International Civil Aviation Organization
Asia and Pacific Office

Sixteenth Meeting of the Regional Aviation Safety Group – Asia and Pacific Regions (RASG-APAC/16)

(Bangkok, Thailand, 26-27 November 2026)

Agenda Item 5: **ICAO/ Member State / Industry Presentations**

RELEVANT OUTCOMES OF CNS SG/30

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the Thirtieth Meeting of the Communications, Navigation and Surveillance Sub-group (CNS SG/30) of APAC Air Navigation Planning and Implementation Regional Group (APANPIRG) concerning progress made in addressing safety risks associated with Global Navigation Satellite System (GNSS) Radio Frequency Interference (RFI) within the APAC Region.

Strategic Objectives:

- ***A:*** ***Safety*** *– Enhance global civil aviation safety*
- ***B:*** ***Air Navigation Capacity and Efficiency*** *— Increase the capacity and improve the efficiency of the global aviation system*

1. INTRODUCTION

1.1 The Thirty-Seventh Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (**APANPIRG/37**) was held at the ICAO Asia and Pacific (APAC) Office, Bangkok, Thailand, from **23 to 25 November 2026**. The Meeting was attended by **182** participants from **23** APAC Member States, two Special Administrative Regions of China, two Middle East (MID) Member States and six International Organizations (CANSO, EASA, IATA, ICCAIA, ICAO and IFALPA).

1.2 The Thirtieth Meeting of the Communications, Navigation and Surveillance Sub-group (**CNS SG/30**) of APAC Air Navigation Planning and Implementation Regional Group (APANPIRG) was held from the afternoon of **6 July to 10 July 2026** at the ICAO APAC Regional Office, Bangkok, Thailand. The CNS SG/30 was attended by 96 participants from **21** Member States/Administrations, 2 International Organizations and 6 industry partners. CNS SG/30 Report, papers and other resources can be accessed at the CNS SG/30 link: https://www.icao.int/APAC/meetingdocs?fid=87956

2. DISCUSSION

Progress of the Procedures for GNSS and Data Link Disruption Ad Hoc Group and Proposed Regional Guidance Material – Singapore (WP/16)

2.1 Singapore, on behalf of the *Procedures for GNSS and Data Link Disruption Ad Hoc Group* established by ATM/SG/12, provided an update on the Ad Hoc Group's work. The CNS SG/30 noted that the *draft APAC Regional Guidance Material for GNSS RFI and Associated Data Link*

Disruption Coordination and Reporting Procedures (Version 1.0) established harmonized regional procedures for the detection, reporting, investigation, and coordinated management of GNSS RFI and its associated data link disruptions and clearly defined the roles and responsibilities of key stakeholders. By enabling timely sharing of information and consistent operational responses across the region, the framework enhanced regional situational awareness, supported safety risk mitigation, and strengthened overall system resilience.

2.2 Given that GNSS interference has direct implications on CNS and data link systems, the draft guidance material included significant CNS-related operational and technical elements that warrant detailed review by CNS SG. CNS SG/30 reviewed the draft guidance material, with particular emphasis on the CNS-related operational and technical elements contained in Chapters 5 and 8. CNS SG/30 expressed concerns regarding Section 8.4 of Chapter 8, which states that ANSP CNS units may explore the deployment of direction-finding equipment to detect and locate sources of GNSS radio frequency interference (RFI). CNS SG/30 noted that in many APAC States/Administrations, the responsibility and capability to locate and eliminate interference sources reside with the national telecommunications authority or spectrum regulator. Many ANSPs may neither possess the necessary technical equipment nor have the mandate to locate interference sources. The common practice is therefore to coordinate with the responsible national authority or organization to identify and address the source of interference.

2.3 In this regard, CNS SG/30 considered that a specific reference to the deployment of direction-finding equipment by ANSPs could create confusion regarding roles, responsibilities, and capabilities. The *Procedures for GNSS and Data Link Disruption Ad Hoc Group* clarified that the proposed text was intended solely to provide guidance to States. Nevertheless, CNS SG/30 suggested that Section 8.4 be revised to explicitly reflect that the use of direction-finding equipment is dependent on national arrangements, responsibilities, and capabilities, and that coordination with the appropriate national authority may be required for the identification and mitigation of interference sources.

