



GLOBAL DEVELOPMENTS RELATED TO CNS AND SPECTRUM

**INTERNATIONAL
CIVIL AVIATION
ORGANIZATION**



GLOBAL DEVELOPMENTS RELATED TO CNS AND SPECTRUM*

9th MEETING OF IIM SUB-GROUP
Dakar, Senegal, 3 – 7 August 2026

PRESENTATION OVERVIEW

01 COMMUNICATIONS

02 NAVIGATION

03 SURVEILLANCE

04 SPECTRUM

05 INTEGRATED CNS &
SPECTRUM

06 OTHER CNSS ACTIVITIES

01

COMMUNICATIONS



1. COMMUNICATIONS

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1.1 Recent ICAO Communication related Annex Amendments Applicable on 26 November 2026

Annex	Amendment	Subject	Key Change	Expected Impact
Annex 10, Volume II Communication Procedures	Amendment 95	 Air-Ground Data Link Operations	Aligns provisions with current technical capabilities, standardizes operational procedures, and harmonizes requirements with PANS-ATM (Doc 4444) and the forthcoming 2nd Edition of the GOLD Manual (Doc 10037).	Enhanced interoperability, harmonization, and efficiency of data link operations.
Annex 10, Volume III Communication Systems	Amendment 94	 Communicati on Systems	Deletes obsolete technical provisions related to SSR Mode S Air-Ground Data Link (SP/5).	Streamlined and modernized ICAO communication system provisions.

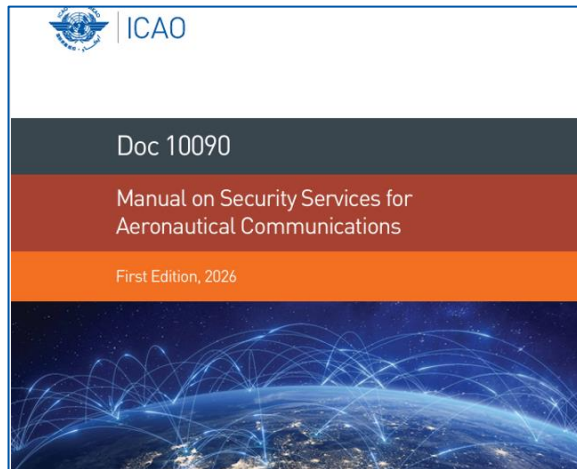


Applicable Date: 26 November 2026

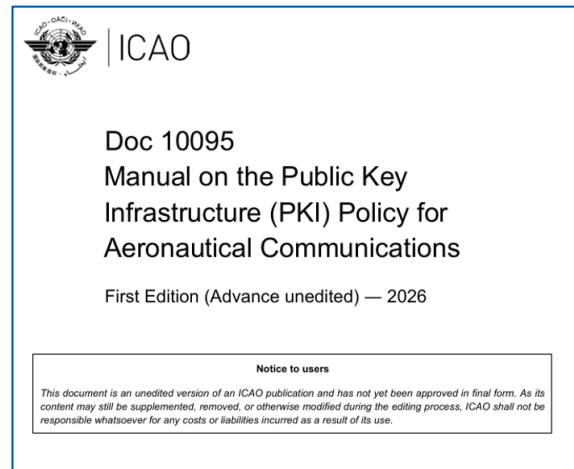
1. COMMUNICATIONS

1.2 ATN/IPS Implementation: New ICAO Guidance Material Published

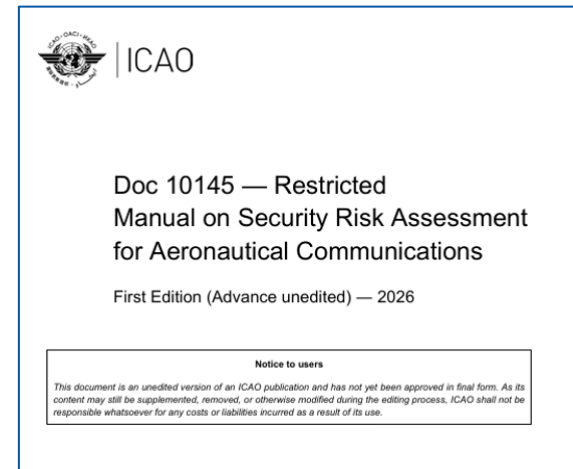
In support of the ICAO Council provisions on ATN/IPS-based information exchange adopted in March 2025, three new manuals and the third edition of Doc 9896 have been published in 2026:



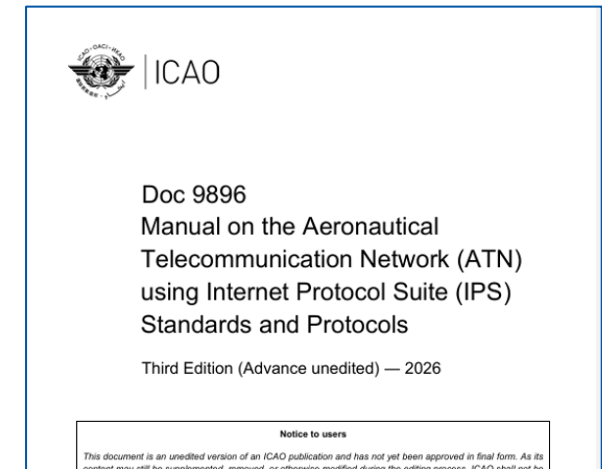
 Doc 10090 “Manual of Security Services for Aeronautical Communications”



