International Civil Aviation Organization

Twelfth Meeting of the Air Traffic Management Sub-Group (ATM/SG/12) of APANPIRG

Bangkok, Thailand, 23 – 27 September 2024

Agenda Item 5: ATM Systems (Modernization, Seamless ATM, CNS, ATFM)

REPORTING OF GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) INTERFERENCE

(Presented by Singapore)

SUMMARY

This paper presents the growing number of GNSS interference events globally and the need for States/Administrations to establish procedures for pilot to report promptly to ATS units when GNSS interference are detected. States/Administrations should also publish the procedures in their Aeronautical Information Publication (AIP). The information gathered through sharing of reports will help to raise awareness, locate and resolve the source of interference.

1. INTRODUCTION

1.1 The Global Navigation Satellite System (GNSS) has played a significant role for civil aviation by providing position, navigation and timing (PNT) information for use in multiple air navigation applications like performance-based navigation (PBN) for improved navigation precision and automatic dependent surveillance – broadcast (ADS-B) for application of surveillance separation.

1.2 However, GNSS is susceptible to various forms of interference including unintentional interference like space weather and intentional interference like jamming and spoofing.

1.3 Based on information from open-source sites, it can be seen in Figure 1 below that low levels of GNSS interference is experienced over the Asia Pacific region.

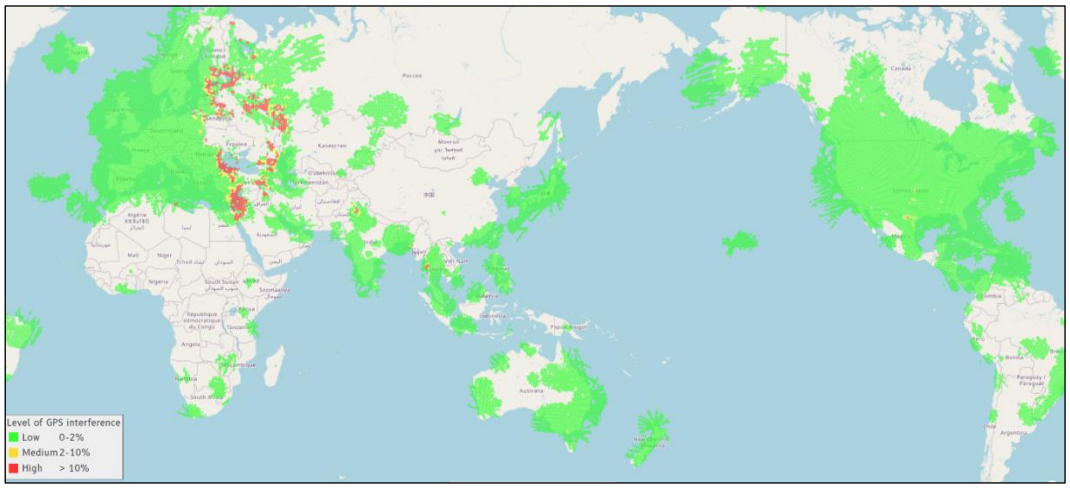

Figure 1: Map of GPS interference on a randomly selected day in 2024

1.4 While the levels of GNSS interference in Asia Pacific are relatively low, the impacts of GNSS interference events are still significant given the high reliance on GNSS for air navigation applications. Hence, it is essential for States/Administration to establish a clear process for pilots to report GNSS interference to the respective ATS units. This will then allow the ATS units to quickly implement mitigation measures to ensure air navigation safety.

2. DISCUSSION

Reporting of GNSS interference

2.1 When GNSS interference events occur, the most important measure is to raise awareness of such issues so that appropriate actions can be taken by each of the parties affected to mitigate the impacts of the interference. It is therefore vital to establish a process of efficient reporting of GNSS interference that would allow for ATS units to be aware of the degradation of navigation capabilities and any systems dependent on GNSS in order to quickly intervene and apply alternate procedures to achieve separation between aircraft so that safety of the aircraft is ensured.

2.2 During the Eighth Meeting of the Spectrum Review Working Group (SRWG/8) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the Decision SRWG/8/5 was adopted for States to use the GNSS Interference Reporting Form for APAC which can be accessed at https://www.icao.int/APAC/Meetings/Pages/2024-SRWG8.aspx and also circulated through State letter T 8/5.10 – AP052/24 (CNS) to report such occurrences to ICAO.

2.3 Notwithstanding the need to collate such report post flight, procedures should also be established for pilots to report GNSS interference to ATS units as soon as practicable as this would allow for quick notification to other airspace users through publication of NOTAMs and suspension of GNSS dependent procedures and applications.

2.4 Minimally, pilots that encounter GNSS interference should report to the relevant ATS units the following information:

a) Callsign

b) Time and Location interference was encountered

c) Type of interference

d) Capabilities affected, if any

e) Assistance required, if any

2.5 In order for operators and pilots to be aware of these reporting procedures, including the need to submit the GNSS Interference Reporting Form, States/Administration should consider publishing this information in their Aeronautical Information Publication AIP), specifically in the ENR 4.3 GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) section of the AIP.

2.6 As GNSS interference events could span across a wide area and also impact adjacent ATS units, it is further recommended that ATS units consider including processes to also share GNSS interference reports received with adjacent ATS units for awareness.

3. CONCLUSION

3.1 As reliance on technology increases to cater for the growth in air traffic over the years, the impacts of disruption will similarly be more drastic. As it is impossible to completely prevent GNSS interference events from occurring, it is therefore important for States to develop and establish a reporting process that caters for quick detection of GNSS interference events to allow initial mitigating

measures to be put in place as well as comprehensive information through subsequent reporting forms for follow up investigations and analysis post event.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

a) note the information contained in this paper;

b) note the importance of establishing a procedure for pilot to report GNSS interference to ATS unit, which will allow prompt detection and notification to airspace users in affected areas;

c) consider for States/Administration to publish the reporting procedures in ENR 4.3 of their Aeronautical Information Publications; and

d) encourage coordination between ATS units for sharing of GNSS interference event that spans across a wide area; and

e) discuss any relevant matters as appropriate.

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