2.4 CNS SG/30 also raised a concern regarding Section 5.9 of Chapter 5. It was noted that the roles and responsibilities of ANSP/CNS units should include a specific provision on coordinating with the appropriate national authority responsible for frequency spectrum management for the detection, location, and elimination of GNSS RFI sources. *The Procedures for GNSS and Data Link Disruption Ad Hoc Group* clarified that such coordination is already addressed under the roles and responsibilities of the Civil Aviation Authority (CAA) and that the document provided guidance to States/Administrations, which could not prescribe all domestic arrangements — in some States/Administrations, CAAs retained coordination with spectrum regulators, while in others this function might have been delegated to ANSPs. However, CNS SG/30 considered that ANSP/CNS units are often the first entities to identify and report GNSS interference events and therefore have an important role in coordinating with the relevant national authorities. Accordingly, CNS SG/30 suggested that a corresponding provision be incorporated under the roles and responsibilities of ANSP/CNS units to clearly reflect their role in supporting the detection, localization, and resolution of GNSS RFI events through coordination with the appropriate national spectrum management authority.

2.5 CNS SG/30 further reviewed and refined the draft guidance material, incorporating the agreed amendments and addressing all outstanding concerns. Following these improvements, CNS SG/30 endorsed the Guidance Material on GNSS and Data Link Disruption. The CNS SG/30 noted that the endorsed draft guidance material would be submitted to ATM/SG/14 (August 2026) for consideration and adoption.

2.6 CNS SG/30 suggested that, following endorsement of the draft guidance material by CNS SG/30, any subsequent amendments should be recorded using track changes. This would enable CNS SG members to clearly identify the additional modifications made after CNS SG/30 and prior to the document's consideration and adoption by ATM SG/14. In response to a question regarding the future maintenance of the APAC Regional Guidance Material for GNSS RFI and Associated Data Link Disruption Coordination and Reporting Procedures (Version 1.0) following the dissolution of the

Procedures for GNSS and Data Link Disruption Ad Hoc Group, it was clarified that responsibility for maintaining the document would be with the ATM SG upon its publication. It was further suggested that any proposed amendments to the guidance material should first be considered by the relevant sub-group before being submitted to the ATM SG for review and adoption.

2.7 The draft *APAC Regional Guidance Material for GNSS RFI and Associated Data Link Disruption Coordination and Reporting Procedures (Version 1.0)* was adopted by ATM SG/14, and the *Procedures for GNSS and Data Link Disruption Ad Hoc Group* was dissolved.

Outcomes of the joint effort of the GNSS RFI Ad Hoc group and the OPS (SEI) WG for GNSS RFI matters in the APAC Region – Sec (WP/17)

2.8 The paper presented the outcomes of the joint effort by the GNSS RFI Ad hoc Expert Group under SRWG and the OPS WG, previously the Safety Enhancement Initiatives (SEI) WG, under APRAST to address GNSS RFI matters for CNS SG/30 review. It was recalled in APANPIRG/36 that the OPS (SEI) WG proposed to collaborate closely with the CNS SG by WP/21. To operationalize this collaboration, OPS (SEI) WG proposed the following APRAST actions aligned with the AP-RASP 2026–2028 objectives:

- In coordination with APANPIRG, identify geographic areas of concern and analyze the underlying factors specific to the APAC region that contribute to GNSS RFI risk.
- Based on this analysis, prioritize the highest-severity threats and subsequently develop focused regional SEIs and/or RASG-APAC Safety Advisories (RSAs).
- Develop a comprehensive, holistic understanding of Original Equipment Manufacturer (OEM) guidance and existing regional efforts on managing the risk of GNSS interference.
- In coordination with the appropriate APANPIRG contributing bodies, identify and implement additional efforts to mitigate the risk of GNSS interference within the region.

2.9 During SRWG/10, it was agreed that, to identify geographic areas of concern and analyze the underlying factors specific to the APAC region, data shared by States on GNSS RFI occurrences after the Procedures for GNSS and Data Link Disruption Ad-Hoc Group provides guidance will be helpful. The SRWG/10 agreed to form the **GNSS RFI Ad-Hoc Expert Group**. China, Hong Kong China, India, Indonesia, Japan, Singapore, Thailand, and the United States volunteered to join the group.