Doc 10095 “Manual of Public Key Infrastructure (PKI) Policy for Aeronautical Communication



Doc 10145 “Manual of Security Risk Assessment for Aeronautical Communications”



Doc 9896 “Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocol, edition 3”

1. COMMUNICATIONS

1.3 Communications Panel (CP/DCIWG) Developments

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 Space-Based VHF	 LDACS	 AeroMACS
Comprehensive SARPs package completed	SARPs development progressing	AeroMACS modernization underway
PfA developed for Annex 10 Vol. III & V	PfA submission deferred pending compatibility comments	New performance-based PfA under development for Annex 10 Vol. III
Validation Report confirms technical feasibility Impact Assessment & Implementation Plan completed, Submitted to CP/DCIWG/8, ANC review planned (Sep 2026)	Inter-panel coordination ongoing (NSP/ SP)	Supports future digital airport operations
 Emerging Topics	 Other DCIWG/8 Activities	
VoIP Air-Ground Networks study ongoing under DCIWG WG-I	Air-ground data link documents maintenance and improvements	
Study initiated in October 2025	Review of the new HYCON Job Card	

Significant progress toward future aviation communications through Space-Based VHF, LDACS, AeroMACS, and next-generation IP-based communication technologies.



02

NAVIGATION



2. NAVIGATION

2.1 Recent ICAO NAV related Annex Amendments Applicable on 26 November 2026

 ANNEX 10, VOLUME I Radio Navigation Aids	
Amendment	Amendment 95
Focus Area	Performance-Based Navigation (PBN)
Key Change	Clarifies that all RNAV operations are encompassed within the PBN concept through updated definitions of RNAV, Navigation Specification and PBN.
Associated References	PBN Framework
Expected Benefit	Consistent interpretation and implementation of PBN operations.



2. NAVIGATION

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2.2 GNSS Resiliency

Complementary Positioning, Navigation and Timing (C-PNT)

Assembly Resolution A42-8 emphasizes the need for enhancing resilience to interference by maximizing the integration of all suitable infrastructure components.

Multi-Sensor Integration

Improve integration between space-based, ground-based, and airborne capabilities

Ensure individual airborne systems cannot corrupt others

Balanced Capabilities

Achieve suitable balance between terrestrial, aircraft autonomous capabilities (INS and other sensors), and space-based capabilities

Precise Time Sources

Introduce GNSS-independent time sources to enhance integrity of air and ground systems

C-PNT related provisions are expected to be completed by 2030, requiring industry commitment and support from all stakeholders

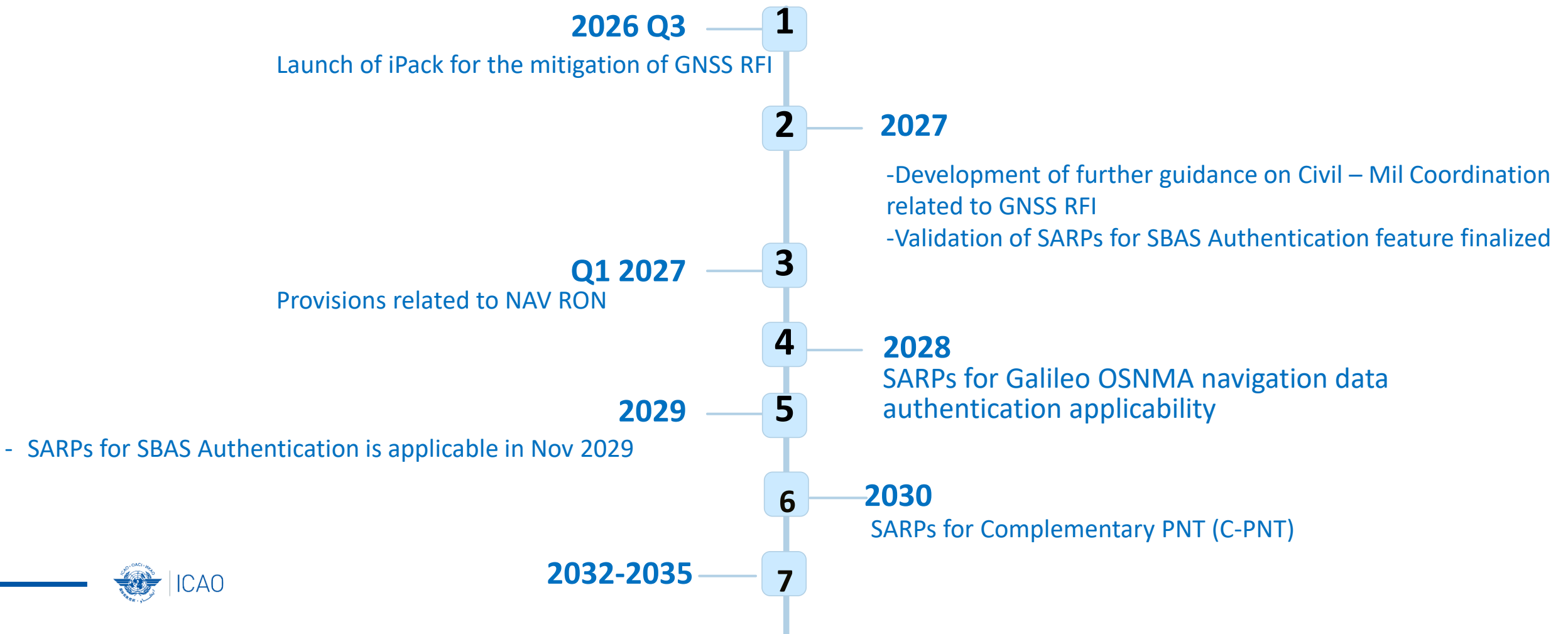


2. NAVIGATION

2.2 GNSS Resiliency

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ICAO Roadmap to enhance GNSS Resiliency



