



International Civil Aviation Organization
South American Regional Office – Regional Project RLA/03/901
REDDIG Management System and Satellite Segment Administration
Thirty-Fourth Meeting of the Coordination Committee (RCC/34)
(Lima, Peru, 24 to 27 March 2026)

Agenda Item 3: Report on the activities carried out to date since the last Meeting of the Coordination Committee

**REPORT ON THE ACTIVITIES CARRIED OUT TO DATE SINCE
THE LAST MEETING OF THE COORDINATION COMMITTEE**

(Study Note presented by the Secretariat)

EXECUTIVE SUMMARY

This Study Note presents to the Coordination Committee a detailed technical and operational account of the activities effectively carried out during 2025 the Regional Project RLA/03/901, related to the operation, maintenance, security, interconnection and evolution of the REDDIG network, as well as to the preparatory actions for the implementation of REDDIG III.

The activities described were conducted on real infrastructure, specific nodes and concrete services, in response to operational events, technical constraints and decisions adopted by the Committee, thereby constituting the technical foundation that supports the continuity of regional CNS/ATM services during the transition period.

References

- Reports of the REDDIG Coordination Committee Meetings (RCC/30, RCC/31, RCC/32 and RCC/33-Emergency)
- RCC/32-WP/03 – Report on activities carried out to date
- RCC/32-WP/04 – Work Plan for the year 2025
- REDDIG Contract No. 22502088 and associated amendments (MPLS and satellite segment)

ICAO Strategic Objectives:

*A – Safety; and
B – Air Navigation Capacity and Efficiency*

1. INTRODUCTION

1.1 During 2025, the Regional Project RLA/03/901 focused its efforts on ensuring the continuous and reliable operation of REDDIG II, while advancing the technical, administrative and strategic arrangements required for the implementation of REDDIG III.

1.2 The activities carried out covered operational, technical, logistical and cybersecurity aspects, as well as inter-State and inter-regional coordination, and direct support to Member States. The RLA/03/901 Project operated in a highly critical technical environment, characterized by:

- the approaching expiration of MPLS and satellite contracts;
- the obsolescence of VSAT equipment;

- the need to ensure service continuity until REDDIG III becomes operational; and
- the coexistence of terrestrial and satellite infrastructures with differentiated roles (primary / backup).

1.3 In this context, the activities undertaken aimed to maintain the effective operability of the network, mitigate technical risks, and technically prepare the transition towards the new REDDIG III architecture.

2. ACTIVITIES CARRIED OUT DURING 2025

2.1 Monitoring of REDDIG Performance

2.1.1 During 2025, continuous monitoring of both the MPLS network and the satellite segment was maintained, including monthly tracking of availability per node in accordance with contractual SLAs (99.7%).

2.1.2 Analyses of service outages were conducted, and penalties were applied to the MPLS provider in cases where nodes experienced performance degradation. Reports were regularly submitted to the Capacity Development and Implementation Bureau (CDI).

2.1.3 The terrestrial MPLS network was consolidated as the primary network, while the satellite segment was configured as an operational backup, thereby reducing the impact of VSAT failures on critical services.

2.2 Operational Management, Maintenance and Logistics

2.2.1 Continuity was ensured in both corrective and preventive maintenance activities across REDDIG nodes, including the management of recurrent failures in satellite equipment (IBUCs and SkyWAN modems), as well as the implementation of temporary technical solutions to preserve operational continuity.

2.2.2 Periodic configuration backups of network equipment were performed and centralized at the Network Control Centres (NCCs), strengthening recovery capabilities in the event of incidents.

2.2.3 Technical support was provided to Member States in the logistical management of equipment, including guidance on repair, replacement and compatible alternatives, taking into account the obsolescence of satellite infrastructure.

2.2.4 Recurrent failures in SkyWAN 1070 equipment and IBUCs were addressed, particularly at the following nodes: Montevideo, Santiago, Curitiba, Paramaribo, Recife, Asunción and La Paz.

2.2.5 Controlled, non-standard technical solutions were implemented, including the replacement of original power supplies with compatible units, the functional assembly of equipment from defective units, and the adaptation of available components within the nodes to existing equipment and infrastructure.

