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New Zealand

**preliminary views on WRC-19 agenda items 1.13, 1.16, 9.1 (Issues 9.1.1, 9.1.5, 9.1.8)**

# Agenda Item 1.13

*to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution* ***238 (WRC-15)***

**1. Background**

Agenda item 1.13 aims to identify suitable frequency bands above 24 GHz for larger contiguous blocks of spectrum to facilitate the development of IMT beyond 2020. These IMT-2020 systems are expected to be evolved to provide diverse usage scenarios and applications, such as enhanced mobile broadband (eMBB), massive machine type communications (mMTC) and ultra-reliable and low latency communications (URLLC). Such applications will require larger contiguous blocks of spectrum than those available in frequency bands currently identified for use by IMT (below 6 GHz).

Resolution **238 (WRC-15)** specifies the following frequency bands in *resolves to invite ITU-R* 2 for the appropriate sharing and compatibility studies with respect to services in adjacent bands:

* 24.25-27.5 GHz2, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis; and
* 31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz, which may require additional allocations to the mobile service on a primary basis.

With respect to the development of sharing studies, it is noted that system parameters, propagation models and other clarifications on sensitivity analysis are outlined in the TG 5/1 Chairman’s Report (Document [5-1/478 Annex 1](https://www.itu.int/dms_ties/itu-r/md/15/tg5.1/c/R15-TG5.1-C-0478!N01!MSW-E.docx)). Individual sharing studies are also available in various annexes to the TG 5/1 Chairman’s Report (Annexes 3-12 to Document [5-1/478](https://www.itu.int/md/R15-TG5.1-C-0478/en)).

**2. Method(s) to satisfy the Agenda Item**

Given the complexity of the overall combinations of Methods, Alternatives, Conditions and associated Options, a simplified version of the proposed methods to satisfy WRC-19 Agenda item 1.13 can be found in the embedded summary table. For full details, please refer to the precise text as contained in the draft CPM Report (Document [CPM19-2/1](https://www.itu.int/md/R15-CPM19.02-C-0001/en)).



**3. Preliminary Views**

New Zealand has a preference toward identifying the frequency bands 24.25-27.5 GHz and 37-43.5 GHz, or portions thereof, as possible candidate bands to satisfy this agenda item.

For frequency band 24.25-27.5 GHz, New Zealand supports Method A2, Alternative 2, with the following options for the associated conditions:

* Condition A2a: Option 1 - mandatory limit to protect EESS (passive) in the band 23.6-24 GHz, but only applicable to the portion of 24.25-25.25 GHz as active band
* Condition A2b: Option 3 - no condition is necessary to protect EESS in second harmonic
* Condition A2c: Option 4 - no condition is necessary for stations in SRS/EESS as it is a national matter
* Condition A2d: Option 4 - no condition is necessary for transmitting earth stations in FSS as it is a national matter
* Condition A2e: Option 9 - no condition is necessary for receiving space stations in ISS/FSS as studies show that sharing is feasible when using the baseline parameters
* Condition A2f: Option 3 - no condition is necessary for stations in RAS as it is a national matter
* Condition A2g: Option 4 - no other condition is required

For frequency band 40.5-42.5 GHz, New Zealand supports Method D2, Alternative 2, with the following options for the associated conditions:

* Condition D2a: Option 5 - no condition is necessary for receiving earth stations in FSS as studies show that sharing is feasible when the required separation distance can be maintained between a FSS earth station with a known position and a deployment area of IMT stations
* Condition D2b: Option 3 - no condition is necessary for stations in RAS as it is a national matter
* Condition D2c: Option 3 - no other condition is required

For frequency band 42.5-43.5 GHz, New Zealand supports Method E2, Alternative 2, with the following options for the associated conditions:

* Condition E2a: Option 7 - no condition is necessary for receiving space stations in FSS as studies show that sharing is feasible when using the baseline parameters
* Condition E2b: Option 3 - no condition is necessary for stations in RAS as it is a national matter
* Condition E2c: Option 4 - no other condition is required

New Zealand is also open to consider other feasible candidate bands if there are other suitable frequency ranges being supported more broadly on a global, regional or sub-regional basis.

# Agenda Item 1.16

*to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution* ***239 (WRC-15)***

**1. Background**

The demand for ubiquitous radio local area networks (RLAN, or commonly known as Wi-Fi) resulted in substantial congestion in the 2.4 GHz band. The growth of such demand would likely be addressed by implementing RLAN/Wi-Fi in parts of the 5 GHz band, or expanding other parts of 5 GHz to be made available for RLAN/Wi-Fi.

The use of the bands 5 150–5 350 MHz and 5 470–5 725 MHz by the mobile service for the implementation of RLAN/Wi-Fi is as prescribed in Resolution **229 (Rev. WRC-12)**. To ensure protection for other primary services in the bands 5 150–5 350 MHz and 5 470–5 725 MHz, this Resolution outlined a number of restrictions and interference mitigation measures, including maximum transmitter power, maximum e.i.r.p. levels and power flux density limits at different elevation angle above the horizontal plane of the Earth.

