (single database and situational awareness), SIGMA/FPL, with automatic alerts to users about active restrictions. Information transparency will be ensured through real-time publication of TSA/TRA and temporary reservations in the Brazil AIP.

The new ASM regulations and collaborative ecosystem will be based on the publication of a new Airspace Management (ASM) regulation in the first half of 2027, which will: introduce the figure of the Area Manager, turn the user into an active agent of the system, integrate in the systems the intended use and the actual activation/deactivation times, maximizing flexible use of airspace (FUA). At the same time, a Project Management Methodology Manual for FRTTO implementation is being developed, with publication expected in the second half of 2027.

Regarding FRTTO planning in Brazil, the following aspects stand out:

- National strategy on 3 pillars: Regulations, Technology, Dynamic Processes.
- Standard to streamline special airspace use requests and centralization at DASA.
- Training (ATM-049) to standardize analysis and mitigations (conditional routes).
- Systemic enablers (user alerts, TSA/TRA transparency, database, etc.).
- Roadmap: 2026 enablers and testing; 2027 ASM standard + project management manual.

4. Chile

Chile has reported that SDR development in Chile is currently limited by the RNAV/RNP 10 condition, where existing airways already use the required minimum separation, and outside radar coverage, a 50 NM separation is maintained, which restricts flexibility.

Existing SDR spaces are concentrated in areas with radar coverage. In the future, Chile is considering planning with the use of ADS-B and the development of the FUA, although with high institutional complexity due to large areas reserved for the Chilean Air Force.

The joint evaluation (Chile–Peru) of UPR or equivalent solutions within areas with radar/VHF coverage, avoiding CPDLC zones, was also mentioned.

Regarding FRTTO planning in Chile, the following aspects stand out:

- Structural restriction: RNP 10 operation and minimum separation; SDR is mainly viable in areas with radar; outside radar, the required separation is maintained.
- In the future: evaluation of ADSB and FUA, with complexity in areas reserved for the Air Force.

5. Colombia

During the session, progress, plans, and challenges related to the implementation of UPR, SDR, and FRA were presented, as well as the restructuring of Colombian airspace, both in the Pacific and inland, with special emphasis on inter-institutional coordination, regional harmonization, and operational benefits for airspace users.

Regarding the current status of UPR, SDR, and FRA, Colombia has reported that, although there has been progress with UPRs, in the last six months progress in SDR has been limited because Colombia is currently undergoing a comprehensive restructuring of national airspace.

However, the strategic plan includes the SE Sector (southeast of Colombia – Amazon and Orinoquía regions), where technical studies for the implementation of Free Route Airspace (FRA) have already been carried out. This area represents about 30% of Colombian airspace, with a goal of implementation around mid-2027. Until this process is completed, the airspace will continue operating mainly with UPRs.

Regarding UPRs, it was mentioned that between two and four UPRs have been developed for traffic departing from Bogotá to the north, particularly towards the FIR Barranquilla.

Additionally, in the Colombian Pacific, significant progress was reported, where practically the entire airspace now operates under the SDR concept, evolving towards a hybrid model between SDR and FRA. Aircraft can enter through a boundary waypoint with Panama and exit through another boundary with Ecuador (Guayaquil), operating point-to-point without the need to fly full published routes. This setup was described as a “semi-FRA,” although there is still a recognized need for greater awareness among crews and operators.

Regarding civil-military coordination and conditional routes, Colombia highlighted the work done in the center of the country, where an extensive process of coordination and awareness-raising with the Military Forces has been carried out, aligned with the FUA and the ASBU-FRTO module, to optimize the shared use of airspace. As a result, a Conditional Route 2 (CDR2) is very advanced, and its publication is expected by the end of this year, representing a significant milestone in flexible airspace management.

Regarding governance and strengthening of airspace planning, the representatives from Colombia have reported that, about two years ago, an Air Navigation Service Planning Group was created in Colombia with the aim of elevating airspace redesign to a managerial level.