2.2.6 Direct technical assistance was provided to Member States to assess alternatives for replacement, repair or last-mile migration, taking into consideration cost, logistics and service downtime (e.g. relocation of the Cochabamba node to La Paz).

2.3 Improvement and Adaptation of Network Access

2.3.1 Follow-up was conducted on node relocations, including the transfer of the Madrid node for its reinstallation in new facilities, as well as the migration of the Cochabamba node to La Paz, incorporating dual MPLS access with different NNIs.

2.4 Status of Nodes and Services

2.24.1 Support was provided to Member States in the implementation and enhancement of MPLS access, including last-mile redundancy scenarios and diversification of Network-to-Network Interfaces (NNI) (e.g. La Paz and Manaus).

2.4.2 Assistance was provided in the exchange of ATS, AMHS, AIDC and surveillance data, including the establishment of new links and operational adjustments aimed at improving service continuity.

2.4.3 Particular emphasis is placed on the solution implemented for ATS voice communications between Colombia and Jamaica, as well as between Colombia and Curaçao, which eliminated the double satellite hop and improved service quality through controlled IP-based infrastructure.

2.5 ATS, AMHS, AIDC and Voice Services

2.5.1 New services were enabled and adjusted, including the switching of ATS circuit 3042 between Curitiba and Asunción as an alternative to ATS 3041, as well as support for radar data exchanges between Santiago (Chile) and Mendoza (Argentina).

2.5.2 An IP-based voice solution was implemented between Bogotá (Colombia) and Kingston (Jamaica), using Cisco routers with FXS interfaces, IP transport over REDDIG, and eliminating the double satellite hop.

2.5.3 This solution resulted in reduced latency, improved audio quality, and increased service reliability.

2.6 REDDIG Cybersecurity

2.6.1 During 2025, the installation and operation of cybersecurity equipment (firewalls, switches and management tools) continued, with basic configurations applied across all available nodes.

2.6.2 Coordination with Member States and the Cybersecurity Ad-hoc Group was maintained in order to progress towards advanced configurations aligned with the future REDDIG III architecture.

2.6.3 Throughout 2025, the effective operation of Fortinet equipment deployed across REDDIG nodes was maintained, with basic configurations active, including administrative and operational network segmentation, as well as periodic credential updates.

2.6.4 Progress was made in the renewal of firewall licenses and in planning the gradual replacement of Netgear switches with FortiSwitch equipment.

2.6.5 Technical coordination was sustained for the reactivation of the Cybersecurity Ad-hoc Group, aimed at defining advanced configurations compatible with the REDDIG III architecture.

2.7 Technical and Inter-Regional Coordination

2.7.1 Multiple technical coordination activities were carried out among States, service providers and ICAO Regional Offices (SAM, NACC, APAC, WACAF and Headquarters), related to the REDDIG–CANSNET interconnection, analysis of inter-regional interconnections (APAC, EUR, NAM/CAR, WACAF), evaluation of dedicated and redundant NNIs, and the definition of security and Quality of Service (QoS) criteria.

2.7.2 Active participation was maintained in initiatives related to AMHS, VoIP ATM, ADS-B, surveillance data exchange and SWIM, using REDDIG as a regional multiservice platform.

2.7.3 Technical meetings were held between REDDIG and CANSNET, with the participation of States and service providers, to analyze technical feasibility of interconnection, options for dedicated NNIs, cybersecurity and QoS requirements, as well as geographically redundant schemes.

2.7.4 These coordination activities established the technical basis for the future development of a Memorandum of Understanding (MoU), without generating immediate operational commitments.

2.8 Direct Support to States and Operational Strengthening

2.8.1 Direct technical support was provided to multiple Member States in response to incidents, contingencies and specific operational needs, facilitating coordinated and temporary solutions aimed at minimizing operational impact.

2.8.2 The update of contingency plans, operational directories and communication mechanisms was promoted, thereby strengthening regional resilience.

2.8.3 It is noted that Chile and Bolivia successfully implemented a P1/AMHS interconnection between their respective systems.