2.10 The CNS SG/30 noted information about NOTAM codes being developed by the Navigation System Panel (NSP). It was informed that a working paper has been submitted to the Information Management Panel (IMP), and it was suggested to create a new NOTAM code for spoofing "LO" through updating PANS-ABC. For the NOTAM text, IMP will complete the review of the NSP proposal in Nov 2026. It was added that the Draft guidance for Pilots on interpreting GNSS RFI-related NOTAMs has been shared with the FLTOPS panel for their feedback. It was also noted that updating the PANS-ABC and AIS Manual will take at least 1-2 years to complete, as per the normal procedure and timeline for ICAO SARPs and Guidance material updates.

2.11 CNS SG/30 noted that from the ICAO Perspective, it was highly recommended that **States develop a coordination mechanism with their national radio regulator to identify, locate and eliminate the source of interference**. According to the ITU Radio Regulations, the national radio regulator may coordinate with its counterpart to eliminate the source of interference when necessary. If these efforts fail, they can report to the ITU for assistance until the issue is resolved. It was added that States should not report all cases to ICAO. If there were recurring interference from the same source that cannot be resolved, the State should report it to ICAO for assistance.

2.12 CNS SG/30 noted that the ICAO Secretary of the ATM, CNS, and Safety section developed a template to report GNSS RFI Incidents to ICAO, which would be reviewed and updated through the respective sub-group Meetings, for presentation to APANPIRG/37 for adoption. The intention was to initiate collecting GNSS RFI incident information in the proposed template as soon as possible. CNS SG/30 reviewed and endorsed the template to report GNSS RFI Incidents to ICAO.

2.13 CNS SG/30 requested the APRAST Secretary to share APRAST/25 feedback on the proposed template for reporting GNSS RFI incidents to ICAO. CNS SG/30 was informed that APRAST/25 had deferred finalization of the proposed template pending a review of existing reporting mechanisms and their contents. Recognizing that the proposed template is a simplified reporting table and noting the need to finalize it before APANPIRG/37, CNS SG/30 emphasized the importance of securing APANPIRG/37 endorsement to facilitate the timely initiation of data collection activities. CNS SG/30 further recommended that, once adopted by APANPIRG/37, the template be used throughout the APAC Region to support the systematic collection, reporting, and analysis of GNSS RFI incidents.

2.14 In APRAST/26 (09-13 November 2026), the Secretariat (ATM and CNS) presented updates on the GNSS RFI coordination activities between APANPIRG and RASG-APAC since APANPIRG/36 (2025). APRAST/26 was advised that WP/21, presented by the OPS WG (formerly the SEI WG) at APANPIRG/36, indicated that the CNS SG would provide technical data (e.g., RFI location, signal intensity) to the OPS WG, while the OPS WG would share prioritized risk analyses to help the CNS SG focus technical responses and monitoring, thereby maximizing safety outcomes. In support of the objectives contained in APANPIRG/36 WP/21, CNS SG/30 invited APRAST to review and finalize the reporting template agreed upon by the Procedures for GNSS and Data Link Disruption Ad Hoc Group and CNS SG/30 prior to its adoption by APANPIRG/37.

2.15 The proposed template was discussed in detail. The Secretariat advised that the template was intended only for State focal points to consolidate GNSS RFI information already available through their national reporting processes, and to submit it to the ICAO APAC Regional Office for further analysis by CNS SG and OPS WG. The OPS WG acknowledged the clarification, while noting that the template could potentially lead to additional reporting responsibilities on industry. OPS WG considered that the GNSS RFI occurrence data currently collected and shared by IATA would be sufficient to support its immediate objectives. Therefore, the OPS WG concluded that the proposed reporting template is not required. APRAST/26 nevertheless supported a joint review of the data collected by CNS SG under the Regional Coordination Framework and agreed that no change to the existing framework was required.

