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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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Item 3: Strengthening collaboration to address frequency challenges

Session 3: Managing frequency interference

Virtual Workshop on Aeronautical Frequency Management for the WACAF Region, from 4 to 5 December 2025

Atelier virtuel sur la gestion des fréquences aéronautiques – Région WACAF
4 au 5 décembre 2025

SESSION 3: MANAGING FREQUENCY INTERFERENCE

ICAO WACAF Regional Office

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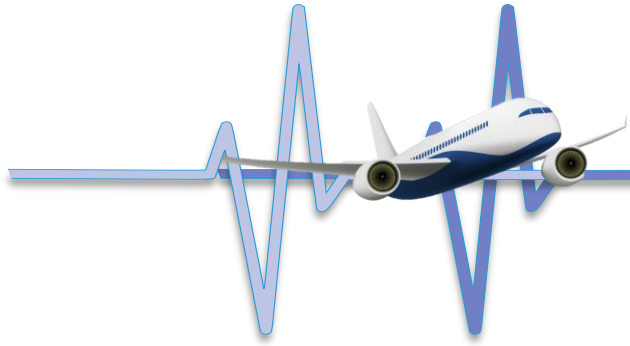
Date: 5 December 2025



Outline

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1.1 Why this topic matters?

1.2 Regional context

1.3 Presentation objectives

02 Frequency Interference: Types, Causes, and Operational Impact

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04 Conclusion

Key takeaways

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01

Introduction

1.1 Why this topic matters?

1.2 Regional context

1.3 Presentation objectives

1. Introduction

1.1 Why this topic matters?

- Reliable aeronautical communications are critical for safety of air navigation.

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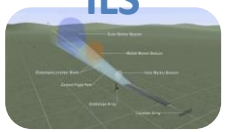


1. Introduction

1.1 Why this topic matters? Con’td

- Frequency interference disrupts ATS communications and jeopardizes the integrity of the CNS/ATM system.
- Impacts extend to:
  - VHF communications
  - Navigation aids and GNSS services.
  - Critical airborne equipment (e.g., radio altimeters) …
- Consequences include:
  - Compromised ATS communication integrity.
  - Degraded situational awareness.
  - Operational inefficiency.
  - Increased safety risks for aircraft operations and air traffic management…

1. Introduction

1.2 Regional context : AFI and focus on WACAF Region

- WACAF region faces growing traffic, spectrum congestion, rising frequency interference and cross-border coordination challenges.

- The **First Meeting of the AFI ATS Events Analysis Group (AEAG/1),** held in Libreville, Gabon (13–17 October 2025), analyzed 455 ATS-related events (2023–2024) across 10 FIRs.

  - ✓ **Key findings :** Communication deficiencies and interference were major contributors to Loss of Separation and AIRPROX.
  - ✓ **Observed Issues (2023–2024):**

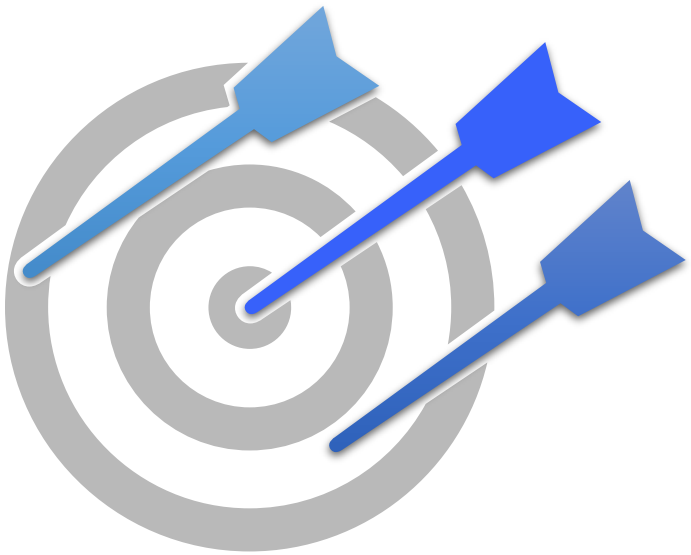
    - ❑ Radio-frequency interference and limited VHF coverage were recurrent.
    - ❑ Ground/Air communication unserviceability and onboard transceiver malfunctions linked to separation losses.