This new approach has allowed them to: align the needs of ATM and CNS, strengthen planning, coordination, and inter-area organization, as well as clearly separate the strategic planning phase from technical execution (flight procedures, charts, socialization). Thanks to this structure, the FRA and SDR concepts now already have theoretical, conceptual bases and complete CNS/ATM analysis, with mainly operational implementation tasks still pending, such as chart development and change management.

Regarding the rescheduling of FRA implementation, Colombia acknowledged that the implementation of FRA in SE, initially planned for previous years, was delayed due to an intensive effort to update PBN procedures throughout the year and the need to strengthen work teams, including additional hiring. Despite this, the commitment to implement FRA in SE by mid-2027 at the latest remains, with the aspiration to later extend the concept to SW.

Regarding international coordination and flow optimization, significant progress was reported in international coordination. In the Pacific, coordination with Panama continues to define a pending floating waypoint. With Guayaquil, an additional floating waypoint has already been implemented, which is key to separating entry and exit flows to/from Asia, Bogotá, and Guayaquil, mitigating a hotspot identified in the Bogotá–Quito transit, where takeoffs and landings are concentrated in the same spot, as well as applying SDR concepts more efficiently.

Also, it was noted that many of the direct routes to Barranquilla are already being used operationally, and the goal for this year is to formalize them through official publication, expanding their use to all operators, not just those (like Delta) who initially requested them.

Regarding the future restructuring in the Barranquilla FIR, it was reported that at the end of April, specific meetings will be held for the restructuring of the Barranquilla FIR airspace, including San Andrés. These meetings include coordination with Panama to: align waypoints near the San Andrés TMA and correct misalignments in the boundaries between FIRs.

Regarding FRTO planning in Colombia, the following points stand out:

- Comprehensive restructuring of the airspace is a priority, with progress in UPR.
- Plan to implement FRA in a large area (Amazon/Orinoquia) by 2027 (around 30% of the country).
- In the Pacific, operations allow point-to-point entry/exit between FIR boundaries, requiring more crew awareness.
- Progress in FUA (military coordination) and development of conditional routes; intention to publish updates before the end of the year.
- Meeting plan for the restructuring of Barranquilla/San Andrés FIR, including alignment with Panama.

6. Ecuador

Regarding regional coordination and alignment with existing publications, Ecuador indicated that, in the Pacific area as well as in the airspace between Colombia, Central America, and Peru, alignment is maintained with the publications and ongoing projects in the region. It was pointed out that Ecuador is awaiting coordination with Colombia to define: departure and arrival routes, possible traffic routings, and operational adjustments that allow for better regional integration. This coordination are considered crucial to ensure the continuity and efficiency of air traffic flow at these connection points.

The importance of harmonizing aeronautical publications among States was highlighted, noting that, so far, Brazil has progressed more consistently, while other States — including Ecuador — have mixed publication schemes.

Due to limitations in the regular amendment cycles for aeronautical publications, many States have not permanently incorporated it into the AIP (ENR); instead, it is published through AIP Supplements or AICs.

It was emphasized that this approach may be insufficient in the long term, especially considering the regional milestones associated with publication in AIP SDR in ENR 2.2 and UPR in ENR 3.5.

Regarding FRTO planning in Ecuador, the following aspects stand out:

- Confirmation of continuity of current implementations and alignment with regional projects/publications.
- Coordination with Colombia to define trajectories/paths.
- Need for harmonization/publication and commitment to progress in upcoming cycles.

7. Guyana

SDR is already in effect throughout the Georgetown FIR, and the natural next step would be the implementation of FRA.

8. French Guyana

FRA is already in effect in a significant part of the Cayenne FIR, and the natural evolution would be the implementation of FRA throughout the entire FIR. The FRA publication in the Cayenne FIR has followed the EUROCONTROL model and can be used as a reference for the FRA publication in the SAM Region.

9. Panamá

Panama plays a strategic role as a key transition point between the CAR and SAM regions, characterized by a significant volume of air traffic on interregional routes and complex operational conditions, with a substantial flow of traffic ascending and descending.

Panama has steadily progressed in harmonizing its aeronautical publications, particularly regarding the Pacific SDR. This information has already been permanently incorporated into the AIP, which represents an important step toward regional alignment and stability of the published information.

