



International Civil Aviation Organization

MIDANPIRG/23 & RASG-MID/13 Meetings

(Cairo, Egypt, 14 – 18 June 2026)

Agenda Item 5.7: CNS

NAVIGATION MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the CNS SG/15 meeting concerning navigation matters, including the escalating issue of GNSS RFI, and invites the meeting to support those outcomes.

Action by the meeting is at paragraph 3

REFERENCE

- the 42nd Session of ICAO Assembly
- the 14th Air navigation Conference Report
- CNS SG/15 Meeting Report
- MIDANPIRG/22 Report

1. INTRODUCTION

1.1 The Global Navigation Satellite System (GNSS) is a crucial enabler for modern aviation services and technologies.

1.2 The GNSS provides highly precise positioning, navigation, and timing (PNT) which enables accurate location tracking and flight guidance. Additionally, GNSS provides accurate time synchronization for avionics, communication networks and operational systems, facilitating seamless communications and coordination between pilots, controllers and ground services, significantly enhancing safety and efficiency of flight operations and air traffic management.

1.3 The 14th Air Navigation Conference was held from 26 August to 6 September 2024, at ICAO HQ in Montreal. The AN-Conf/14 addressed the issue of GNSS RFI and voiced significant concerns with the escalation of GNSS jamming and spoofing, and the significant safety risk it poses to civil aviation operations. The Conference agreed on Recommendation 2.2/2 – Addressing global navigation satellite system interference and contingency planning.

1.4 The 42nd Session of ICAO Assembly, which was held from 23 September to 3 October 2025, at ICAO, Montreal, Canada, updated Assembly Resolution 42-8/c “Ensuring the resilience of ICAO CNS/ ATM Systems and Services” and introduced mainly the following:

- a) Included operative clause on NAV RON “... . Encourages States to ensure that **sufficient resilient** terrestrial CNS capabilities remain available ...”
- b) **New Operative clause to secure industry and standardization organization support to ICAO roadmap** “*Encouraged standardization bodies and industry*”

- to collaborate with ICAO in advancing PNT solutions that align with ICAO initiatives;*
- c) Updated the operative clause on the requirement for protection from harmful interference “*Urges States to apply necessary measures to avoid the commercialization/ proliferation, purchase, possession, and the use of illegal transmitters such as jammers*”

2. DISCUSSION

ICAO GNSS RFI Roadmap

2.1 The CNS SG/15 meeting was apprised of the outcome of the 42nd session of ICAO Assembly and the 14th Air Navigation Conference (AN-Conf/14) concerning the GNSS. The meeting voiced serious concerns that GNSS RFI can have a significant impact on operational safety, potentially contributing to three global high-risk categories of occurrence (G-HRC): Mid-Air Collision (MAC), Controlled Flight Into Terrain (CFIT), and Loss Of Control In-flight (LOC-I). In addition, it is likely to result in a significant operational and financial impact, including flight rerouting, delays, cancellations and increased workload for both controllers and pilots.

2.2 Recognizing the significant risks and potential consequences of GNSS RFI on aviation safety and security, ICAO has outlined a roadmap set of short, medium, and long-term actions. ICAO roadmap is available at ([ICAO GNSS RFI Roadmap](#)).

2.3 In the short term, conventional navigation infrastructure can continue to serve as a reliable backup. At the same time, the implementation Package (iPack) for the mitigation of GNSS RFI will provide targeted support to States encountering implementation challenges, assisting them in deploying both preventive and reactive mitigation measures, as necessary.

2.4 It is worth mentioning that no single solution is known to be effective in all GNSS RFI cases; therefore, the most robust approach is a combination of technical measures, including signal authentication for core constellations (GPS, Galileo), SBAS authentication, C-PNT, NAV RON, enhanced antenna types, and other complementary technologies.

GNSS RFI Near Real-Time Monitoring

2.5 The CNS SG/15 meeting recalled that MIDANPIRG/20, through Decision 20/47, requested the ICAO MID Office to collaborate with ACAO to assess the feasibility of establishing a Regional GNSS RFI monitoring System and report the outcome to the CNS SG/13 and MIDANPIRG/21 meetings.

2.6 The CNS SG/15 meeting further recalled that AN-Conf/14, through Recommendation 2.2/2(b), agreed that States should develop a GNSS reporting mechanism, using the PRIG framework, to enhance operational awareness of affected geographical areas, to the extent feasible, as described in the GNSS Manual (Doc 9849). This is consistent with MIDANPIRG Conclusion 20/47.

2.7 It was further highlighted that establishing a GNSS Signal Monitoring and Reporting System will significantly improve situational awareness, support mitigation efforts, and enhance safety. The CNS SG/15 meeting received several industry briefs on GNSS RFI monitoring solutions. In this regard, States were encouraged to consider establishing a GNSS RFI monitoring system. Furthermore, the meeting agreed that the establishment of a regional or sub-regional central RFI information repository, should be explored once States have developed sufficient national capabilities.

2.8 Based on the above, the meeting agreed to the following Draft Conclusion to replace and supersede MIDANPIRG/22&RASG-MID/12 Conclusion 2 and MIDANPIRG Conclusion 20/47:

DRAFT CONCLUSION 15/8: STRENGTHENING REGIONAL PREPAREDNESS AGAINST GNSS RFI DISRUPTIONS

That, in order to strengthen regional preparedness for responding to disruptions caused by GNSS RFI, States are urged to:

- a) *implement Assembly Resolution A42-8 Appendix C to ensure timely and effective measures are taken; and*
- b) *consider establishing a GNSS RFI monitoring system to enhance situational awareness and mitigate safety and security risks.*

Regional GNSS-related Documents

2.9 The RASG-MID Safety Advisory on GNSS vulnerabilities (RSA-14) was endorsed in 2018 and amended in 2025. The CNS SG/15 meeting agreed that the RSA-14 requires a substantial update to keep pace with developments, given the evolving nature of GNSS jamming and spoofing, as well as ICAO's recent publications and provisions on the subject. It was therefore decided that Oman will lead the review process, with support from Egypt and the ICAO Secretariat.

