

NATIONAL PREPARATORY COMMITTEE TOWARDS WRC-27 AGENDA ITEM 1.9 BRIEF

Chapter: 2

Service: *Mobile, fixed, satellite, aeronautical and science service issues*

Agenda Item: 1.9

Description of Agenda Item: *Consideration of appropriate regulatory actions to update Appendix 26 to the Radio Regulations in support of aeronautical mobile (OR) high frequency modernization, in accordance with Resolution 411 (WRC-23).*

Focus: *Inclusion of wideband digital emissions in candidate bands for aeronautical mobile (OR) service (AM(OR)S), subject to sharing and compatibility with existing in-band and adjacent band services.*

Status of Studies

Studies are being conducted within ITU-R Working Party 5B (WP 5B), under Sub-Working Party 5B-2a. Initial contributions have been submitted towards the development of draft CPM text, which is expected to be finalised at the final WP 5B meeting before the CPM deadline for WRC-27. Both measurement-based and simulation studies have been conducted across the 3 – 18 MHz frequency range with the following key findings:

- a) Adjacent band emissions and noise levels remain below harmful interference thresholds and comply with the defined wideband HF (WBHF) emission masks.
- b) Static analysis indicates that interference levels at incumbent receivers are significantly below permissible limits across propagation paths ranging from 500 km to 10,000 km, with margins between 66 dB and 175 dB.
- c) No anomalous emissions were identified.

These results suggest that the introduction of WBHF systems is technically feasible without causing harmful interference to incumbent services.

Objective of the Studies

The studies taken under WRC-27 AI 1.9 aim to achieve the following objectives pursuant to Resolution 411 (WRC-23):

- a) To study the introduction of new technologies aimed at enhancing the performance of AM(OR)S systems, including new classes of emission and wideband systems, within the frequency ranges specified in RR Appendix 26.
- b) To define the relevant technical and operational characteristics of such technologies.
- c) To conduct sharing and compatibility studies with existing AM(OR)S systems, as well as with other primary services operating in the same or adjacent frequency bands.
- d) To identify any potential modifications to RR Appendix 26, while preserving existing area allotments and ensuring that current narrowband systems remain unaffected, continue to operate without disruption, and are not precluded by any revisions.

Studied Frequency Bands

The candidate frequency bands under study are those in the radio regulations Appendix 26 Frequency ranges exclusive to AM(OR)S (kHz) as outlined in the table below:

3 025-3 155	8 965-9 040
3 900-3 950 (Region 1 only)	11 175-11 275
4 700-4 750	13 200-13 260
5 680-5 730	15 010-15 100
6 685-6 765	17 970-18 030

Methods to Satisfy the Agenda Item

According to the CPM draft, there are two methods to satisfy the WRC-27 AI 1.9 as follows:

Method A - No Change (NOC): proposes retention of the current version of RR Appendix 26.

Method B – there are two proposed alternatives for this method to enable the inclusion of the aggregation of single 3 kHz channels for wideband digital communications, contiguous and non-contiguous channel aggregation as follows:

- a) Method B1: Power limits for contiguously aggregated channels are defined separately from single 3 kHz channels
- b) Method B2: Single power limit for both contiguously aggregated channels and single 3 kHz channels

Regulatory and Technical Framework

The evolving regulatory framework includes:

- a) Modification of Appendix 26/3.6 to introduce channel aggregation for wideband emissions.
- b) Addition of a new provision (26/4.6) defining emission tolerance outside the necessary bandwidth.
- c) Suppression of Resolution 411 (WRC-23) upon completion of studies.

Interference Protection Mechanisms

Protection of AM(OR)S continues to rely on:

- a) Dedicated frequency allocations,
- b) Power limitations,
- c) Frequency reuse planning,
- d) Coordination procedures.

In addition, WBHF systems are expected to employ 4G Automatic Link Establishment (ALE) techniques to dynamically select channels and mitigate interference.

Technical and Regulatory Challenges

In additional aspects, some issues remain to be addressed and clarified as outlined below:

- a) What threshold value is used by a WBHF receiver, through its ALE function, to determine whether a channel is idle or occupied?
- b) On what basis was it established that this threshold level is sufficient to prevent harmful interference to existing AM(OR)S systems?
- c) If this threshold is exceeded, does the 4G ALE mechanism immediately vacate the channel? Or not
- d) If the 4G ALE is only used to mitigate interference, not to avoid, more clarification is needed on how incumbent AM(OR)S systems can assure their protection.

Preliminary National Considerations

Uganda supports Method B and agrees with the proposals to:

- a) To add a new channelling arrangement condition for contiguous aggregation, to enable wideband HF emissions for digital communications. (MOD 26/3.6)
- b) To add tolerance for levels of emission outside the necessary bandwidth. (ADD 26/4.6)
- c) To suppress Resolution 411 (WRC-23) from the ITU radio regulations upon completion of studies.

Uganda emphasises the need to ensure the continued protection of the safety of life, communications and existing narrowband AM(OR)S operations

Conclusion

Studies under WRC-27 Agenda Item 1.9 confirm that wideband HF can be introduced into AM(OR)S without harmful interference, subject to appropriate safeguards. Uganda supports Method B, provided safety-of-life services and existing systems are protected, and emphasises continued work within ITU and alignment with ICAO. Overall, modernization of AM(OR)S offers a strategic opportunity to enhance aeronautical communications while preserving system integrity.