International Civil Aviation Organization

The Fifth Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/5)

Bangkok, Thailand, 13 – 16 January 2026

Agenda Item 4: Implementation of CNS-ATM Systems

SPECTRUM RESILIENCE: BALANCING SPECTRUM EFFICIENCY WITH AVIATION SAFETY

(Presented by International Air Transport Association - IATA)

SUMMARY

This paper discusses the need for continued management of the aeronautical spectrum to ensure flight safety and optimized efficiency. As technologies such as 5G and 6G emerge, they present challenges related to potential interference with critical aeronautical systems, such as radio altimeters.

1. INTRODUCTION

1.1 The invisible asset underlying all commercial aviation operations is the frequency spectrum, specifically the allocations granted by the International Telecommunications Union (ITU) to "safety of life" flight operations. It underpins the communications, navigation, and surveillance (CNS) systems critical to safe flight. Therefore, interference-free access to this spectrum is essential for the seamless operation of air traffic, ensuring that pilots, air traffic controllers, and ground personnel can exchange crucial information without disruptions.

1.2 As the telecommunications industry accelerates innovation and delivery of diverse applications powered by 5G, telecommunications operators are pressuring governments to release additional spectrum. This demand is leading to the allocation or reallocation of frequency bands adjacent to those used in aviation, increasing the threat of RFI to legacy avionic systems.

2. DISCUSSION

2.1 In recent years, the telecommunications industry has deployed networks based on 5G C-band technology in the spectrum below the radio altimeter band (4.2-4.4 GHz), which challenges the interference-free use of that segment of the aeronautical spectrum by legacy avionics. Some states activated 5G mitigation measures (with sunsets in 2026 and 2028) concurrent with the rollout of 5G C-band operations at or near airports.

2.2 New radio altimeter standards are in development by RTCA and EUROCAE. However, new radio altimeters built to this standard are unlikely to be widely available until the early 2030s. In addition, supply chain and aircraft downtime issues point to operational disruption over the next decade.

2.3 While current Group 4 altimeters are more resilient, they are not impervious to all forms or levels of 5G interference. The G4 standard defines a minimum level of performance. Real-world

operating environment, with varying 5G power levels, antenna configurations, and proximity to runways, can still pose a threat. Consequently, it is essential to continue mitigation of 5G RFI beyond the current sunset dates to ensure protection of RAD ALT systems.

2.4 Deployment of 5G is often mischaracterized as a national issue. In reality, airlines operate across multiple regulatory jurisdictions as commercial aircraft routinely fly across international borders. Therefore, varying requirements and mitigation measures may affect flight safety and operational efficiency.

2.5 Consideration of IMT or other services above the radio altimeter band must be preceded by comprehensive studies incorporating operational scenarios during all phases of flight, including off-nominal flight profiles. Aviation safety must not be compromised by spectrum decisions made in the absence of rigorous technical and operational validation. A precautionary approach should be non-negotiable: spectrum policy must be guided by worst-case interference scenarios, validated safety margins, and a clear commitment to preserving the integrity of critical aeronautical systems.

2.6 Dynamic evolution of the global regulatory environment highlights a need for early, continuous, and structured collaboration between aviation and radio regulatory authorities. Such coordination is essential to ensure that future spectrum management decisions are fully aligned with the highest standards of aviation safety, operational resilience, and system integrity.

2.7 To ensure ongoing provision of safe and efficient global air navigation services (ANS) by balancing spectrum efficiency with the needs of aviation safety, rule-makers need to investigate and implement measures to significantly expedite a process for the development, standardization, and certification of novel 21st century avionic systems capable of harmonious spectrum coexistence with the telecommunications industry and other users of spectrum.

2.8 Accelerated deployment of more spectrum efficient CNS technologies are crucial in an electromagnetic environment where substantial telecommunications advancements typically have a deployment cycle measured in years rather than decades (e.g., 4G to 5G and soon 6G - while aviation still has older technology for its primary voice communications). This disparity in innovation and deployment timelines must be effectively addressed at ICAO level as governments look to spectrum auctions as a significant source of funds.

2.9 IATA is developing a global strategy to engage on minimising impacts of telecommunications utilising bandwidth adjacent to aviation frequencies. A key message will underline the economic value of aviation to telecom regulators, authorities, and ministers.

2.10 Advocacy goals are to increase awareness with telecom regulators, authorities, and ministers regarding the safety impacts and risks associated with interference with aircraft avionics, and to ensure that there is an operationally viable transition plan for sunsetting of any 5G mitigations.

2.11 Interference-free access to the aeronautical frequency spectrum is crucial for ensuring the safety, efficiency, and growth of the aviation industry. It supports seamless CNS, enabling the sector to operate reliably and profitably. To preserve these capabilities, it is imperative that governments, regulatory authorities, and industry stakeholders collaborate to continue protecting the aeronautical frequency spectrum and ensure interference-free access.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) Reiterate the responsibility of all member States to ensure that aviation safety continues to be a matter of highest priority, and to maintain interference-free operation of aeronautical safety systems amid the introduction of new or additional services;

c) Support relevant ICAO expert groups to implement strategies aimed at facilitating safe but faster innovation, development, certification, and implementation of 21st-century avionic systems; and,

d) Request ICAO to continue organizing interactive workshops with the support of member States, aviation organizations, and industry, with special attention given to the continued protection of aeronautical safety services.

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