Regarding the implementation of UPR, the meeting was informed that UPR has been implemented at Delta's request, with positive results from an operational standpoint.

Additionally, coordination with Colombia, requested by that State, is still pending to define a scheme associated with the implementation of a floating point, a topic that has already been discussed preliminarily and is ready to be resumed in a future bilateral coordination session.

Panama plans to start a new SDR implementation project within its own FIR, specifically in the northern sector. The main goal of this initiative is to enable more direct routes and connect departures more efficiently with the FIR boundary points.

To do this, a dedicated working group will be set up, and the project is planned to be developed during the second quarter, as part of a gradual evolution of Panamanian airspace.

It was highlighted that, alongside SDR and UPR, Panama continues working on airspace restructuring and procedure updates, necessary to ensure regulatory and operational compliance. This simultaneous approach helps maintain a balance between innovation, safety, and regulatory conformity.

Regarding the regional interconnection of SDR, as a long-term vision, the possible interconnection of the Pacific SDR with Caribbean airspaces, including Jamaica and Cuba, was mentioned, an idea initially proposed by Delta Airlines. While it was acknowledged that it is a complex initiative, it was highlighted that it is strategic for the region, will require a formal mechanism of regular meetings between both regions (SAM and CAR), and will need to be worked on institutionally with the support of the Regional Secretariat.

Regarding FRTTO planning in Panama, the following points stand out:

- Pacific SDR published in the AIP and UPR implemented via AIC.
- Coordination with Colombia for fixed/floating waypoint is pending.
- Planned project: intra-FIR SDR (northern sector) for more direct routes from departures to FIR boundaries (working group, second quarter).
- Parallels: airspace restructuring and procedure updates.

10. Paraguay

It was noted that Paraguay has radar surveillance and good VHF coverage, which suggests that after an initial stage with UPR, it could gradually move towards SDR, following processes similar to those adopted by other states in the region.

11. Perú

During the FRTTO/19 meeting, an update was presented on the progress and current status of activities related to the implementation of direct routing in the Lima FIR, as well as progress in data link, regional coordination, and system modernization.

Regarding the SDR, significant progress was reported in the publications in the Lima FIR, using floating waypoints, thanks to the support and coordination of Guayaquil Control and Santiago Oceanic.

The published routes are being used correctly by operators, with no operational issues detected. The automation of transfers through AIDC has been working in a stable and efficient manner.

Internal coordination has started, with Chile's participation, for the gradual activation of additional coordination tools, including functionalities like CPL. Chile proposed tentative dates for activating certain messages, conditioned on interruptions in their database, so confirmation is still awaited to enable AIDC messages and start formal direct routing tests between FIR Lima and FIR Santiago. These tests will be subject to the restriction that the proposed routes do not interfere with airways classified as RNP 10 (SORTA/IREMI). It was noted that over the past few months FIR Lima has been transitioning to a new surveillance system, which temporarily slowed some operational tests. The process is currently in its final phase, and it is expected that, in the short term, the new system's capabilities will be fully utilized and maximized.

The peculiarities of Peruvian airspace are as follows:

- Peru already has an SDR in the Pacific, within the VHF and radar coverage area.
- Expansion to the west faces limitations due to reliance on ADS-C/CPDLC, which introduces the need for a deeper analysis on the future application of SDR in Data Link environments.

Additionally, it is necessary to take into account the operational complexity generated by Lima Airport, where the high traffic density and the climb and descent phases limit the lateral expansion (east/west) of the SDR space. Nevertheless, these difficulties are part of the natural evolution of Peruvian airspace and will need to be addressed progressively.

Regarding FRTO planning in Peru, the following points stand out:

- Progress in publications and operational use of direct routes with floating waypoints, supported by coordination with Guayaquil and Oceanic Santiago.
- AIDC transfers without issues for automation.
- Operational restriction: avoid proposals that cross segments constrained by RNP 10.
- Surveillance system transition (temporary impact during tests).

12. Suriname

SDR is already in force throughout the Paramaribo FIR, and the natural evolution would be the implementation of FRA.

