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(NACC/WG/11)**

Guatemala City, Guatemala, September 21-25, 2026

**Agenda Item 3: Presentation of progress on the action plans of the Task Forces comprising the
NACC/WG and progress on regional work.**

**OUTCOMES OF FSMP/WG/23: PRIORITIES FOR THE MANAGEMENT AND PROTECTION OF THE
AERONAUTICAL SPECTRUM IN THE CAR REGION**

(Presented by the Aeronautical Frequency Management Task Force: FREQ/TF)

EXECUTIVE SUMMARY

The Twenty-Third Meeting of the Frequency Spectrum Management Panel Working Group (FSMP/WG/23), held in Lima, Peru, from 31 August to 11 September 2026, examined matters with a direct impact on the safety, resilience and modernization of communications, navigation and surveillance (CNS) in the CAR Region. Regional priorities include the protection of the aeronautical spectrum from new radiocommunication services; preparation for the 2027 World Radiocommunication Conference (WRC-27) of the International Telecommunication Union (ITU); protection of radio altimeters in the 4 200–4 400 MHz band; preparation for L-band Digital Aeronautical Communications System (LDACS) and its coexistence with DME/UAT/SSR/ADS-B/ACAS/MLAT; radio frequency interference management; the evolution of HYCON and data link capacity; and preparation for RPAS/AAM, 6G/IMT and other future systems. This Working Paper proposes specific responsibilities for States/Territories, Civil Aviation Authorities (CAAs), Air Navigation Service Providers (ANSPs) and the NACC/WG Task Forces and includes in the Appendix the supporting regional technical report.

Action:	Suggested actions are presented under item 4 of this working paper.
<i>Strategic Objectives:</i>	• Every Flight is Safe and Secure • Aviation is Environmentally Sustainable • Aviation Delivers Seamless, Accessible, and Reliable Mobility for All • No Country Left Behind
<i>References:</i>	• Annex 10 — Aeronautical Telecommunications, Volume V. • Doc 9718 — Handbook on Radio Frequency Spectrum Requirements for Civil Aviation. • ITU Radio Regulations. • FSMP/WG/23 documentation. • Appendix to this Working Paper.

1. Introduction

1.1 ICAO seeks to ensure that international civil aviation maintains sufficient, protected and sustainable access to the radio frequency spectrum required for communications, navigation and surveillance/air traffic management (CNS/ATM) systems. The FSMP advises the Air Navigation Commission on spectrum matters, contributes to ITU-R studies and supports the development of the ICAO position for World Radiocommunication Conferences (WRCs).

1.2 FSMP/WG/23 examined the protection and planning of the aeronautical spectrum in light of new radio and satellite applications, preparation for WRC-27, and the evolution of regulatory and guidance material. During the preparatory workshop, results were also presented from frequency management validation activities in the NAM/CAR Region, together with a draft harmonized frequency management procedure. The Appendix to this Working Paper contains the report on the items addressed during the event.

1.3 For the CAR Region, this work requires moving from a management approach focused mainly on individual assignments to an integrated approach linking safety, CNS resilience, regional planning, electromagnetic compatibility, interference monitoring and preparation for future systems.

2. Discussion

2.1 Effective protection of the aeronautical spectrum depends on the active participation of States and Territories, coordination among CAAs, ANSPs and national spectrum regulators, and support for ICAO positions at WRC-27 and other ITU forums.

2.2 CAAs and ANSPs should not regard frequency management as an external or ancillary activity to their operations, but rather as an institutional priority directly linked to the safety, continuity and modernization of CNS services. To this end, they should assign competent personnel and sufficient resources to spectrum management; assess its operational impact; establish mechanisms and indicators to measure spectrum performance and detect, record, analyse and mitigate interference; systematically analyse the agendas and outcomes of the various WRCs; and anticipate, analyse and plan spectrum requirements associated with future technological and operational implementations.

