



International Civil Aviation Organization

**SIXTEENTH MEETING OF THE  
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND  
METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG**

Bangkok, Thailand, 23 – 27 July 2012

**Agenda Item 5: Navigation**

- 2) discuss issues related to implementation of GNSS and review developments that have taken place in the Region

**GNSS INTERFERENCE AND ITS IMPLICATIONS**

(Presented by Secretariat)

**SUMMARY**

APANPIRG, through its Conclusion 22/28 invited State aviation authorities to prohibit both intentional and unintentional sources interference to GNSS. This paper provides information on the actions taken at ICAO level to address the issue of GNSS interference.

This paper relates to –

**Strategic Objectives**

**A: Safety** - *Enhance global civil aviation safety*

**C: Environmental Protection and Sustainable Development of Air Transport** - *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

**Global Plan Initiatives:**

GPI-5 RNAV and RNP (Performance-based navigation)

GPI-11 RNP and RNAV SIDs and STARs

GPI-21 Navigation systems

**1. Introduction**

1.1 ICAO Electronic Bulletin “EB 2011/56” dated 21 November, 2011 highlighted the increasing reliance of aviation operations on Global Navigation Satellite System (GNSS) to improve navigation and stressed on the essential role of Member States in ensuring protection of GNSS signals from interference through cooperation of the national aviation and telecommunication authorities in the introduction and enforcement of appropriate regulations controlling the use of radio spectrum.

1.2 Threats to GNSS Performance because of interference were also discussed in APANPIRG/22 meeting and States and Aviation authorities were urged to prohibit malicious and unintentional interference to GNSS through following Conclusion:

**Agenda Item 5 (2)**

23/07/12

***Conclusion 22/28 – Protection of aviation utility of GNSS***

*That, State aviation authorities in participation with other agencies of the State prohibit malicious and unintentional interference to GNSS and regulate legitimate uses of technology to preserve aviation utility of GNSS.*

1.3 ICAO APAC Office, through its State Letter T 8/5.1 & T8/5.15: AP156/11 (CNS) dated 24 November, 2011 reminded the States about APANPIRG Conclusion 22/28 and urged them to take necessary follow-up actions to prohibit such interfering tendencies through suitable administrative and legislative measures and put in place a well-coordinated mechanism in this effort.

1.4 A specific interference incident and its implications on the safety and security of international civil aviation were projected to ICAO Council on 5 June, 2012 through a Working Paper.

**2. Discussion**

2.1 APANPIRG, in its Twenty Second meeting noted with grave concern, potential threats to the performance of GNSS from naturally occurring or manmade sources. Meeting was explained the sources of deliberate and inadvertent interference and their implication on GNSS performance. Deliberate threats to GNSS from individuals, who seek to defeat security and tracking devices on the basis of privacy protection, rising usage of low cost jammers were also discussed in the meeting. Legislative/regulative arrangements in some of the States in the region were informed to the meeting. Recognizing the urgency of situation, meeting adopted a Conclusion urging the State aviation authorities to prohibit malicious and unintentional interference to GNSS and regulate legitimate uses of technology.

2.2 ICAO, in its Electronic Bulletin EB 2011/56 dated 21 November, 2011 stressed on ICAO Member States' essential role in ensuring protection of GNSS signals from interference and identified Sources of Interference to the Global Navigation Satellite System (GNSS). Sources of interference identified in the Bulletin included GNSS repeaters and pseudolites, GNSS jammers, and systems operating outside the GNSS frequency bands that are not properly designed or are inappropriately regulated and operated.

2.3 A Working Paper on "GPS Interference Incident and its Implications on the Safety and Security of International Civil Aviation" was presented to the 196th Session of ICAO Council meeting. GPS is one of the core satellite constellations serving international air navigation systems and has been specified in ICAO Annex 10. Since majority of the civil transport aircraft at present are equipped with GPS receivers, interference on the performance of GPS can cause a hazard to aviation safety through non-availability of GNSS and GPWS services. Non availability of GPS (predominant source of GNSS information) also increases the workload of pilot by making him check other navigation systems and take recovery action etc.

2.4 ICAO also agreed that intended GPS interference to jeopardize safety of civil aviation is in contravention of the principles of Convention on International Civil Aviation and poses an acceptable hazard to the safety of civil aviation in a manner that undermines the objectives of Annex 17. A reference can also be made to the outcome of Beijing Convention on the Suppression of Unlawful Acts Relating to International Civil Aviation. It obligates the parties to criminalize conduct by any person that "unlawfully and intentionally .... damages air navigation facilities or interferes with their operation, if any such act is likely to endanger the safety of aircraft in flight".

2.5 Council, after discussing a specific interference incident in the region, developed following recommendations/actions:

- a) Noted with grave concern the recurrence of global positioning system (GPS) interference incident affecting the safety of international air navigation in the Incheon Flight Information Region (FIR);
- b) Urged the Contracting States with the source of such GPS interference signals to ensure that any similar incidents do not take place again;
- c) Noted that GPS interference can cause a hazard to aviation safety and even lead to accidents through the malfunctioning of GPS receivers and the ground proximity warning systems (GPWS);
- d) Recognized that GPS interference, if it is intended to jeopardize the safety of civil aviation, is not only in contravention of the principles of the Convention on International Civil Aviation, but also poses a hazard to civil aviation in a manner that undermines the objectives of Annex 17 – Security to the Convention;
- e) Requested the Secretary General to study, in collaboration with ITU, when necessary, the implications of GNSS interference on the safety of international civil aviation with a view to preventing or addressing any similar incidents in the future;
- f) Noted that the Twelfth Air Navigation Conference (AN-Conf/12) would consider the issue of interference with the GNSS; and
- g) Requested the Secretary General to issue a State Letter informing States of the Council’s decision on this subject.

2.6 ICAO, through State Letter AN 13/4.5-12/50 dated 9 July, 2012 informed the States about Council’s Decisions on the issues related to interference and requested them to take action to ensure that sources of GPS interference signals are identified and mitigated to ensure that the integrity of international air navigation is maintained.

### **3. Action by the Meeting**

3.1 Meeting is invited to note the contents of the paper and make sure necessary action is taken with radio regulators and other national administrations concerned to remove all sources interfering with the performance of GPS. Meeting is also invited to refer to ICAO APAC Office State Letter mentioned in para 1.3 above.

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