ICAO GNSS RFI Roadmap

Medium Term
To enhance the resilience and efficiency of aviation operations by optimizing ground radio navigation infrastructure, introducing RFI detection capabilities and improving civil-military coordination in managing GNSS RFI

2027 -
2029

Long Term
To ensure the resilience of aviation operations in the presence of GNSS RFI through the development and integration of technological enhancements across GNSS, along with independent timing sources

2030
onward

Short Term

To ensure safe operations during GNSS RFI events by sustaining the provision of air navigation services, by development and use of contingency procedures, and strengthening awareness and vigilance of flight crew and ATS personnel

2023 -
2026

03

SURVEILLANCE



3. SURVEILLANCE

3.1 Surveillance SARPs Modernization

Key SP/5 Outcomes

 ADS-B & SSR Modernization	 Status
SSR transponder requirements updated for compatibility with 1090 MHz ES ADS-B Version 3	Amendment 92 to Annex 10, Volume IV
Adoption	 March 2026
Applicability date	 26 November 2026

Remaining SP/5 Package

 **ACAS III technical provisions (based on ACAS Xu)**

 **Airborne Surveillance Applications**

- ADS-B IN
- Flight Interval Management (FIM)



International Civil Aviation Organization Organisation de l'aviation civile internationale Organización de Aviación Civil Internacional Международная организация гражданской авиации منظمة الطيران المدني الدولي 国际民用航空组织

Tel.: +1 514-315-1872

Ref: AN 7/66.2.1-26/17 13 April 2026

Subject: Adoption of Amendment 92 to Annex 10, Volume IV

Action required: a) Notify any disapproval before 3 August 2026; b) Notify any differences and compliance before 26 October 2026; c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 92 to the *International Standards and Recommended Practices, Aeronautical Telecommunications — Surveillance and Collision Avoidance Systems* (Annex 10, Volume IV to the Convention on International Civil Aviation) was adopted by the Council at the third meeting of its 237th Session on 25 March 2026. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 3 August 2026 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 92, to the extent it becomes effective, will become applicable on 26 November 2026.

3. Amendment 92 arises from the recommendations developed by the fifth meeting of the Surveillance Panel (SP/5).

4. The amendments are intended to support the continued evolution, safety, and efficiency of surveillance systems by enabling the use of enhanced transponder and automatic dependent surveillance — broadcast (ADS-B) capabilities. This includes provisions on ADS-B Version 3, which provides additional capabilities beyond those supported by earlier versions, such as aircraft tracking support, broadcasting of aircraft-based weather data, indication of lost C2 Link state for Remotely Piloted Aircraft Systems (RPAS) and features to support commercial space and hypersonic aircraft operations. It should be noted that ADS-B Version 3 also includes several optional avionics functions such as phase overlay, which is an optional

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3. SURVEILLANCE

3.2 Future Surveillance Developments

Key Outcomes from SP/6

 Surveillance Systems	 Guidance Material
✓ Updated ATS surveillance performance requirements ✓ ACAS broadcast message behaviour clarified ✓ ACAS interrogation protocols clarified ✓ Reed-Solomon error correction standardized ✓ Corrections to ACAS reply information coding	✓ New Surveillance Performance Requirements Manual adopted ✓ RSUR Manual renamed and updated  Updated documents to be published