2.10 The meeting may wish to recall that the ICAO MID Regional Office has published ICAO MIDANPIRG DOC 011 titled "GUIDANCE ON GNSS IMPLEMENTATION IN THE MID REGION", Edition December 2018. This guidance includes some mitigation strategies to GNSS vulnerabilities in Part III: GNSS Vulnerabilities. The CNS SG/15 meeting agreed on the need to revise and update MID DOC 011 to take into account, inter alia, the followings:

- i. the latest amendment to ICAO Annex 10, Volume I;
- ii. Assembly Resolution 42-8 Appendix C;
- iii. AN-Conf/14 Recommendation 2.2/2;
- iv. the most recent revision of RASG-MID Safety Advisory 14 (RSA-14); and
- v. the outcomes of ICAO events, including the 1st and 2nd Radio Navigation Symposia.

2.11 In this regard, Egypt volunteered to lead the review of the MID DOC 011, with the intention of presenting the revised document to the CNS SG/16 meeting for further consideration and enhancement. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 15/6: REVISION OF THE GUIDANCE ON GNSS IMPLEMENTATION IN THE MID REGION

That, in order to ensure alignment of regional guidance with global developments, emerging threats, and ongoing international and regional efforts, Egypt lead the review and update of the ICAO MID DOC 011- Guidance on GNSS Implementation in the MID Region. The revised document will then be subject to further review and endorsement by the CNS SG/16 meeting before presentation to the MIDANPIRG/24 meeting for endorsement.

NAV MON/RON

2.12 The meeting may wish to recall that the ASBU element NAVS B0/4 -NAV MON (Minimum Navigation Operational Network) was identified in 2018 as a priority 1 element for

implementation in the MID Region Air Navigation Strategy. In order to assist States with the implementation and monitoring of NAV-MON, MIDANPIRG/18, through Decision 18/42, established the NAV-MON Action Group to develop a Template for a NAV-MON Plan. Consequently, the Action Group held several virtual meetings with four volunteering States (Egypt, Jordan, Oman, and the UAE) and produced the initial draft of the NAV-MON Template. Feedback was requested from the ATM SG and PBN SG through MIDANPIRG Conclusion 21/26.

2.13 The CNS SG/15 meeting was apprised of global developments in this regard, including the AN-Conf/14 Recommendations and Assembly Resolution A42-8/C, as well as the introduction of the NAV-RON Concept (Resilient Navigation Operational Network), and noted that the definitions of both concepts and related ICAO Provisions are still under development.

2.14 The CNS SG/15 meeting agreed on the need to verify the existence of NAV-MON until the new concept is introduced. Consequently, the meeting decided to update the composition and objectives of the NAV-MON Action Group and, agreed to the following Draft Decision to supersede MIDANPIRG Conclusion 21/26 and Decision 22/20:

DRAFT DECISION 15/7: NAVIGATIONAL OPERATIONAL NETWORKS-NAV MON ACTION GROUP

That, in order to assist States with the implementation of the required conventional infrastructure, NAV-MON and the forthcoming, NAV-RON, the NAV MON Action Group:

a) undertake the necessary actions to assist States with the NAV-MON and NAV-RON implementation, and facilitate the sharing of resources and best practices among States;

b) is composed of:

- *Mr. Waheed Sulieman (Egypt)*
- *Ms. Neveen Askar (Jordan)*
- *Mr. Abdullah AlFarsi (Oman)*
- *Mr. Sadiq Al-Laweaiti (Oman)*
- *Ms. Wadha Almalki (Qatar)*
- *Mr. Khaled Al-Harby (Saudi Arabia)*
- *Mr. Hussam Alsaïd Ali (Syria)*
- *Mr. Jacob Avis (UAE)*
- *Ms. Lindi Kirkman (IATA)*
- *Mr. Arnaud Du Bédât (IFALPA)*
- *The ICAO MID Secretariat*

Radio Navigation Flight Inspection

2.15 The CNS SG/15 discussed extending periodic flight inspection intervals for ground-based navigation aids and the criteria used to extend the periodicity of flight inspection intervals. The meeting noted that the majority of recorded Significant Safety Concerns under the ICAO USOAP programme in the air navigation services area are related to the flight inspection of the ground-based radio navigation and Instrument Flight Procedures.

2.16 The CNS SG/15 meeting invited States to share their experience, best practices, and lessons learned related to the flight inspection intervals and the monitoring strategies, and encouraged the exchange of information on regulatory frameworks, safety assessments, and monitoring arrangements to support harmonized and safe implementation of extended flight inspection intervals within the MID Region, as appropriate.

2.16 The meeting may wish to note that a PBN/GNSS Workshop will be held in Cairo, 27-29 September 2026. The Workshop will address, inter-alia, radio navigation flight inspection matters.,.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note and support the outcomes of the CNS SG/15 meeting concerning Navigation matters;
- b) endorse Draft Conclusions and Decision; and
- c) encourage States to participate actively in the PBN/GNSS Workshop (Cairo, 27-29 September 2026).

- END -