2.3 The information reviewed identifies the following issues as being of particular relevance to the CAR Region: coexistence of radio altimeters with IMT/5G/6G; LDACS and its coexistence in the L-band with DME, UAT, SSR, ADS-B, ACAS and MLAT/WAM; radio frequency interference; RPAS/AAM and Detect and Avoid; satellite and space communications; HYCON and VDL/SATCOM capacity; and the evolution of 6G/IMT and NTN technologies.

2.4 Priorities identified for the CAR Region:

Priority 1: Spectrum governance and coordination. Strengthen coordination among CAAs, ANSPs and national regulators, designate technical points of contact, and ensure that national telecommunications decisions take into account the protection of aeronautical safety services.

Priority 2: Regional frequency database. Maintain and validate the CAR database as an operational baseline, incorporating assignments, equipment, coverage, power/EIRP, antenna characteristics, operational status and planned changes.

Priority 3: WRC-27 and ITU/CITEL coordination. Support ICAO positions, promote the inclusion of aviation specialists in national delegations, and monitor agenda items with an impact on CNS.

Priority 4: Protection of radio altimeters. Develop a CAR approach to assess coexistence and interference in the 4 200–4 400 MHz band and adjacent bands, considering 5G/6G, power, unwanted emissions, antennas, flight path, operational phase and aggregate interference.

Priority 5: Preparation for LDACS. Develop a regional roadmap for channel planning and coexistence with existing L-band systems, including specific conditions around UAT 978 MHz and 1030/1090 MHz.

Priority 6: RFI and CNS resilience. Strengthen national and regional processes for reporting, investigating, escalating and mitigating interference, and share technical information and lessons learned.

Priority 7: Future communications/HYCON. Quantify VDL/SATCOM capacity and traffic, classify safety/non-safety and urgent/non-urgent traffic, preserve qualified safety links, and monitor the regulatory evolution of HYCON before creating new operational dependencies.

Priority 8: Emerging systems. Maintain technical monitoring of RPAS/AAM, DAA, 6G/IMT, NTN, UWB and other developments that may require spectrum or affect existing aeronautical systems.

2.5 Priorities for ANSPs

- Maintain complete and validated technical inventories of CNS assignments and communicate new assignments, modifications and withdrawals in a timely manner.
- Implement formal RFI procedures, including evidence collection, technical analysis, coordination with the regulator and operational contingency measures.
- Provide engineering data and operational scenarios for compatibility studies, particularly radio altimeter/IMT and LDACS/UAT/DME/surveillance.
- Conduct an LDACS readiness assessment considering operational need, coverage, L-band occupancy, surveillance environment, airports and cross-border effects.
- Measure VDL/SATCOM utilization and classify ATS, AOC and other flows in order to establish a regional capacity baseline.
- Integrate spectrum risks into the CNS lifecycle, procurement processes, safety assessments, change management, continuity and modernization.

2.6 Priorities for the NACC/WG Task Forces

FREQ/TF: Lead validation of the CAR database; WRC-27 coordination; RA/5G/6G methodology; RFI; 6G/IMT/NTN monitoring; and spectrum planning for future systems.

Required coordination: CAAs, ANSPs, regulators, COMM/TF and SURV/TF.

Expected product: CAR programme for spectrum safety and resilience; regional criteria; annual follow-up.

COMM/TF: Assess VDL/SATCOM capacity, traffic classification, HYCON, LDACS and future communications needs.

Required coordination: FREQ/TF, ANSPs and operators/CSPs, as applicable.

Expected product: Capacity baseline and communications/LDACS roadmap.

SURV/TF: Provide SSR, ADS-B, ACAS, MLAT/WAM and DAA requirements and data for coexistence studies and L-band planning.

Required coordination: FREQ/TF and COMM/TF.

Expected product: Surveillance compatibility criteria and operational scenarios.

AMCD/TF: Define flight scenarios, operational phases, TBO needs and ATM consequences of CNS interference or loss/degradation.

Required coordination: FREQ/TF, COMM/TF and SURV/TF.

Expected product: Operational scenarios for compatibility and contingency studies.

AGA/TF: Support analysis of the airport environment, transmitter locations, RA protection and aircraft separation scenarios on the surface.