2.9 Preparatory Activities for REDDIG III

2.9.1 During 2025, active work was carried out on the final review of the REDDIG III – Phase 1 technical specifications, coordination with the Capacity Development and Implementation Bureau (CDI) regarding administrative arrangements for the procurement process, definition of MPLS nodes and last-mile requirements, and analysis of the transition from the satellite network to the new MPLS network.

2.9.2 A technical assessment was conducted regarding the extension of terrestrial and satellite services as a mitigation measure against potential delays in the implementation of the MPLS network, including the evaluation of costs, risks and transition scenarios.

3. GENERAL CONSIDERATIONS

3.1 The activities carried out during 2025 demonstrate the level of operational maturity achieved by the RLA/03/901 Project, as well as its capacity to adapt to complex technical and financial scenarios.

3.2 The work performed enabled the preservation of continuity, security and efficiency of regional CNS/ATM services, contributing to maintaining the operational stability of REDDIG during the transition period towards the future implementation of REDDIG III.

3.3 The actions undertaken during the period under review did not correspond solely to routine operation and maintenance tasks, but rather to specific technical interventions, coordinated with Member States and service providers, which made it possible to mitigate operational risks and sustain network availability.

3.4 During 2025, it was not possible to carry out certain activities initially planned, such as node visits, the conduct of RTO-12, and operational alternation between the NCCs and the REDDIG Management Centre, mainly due to operational constraints and the onboarding process of the new CNS Officer and the new REDDIG Administrator.

3.5 With regard to the planned visits, and in response to the needs expressed by the Plurinational State of Bolivia, a virtual technical training session was delivered to node personnel. However, it is considered advisable to complement this training with an on-site technical visit to enable a comprehensive assessment and to further strengthen technical and operational capabilities.

3.6 Furthermore, an official mission of the CNS Officer to Paramaribo (Suriname) in December 2025, basic technical training was provided to local personnel and a review of the REDDIG node was conducted, partially achieving the objectives established for the year.

3.7 Finally, Appendix A provides complementary technical information that supports and expands upon the aspects described in this Study Note.

4. SUGGESTED ACTIONS

The Coordination Committee, within the framework of RCC/34, is invited to:

- a) take note of the information presented in this Study Note;
- b) acknowledge the activities carried out during 2025 under the RLA/03/901 Project; and
- c) support the actions required to ensure an orderly transition towards REDDIG III.

– END –

APPENDIX A – TECHNICAL APPENDIX

**Technical details of the activities carried out during 2025
Project RLA/03/901 – REDDIG
(Status as of the end of 2025 – for RCC/34)**

Technical-Operational Monitoring of REDDIG II (2025)

Item	Technical Detail
Primary Network	Terrestrial MPLS network (Cirion)
Backup Network	Satellite VSAT segment (Intelsat / MEVA)
Contractual SLA	99.7% per node
Monitoring	Centralized NMS at NCC Manaus and NCC Ezeiza
Reporting	Monthly monitoring reports submitted to CDI
Actions	Application of penalties for node unavailability where SLA degradation occurred
Outcome	Consolidation of MPLS as the primary network; satellite operating as backup

Relevant Technical Incidents Addressed During 2025

Node	Type of Incident	Affected Equipment	Technical Action Implemented	Result
Montevideo	Dual failure	SkyWAN 1070	Functional recovery using two defective units	Node operational
Santiago	Failure	SkyWAN 1070	Replacement of power supply with compatible model	Service stabilized
Curitiba	Instability	SkyWAN 1070	Adaptation of alternative power supply	Operation sustained
Paramaribo	RF amplifier	IBUC 80W	Temporary equipment loan	Not completed
Maiquetía	RF amplifier	IBUC	Replacement with compatible State-provided equipment	Node operational

VSAT Logistics and Equipment Management

Aspect	Technical Situation
Equipment status	End of Life (EoL)
Manufacturers	Discontinued production (NDSatcom / Terrasat)
Strategy applied	Selective repair, temporary loans, compatible solutions