Ongoing Activities

 **Interval Management (IM) airborne applications**

 **Adopted change proposal to :**

- Doc 8071 Vol. III
- Doc 9830
- Doc 9863
- Doc 9871
- Doc 9924
- Doc 9994

Updated docs are to be published

04

FREQUENCY SPECTRUM MANAGEMENT



4. FREQUENCY SPECTRUM MANAGEMENT

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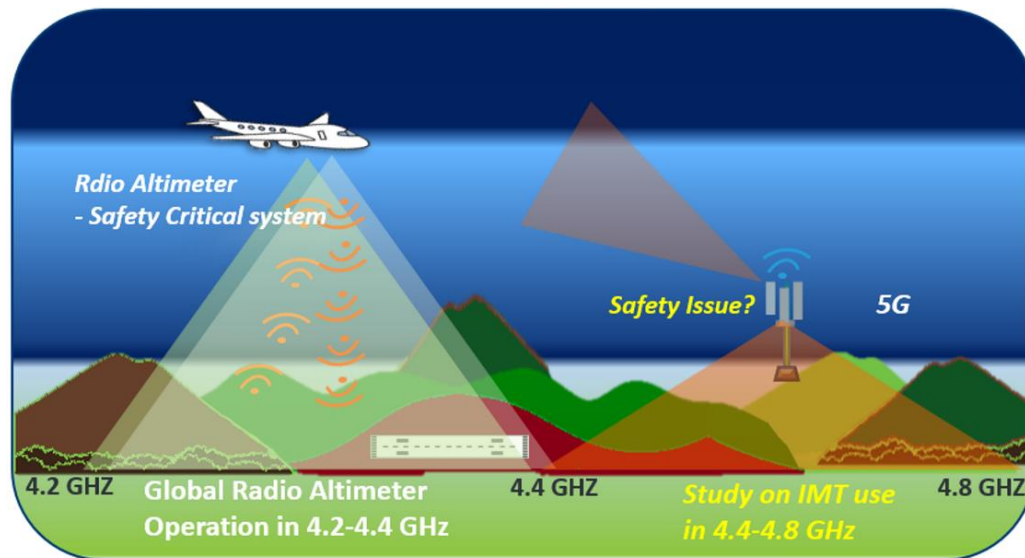
4.1 WRC 27 Agenda items – affecting Aviation

WRC-27 Agenda Item 1.7—and More —Affect Aviation Safety

Many WRC agenda items could affect aeronautical safety services! *Further collaboration is needed!*

WRC-27 Agenda Item 1.7:

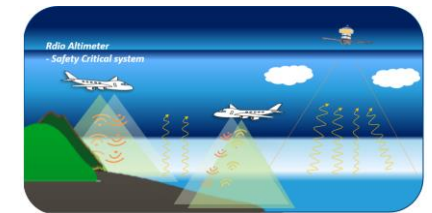
Study on IMT Use in the frequency bands 4400-4800



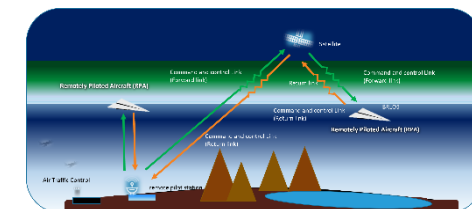
AI 1.17: Space Weather Sensors



AI 1.19: Primary allocations to the EESS passive in the frequency bands 4200-4400



AI 9.1: Urgent action by Study groups in prep for the next WRC beyond-line-of-sight C2-link for RPAS



4. FREQUENCY SPECTRUM MANAGEMENT

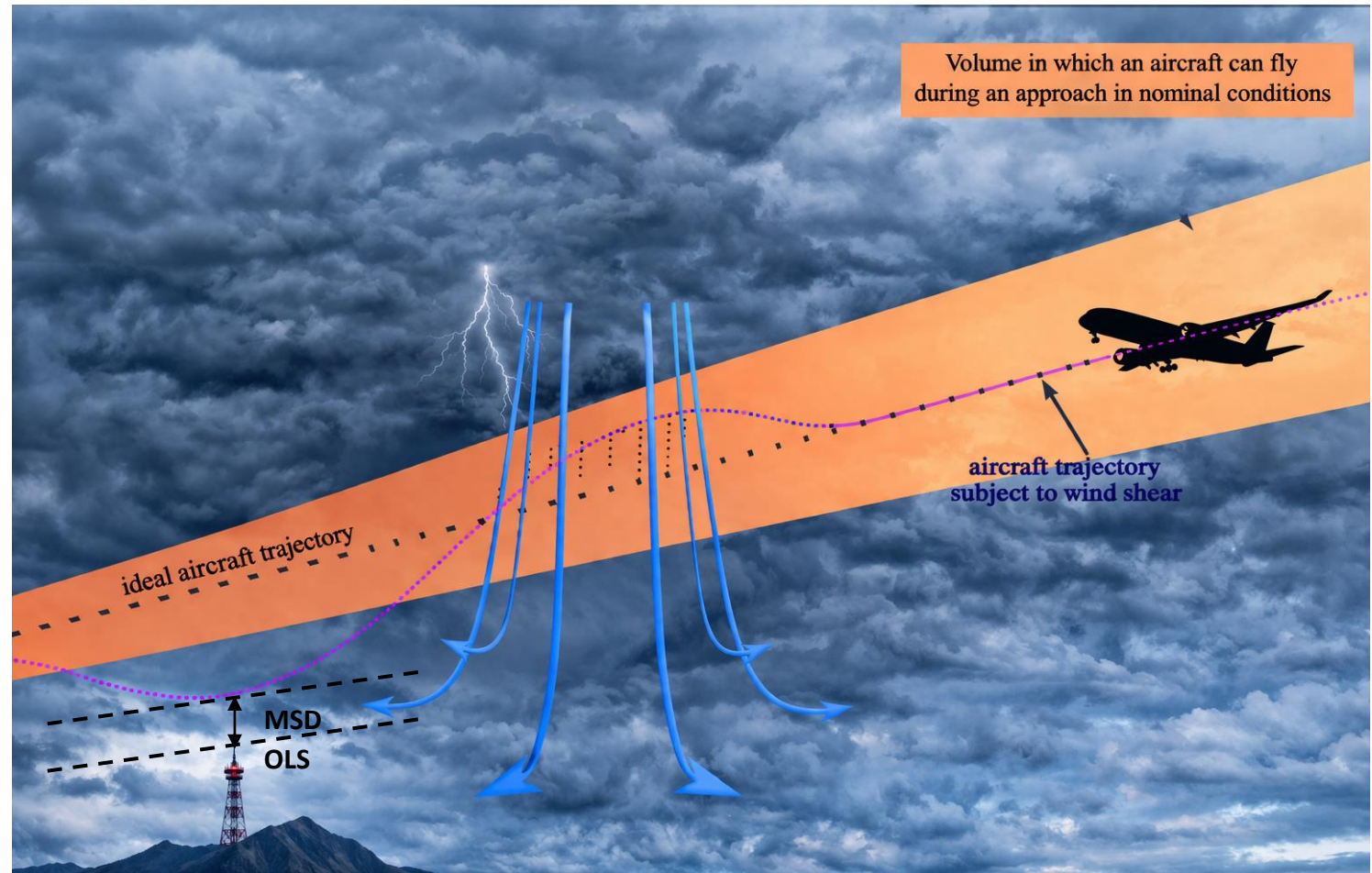
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4.1 WRC 27 Agenda items – affecting Aviation