Required coordination: FREQ/TF, ANSPs and airports.

Expected product: Airport data and criteria for coexistence studies.

MET/TF: Monitor spectrum issues that may affect meteorological systems and the benefits/impacts of relevant passive services.

Required coordination: FREQ/TF and regulators.

Expected product: MET requirements incorporated into regional positions and studies.

3. Conclusions

3.1 Spectrum management should be treated as a function of safety, resilience and continuity of CNS services, and not merely as an administrative frequency assignment process.

3.2 The CAR Region requires early regional coordination for LDACS, radio altimeter protection, RFI and future systems, due to the cross-border nature of the spectrum and coexistence with existing CNS infrastructure.

3.3 The regional database should be maintained as a validated operational baseline, with sustained ANSP participation and CAA oversight.

3.4 Compatibility assessments should use representative operational scenarios and consider transmitter and receiver characteristics, geometry, altitude, phase of flight, antennas, aggregate emissions and airport conditions.

3.5 Preparation for WRC-27 requires an ongoing relationship between the aeronautical community and national spectrum regulators, as well as the participation of aviation specialists in national delegations whenever possible.

3.6 The NACC/WG should maintain a multi-year programme coordinated by the FREQ/TF, with participation from COMM/TF, SURV/TF, ATM/TF, AGA/TF, MET/TF and other relevant groups, to follow up on the priorities identified.

3.7 CAAs and ANSPs should institutionalize spectrum management as an operational priority, assigning adequate human, technical and financial resources, as well as governance and performance measurement mechanisms. This capability should include interference monitoring and analysis, continuous follow-up of WRC agendas and decisions, and advance planning for future CNS implementations and emerging technologies.

4. Suggested Action

4.1 The Meeting is invited to:

- a) take note of the outcomes of FSMP/WG/23 and the analysis for the CAR Region contained in this Working Paper and Appendix A;
- b) urge States and Territories to ensure that their CAAs and ANSPs recognize spectrum management as an operational and institutional priority, strengthen coordination mechanisms with national spectrum regulators, designate or confirm their frequency management points of contact, and assign competent personnel and sufficient resources for this function;
- c) request CAAs and ANSPs to establish mechanisms and indicators to assess the impact and performance of spectrum management; detect, record, analyse and mitigate interference; maintain and validate technical information on CNS assignments; analyse the agendas and decisions of the various WRCs; and anticipate and plan spectrum needs for future technological and operational implementations;
- d) support ICAO positions for WRC-27 and promote, to the extent possible, the participation of civil aviation representatives and aeronautical specialists in national delegations;
- e) task the FREQ/TF, in coordination with COMM/TF, SURV/TF, AMCD/TF, AGA/TF, MET/TF and other relevant groups, with preparing and monitoring a 2027–2030 CAR Aeronautical Spectrum Safety, Resilience and Future Systems Programme;
- f) prioritize within that programme: regional database; WRC-27; radio altimeters/5G/6G; RFI; LDACS and L-band coexistence; VDL/SATCOM capacity and HYCON; and RPAS/AAM, DAA, NTN and emerging technologies; and
- g) request the FREQ/TF to report periodically to the NACC/WG on progress, risks, coordination needs and actions required by States, Territories and ANSPs.

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APPENDIX

TITLE REPORT ON THE TWENTY-THIRD MEETING OF THE FREQUENCY SPECTRUM MANAGEMENT PANEL WORKING GROUP (FSMP/WG/23)

Implications, conclusions and recommendations for the CAR Region
Addressed to Civil Aviation Authorities (CAA) and Air Navigation Service Providers (ANSP)
Lima, Peru, 31 August–11 September 2026 | Regional follow-up: 2027–2030

Executive Summary

The FSMP/WG/23 material reviewed for this report identifies several developments in spectrum management that are directly relevant to the Caribbean (CAR) Region. The main operational implications concern: i) preparation for the L-band Digital Aeronautical Communications System (LDACS) and its coexistence with current navigation and surveillance systems; ii) the protection and modernization of radio altimeters in the 4 200–4 400 MHz band in the context of 5G/6G deployments; and iii) the evolution of the Hybrid Communications Network (HYCON), including the appropriate boundary between protected safety links and commercial/non-safety connectivity.