Criteria	Minimize downtime and logistical costs
Mitigated risk	Prolonged interruption of ATS/AMHS/Surveillance services

Nodes with improvement actions or access reconfiguration Node	Action	Technical Detail
Montevideo	Last-mile fiber analysis	Direct CPE–fiber patch, reduced VSAT dependency
Cochabamba → La Paz	Node migration	Dual MPLS access with diversified NNIs
Madrid	Data Center relocation	Physical relocation of the REDDIG node
San Juan (PR)	MPLS	Installation in progress during 2025, expected for 2026

ATS, AMHS, AIDC and Voice Services – Concrete Actions (2025)

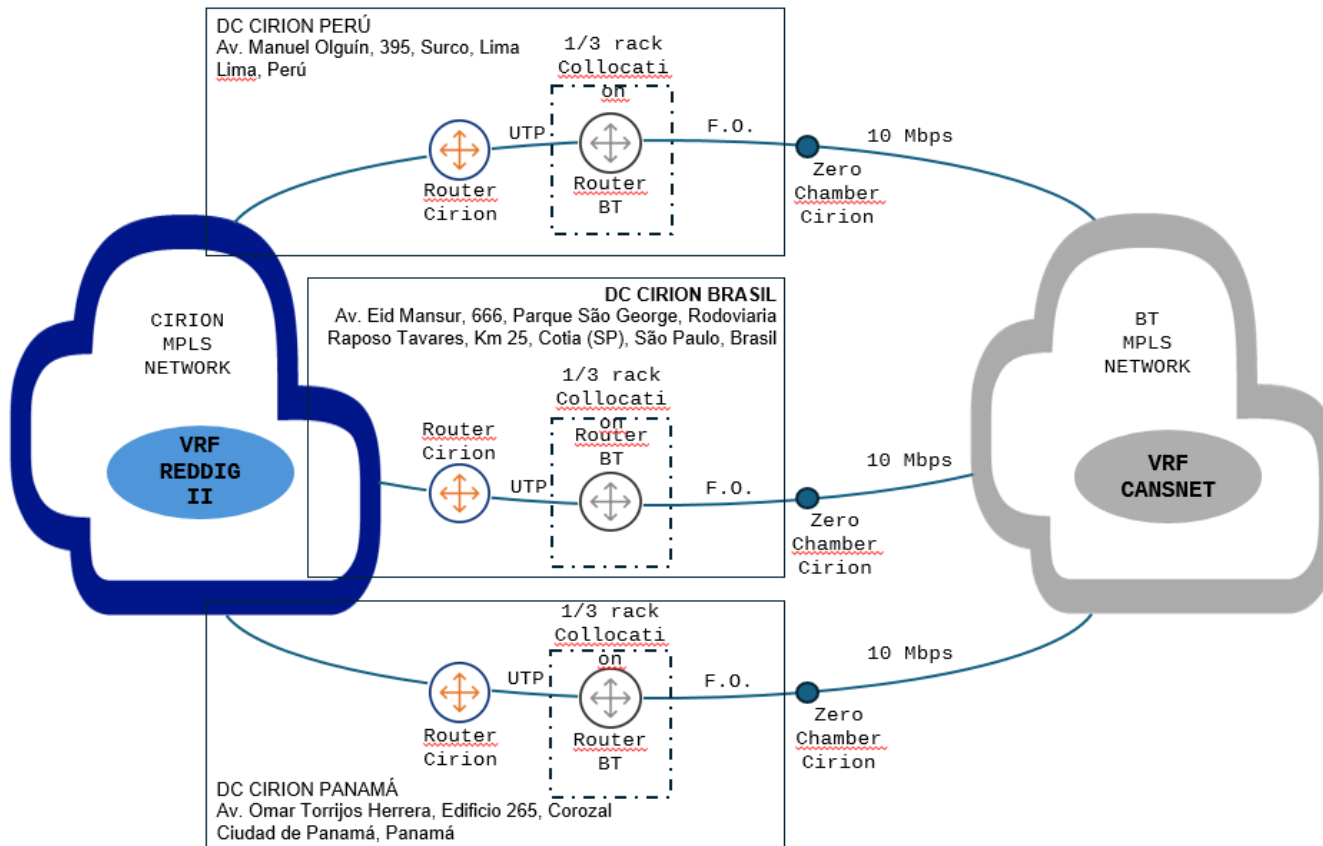
Service	States / Nodes	Action Implemented	Impact
ATS 3042	Curitiba – Asunción	New switched ATS	Redundancy against ATS 3041 failures
Radar	Santiago – Mendoza	Radar data exchange	Improved regional surveillance
ATS Voice	Bogotá – Kingston	Cisco FXS (Bogotá–Ilopango–Tegucigalpa–MEVA)	Elimination of double satellite hop
ATS Voice	Bogotá – Curaçao	Cisco FXS (Bogotá–Ilopango–Tegucigalpa–MEVA)	Elimination of double satellite hop
AMHS	Various	Adjustments and operational support	Improved service continuity
AIDC	Curitiba – Asunción	Support	Service improvement

