



WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

**Agenda Item 2: Enabling the global air navigation system
2.2: Integrated CNS and spectrum strategy**

**MANAGING PRESSURES FROM NON-AERONAUTICAL USERS TO SHARE
AERONAUTICAL FREQUENCY SPECTRUM**

(Presented by Canada)

EXECUTIVE SUMMARY

Frequency spectrum is a limited resource. Aviation as a global industry requires access to interference free spectrum, which is operationally critical for safe and efficient air transport. This paper highlights the concerns of the aviation industry regarding the ever increasing pressures from non-aeronautical frequency spectrum users seeking to share aeronautical frequency bands. The provision of aeronautical communication, navigation and surveillance (CNS) services all require access to spectrum that is recognized in the International Telecommunication Union (ITU) Radio Regulations as protected for “safety of life” usage. Sharing aeronautical spectrum with non-aeronautical commercial users can raise the potential for harmful interference and increase the risk of degradation to safety of life operations, resulting in inefficient airspace usage and/or airport capacity constraints.

Action: The Conference is invited to agree to the recommendation in paragraph 3.2.

1. INTRODUCTION

1.1 This working paper highlights the harmonized global requirement for access to frequency spectrum that is free from interference, while also expressing the growing aviation concerns from the increasing pressures of non-aeronautical frequency spectrum users seeking access to aeronautical frequency bands. communications, navigation, and surveillance (CNS) systems have an absolute requirement for interference-free access to frequency spectrum, an element that remains critical to the global aviation industry.

1.2 As a global user of frequency spectrum, the aviation industry is unique, particularly with regard to the CNS systems used for safe and efficient flight requiring simultaneous usage of multiple frequency bands on-board an aircraft. Accordingly, aviation cannot be compared to any other commercial non-aeronautical frequency spectrum user in respect to availability of spectrum, particularly protected spectrum that has special recognition under the International Telecommunication Union (ITU) Radio Regulations. Aeronautical systems are globally standardised and internationally recognized to meet specified technical performance requirements for the provision of communications, navigation and surveillance functions. The safety critical elements in the provision of globally harmonised aeronautical

CNS systems and the usage of protected frequency spectrum are some of the factors that make it extremely difficult for non-aeronautical users seeking to share aeronautical frequency bands.

1.3 Aviation frequency bands often have multiple International Civil Aviation Organization (ICAO) standardized systems operating within the same band in a harmonised manner. This promotes spectral efficiency and operational benefits in aircraft avionics equipment. Overall, it allows aviation to manage the respective frequency bands in a manner that also allows current systems to evolve when newer technologies become available. Moreover, as noted in the preceding paragraph, this becomes an additional factor to be considered when non-aeronautical users are seeking access to aviation frequency band, as

1.4 Within the last thirty years the air transport industry has benefitted from enhancements to communications, navigation and surveillance service availability via satellite. Technological advancements in CNS services via satellite have supported continued annual growth rates in the aviation industry, with increased safety and efficiencies gained in airspace management. One such ICAO initiative, performance-based communications and surveillance (PBCS), is being implemented to optimise reduced vertical separation minimum (RVSM) airspace.

1.5 It is important to note that achieving efficiencies in airspace management to support the ever increasing air transport flow capacity in continental and oceanic airspace also has a direct impact on air traffic management at airports. In particular, the arrival flow rate at airports remains dependent on traditional terrestrial systems for precision approach in low visibility operational conditions. As such, the frequency bands used by navigation, surveillance and communications systems in the airport terminal environment have a critical requirement to be interference free, with 100 per cent availability and use only by aeronautical systems.

1.6 There are many aerodrome components that comprise the requirements of a precision approach in low visibility conditions. The loss of any single integral component, whether it be airfield lighting, a terrestrial navigation-aid or runway visual range (RVR), immediately has the effect of compromising the precision approach capability, and thus a potential impact to aircraft conducting an approach, further decreasing airport capacity.

1.7 With respect to the radio frequency (RF) environment at an airport where a variety of aeronautical CNS systems use different frequency bands, the competent authorities, being either the civil aviation authority (CAA) or the air navigation services provider (ANSP), would have conducted a ‘safety case assessment’ of the known static RF environment; this would take the form of a documented validation that specific airport runway(s) precision approach capabilities can be supported. This function is normally part of a State’s Safety Oversight Program.

2. DISCUSSION

2.1 The above described scenario involving precision approach capabilities is an example of what is available at airports all around the world. The standardized aeronautical systems all use the same frequency spectrum that is globally harmonized and afforded special protection by the ITU Radio Regulations from harmful interference. This scenario would change significantly if non-aeronautical users are permitted access to share the spectrum.

2.2 Considering the trends in non-aeronautical frequency spectrum bands in which compatible sharing can sometimes be achieved as a result of successful technical studies, it must be stressed that these are non-safety of life systems or services that would not cause any impact to human

life. As stated, systems with similar technical operating characteristics can sometimes be candidates for compatible sharing in the same frequency band. However, this is not the case with aeronautical systems.

2.3 More recently, aviation has had to defend against a non-aeronautical user seeking access to share a frequency band that has multiple aeronautical systems and services, a frequency band that is critical to the safe and efficient operation of the air transport industry on a global basis. The band has navigation, surveillance and also communications systems operating in accordance with ICAO Standards.

2.4 Aviation cannot afford to have diminished access to protected spectrum. The potential effects would be significant and may constrain the expected continued annual growth rates in the global air transport industry.

3. CONCLUSION

3.1 Safety and efficiency are of paramount importance in the aviation industry. Frequency spectrum access cannot be compromised by the impediment of forced sharing with non-aeronautical users. Equally important is the requirement to ensure effective implementation of a Safety Oversight Program in accordance with ICAO State obligations to ensure that aviation remains aware of the consequences of diminished access to protected frequency spectrum.

3.2 In light of the above, the Conference is invited to agree to the following recommendation:

Recommendation 2.2/X – Managing pressures from non-aeronautical users to share aeronautical frequency spectrum

The Conference is invited to:

- a) urge States to actively engage in spectrum regulatory process to ensure the protection of the safety critical operation of aeronautical communications, navigation, and surveillance (CNS) systems as per Assembly Resolution A38-6, *Support of the ICAO policy on radio frequency spectrum matters*; and
- b) urge States, to ensure through the implementation of their Safety Oversight Program, that the designated competent authorities (civil aviation authority (CAA) or air navigation services provider (ANSP) are involved in safety case assessments of the radio frequency environment, in such a manner as to adequately protect the operational availability of aeronautical CNS systems.

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