Accordingly, the regional priority should shift from isolated frequency assignment to an integrated safety and resilience management framework for spectrum and future systems. CAAs should strengthen regulatory coordination, national spectrum governance and the protection of safety services; ANSPs should improve frequency inventories, operational requirements, interference monitoring, compatibility assessments and implementation readiness. Regional coordination is essential, since LDACS frequency planning, UAT compatibility, cross-border interference, satellite/terrestrial communications and emerging IMT systems cannot be effectively managed by each State in isolation.

Status note: Several FSMP/WG/23 documents used in this report are working papers or preliminary proposals. Their technical content is valuable for regional preparation, but the proposed SARPs, manuals, options and dates should not be considered ICAO-adopted requirements until the relevant approval process has been completed.

1. Objective and scope

This report translates the main technical deliberations of FSMP/WG/23 into practical conclusions and recommended actions for Civil Aviation Authorities and Air Navigation Service Providers in the CAR Region. It focuses on matters that may affect the continuity, safety, capacity and modernization of CNS services, and proposes a regional implementation framework for the 2027–2030 period.

2. Main conclusions for the CAR Region

2.1 Preparation for LDACS and L-band coexistence

LDACS is progressing toward a consolidated SARPs framework and is intended to support aeronautical mobile communications in en-route, terminal and airport environments. The proposed system supports services such as ATN-B1, ATS-B2, AOC, digital voice and ADS-C, with ATN/IPS integration. For the CAR Region, the immediate issue is not mandatory implementation but preserving spectrum conditions and regional readiness for future use.

Compatibility testing covered ACAS, ADS-B IN, MLAT/WAM, SSR and UAT. The results were generally positive; however, specific attention is required for UAT around 978 MHz, off-aircraft ACAS and air-to-air compatibility on airport surfaces. The proposed material for Annex 10, Volume V, requires regional agreement on the allocation of LDACS channels adjacent to UAT and includes provisions on guard bands and protection around 1030/1090 MHz.

Regional implication: the CAR Region should establish an LDACS readiness workstream before national implementations occur. This workstream should integrate frequency planning, DME/UAT/SSR/ADS-B/ACAS/MLAT coexistence, airport surface scenarios, EIRP criteria and cross-border coordination.

2.2 Protection of radio altimeters and coexistence with 5G/6G

FSMP/WG/23 continued work on proposed SARPs for radio altimeters and on an ICAO technical manual for radio altimeters. The material recognizes the operational importance of radio altimeters in the 4 200–4 400 MHz band and their integration with flight control, automatic landing, terrain awareness, collision avoidance and wind shear detection systems. The proposed framework addresses interference tolerance and coexistence with terrestrial mobile systems operating in adjacent spectrum.

For CAR Region administrations, compatibility studies should consider both fundamental emissions outside the 4 200–4 400 MHz band and unwanted emissions within it. Assessments should include transmitter power, antenna directivity and AAS characteristics, receiver performance, altitude, trajectory, operational phase, minimum separation and aggregate interference, rather than relying solely on frequency separation.

The proposed SARPs framework also contains a future transition concept for radio altimeters manufactured from 1 January 2036 onward. This is useful for long-term planning but remains proposed material and should not yet be presented as an adopted applicability date.

2.3 HYCON, data link capacity and use of commercial links

The FSMP/WG/23 material reflects an ongoing discussion on how commercial/non-safety links could complement protected aeronautical safety links. The documents agree that growth in data link traffic is creating capacity pressure, but present different approaches regarding the transport of safety traffic through commercial networks.

One approach emphasizes transferring non-safety and non-urgent traffic while keeping safety and flight regularity traffic on protected links. Other HYCON material proposes using commercial links as part of an overlay architecture, with monitoring, security and reversion to qualified safety links. Since policy, SARPs, accountability and spectrum implications remain under discussion, CAR States should avoid premature national assumptions that commercial connectivity is equivalent to protected aeronautical spectrum for safety-of-life services.