    - ❑ Delayed inter-ACC coordination due to insufficient use of HF/VHF/CPDLC tools.
    - ❑ Facility-COM issues ranked among the top 8 event categories (33 reports in 2023)

- GNSS radio-frequency interference (RFI) occurrences have also been reported across the region

1. Introduction

1.3 Objectives of Session 3



- Understand key types of frequency interference and their impact on Air traffic operations
- Review effective reporting and resolution mechanisms for interference events
- Foster regional collaboration to mitigate interference and enhance CNS/ATM reliability

02

Frequency Interference: Types, Causes, and Operational Impact

2. Frequency Interference: Types, causes, and operational Impact

Type and possible causes of interference

1

Unintentional Interference

- Poor equipment maintenance
- Incorrect or non coordinated frequency assignments
- Overlapping coverage areas
- Emissions from defective equipment …

2

Intentional Interference

- Deliberate jamming or unauthorized transmissions.
- Malicious activities targeting aeronautical frequencies.

3

External Sources

- Unauthorized broadcasting or telecom emissions
- Non-aeronautical systems (e.g., FM radio, telecom towers).
- Radio FM interfering with VHF COM bands..

2. Frequency Interference: Types, causes, and operational Impact

2.2 Operational Impact

Operational impact of interference on aeronautical frequencies used for Communication, Navigation and Surveillance:

- ✓ Loss of essential communications (between pilots and ATC, ..)
- ✓ Inaccurate or incorrect navigation
- ✓ Dangerous landing approaches
- ✓ Degraded situational awareness for controllers and pilots.

Potential Consequences

Exposes aircraft to serious, major safety risks, including:

- ✓ Loss of separation Mid-air collisions
- ✓ Inadvertent entry into restricted zones
- ✓ Landing accidents (runway excursions, collisions, CFIT)
- ✓ Delayed transmission of distress messages
- ✓ ….

Economic impact:

- Flight delays.
- Increased fuel consumption.

03

Addressing Interference

3. Addressing Interference

State-level and Regional actions

State level

- Establish robust reporting and resolution mechanisms in coordination with national spectrum authorities.
- *Recommendations:*
  - ✓ 👨‍💼 Designate national focal points for interference management.
  - ✓ 📐 Harmonize frequency plans across all aviation stakeholders.
  - ✓ 📡 Engage telecom regulators to prevent unauthorized emissions and resolve conflicts.

Regional level

- Interference issues are regularly addressed through regional platforms, including:
- APIRG IIM Sub-Group and CNS projects (COM 3, NAV, SPEC).
- *Recommendations:*
  - 🌎 Strengthen the AFI Frequency Management Task Force under APIRG and AFI IIM spectrum projects : *RFI reporting templates developement, guidance for RFI management,*
  - 🛠️ Implement conclusions from AASPG/APIRG and other regional bodies to mitigate radio interference.
- 🤝 ICAO AFI Regional Office coordination to resolve RFI issues (VSAT, GNSS, VHF COM, NAV) among States.

04

Conclusion

4. Conclusion

Key Takeaways

- Interference is a shared challenge requiring regional cooperation
- Effective management depends on:
  - ✓ Timely reporting
  - ✓ Efficient coordination with national spectrum/ telecom regulators
  - ✓ Technical capability
  - ✓ Cross-border coordination
- Next steps:
  - ✓ Strengthen regional monitoring
  - ✓ Improve data sharing
  - ✓ Enhance training and awareness





(*) Source of icons : flaticon, freepik

Thank You

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