Agenda item 1.16 seeks to study the RLAN technical characteristics and operational requirements in the band 5 150–5 925 MHz. This would include the possibility of reviewing the access conditions applicable to RLAN in the band 5 150–5 350 MHz as prescribed in Resolution **229 (Rev. WRC-12)**. The scope of this study could also explore the possibility of accommodating RLAN use in other bands such as 5 350–5 470 MHz, 5 725–5 850 MHz and/or 5 850–5 925 MHz while not imposing any additional constraint on the incumbent services.

In New Zealand, RLAN/Wi-Fi is permitted to operate in the bands 5 150–5 350 MHz and 5 470–5 725 MHz based on the access conditions as prescribed in Resolution **229 (Rev. WRC-12)**. RLAN/Wi-Fi is also permitted to use 5 725–5 875 MHz, which is designated for industrial, scientific and medical (ISM) applications. To date, there are recurring intermittent interference incidents to the ground-based weather radar in New Zealand operating within 5 600–5 650 MHz (refer to RR No. **5.452**) where RLAN/Wi-Fi were found to transmit in overlapping frequencies of the weather radar.

**2. Method(s) to satisfy the Agenda Item**

The following methods to satisfy WRC-19 Agenda item 1.16 as outlined in the draft CPM Report are categorised into five frequency sub-bands, i.e. 5 150-5 250 MHz, 5 250-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz:

*A) Frequency sub-band 5 150-5 250 MHz:*

**Method A1** No change to the Radio Regulations, with the exception of the suppression of Resolution **239 (WRC-15)**

**Method A2** Revision to Resolution **229 (Rev.WRC-12)** to enable outdoor RLAN operations including possible associated conditions for new e.i.r.p. limits while addressing the protection of incumbent services

**Method A3** Revision to Resolution **229 (Rev.WRC-12)** to enable outdoor RLAN operations by applying the same conditions of use as defined for 5 250-5 350 MHz band in *resolves* 4 of Resolution **229 (Rev.WRC-12)**

**Method A4** Revision to Resolution **229 (Rev.WRC-12)** to enable in-vehicle use of RLAN operations with e.i.r.p. limits up to 40 mW to provide the same level of protection established by Resolution **229 (Rev.WRC-12)** to incumbent services

*B) Frequency sub-band 5 250-5 350 MHz:*

**Method B** No change to the Radio Regulations, with the exception of the suppression of Resolution **239 (WRC-15)**

*C) Frequency sub-band 5 350-5 470 MHz:*

**Method C** No change to the Radio Regulations, with the exception of the suppression of Resolution **239 (WRC-15)**

*D) Frequency sub-band 5 725-5 850 MHz:*

**Method D1** No change to the Radio Regulations, with the exception of the suppression of Resolution **239 (WRC-15)**

**Method D2** Allocate 5 725-5 850 MHz to the Mobile Service on a primary basis worldwide or in Region 1 to accommodate RLAN use restricted to indoor operations with e.i.r.p. limits up to 200 mW including associated mitigation techniques and together with the revision to Resolution **229 (Rev.WRC-12)**

**Method D3** Accommodate RLAN in an existing or a new footnote having mobile primary allocation

*E) Frequency sub-band 5 850-5 925 MHz:*

**Method E** No change to the Radio Regulations, with the exception of the suppression of Resolution **239 (WRC-15)**

**3. Preliminary Views**

New Zealand is of the view that the existing regulatory framework applicable to the band 5 150-5 250 MHz, as contained in Resolution **229 (Rev. WRC-12)**, should be reviewed by enabling outdoor WAS/RLAN operation. New Zealand supports Method A2 or A3 as outlined in the draft CPM text for WRC-19 Agenda item 1.16.

In the band 5 725-5 850 MHz, New Zealand already permitted WAS/RLAN operation to share with other ISM applications. Therefore, New Zealand supports a primary Mobile Allocation in this band as proposed in Method D3 by adding New Zealand to footnote RR No. **5.453**.

In the bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 875-5 925 MHz, New Zealand supports no change to the Radio Regulations (i.e. Methods B, C and E, respectively).

# Agenda Item 9.1, Issue 9.1.1

*Resolution* ***212 (Rev. WRC-15)*** *- Implementation of International Mobile Telecommunications (IMT) in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz*

**1. Background**

Since the existing footnotes RR Nos. **5.388** and **5.389A** do not establish priority between the satellite and terrestrial component of IMT in the bands 1 980-2 010 MHz and 2 170-2 200 MHz, the issue about the coexistence and compatibility between the terrestrial and satellite components of IMT when deployed by neighbouring countries was raised at RA-15 and WRC-15. Issue 9.1.1 is established to study the technical and operational measures to ensure coexistence and compatibility between the terrestrial and satellite components of IMT, in accordance with Resolution **212 (Rev. WRC-15)**.

