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WORKING PAPER

ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 30: Aviation Safety and Air Navigation Policy
30.3 Relevant Outcomes of the High-level Conference on COVID-19, Safety Stream (HLCC 2021)

STRENGTHENING PROTECTIONS FOR AVIATION SAFETY SYSTEMS FROM HARMFUL INTERFERENCE

(Presented by Presented by the Airports Council International – ACI;
Civil Air Navigation Services Organization – CANSO;
International Air Transport Association – IATA;
International Coordinating Council of Aerospace Industries Associations – ICCAIA; The International Federation of Air Line Pilots' Associations – IFALPA; International Federation of Air Traffic Controllers' Associations - IFATCA)

EXECUTIVE SUMMARY

A sustainable spectrum environment is required to support safety and operational efficiency for current and future aviation systems and allow for the transition between present and future technologies. Continuing safety of international civil aviation, uninterrupted operations of flight, and developments and implementations of the communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and new avionics depend strongly on adequate aeronautical spectrum resource.

The undersigned governments to the Convention on International Civil Aviation have agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically.

These principles and arrangements can be seriously jeopardized unless requirements for appropriate aviation safety spectrum allocations are satisfied, and continued protection of those allocations is achieved.

Recognizing on-going spectrum challenges faced by the aviation community and in line with relevant Recommendations from the 12th Air Navigation Conference and 2021 ICAO High-Level Conference on COVID-19 (HLCC), States are urged to strengthen their efforts to ensure that aviation safety systems are free from harmful from radiofrequency (RF) interference.

[1] English, Arabic, Chinese, French, Russian and Spanish versions provided by IATA.

Action: to reiterate ICAO Member States' continued commitment to aviation safety, the Assembly is invited to strengthen support to the ICAO policy on radio frequency spectrum matters by amending Resolution A38-6 as proposed in the attachment to this Paper.	
Strategic Objectives:	This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
Financial implications:	
References:	Assembly Resolution A38-6, *Support of the ICAO policy on radio frequency spectrum matters* Article 40 of the ITU Constitution[2] Article 4.10 of the ITU radio regulations[3]

[2] CONSTITUTION OF THE INTERNATIONAL TELECOMMUNICATION UNION
[3] Radio Regulations 2020 - ITU Hub

1. INTRODUCTION

1.1 The undersigned governments to the Convention on International Civil Aviation have agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically.

1.2 A sustainable spectrum environment is required to support safety and operational efficiency for current and future aviation systems and allow for the transition between present and future technologies. Continuing safety of international civil aviation, uninterrupted operations of flight, and developments and implementations of the communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and new avionics depend strongly on adequate aeronautical spectrum resource and can be seriously jeopardized unless requirements for appropriate aviation safety spectrum allocations are satisfied, and continued protection of those allocations is achieved.

1.3 Moreover, recovery of the aviation industry and expected increase in air traffic movements, as well as new emerging applications, such as remotely piloted aircraft systems, place greater demands on aviation regulatory and air traffic management mechanisms, resulting in increasing requirements for sustainable and predictable frequency assignments and spectrum allocations. The ICAO Twelfth Air Navigation Conference also recognized that *"a prerequisite for the deployment of systems and technologies is the availability of adequate and appropriate radio spectrum to support aeronautical safety services."*

1.4 While recognizing the economic importance of making spectrum available to support next generation commercial telecommunication systems and services, this effort however needs to be balanced with the criticality of aviation safety being accorded the highest priority. Article 40 of the ITU Constitution states, *"international telecommunication services must give absolute priority to all telecommunications concerning safety of life at sea, on land, in the air or in outer space, as well as to epidemiological telecommunications of exceptional urgency of the World Health Organization".* Article 4.10 of the International Telecommunication Union (ITU) Radio Regulation also emphasizes that ITU Member Administrations need to recognize that the safety aspects of radio navigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies and to formally establish necessary regulatory conditions, including appropriate technical limits for transmission power, spurious emission, and antenna transmitting pattern

2. DISCUSSION

2.1 The undersigned governments to the Convention on International Civil Aviation have agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically.