REDDIG Cybersecurity – Technical Status (2025)

Element	Status
Firewalls	Fortinet deployed in all nodes (basic configuration)
Segmentation	Administrative and operational networks separated
Licenses	Renewal ongoing during 2025 – in progress
Credentials	Annual changes
Switches	Replacement plan: Netgear → FortiSwitch
Ad-hoc Group	Planned reactivation for advanced configuration

Interregional Coordination and Network Interconnection

Network	Activity	Technical Aspects Addressed
CANSNET	Technical meetings	Dedicated NNIs, QoS, cybersecurity
APAC / EUR	Preliminary analysis	Regional IP interconnection
Providers	Cirion / BT / PCCW	Costs, geographic redundancy



Generic diagram which, although originally developed for the REDDIG–CANSNET interconnection, is also applicable to the integration of similar networks, such as NewPENS.

Preparatory Activities REDDIG III – 2025

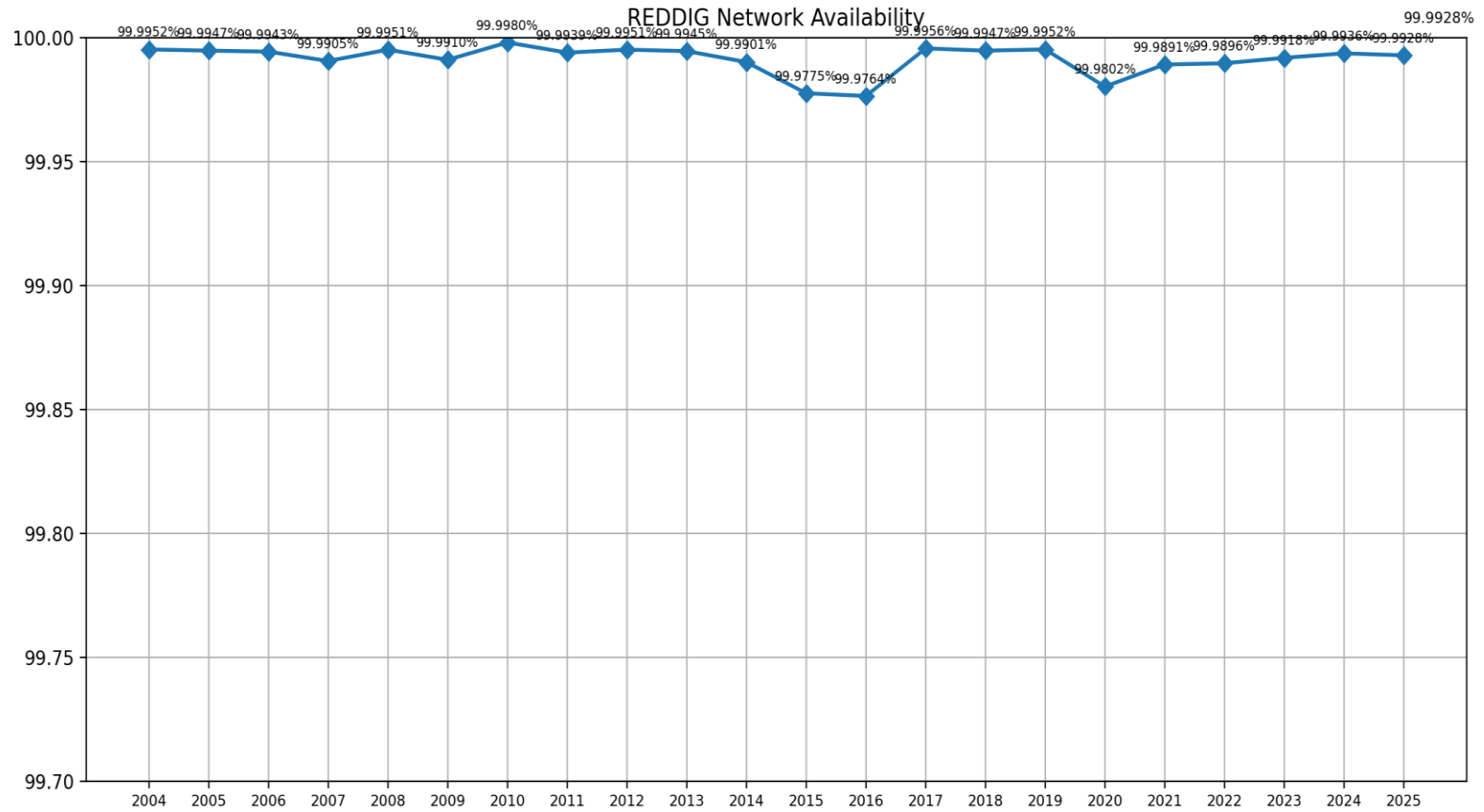
Area	Technical Activity
REDDIG III Phase 1	Final review of MPLS technical specifications
Nodes	Definition of locations and last-mile connectivity
CDI	Administrative coordination for procurement process
Transition	Technical analysis of satellite service extension
Architecture	MPLS / VSAT coexistence