2.16 APANPIRG/37 considered the *Template for Reporting GNSS RFI Incidents* and adopted the following Conclusion, recognizing the importance of the template in facilitating the monitoring, assessment, and analysis of GNSS RFI events by the CNS SG across the APAC Region:

<table>
<tr><td colspan="3">Conclusion APANPIRG/37/11 Adoption of the template to report GNSS RFI Incidents to ICAO APAC Office</td></tr>
<tr><td colspan="2">What: The template to report GNSS RFI Incidents to the ICAO APAC Office, provided in Appendix A, be adopted.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Data shared by States/Administrations on GNSS RFI occurrences is essential for identifying geographical areas of concern and analyzing APAC-specific contributing factors. The data collected through the reporting template would support the work of the GNSS RFI Ad-Hoc Expert Group</td><td colspan="2">Follow-up: ☒Required from States</td></tr>
</table>

under the CNS Sub-Group in monitoring, assessing, and analyzing GNSS RFI events across the region. The information would also facilitate the identification of trends, recurring hotspots, and potential mitigation measures, thereby enhancing regional situational awareness and supporting coordinated actions to address GNSS RFI challenges			
When:	25-Nov-26	Status:	Adopted by PIRG
Who:	☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: SRWG		

Outcomes of APRAST/25 on the Regional Coordination Framework for GNSS-RFI Reporting and Analysis – Sec (WP/06)

2.17 This paper presented the outcomes of the Twenty-Fifth Meeting of the APAC Regional Aviation Safety Team (APRAST/25) regarding the proposed Regional Coordination Framework for GNSS RFI. CNS SG/30 noted that, during APRAST/25 (22–26 June 2026), a regional framework and implementation timeline for the collection, consolidation, and analysis of GNSS RFI occurrence information was proposed through APRAST/25-WP/05, aiming to support the identification of geographical areas of concern and coordinated mitigation measures.

2.18 CNS SG/30 reviewed the proposed *Regional Coordination Framework for GNSS RFI Reporting and Analysis*. It was clarified that, under the framework, the CNS SG would currently be represented by the GNSS RFI Ad Hoc Group established under the SRWG, as the Ad Hoc Group possesses the necessary expertise to conduct data analysis, assess trends and priorities, and develop recommendations for mitigation actions.

2.19 CNS SG/30 further noted that, as the role and structure of groups under CNS SG evolve, CNS SG would designate an appropriate responsible body to collaborate with the OPS (SEI) WG on GNSS RFI-related matters within the framework. CNS SG/30 **adopted the Regional Coordination Framework** for GNSS RFI Reporting and Analysis.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) note the adoption of *ICAO APAC Regional Guidance Material for GNSS RFI and Associated Data Link Disruption Coordination and Reporting Procedures* by ATM SG/14;

b) note the outcomes of the joint effort of the GNSS RFI Ad hoc Expert Group under SRWG and the OPS (SEI) WG;

c) note the adoption of the *template to report GNSS RFI Incidents to the ICAO APAC Office* provided in **Appendix A** by APANPIRG/37; and

d) note the adoption of *the Regional Coordination Framework for GNSS RFI Reporting and Analysis* by CNS SG/30.

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No.	Number of GNSS RFI Occurrences	Geographical Area of Concern			Primary Operational Effect *(Please select the primary observed operational effect)*	Additional Remarks
		Location (Coordinates or Nearest city or landmark)	Altitude / Flight Level	Phase of Flight		
1	Please enter manually	Please enter manually	Please enter manually	Please choose option	Please choose option	Please enter manually
2						
3						
4						
5						
6						

Note: Please use multiple rows as required to share details of various locations affected by GNSS RFI issues.

Legend:

Please enter manually: Data to be entered manually

Please choose option: Select from the dropdown list

Flight phase	Primary Operational Effects
En-route	Total loss of navigation capabilities
Approach	Need to change the navigation procedure
Terminal	Inability to fly RNP and request for radar vectoring
Ground	Inability to fly a GNSS-based approach (GLS, SLS)
Please choose option	GNSS fault (1 or 2)
	TAWS/EGPWS warnings or loss of terrain and surface functionalities
	Loss of ADS-B
	Wind and ground speed wrong presentations
	Aircraft clock anomaly
	Loss of situational awareness (SVS, Cockpit Display of Traffic Information)
	Loss of communication functions (CPDLC, ACARS)
	AHRS failure
	Map shift
	Other: Specify in remarks
	Please choose option