Aviation Safety Concerns: Missing scenario: Off-nominal operations

If the radio altimeter fails to provide accurate altitude information, the consequences could be severe ...

This scenario must be thoroughly addressed under WRC-27 Agenda Item 1.7

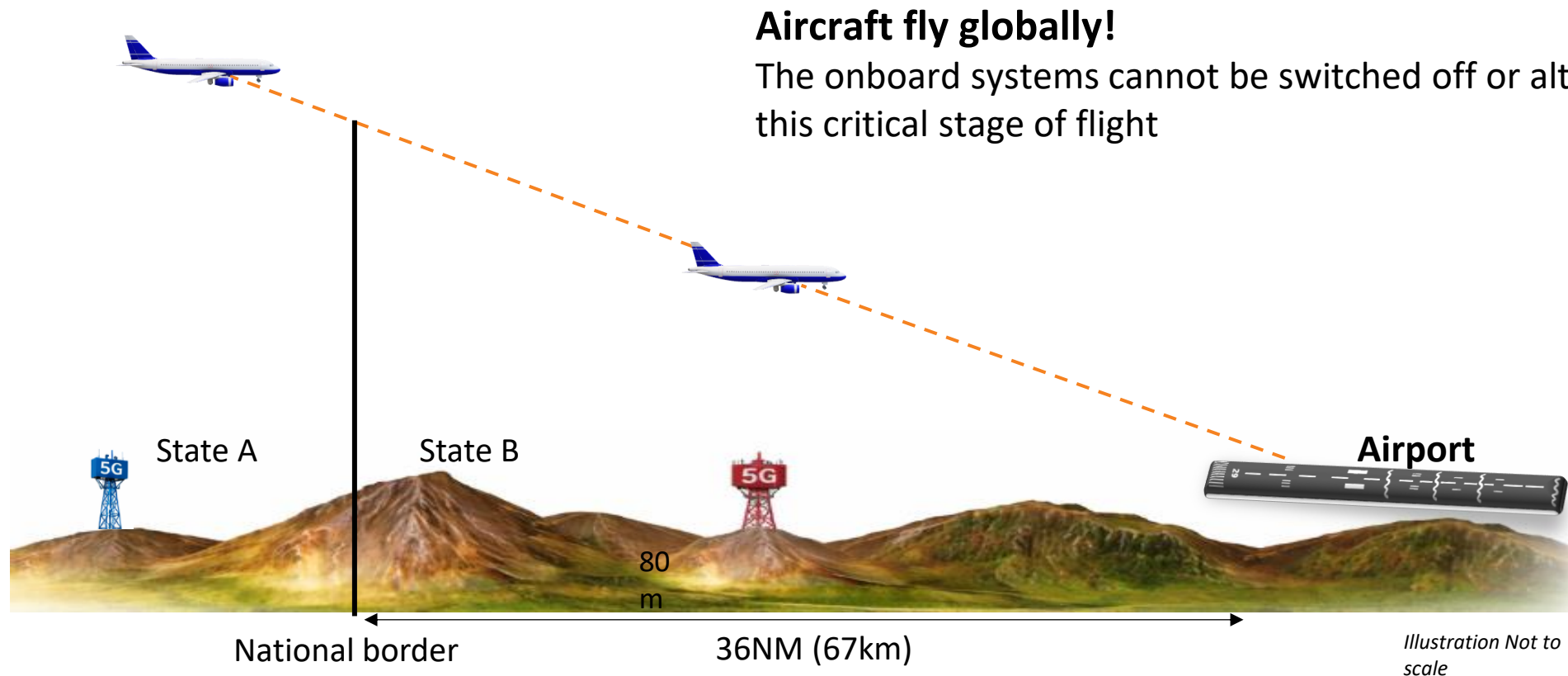


4. FREQUENCY SPECTRUM MANAGEMENT

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4.1 WRC 27 Agenda items – affecting Aviation

Aviation Safety Concerns: Misconception should be corrected (It is a global issue!)



