Agenda Item 5: Other Business

AVIATION RISK MITIGATION MEASURES DUE TO THE IMPLEMENTATION OF 5G FREQUENCIES IN BRAZIL

(Presented by Brazil)

SUMMARY

This Information Paper presents the actions carried out so far and in progress in Brazil to mitigate possible interference from 5G/IMT base stations emissions on aircraft radio altimeters in the 3,300 MHz to 3,700 MHz frequency band.

References

- Base Station radio transmission and reception – 3GPP TS 38.104 – Release 16; and
- Twentieth Meeting of the Regional Group for Planning and Execution of the Caribbean and South America (GREPECAS/20), Salvador, Brazil, November 16-18, 2022.

ICAO's Strategic Objectives:	*A – Safety* *B – Air Navigation Capacity and Efficiency*

1. BACKGROUND

1.1 ICAO has been concerned by the apparent lack of a consistent standardized approach between States as they proceed with the rollout of 5G. Frequency ranges slated for 5G use vary from country to country, including with respect to how close they come to the Radio Altimeter band. There is also a very substantive difference in the prescribed maximum radiated power of the 5G base stations from one country to another.

1.2 The importance of ensuring compatibility of radio altimeters (RA) with new cellular terrestrial systems operating in the 3,5 GHz frequency band has been described in WP19 from Frequency Spectrum Management Panel (FSMP) [FSMP/11-WP/19], paper which explains that temporary mitigation measures are needed to provide time to obtain data on 5G regulatory implementations and technical information.

2. ANALYSIS

2.1 In November 2021, the National Telecommunications Agency of Brazil (ANATEL) held the 5G auction in Brazil, which established the range of 3,300-3,700 MHz for the implementation of IMT/5G systems.

2.2 In view of the need to ensure the continuity of safe air navigation operations in Brazilian airspace, DECEA held meetings with ANATEL, aiming to identify restrictive measures to 5G

systems that guarantee the safe operation of aviation radio altimeters, during the period of development of a new regulation and, consequent modernization of radio altimeter equipment.

2.3 ANATEL submitted to comments and suggestions from the overall public, a proposal for Operational Requirements for 5G stations operating in the 3.5 GHz band for the protection of radio altimeters operating in the 4,2 – 4,4 GHz band, through Public Consultation No. 36/2022. Based on these contributions, ANATEL published Act. No. 9064/2022, establishing the following rules:

- On a provisional and precautionary basis, the main beams of the antennas used in base, nodal or repeater stations operating in the sub-band from 3,300 to 3,700 MHz, installed in areas close to the aerodromes specified in the Annex, shall have their pointing limited between the horizon line and below, within the area limited by the rectangle comprised by the following distances:
  a) 2100 meters from the edge of the landing and take-off runway; and
  b) 910 meters on each side of the central axis of the runway.

- The pointing limit applies to both AAS and non-AAS antennas.
- For the base station, nodal or repeater installed in the areas define above, the maximum power, by polarization, must be limited to:
  a) 67 dBm/100 MHz, when operation in the 3,300 MHz to 3,600 MHz sub-band; or
  b) 65 dBm/100 MHz, when operating in the sub-band 3,600 MHz to 3,700 MHz.

2.4 Two relevant points under the WRC-23 Agenda Item 1.7 are:

- *to consider a new aeronautical mobile-satellite (R) service allocation in accordance with Resolution **428 (WRC-19)** for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications in all or part of the frequency band 117.975-137 MHz, while preventing any undue constraints on existing VHF systems operating in the aeronautical mobile (R) service, in the aeronautical radionavigation service, and in adjacent frequency bands.*

- Resolution **428 (WRC-19)** – *Studies on a possible new allocation to the aeronautical mobile-satellite (R) service within the frequency band 117.975-137 MHz in order to support aeronautical VHF communications in the Earth-to-space and space-to-Earth directions.*

2.5 ANATEL published another Public Consultation (No. 86) in December 2022 proposing amendment of Act No. 9064.

2.6 The rules established by the Act 9064 will be reviewed until July 31, 2023, considering the evolution of the studies at national and international level.

2.7 DECEA remains concerned about the issue and closely monitors the evolution of events and studies on the subject, till the next revision of act 9064 that should take place in July 2023.

3. SUGGESTED ACTIONS

3.1 The Meeting is invited to:

a) take note of the activities carried out in Brazil; and

b) analyze other considerations that the Meeting to deems pertinent.