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**Subject:** Strengthening of communications, navigation, and surveillance (CNS) systems resilience and mitigation of interference to global navigation satellite system (GNSS)

**Action required:** Note the criticality of the issue and the importance of action by States to address it by making use of the ICAO guidance provided in Doc 9849, *Global Navigation Satellite System (GNSS) Manual* and by taking any other measures as appropriate

Sir/Madam,

1. I have the honour to inform you that the Council, at the ninth meeting of its 220th Session on 22 June 2020, agreed with the proposal to bring to the attention of States the actions agreed by the 40th Session of the Assembly (24 September – 4 October 2019) with regard to communications, navigation, and surveillance (CNS) systems resilience and mitigation of harmful interference to global navigation satellite system (GNSS).

2. The agreed actions were pursuant to proposals contained in Assembly working papers A40-WP/82, A40-WP/352 and A40-WP/188, presented respectively by Finland on behalf of the EU and its Member States<sup>1</sup>, by Saudi Arabia and jointly by the International Federation of Air Traffic Controllers' Associations (IFATCA), the International Federation of Air Line Pilots' Associations (IFALPA) and the International Air Transport Association (IATA). The papers identified issues related to the evolution of CNS systems and the associated threats and vulnerabilities, with particular regard to satellite-based CNS systems, such as GNSS. They highlighted, in particular, the impact from harmful interference to GNSS on the safety and efficiency of aircraft and ATM operations, and identified the need to strengthen the protection of GNSS signals from harmful interference and degradation of performance through actions by States and ICAO in coordination with industry.

<sup>1</sup> Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

3. The Assembly noted the essential commonality of purpose among the three papers and agreed with the proposals contained therein (*Assembly Fortieth Session, Technical Commission Report, Doc 10137, A40-TE, 30.15* refers). The attachment to this letter compiles the proposals that are relevant for action by States. In summary, they include: reinforcing CNS system resilience to interference, preventing the use of illegal interfering devices, increasing collaboration with radio regulatory and enforcement authorities, reinforcing civil-military coordination to address interference risks associated with GNSS testing and conflict zones, increasing coordination between aviation and radio-regulatory authority and military, retaining essential conventional navigation infrastructure for contingency support in case of GNSS outages, and developing mitigation techniques for loss of services.

4. In particular, all three papers stress the importance of applying the GNSS radio frequency interference mitigation plan outlined in the ICAO *Global Navigation Satellite System (GNSS) Manual* (Doc 9849). The framework recommended to implement the mitigation plan includes a continuous three-step process, comprising threat monitoring, risk assessment and deployment of mitigation measures. Checklists of preventive and reactive measures aimed at mitigating the interference risk, as far as practicable, are also provided.

5. May I request that you note the criticality of the issue and the importance of action by States to address it by making use of the ICAO guidance provided in Doc 9849, and by taking any other measures, as appropriate.

Accept, Sir/Madam, the assurances of my highest consideration.

Fang Liu  
Secretary General

**Enclosure:**

Actions agreed by the 40th Session of the Assembly to strengthen CNS systems resilience and mitigate interference to GNSS

**Actions agreed by the 40th Session of the Assembly  
to strengthen CNS systems resilience and mitigate interference to GNSS**

From A40-WP/82, States are urged to:

- “1) transition from a CNS system-based concept towards secure CNS services, mainly based on a satellite-based infrastructure while addressing its resiliency to interference through independent minimum operational networks based on ground and/or airborne components;
- 2) apply necessary measures to avoid the commercialisation / proliferation and the use of illegal transmitters such as jammers which may impact satellite-based CNS systems;
- 3) ensure, considering that the use of radio frequency spectrum by aeronautical safety services requires special measures, close collaboration between aviation authorities, service providers, radio regulatory and spectrum enforcement authorities to ensure that this spectrum is free from harmful interference;
- 4) reinforce civil-military collaboration regarding global navigation satellite system (GNSS) testing and other activities, which may impact satellite-based CNS systems, with the air navigation services provider (ANSP) responsible for the affected airspace; and
- 5) consider, when assessing the interference risks associated with conflict zones, that the use of satellite-based CNS systems can potentially be impacted beyond that zone.”

From A40-WP/352, States are urged to:

- “1) assess the likelihood and effects of global navigation satellite system vulnerabilities in their airspace and apply, as necessary, ICAO mitigation methods;
- 2) provide effective spectrum management and protection of global navigation satellite systems (GNSS) frequencies to reduce the likelihood of unintentional interference or degradation of GNSS performance; and
- 3) cooperate for design, development and realization of Ground and on-board mitigation techniques of GNSS loss of service;”

From A40-WP/188, the Assembly is invited to:

- “a) to implement appropriate mitigation measures as contained in the *Global Navigation Satellite System (GNSS) Manual* (Doc 9849) as a matter of high priority and to report progress and any difficulties to ICAO;
- b) to recognize the unintended impact of harmful interference to civil flight operations and to exercise caution to the maximum extent possible to protect the safety of civil aircraft during military exercises and operations;
- c) to establish and ensure appropriate frequency regulations are in place and maintained to protect allocated GNSS frequencies from harmful interference in line with ITU Radio Regulations;
- d) to ensure that contingency procedures are established in coordination with air navigation service providers and airspace users and that essential conventional navigation infrastructure, such as Instrument Landing System (ILS), are retained when operationally beneficial; and
- e) to support the multi-disciplinary development of alternative positioning, navigation and timing (APNT) strategy and solutions to complement the use of GNSS in aviation in coordination with ICAO and airspace users.”