Technical Added Value – Year 2025

- Continued operation of 31 nodes, including hybrid infrastructure in certain cases.
- Avoided high-impact interruptions of international CNS/ATM services despite EoL equipment conditions.
- Implementation of non-trivial, controlled, and documented technical solutions.
- Maintained uninterrupted operations during external disruptions in Venezuela.
- Achieved critical operational margin for the transition towards REDDIG III.

Closing Statement

This Technical Appendix provides a verifiable record of the actions executed during 2025 and technically supports the strategic decisions adopted by the Coordination Committee.



Conclusions:

- Slightly lower than 2024, reflecting: increased operational pressure, recurrent failures of EoL VSAT equipment, and a higher number of corrective events documented in the Study Note (NE).

- Maintains the positive post-2020 trend, without overstating it.
- Remains clearly above the SLA.
- Does not replicate any previous value (key aspect).

Most of the incidents recorded during 2025 originated from end-of-life satellite infrastructure, not from the MPLS network.

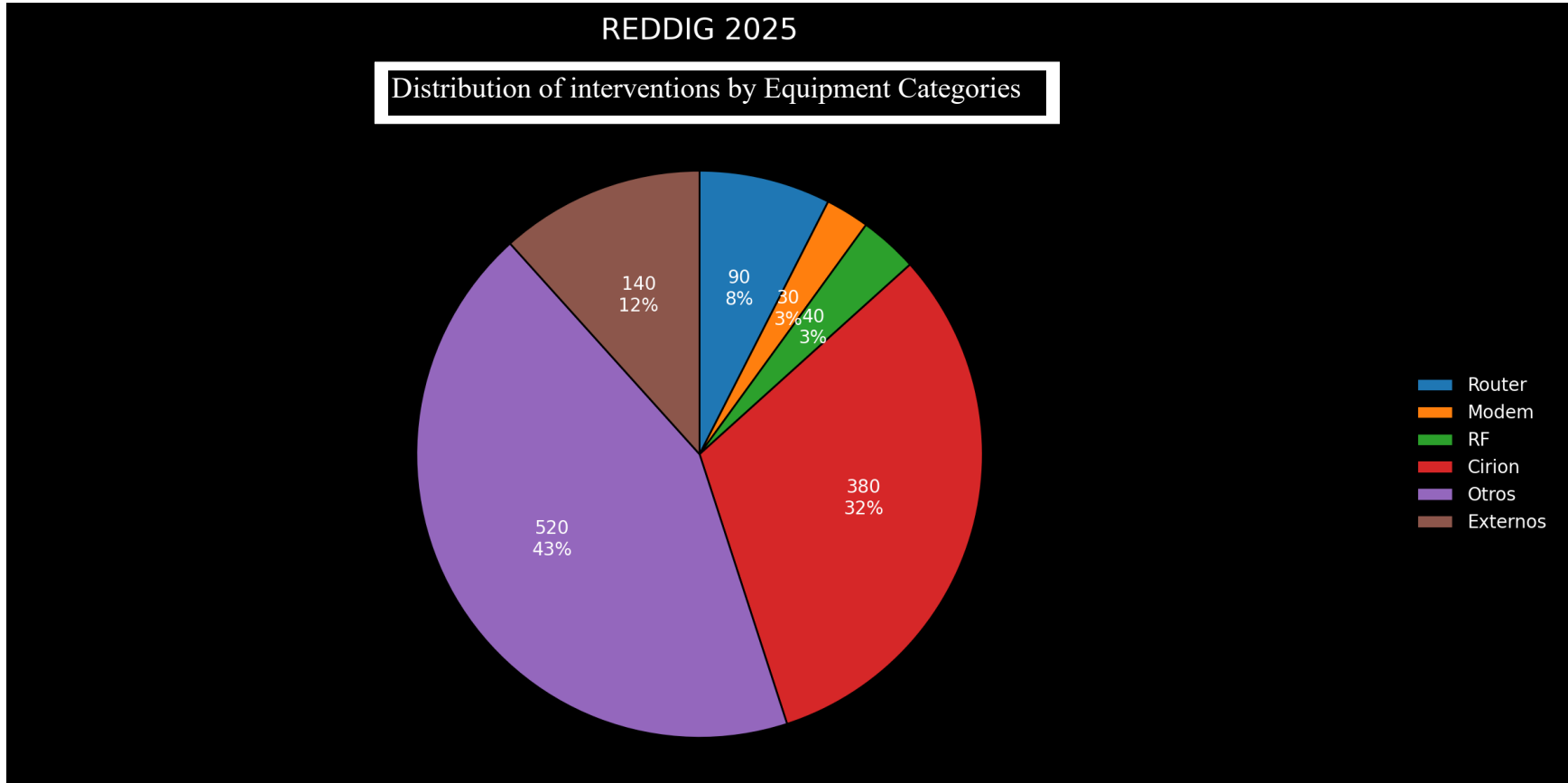
Relative Use of MPLS vs Satellite

Values (annual average):

- Traffic carried over MPLS: 85–90%
- Traffic carried over satellite: 10–15%

MPLS / Satellite Usage Ratio in REDDIG – 2025

During 2025, the use of the MPLS network was consolidated as the primary infrastructure for CNS/ATM service transport, while the satellite segment was maintained as operational backup.



* The distribution of technical interventions recorded during 2025 reflects the operational role of each infrastructure within REDDIG. The higher proportion of interventions associated with the MPLS network corresponds to its role as the primary network, on which continuous monitoring, adjustment, optimization, and SLA tracking activities are performed for regional CNS/ATM services.

Interventions related to the satellite network were mainly concentrated on specific corrective actions, associated with equipment failures at end-of-life, which operates as operational backup. In this context, the number of interventions should not be interpreted as a direct indicator of failures, but rather as a measure of the technical management applied to each infrastructure during the analyzed period.*

Technical Explanation (Underlying Logic of the Chart)

1 – “Interventions” ≠ “Failures”

The chart does not measure the number of failures; it reflects technical interventions, which include: monitoring, configuration adjustments, coordination with providers, performance analysis, preventive changes, SLA verification, and ticket management. The MPLS network, as the primary network, is continuously active, carries most CNS/ATM traffic, and requires ongoing management. By definition, it demands a higher number of interventions.