A useful first regional step is to establish a data link traffic and capacity baseline: classify ATS, AOC and other flows; identify safety/non-safety and urgent/non-urgent traffic; quantify VDL/SATCOM load; assess the benefits of traffic transfer; and only then determine whether additional protected capacity or future connectivity solutions are required.

3. Conclusions for the CAR Region

C1 – Spectrum management is a safety and resilience function. Spectrum management should be considered part of safety, CNS resilience and continuity of air navigation services, and not merely an administrative frequency assignment activity.

C2 – Regional coordination is essential for future L-band modernization. The introduction of LDACS requires coexistence with systems already operating in the L-band. Therefore, the CAR Region needs coordinated planning before individual implementations, particularly around 978 MHz UAT, surveillance functions at 1030/1090 MHz and DME environments.

C3 – The CAR Region frequency database should evolve into an operational spectrum baseline. States and ANSPs need validated information on assignments, equipment, coverage, service status, protection criteria and planned changes, so that compatibility studies and regional coordination are based on current operational data.

C4 – Radio altimeter protection requires joint governance between aviation and telecommunications. CAAs, ANSPs and national telecommunications/spectrum regulators need formal coordination mechanisms for decisions affecting the 4 200–4 400 MHz band and adjacent bands.

C5 – Compatibility assessments must be scenario-based. Future studies should incorporate operational geometry, altitude, antenna characteristics, transmitter power, receiver tolerance, aggregate interference and airport-specific conditions.

C6 – Existing safety spectrum must remain protected while HYCON matures. The documents reviewed do not establish a single final ICAO position on transporting safety traffic over commercial links. Consequently, regional implementation should preserve qualified safety links and monitor ICAO/FSMP developments before adopting new operational dependencies.

C7 – Data link congestion must be quantified before spectrum solutions are selected. Traffic classification and capacity measurement should precede decisions on additional spectrum, transfer to commercial links or new communications architectures.

C8 – The CAR Region needs a structured preparedness programme for future systems. LDACS, HYCON, coexistence with 5G/6G, RPAS/AAM and future WRC matters should be incorporated into a multi-year regional spectrum work programme, rather than addressed only when interference or implementation issues arise.

4. Recommendations for Civil Aviation Authorities

Establish or strengthen a national aeronautical spectrum governance mechanism linking the CAA, ANSP, telecommunications/spectrum regulator, military authorities where applicable, airport operators and other relevant stakeholders.

Designate a national aeronautical frequency management point of contact and an alternate, responsible for regional coordination with ICAO and for maintaining national spectrum data.

Require aviation safety assessments and technical compatibility studies before authorizing telecommunications deployments that may affect aeronautical safety systems, particularly around radio altimeters and other CNS safety bands.

Ensure that national 5G/6G licensing and deployment processes include an effective consultation mechanism with aviation authorities and ANSPs for installations near airports and flight paths.

Preserve aeronautical safety allocations and avoid treating commercial/non-safety spectrum as having equivalent regulatory protection unless the applicable ICAO/ITU framework and operational approvals support such use.

Include spectrum protection and interference reporting, investigation and mitigation in State oversight of CNS services and contingency planning.

Support regional LDACS readiness by providing accurate information on UAT, DME, SSR, ADS-B, ACAS, MLAT/WAM and other relevant L-band infrastructure.

Ensure active national participation in ICAO FSMP follow-up, CITEL/ITU preparations and coordination for WRC-27/WRC-31 on agenda items affecting aviation.

5. Recommendations for Air Navigation Service Providers

Maintain a complete and validated inventory of operational CNS frequency assignments, including location, frequency, bandwidth, equipment type, coverage, EIRP/power, antenna characteristics, operational status and planned changes.

Implement a formal radio frequency interference (RFI) reporting and response process, with operational escalation criteria, evidence collection, technical analysis and coordination with the national spectrum regulator.

