



International Civil Aviation Organization

**Tenth Meeting of the MIDANPIRG AIM Sub-Group
(AIM SG/10)**

(Cairo, Egypt, 28 – 29 February 2024)

Agenda Item 4: AIM Planning and Implementation in the MID Region

GNSS DISRUPTION IN MID

(Presented by the secretariat)

SUMMARY

Aviation worldwide, including ICAO member States, recognizes the reliance on Performance Based Navigation (PBN) operations that require accurate and dependable space-based Positioning, Navigation and Timing (PNT) services delivered by GNSS as noted by the ICAO Assembly in the referenced Assembly Resolutions. Disruptions to GNSS result in compromised safety, inefficiency and financial losses.

Further to the increasing frequency of GNSS disruption events around the globe and in particular in MID Region, this working paper outlines the safety of flight risks related to the GNSS spoofing and jamming activities reported by various AOs and presents the outcomes of the PBN SG8 meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- Assembly Resolution A41-8, Appendix C
- ICAO Doc 9849-GNSS Manual-4th edition (unedited)-2023
- RASG-MID Safety Advisory (RSA-14) on GNSS Vulnerabilities
- NOTAM Template for GNSS RFI

1. INTRODUCTION

1.1 Modern aircraft are reliant on the signals from GNSS to feed their different systems. In recent months, however, potential spoofing activities reported by various civil air operators increased safety of flight risks to civil aviation operations due to potential loss of aircraft situational awareness and increased pilot and air traffic control (ATC) workload issues, which may have an impact on aviation safety.

1.2 The subject of GNSS RFI was addressed by the Eighth Meeting of the Performance Based Navigation Sub-Group (PBN SG/8) which was held in Doha, Qatar, during 12 - 13 December 2023.

1.3 This working paper outlines the safety of flight risks related to the GNSS spoofing activities reported by various AOs and presents the outcomes of the PBN SG8 meeting.

2. DISCUSSION

GPS spoofing

2.1 Since August 2023, a new variety of GPS spoofing is being reported by crews, where the signal is sufficiently strong and of sufficient integrity to feed the aircraft systems. The result is that within minutes, the IRS becomes unusable, and in many cases, all navigation capability on board is lost. Flight Crews have had to ask ATC for radar vectors. Given the types of airspace that these events are occurring in, this presents significant risk.

2.2 Spoofing is the broadcast of GNSS-like signals that cause avionics to calculate erroneous positions and provide false guidance.

2.3 The effects of GNSS possible spoofing activities were observed by flight crew, including:

- Fake GPS signal (spoofed) gives the FMS the indication it is 60nm off track;
- Complete loss of navigational capability including IRS failure;
- No reliable on board navigation – ATC vectors required. One flight required ATC vectors all the way to their destination in Doha;
- Potential airspace infringements due to GNSS degradation. One operator almost entering Iranian airspace without clearance.

GNSS interference NOTAM terminology

2.4 The meeting may wish to recall that the MIDANPIRG/20 endorsed through MIDANPIRG Conclusion 20/18 a NOTAM TEMPLATE FOR GNSS INTERFERENCE. Based on the recent new entry of GNSS Spoofing, the PBN SG/8 meeting held in Doha, Qatar, 12 - 13 December 2023, invited the AIM SG to consider updating the NOTAM Template for GNSS Interference to reflect the spoofing activities and its effect on safety of flight operations - for instance, "GNSS MAY BE MISLEADING WITHIN" for spoofing events.

2.5 Based on the above, the meeting may wish to agree on the following Draft Conclusion:

DRAFT CONCLUSION 10/XX: REVISED NOTAM TEMPLATE FOR GNSS INTERFERENCE

That,

- a) *ICAO and IATA in coordination with AIM SG Chairpersons to develop revised NOTAM template for GNSS interference including jamming and spoofing; and*
- b) *ICAO MID Office circulate the revised NOTAM Template for GNSS interference through State Letter for implementation by States.*

Task ICAO secretariat and IATA

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note and discuss the content of this working paper; and
- b) endorse the Draft Conclusion at Para. 2.5.