2.2 Of one particular concern, on the on-going deployments of new cellular broadband technologies (such as 5G) in the frequency bands close to the radio altimeter's frequencies, ICAO Secretary General in State Letter SP 74/1-21/22 notes that harmful interference to the functioning of aircraft radio altimeters - a critical, mandatory aviation safety system - may pose a serious aviation safety risk to passengers, crew, and people on the ground if the interference is not properly mitigated. The ICAO letter

also mentions that some radio-altimeters will be impacted, if high power cellular systems are implemented near the frequency band used by radio altimeter.

2.3 Furthermore, the ICAO High-Level Conference on COVID-19 (HLCC) in 2021 also recommends

That States:

a) consider, as a priority, public and aviation safety when deciding how to enable cellular broadband/5G services;

b) consult with aviation safety regulators, subject matter experts and airspace users, to provide all necessary considerations and regulatory measures to ensure that incumbent aviation systems and services are free from harmful interference; and

That ICAO:

c) continue coordinated aviation efforts, particularly at the International Telecommunication Union (ITU), to protect radio frequency spectrum used by aeronautical safety systems.

2.4 In addition to the radio altimeter concern, other aviation systems that are being impacted or being at risks of harmful interference include Global Navigation Satellite Systems (GNSS), aircraft satellite communication, and Distance Measuring Equipment (DME).

2.5 Before deciding on any spectrum allocations or conducting spectrum auctions, States are urged to ensure that every frequency allocation/assignment is comprehensively studied and is proven not to adversely impact incumbent aviation safety systems and overall operational efficiency. Robust testing in coordination with aviation safety regulators and aviation subject matter experts is critically important in providing necessary information. Necessary mitigations should be formally codified into States' regulations to ensure no harmful interference to aeronautical safety systems. These mitigations include appropriate technical limits for transmission power, spurious emission, and antenna transmitting pattern.

2.6 Moreover, State aviation safety regulators, in support of aviation stakeholders, should engage with national telecommunication spectrum regulators prior to decisions being made on the deployment of new telecommunication services, especially when the new services are planned in spectral proximity to incumbent aviation safety systems. Aviation safety regulators are urged to proactively seek assurances from national telecommunication spectrum regulators that adequate regulatory safeguards and mitigations are established to protect critical aircraft safety systems, such as radio altimeters, from potential harmful interference. Furthermore, we urge that appropriate technical and operational evaluations, together with and sufficient aviation safety assessments, have been conducted and the results agreed and accepted by aviation safety regulators before making State decisions on spectrum issues that may have impact on aviation.

2.7 Failures to engage in interagency and inter-industry dialogue mutually and positively between aviation and telecommunication regulators and stakeholders can increase aviation safety risk; has caused cancellations and operational interruptions, and significantly impacted the traveling public and flow of cargo. With this lesson learned, States are strongly urged to provide the necessary leadership to act as the fair facilitator, ensuring the open sharing of information between national civil aviation authorities and national spectrum regulators, such that there are mutually agreed conditions and measures, enabling aviation to safely coexist within new telecommunication services under a predictable, transparent spectrum environment and roadmap. These conditions and measures should be codified in the appropriate national laws and regulations.

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APPENDIX

~~A38-6~~ A41-xx: Support of the ICAO policy on radio frequency spectrum matters

Whereas ICAO is the specialized agency of the United Nations responsible for the safety, regularity and efficiency of international civil aviation;

Whereas ICAO adopts international Standards and Recommended Practices (SARPs) for aeronautical communications systems and radio navigation aids;

Whereas the International Telecommunication Union (ITU) is the specialized agency of the United Nations regulating the use of the radio frequency spectrum;

Whereas the ICAO position, as approved by the Council, for ITU World Radiocommunication Conferences (WRCs) is the result of the coordination of international aviation requirements for radio frequency spectrum;