Provide the operational scenarios and engineering data needed for radio altimeter/IMT, LDACS/UAT/DME/surveillance and other compatibility studies.

Begin an LDACS readiness assessment covering operational need, intended services, candidate coverage, L-band occupancy, UAT deployment, surveillance environment, airport surface separation and possible cross-border effects.

Measure data link utilization and classify traffic by ATS/AOC/other uses, safety relevance, urgency and operational phase, in order to establish a CAR capacity baseline for VDL and SATCOM.

Maintain protected and qualified safety communications as the operational baseline while HYCON concepts, SARPs implications, accountability and reversion requirements continue to mature.

Integrate spectrum risks into CNS life-cycle planning, procurement, system changes, safety assessments, continuity of operations and modernization programmes.

Contribute technical specialists to the regional FREQ/TF and compatibility studies, and share interference experience, measurement data and mitigation lessons with other CAR States.

Priority	Regional action	Responsible/participants	Target	Expected output
High	Validate the CAR aeronautical frequency database	ICAO NACC/FREQ-TF; CAA; ANSP	2026	Regional operational spectrum baseline
High	Establish/confirm national spectrum points of contact and CAA–ANSP–regulator mechanisms	States/Territories	2026	National coordination network
High	Develop the CAR radio altimeter protection methodology	ICAO NACC/FREQ-TF; CAA; ANSP; regulators	2027	Common RA/5G/6G assessment framework
High	Strengthen regional RFI reporting and monitoring	ICAO NACC; States; ANSP	2027–2028	Regional reporting/mitigation process
Medium	Develop the CAR LDACS readiness and frequency planning framework	FREQ-TF/COMM-TF with surveillance/navigation experts	2027–2028	Regional LDACS roadmap
Medium	Conduct an LDACS/UAT/DME/surveillance compatibility assessment	Regional technical group	2028	Compatibility criteria and channel planning guidance
Medium	Establish the CAR data link traffic/capacity baseline	COMM-TF; ANSP; inputs from operators/CSP as applicable	2027–2028	VDL/SATCOM capacity report and traffic classification
Medium	Monitor HYCON development and assess its applicability in the CAR Region	COMM-TF/FREQ-TF	2027–2030	Regional readiness assessment
Medium	Coordinate aviation contributions for WRC-27 and post-WRC implementation	ICAO NACC; States; regulators	2026–2028	Coordinated regional positions/actions
Ongoing	Monitor 6G/IMT, NTN, RPAS/AAM and emerging spectrum risks	FREQ-TF	2027–2030	Annual spectrum review for emerging technologies

6. Proposed regional follow-up mechanism

It is recommended that the NACC/WG, through the FREQ/TF and in coordination with the COMM/TF, SURV/TF and other relevant groups, maintain a consolidated Work Programme on Spectrum Safety and Resilience for the CAR Region. Progress should be reviewed at least once a year using measurable indicators: percentage of validated frequency records; States with designated points of contact; States with formal coordination among CAA, ANSP and regulator; number of reported and resolved RFI events; completed radio altimeter compatibility assessments; completed LDACS readiness studies; and States contributing to WRC preparations.

7. Recommended message for CAR Region authorities

For Civil Aviation Authorities: protect aeronautical spectrum as a strategic safety resource, ensure that national telecommunications decisions are coordinated with aviation, and establish the regulatory and institutional mechanisms needed for future CNS systems.

For Air Navigation Service Providers: maintain accurate technical data, monitor interference, quantify communications demand, provide operational scenarios for compatibility studies and incorporate spectrum resilience into CNS modernization and contingency planning.

8. General recommendation

The CAR Region should establish a CAR Aeronautical Spectrum Safety, Resilience and Future Systems Management Framework for 2027–2030. The framework should link operational needs, service/traffic classification, spectrum requirements, compatibility assessment, regional coordination, frequency assignment, implementation, interference monitoring, mitigation, performance validation and technological migration. This approach will enable the Region to protect the current CNS infrastructure critical to safety while preparing in a controlled manner for LDACS, the evolution of data link architectures, coexistence with 5G/6G and other future systems.