13. Uruguay

The discussion focused on the progress of implementing UPR, AIDC, and initiatives related to SDR in the Southern Cone, with an emphasis on Uruguay's experience, technical challenges with Indra systems, and the strategic importance of integration with Brazil and Argentina for the evolution of regional airspace.

Regarding the implementation of UPR, Uruguay reported that it managed to publish its first UPR, initially within the framework of the Delta Airlines initiative, which was used during the trial period. Later, the implementation has shown good operational acceptance, with American Airlines operating almost daily (two flights), Aerolineas Argentinas using UPR on flights from the Caribbean, and other operators beginning to use it.

Based on these positive results, Uruguay is currently looking into two new RNP for joint implementation with Brazil, which represents a significant step forward in efficiency and regional cooperation in the Sao Paulo/Rio de Janeiro – Montevideo – Buenos Aires route. It was highlighted

that the São Paulo Ezeiza/Aeroparque routes are the most important for Uruguay. However, there have been significant challenges in implementing AIDC with Brazil.

The main problem is that Uruguay's ATM system (Indra ARCON – previous version) hasn't been able to establish a stable connection with the Brazilian system. Despite multiple attempts to fix it with patches, these efforts have failed, causing sudden system crashes, loss of the surveillance system, and general operational instability. Even so, Uruguay keeps working actively to implement AIDC, understanding that this is a key step for operational and strategic progress.

Uruguay emphasized that the successful implementation of AIDC is essential to keep moving toward an SDR airspace, especially in the upper airspace, to further reduce LHDs (which are already almost zero) and to facilitate the safe and harmonized future implementation of SDR. The meeting was informed that Uruguay already has preliminary SDR drafts and is working with the system provider. However, a formal proposal has not yet been presented to the regulator.

Regarding the operational complexities in the BUE TMA, it was noted that the implementation of SDR in the traffic feeding the Buenos Aires TMA is particularly complex, since most of the aircraft are in the climb or descent phase, there are multiple crossing routes, and Uruguayan airspace practically functions as a pre-terminal area for Buenos Aires.

Uruguay is looking into how to integrate and harmonize this traffic with a future SDR airspace, acknowledging the technical and operational challenges involved.

The meeting agreed that the ascent and descent phases represent greater complexity for SDR and UPR. It also highlighted the importance of considering Argentina's situation, noting that significant progress has been made with the implementation of the new manager in Cordoba and that the Ezeiza control center is already quite advanced in its installation. Everything indicates that there will be better conditions to move forward with coordinated solutions in the Buenos Aires area in the short/medium term.

From the Brazilian side, there are concrete opportunities, since: the airspace of FIR Curitiba bordering Montevideo already operates with SDR and this could at least facilitate partial implementation from the Brazilian side. From a theoretical point of view, FIR Montevideo would be a good candidate for FRA, although the high proportion of climbs and descents adds complexity. Even so, it is considered that, given the limited size of the airspace, FRA/SDR routes would not differ substantially, a topic that will need to be studied in more detail.

Regarding FRTO planning in Uruguay, the following aspects stand out:

- UPRs published with good operational reception (used by several operators).
- Planning of 2 additional UPRs with Brazil for significant flows.
- AIDC not stable with Brazil due to legacy ATM system (ARCON) and patches with restarts/failures (including loss of surveillance).
- SDR in draft (upper airspace/overflights); additional complexity due to traffic to Buenos Aires TMA (ascents/descents and crossings).

14. Venezuela

Venezuela has implemented SDR in the vast majority of the Maiquetia FIR, except for the North, at the boundaries with the CAR FIR, and the South, at the boundaries with Brazil, due to ATS surveillance issues. In previous meetings, Venezuelan representatives have reported plans to implement ADS-B to cover the mentioned gaps in ATS surveillance and extend SDR to the entire Maiquetia FIR, creating the conditions to move toward FRA. It's important to highlight that Venezuela has also implemented UPRs, which make efficient planning possible in non-SDR airspace.

The meeting highlighted that the expectation for the resumption of flights by some airlines in the Maiquetia FIR results in an even greater importance on the progress in the Maiquetia FIR.