



**Agenda Item 6: Other issues**

**MITIGATION OF INTERFERENCE TO THE GNSS SYSTEM: TECHNICAL AND OPERATIONAL RECOMMENDATIONS FOR ITS IMPLEMENTATION IN THE SAM REGION**

(Prepared by Secretariat)

**SUMMARY**

This working paper presents a set of recommendations based on EASA bulletins, European technical studies, and recent analyses on GNSS system interference (jamming and spoofing), with the aim of strengthening operational and technical resilience in the SAM Region. It proposes adapting procedures, training, and monitoring frameworks to mitigate emerging risks associated with the increasing reliance on GNSS.

**References:**

- Safety Information Bulletin EASA SIB 2022-02R3 (July 2024)
- Project AIRING-GMV – SBAS LATAM Workshop (April 2025)
- EASA Technical Reports on GNSS Interference (2024)
- Final Report of OPSGROUP on GPS Spoofing – WG-OG24 (July 2024)
- EASA Bulletin No. 10209 (June 2024): "Increasing GNSS Threats and Impact on Aircraft Operations"

**1 Background**

1.1 The GNSS system is a critical infrastructure for navigation and surveillance in modern civil aviation. Its widespread use in PBN procedures and ADS-B has increased the system's exposure to both intentional and unintentional interference. Recent studies by EASA and the AIRING consortium (Aviation resilience to GNSS frequency jamming and cyber threats) have shown a global rise in jamming and spoofing events, prompting preventive and corrective actions to preserve operational safety. Although the SAM Region has not yet experienced critical impacts, the growing digitalization and technological dependence justify the adoption of proactive measures.

**2 Analysis**

2.1 In the first instance, the relevance of the recommendations made during the Navigation Meeting of AN-Conf/14 is highlighted, particularly Recommendation 2.2/2 on interference to the Global Navigation Satellite System and contingency planning. This recommendation urges States to implement effective measures to mitigate radio frequency interference, develop regional reporting mechanisms, and work with industry to enhance the resilience of aeronautical systems against GNSS interference, among other actions.

2.2 These guidelines serve as a basis for structuring a common approach within the SAM Region and strengthening coordinated prevention and response strategies among States.

2.3 Recent reports from OPSGROUP (an independent group) and EASA bulletins have raised concerns about a significant increase in spoofing and jamming incidents in various regions of the world, including documented events that directly affected air navigation in European airspace, the Middle East, and regions bordering conflict zones.

2.4 The OPSGROUP WG-OG24 report highlights that several commercial and state operators have encountered false GNSS positions, resulting in route deviations and loss of reference for approaches. Additionally, EASA Bulletin 10209 provides specific recommendations for operators and civil aviation authorities on identifying, reporting, and mitigating these threats, including the use of ADS-B data to confirm GNSS integrity.

2.5 These international experiences may be considered as input for the development of a regional response protocol and the update of SAM procedures.

2.6 Based on the studies analyzed, it is recommended to adopt the following lines of action in the SAM Region

a) **Awareness and Training:**

- Include GNSS-related topics in technical training and recurrent courses.
- Update operational manuals and response protocols for GNSS degradation.

b) **Flight Planning:**

- Promote routing supported by conventional aids and systematic review of NOTAMs.

c) **Event Reporting and Monitoring:**

- Establish common protocols for incident reporting and analysis.
- Integrate early warning signals through ADS-B loss or other CNS sources.

d) **Technical Mitigations:**

- Promote the use of interference-resistant GNSS receivers, anti-jamming antennas, and redundant navigation systems (IRS, VOR/DME).

e) **Regional Management Framework:**

- Assess the development of a CONOPS for GNSS events in the SAM Region.
- Create a regional database and strengthen inter-institutional cooperation.

3 **Suggested Actions**

3.1 The meeting is invited to:

- a. Take note of this Working Paper;
- b. Analyze the feasibility of implementing the recommendations mentioned in their respective States;
- c. Continue the work of the ad hoc group GT-Interop CNS/SUR, which is developing the regional Concept of Operations (CONOPS), considering the recommendations of this Working Paper; and
- d. Include this topic within the 2025/2026 work plans of the relevant contributory groups.

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