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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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ICAO WRC-27 Preparatory Workshop

Agenda item 1.7

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Resolution 256 (WRC-23) Requirements

- Based on sharing and compatibility studies, to identify additional spectrum for international mobile telecommunications (IMT) in one or more of the following frequency bands:
 - 4 400 – 4 800 MHz (in Region 1 and Region 3)
 - 7 125 – 8 400 MHz (in Region 2 and Region 3)
 - 7 125-7 250 MHz and 7 750-8 400 MHz (in Region 1)
 - 14.8-15.35 GHz
- Those studies need to ensure the protection of services to which the frequency band is allocated on a primary basis:
 - including protection of stations operating in international waters or airspace which cannot be registered in the MIFR,
 - without imposing additional regulatory or technical constraints on those services, and on services in adjacent bands.

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ICAO Concerns

- The adjacent frequency band 4.2 – 4.4 GHz is allocated globally to:
 - Radar altimeters in the aeronautical radionavigation service (ARNS) on a primary basis
 - Wireless avionics intra-communication (WAIC) in the aeronautical mobile (route) service (AM(R)S) on a primary basis
- ICAO is particularly concerned about the potential impacts of IMT identification in the band adjacent to the aeronautical systems in the 4.2 – 4.4 GHz frequency band
 - Ongoing issues raised by the ICAO State Letter SL 21/22 and (more generally) the ICAO Assembly Resolution 42-7
- The radio frequency band 15.4–15.7 GHz is allocated to the primary aeronautical radionavigation service
 - Used for ground-based primary surveillance radar systems including precision approach radar (PAR) and airport surveillance surface detection equipment (ASDE).
 - Also identified by ICAO for use on board weather radar, ground mapping radar and detect and avoid (DAA) for RPAS

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Additional Considerations – Radio Altimeter

- Majority of existing national studies/data on the radar altimeter have been for 5G below 4.2 GHz
 - Limited radio altimeter data available for performance above 4.4 GHz
 - Performance for current altimeters is not symmetrical below 4.2 GHz and above 4.4 GHz
- Majority of current radio altimeters in use have not been modified to be robust to new sources of adjacent band interference
 - US interim filter modification from 2020 not a global standard nor tuned to above 4.4 GHz
 - New altimeter designs with improved interference performance are not available until mid-2030s

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Current Status

- ICAO has provided both technical and operational parameters of ICAO 4200-4400 MHz systems
 - Proposed use of existing ITU-R recommendation (Recommendation ITU-R M.2059) and a Minimum Separation Distance (MSD) of 35 ft (10.6 m) for operational scenarios
 - Provided a list of technical WAIC-RF characteristics
- WP 5B has not endorsed the ICAO technical and operational material to send to WP 5D
 - ICAO material has not been adopted as a baseline for studies by WP 5D
- ITU studies are nearly finalized
 - Radio altimeter study results vary from no interference to 65+ km zones of interference
 - Some States view only the need for cross-border interference studies at ITU, and not for aircraft in close proximity to cellular towers as recommended by ICAO.
 - No WAIC studies under development in the ITU
- Low attendance in ITU-R meetings from aviation experts
 - Has contributed to the ICAO provided information from not being included in current ITU-R work

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CPM Methods Overview – 4 GHz

Current methods proposed:

- 1A: No Change, but suppression of **Res 256 (WRC-23)**
- 1B1: 4.4 – 4.8 GHz IMT identification in Regions 1 & 3 with obligations, pfd limits, and protection distances
- 1B2: 1B1 with additional obligations and pfd limits
- 1C: 4.4 – 4.8 GHz IMT identification in Regions 1 & 3 with pfd limits, and protection distances
- 1D: 4.4 – 4.8 GHz (or portions of) IMT identification in Regions 1 & 3 draft **new WRC Res**
- 1E: 4.4 – 4.8 GHz IMT identification in Regions 1 & 3 through bi-/multi-lateral coordination, Mods to **Res 223**
- 1F: 4.5 – 4.8 GHz IMT identification Globally, Mods to **Res 223**

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CPM Methods Overview – 15 GHz

Summary of Studies: Still in development, previous meetings were unable to come to agreement on the content

Current methods proposed:

- 5A: No Change, but suppression of **Res 256 (WRC-23)**
- 5B: 14.8 – 15.35 GHz (or portions of) IMT identification globally with **new WRC Res** and pfd limits

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ICAO Position

To oppose any new identification for IMT in the frequency band 4 400-4 800 MHz that reduces the protection of, or imposes additional regulatory or technical constraints, on all types of radio altimeters and Wireless Avionics Intra-Communications operating in the frequency band 4 200-4 400 MHz during all phases of flight.

To ensure the results of this agenda item would not reduce the protection of, or impose additional regulatory or technical constraints, on ground-based air traffic surveillance systems, airborne weather radar, and DAA radars, operating in the frequency band 15.4-15.7 GHz.

Thank You