This scenario is not a national matter but a global safety issue that must be thoroughly addressed under WRC-27 Agenda Item 1.7

4. FREQUENCY SPECTRUM MANAGEMENT

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4.2 ICAO Position for WRC-27 & the Call for State Support

Call to Action



Focused Messages

Understand the key messages to support aviation safety



Early engagement

Engage nationally and regionally to align policies



ITU Prep. Meetings & WRC

Participate in preparing meetings for the World Radio conference



Represent Aviation

Attend to represent aviation in your national designation



Upcoming spectrum meetings

2026

- ITU WP4C – Mobile Satellite Service (Apr, Oct)
- ITU WP5B – Aeronautical and RADAR (May, Nov)
- ITU WP5D – International Mobile Telecom (May, Oct)
- APT (Asia-Pacific Regional Spectrum Group)
- CEPT (European Regional Spectrum Group)
- ATU (African Regional Spectrum Group)
- ASMG (Arab Regional Spectrum Group)
- CITEL (Americas Regional Spectrum Group)

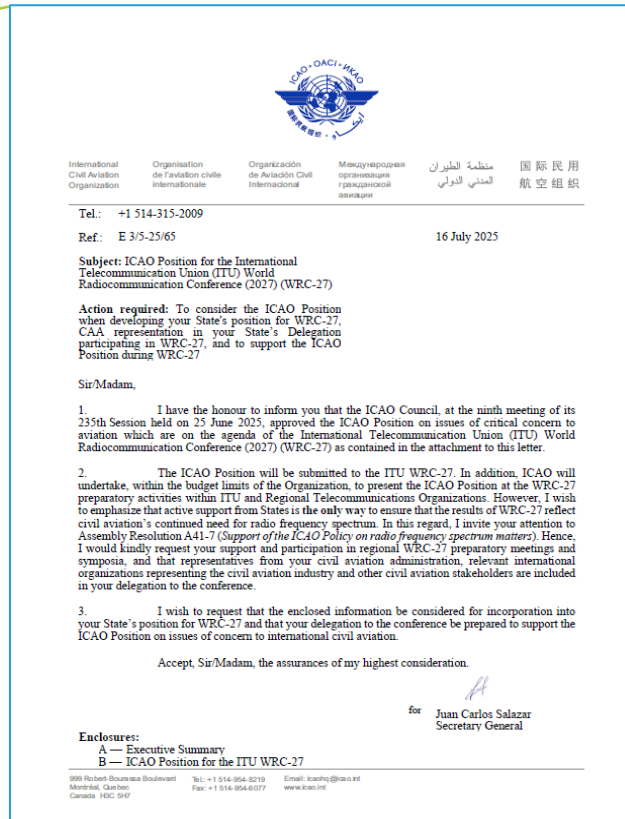
2027

- ITU Conference Preparatory Meeting; Apr 5-17; Geneva, Switzerland
- APT (Asia-Pacific Regional Spectrum Group)
- CEPT (European Regional Spectrum Group)
- ATU (African Regional Spectrum Group)
- ASMG (Arab Regional Spectrum Group)
- CITEL (Americas Regional Spectrum Group)
- **World Radio Conference-27; Oct 18-Nov12; Shanghai, China**

4. FREQUENCY SPECTRUM MANAGEMENT

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4.2 ICAO Position for WRC-27 & the Call for State Support



➤ States and Int Orgs are requested to take into account the ICAO Position, to the maximum extent possible

- in their preparatory activities for the WRC-27 at the national level
- in the activities of the regional telecommunication organizations and
- in the relevant meetings of the ITU

Active support from States is deemed to be the only means to ensure that the results of the WRC-27 reflect civil aviation's interest.

Your participation is essential to secure aviation's spectrum future at WRC-27!

State Letter 24/93 (ICAO-NET)

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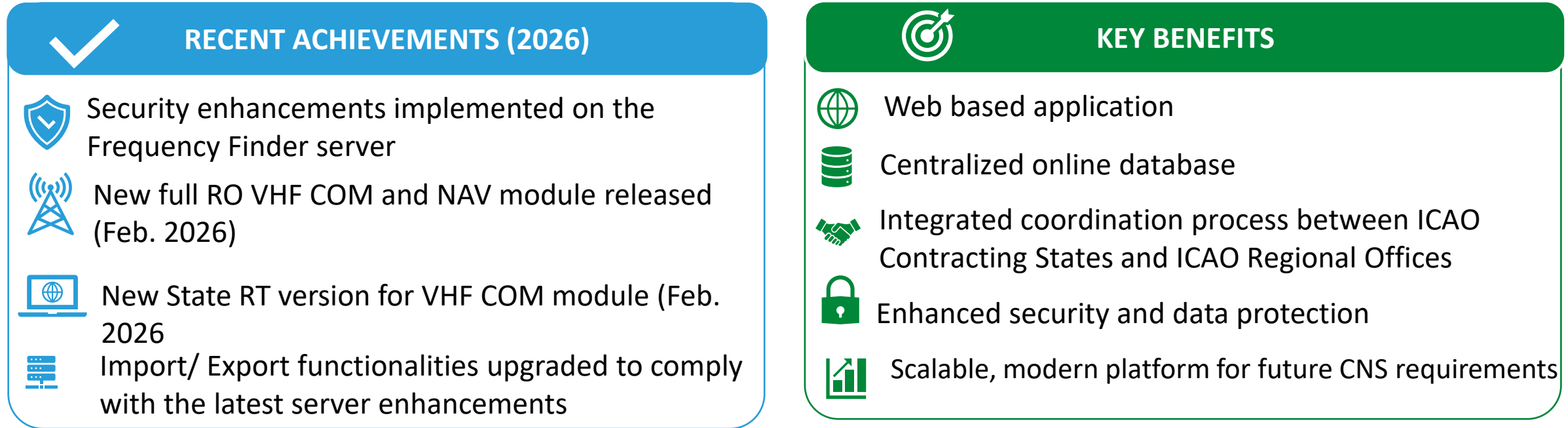
ICAO