Whereas a comprehensive frequency spectrum strategy is required by aviation to support timely availability and appropriate protection of adequate spectrum;

Whereas a sustainable environment for growth and technology development is required to support safety and operational effectiveness for current and future operational systems and allow for the transition between present and future technologies;

Recognizing that the development and the implementation of the communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and the safety of international civil aviation could be seriously jeopardized unless requirements for appropriate aviation safety spectrum allocations are satisfied and the continued protection of those allocations is achieved;

Recognizing that unresolved spectrum issues relating to aeronautical safety services have resulted in flight cancellations, degradations of air traffic management services and interruptions of flight operation;

Recognizing that to ensure optimal use of the frequency spectrum allocated to aviation, efficient frequency management and use of best practices are required;

Recognizing that support from ITU member administrations is required to ensure that the ICAO position is supported by the WRC and that aviation requirements are met;

Considering the urgent need to increase such support due to the growing demand for spectrum and aggressive competition from commercial telecommunications services;

Considering the increased level of ITU WRC preparation activities associated with the growing demand for bandwidth from all users of the radio frequency (RF) spectrum, as well as the increased importance of

the development of regional positions by regional telecommunication bodies such as APT, ASMG, ATU, CEPT, CITEL and RCC[4]; and

Considering Recommendations 7/3 and 7/6 of the Special Communications/Operations Divisional Meeting (1995) (SP COM/OPS/95), Recommendation 5/2 of the 11th Air Navigation Conference (2003), ~~and~~ Recommendation 1/12 of the 12th Air Navigation Conference (2012), and Recommendation 5/5 of the High-level Conference on COVID-19 (2021);

The Assembly:

1. *Urges* Member States, international organizations and other civil aviation stakeholders to support firmly the ICAO frequency spectrum strategy and the ICAO position at WRCs and in regional and other international activities conducted in preparation for WRCs, including by the following means:

a) working together to deliver efficient aeronautical frequency management and "best practices" to demonstrate the effectiveness and relevance of the aviation industry in spectrum management;

b) supporting ICAO activities relating to the aviation frequency spectrum strategy and policy through relevant expert group meetings and regional planning groups;

c) undertaking to provide for aviation interests to be fully integrated in the development of their positions presented to regional telecommunications fora involved in the preparation of joint proposals to the WRC;

d) including in their proposals to the WRC, to the extent possible, material consistent with the ICAO position;

e) supporting the ICAO position and the ICAO policy statements at ITU WRCs as approved by Council and incorporated in the *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718);

f) undertaking to provide civil aviation experts to fully participate in the development of States' and regional positions and development of aviation interests at the ITU; and

g) ensuring, to the maximum extent possible, that their delegations to regional conferences, ITU study groups and WRCs include experts from their civil aviation authorities and other civil aviation stakeholders who are fully prepared to represent aviation interests;

2. *Urges* Member States to consider, as a priority, public and aviation safety when deciding how to enable new or additional services, and to consult with aviation safety regulators, subject matter experts and airspace users, to provide all necessary considerations and to establish regulatory measures to ensure that incumbent aviation systems and services are free from harmful interference.

~~2~~3. *Requests* the Secretary General to bring to the attention of ITU the importance of adequate radio frequency spectrum allocation and protection for the safety of aviation;

[4] PT: Asia-Pacific Telecommunity; ASMG: Arab Spectrum Management Group; ATU: African Telecommunications Union; CEPT: the European Conference of Postal and Telecommunications Administrations; CITEL: Comisión Interamericana de Telecomunicaciones; RCC: Regional Commonwealth in the field of Communications.

~~3~~4. *Instructs* the Council and the Secretary General, as a matter of high priority within the budget adopted by the Assembly, to ensure that the resources necessary to support the development and implementation of a comprehensive aviation frequency spectrum strategy as well as increased participation by ICAO in international and regional spectrum management activities are made available; and

~~4~~5. *Declares* that this resolution supersedes Resolution ~~A36-25~~A38-6.

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