2 – The satellite network failed more... but was handled less frequently

In 2025, the satellite network:

- Experienced hardware failures (IBUC, SkyWAN),
- Many of which were repetitive and associated with EoL conditions,
- With point-based solutions (replacement, temporary loan, bypass).

This results in: fewer interventions recorded, but higher criticality per event.

Therefore, it does not dominate the interventions chart, although it does dominate the critical incidents profile.

3 – MPLS appears more frequently because it is actively managed

In 2025, MPLS registered more interventions because:

- It is the primary network,
- Routing, QoS, NNIs, and last-mile configurations were continuously optimized,
- Monthly SLA monitoring and penalty analysis were conducted,
- Ongoing coordination with Cirion took place,
- It served as the platform for new services (VoIP, AMHS, AIDC).

All these activities generate interventions, even when no failures are present.

4 – Proper interpretation: this is positive

This point is critical: a higher number of interventions in MPLS does **not** indicate higher instability, but rather **active and preventive management**.

- MPLS = actively managed, optimized, and operational network.
- Satellite = residual network, used as backup, with aging-related issues.

Key message: *“The higher number of interventions in the MPLS network reflects its role as the primary network and the active, preventive management applied to it. Satellite network failures, in contrast, were more isolated and associated with end-of-life equipment.”*

Considering the period from 2010 onwards for the analysis (although the network began operating in 2003).

2010–2013 | Initial Phase

- First AMHS interconnections
- Dominant technology: VSAT 64 kbps
- Simple architecture, star topology
- Focus: basic interoperability

2014–2018 | Regional Expansion

- Progressive incorporation of SAM States
- Increase in AMHS adjacencies
- First redundant routes
- Consolidation of key nodes

2019–2021 | Technological Transition

- Start of migration from VSAT → MPLS
- Introduction of external gateways (USA, Africa, Central America, Caribbean, Europe)
- Significant improvement in latency and stability
- First measurable availability gains

2022–2023 | Optimization and Resilience

- MPLS established as primary network
- VSAT shifted to backup role
- Integration of Panama and new interregional routes
- Measurable improvement in service continuity

2024–2025 | Operational Maturity

- New P1 interconnections (e.g., Bolivia–Chile)
- Regional routing optimization
- REDDIG consolidated as critical CNS infrastructure
- Preparation phase for REDDIG III

Availability Correlation

There is a direct correlation between the network evolution timeline and service availability, demonstrating that:

- Migration to MPLS,
- Architectural optimization, and
- Strengthened interconnections

have progressively improved operational performance and service continuity across the REDDIG network.

Availability Correlation

Direct relationship between timeline ↔ availability

Period	Dominant	Observed Availability	Technical Explanation
2010–2013	VSAT	Medium	Satellite dependency, variable latency
2014–2018	VSAT	Medium–High	Increased operational experience, but same technology
2019–2021	Hybrid (VSAT/MPLS)	High	Redundancy and alternative routing
2022–2025	MPLS (primary)	Very High	QoS, low latency, centralized management

The sustained increase in availability is not incidental; it is directly correlated with the technological migration and the optimization of the REDDIG topology.

Cross-reference with the maintenance/incident chart

Integrated interpretation

Phase	Volume of Interventions	Type of Interventions	Correct Interpretation
2010–2013	Low	Commissioning	Small-scale network
2014–2018	Medium	Expansion and adjustments	Network growth
2019–2021	High	Technological migration	Structural transformation
2022–2025	Medium–Low	Optimization and monitoring	Mature network

Key point: The increase in technical interventions during 2019–2021 does not indicate degradation, but rather an active modernization phase, with a subsequent positive impact on stability and availability.

The combined analysis of the implementation timeline, availability indicators, and the volume of technical interventions demonstrates a coherent and well-planned evolution of the REDDIG network. Periods of higher technical activity coincide with phases of expansion and technological migration, while the most recent years reflect a mature, stable, and resilient network, aligned with ICAO regional objectives for the SAM Region.