4. FREQUENCY SPECTRUM MANAGEMENT

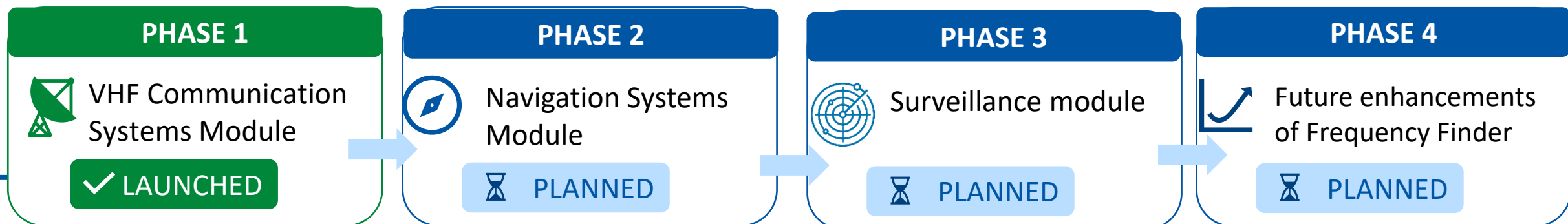
4.3 Frequency Finder Tool Modernization

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Enhancing Security, Aecessibility and Coordination



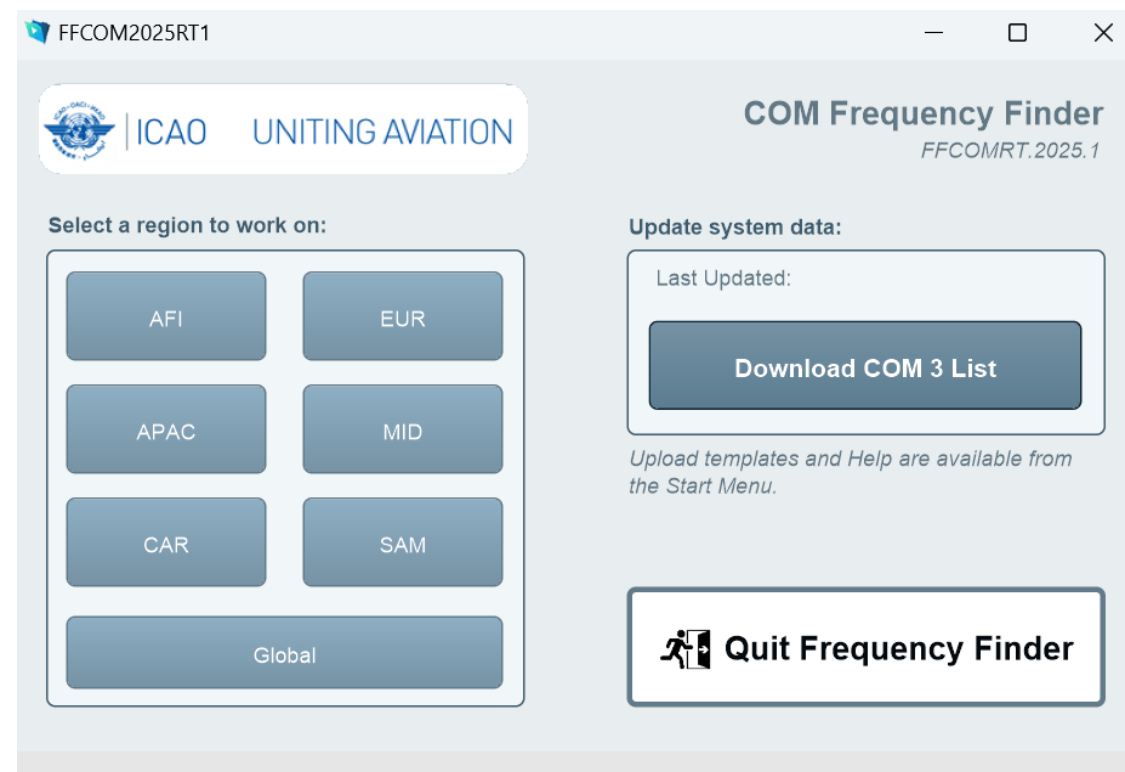
Modernization roadmap



4. FREQUENCY SPECTRUM MANAGEMENT

4.3 ENHANCEMENT OF CURRENT FREQUENCY FINDER

- Development of a new **State's RunTime version for the VHF-COM module**
 - Released in February 2026.
 - A new layout has been implemented
 - Export/import functionalities were upgraded to ensure
- Compliance with the latest server enhancements.



Key message Frequency Finder is evolving into a secure, web based and integrated platform supporting regional frequency management and future CNS needs

05 INTEGRATED CNS & SPECTRUM



5. INTEGRATED CNS AND SPECTRUM

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5.1 Long Term Evolution of CNS and Spectrum matters

ICAO CNS & Spectrum Long-Term Strategy

- ✓ ICNSS-TF established to lead the development of the Integrated CNS & Spectrum Global Concept.
- ✓ **Objective:** Deliver a long-term CNS & Spectrum roadmap ensuring efficient spectrum use, technology evolution, and future CNS resilience.

ICNSS & SARPS Streamline

INTEGRATED CNS and Spectrum Task Force

ICNSS roadmap Task

Develop CNSS roadmap on flexible and continuing technical evolution

CNSS Standards Task

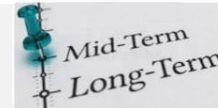
Define Performance Standards vs Technical Specifications

End goal

ICNSS roadmap

(Minimal Essential)
SARPs framework

Global Technical
Specification framework



5. INTEGRATED CNS AND SPECTRUM

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5.2 ICNSS Timeline

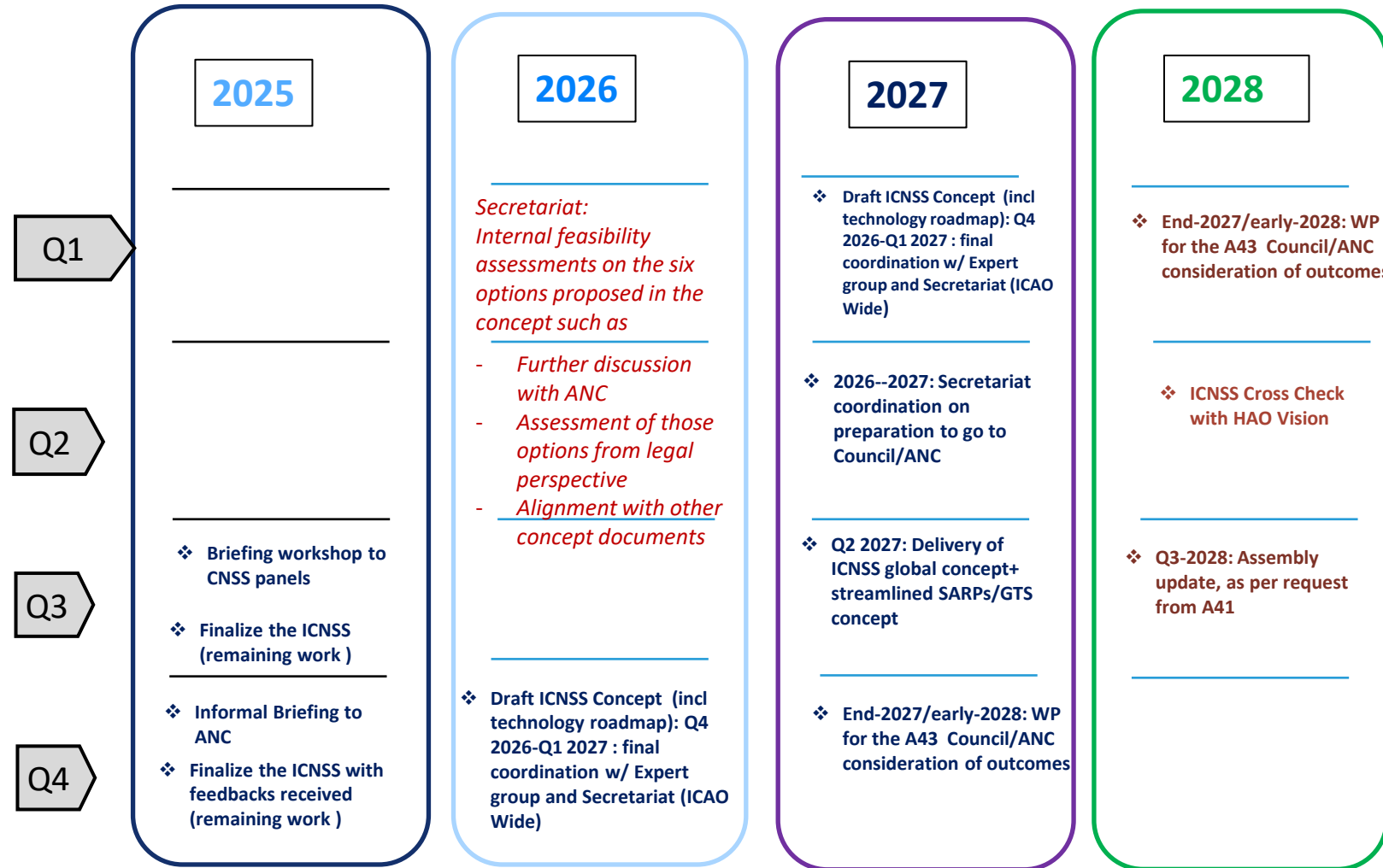
Current Status (Q2 2026)

✓ Development of the **Integrated CNS & Spectrum Global Concept** is underway, combining the ICNSS Roadmap and CNS Standards initiatives into a single strategic framework.

✓ The document is organized into six chapters covering:

- Introduction
- System Design & Spectrum
- CNS & Spectrum Roadmap
- Streamlined CNS Standardization Framework
- ICNSS Task Force Considerations
- Recommendations & Conclusion

ICNSS Timeline 2025-2028





Thank You