WPs 4C and 5D, as the two responsible groups, have jointly developed the working document towards a preliminary draft new [Recommendation/Report] ITU-R M.[MSS&IMT-ADVANCED SHARING] “*Coexistence and compatibility study between mobile satellite systems and terrestrial IMT-Advanced systems in the IMT-2 GHz bands in different countries*”, as contained in Document [4C/417 Annex 4](https://www.itu.int/dms_ties/itu-r/md/15/wp4c/c/R15-WP4C-C-0417!N04!MSW-E.docx) and Document [5D/1110 Chapter 4](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5D-C-1110!H04!MSW-E) (Attachment 4.7).

The following four scenarios have been considered in the sharing studies:

* Interference from IMT base stations/user equipment to mobile-satellites (Scenario A1);
* Interference from IMT base stations to mobile-satellite earth stations (Scenario A2);
* Interference from mobile-satellite earth stations to IMT base stations/user equipment (Scenario B1);
* Interference from mobile-satellite to IMT user equipment (Scenario B2).

The conclusions in the draft CPM Report for WRC-19 Agenda Item 9.1, Issue 9.1.1, indicate that potential interference for all four scenarios could be managed by bilateral/multilateral negotiation where administrations can bilaterally/multilaterally determine the appropriate mitigation techniques on a case-by-case basis. Due to the disagreement on how to apply the existing power flux density coordination threshold with respect to the results of the studies, a NOTE was added with two views were expressed immediately after the conclusions section. There was no consensus on whether or not the NOTE and these two Views would form part of the conclusions.

**2. Preliminary Views**

New Zealand supports no change to the Radio Regulations. Since the Radio Regulations did not establish priority neither between terrestrial and satellite components of IMT, nor between mobile and mobile-satellite services in the bands 1 980-2 010 MHz/2 170-2 200 MHz, New Zealand is currently of the view that potential interference for all four possible scenarios between these services could be managed by bilateral/multilateral negotiation where administrations can bilaterally/multilaterally determine the appropriate mitigation techniques on a case-by-case basis.

# Agenda Item 9.1, Issue 9.1.5

*Resolution* ***764 (WRC-15)*** *- Consideration of the technical and regulatory impacts of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in Nos.* ***5.447F*** *and* ***5.450A*** *of the Radio Regulations*

**1. Background**

During the WRC-15 study cycle, Recommendation ITU-R M.1638-0 that was incorporated by reference in the Radio Regulations was revised as Recommendation ITU-R M.1638-1. In this revision process, several new radars with different system characteristics were included in Recommendation ITU-R M.1638-1 and the technical characteristics and protection criteria for ground based meteorological radars were removed from Recommendation ITU-R M.1638-1 and relocated to Recommendation ITU-R M.1849-1.

Given the potential impact on the widespread deployment of RLANs in the 5 250-5 350 MHz and 5 470-5 725 MHz, WRC-15 decided that the reference in the Radio Regulations shall continue to apply to the earlier version incorporated by reference while allowing more time to review the revised system characteristics before deciding whether to incorporate the new version of these Recommendations at WRC-19. This approach is in line with the provisions of Resolution **27 (WRC-07)**.

In New Zealand, RLAN/Wi-Fi is permitted to operate in the bands 5 150–5 350 MHz and 5 470–5 725 MHz based on the access conditions as prescribed in Resolution **229 (Rev. WRC-12)**. RLAN/Wi-Fi is also permitted to use 5 725–5 875 MHz, which is designated for industrial, scientific and medical (ISM) applications. To date, there are recurring intermittent interference incidents to the ground-based weather radar in New Zealand operating within 5 600–5 650 MHz (refer to RR No. **5.452**) where RLAN/Wi-Fi were found to transmit in overlapping frequencies of the weather radar.

The following three approaches were suggested as regulatory examples in the draft CPM Report for WRC-19 Agenda Item 9.1, Issue 9.1.5, to address the issue of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in RR Nos. **5.447F** and **5.450A**:

* Approach A updates the reference to Recommendation ITU-R M.1849-1 in RR No. **5.450A** and leaves all other references unchanged;
* Approach B updates both footnotes RR Nos. **5.447F** and **5.450A** by removing the references and replacing them with the sentence “No. **5.43A** does not apply”;
* Approach C does not change the footnote texts at all.

**2. Preliminary Views**

New Zealand is of the view that Recommendation ITU-R M.1849-1 should be referenced in RR No. **5.450A** to reflect the updated technical/operational characteristics and protection criteria for ground-based meteorological radars. Considering that this change would not impose unacceptable constraints on systems in the mobile service, in particular RLAN/WAS, New Zealand supports Approach A by referencing Recommendation ITU-R M.1849-1 in RR No. **5.450A** (applicable to the frequency band 5 470-5 725 MHz) while leaving all other references unchanged.

# Agenda Item 9.1, Issue 9.1.8

*Issue 3) in the Annex to Resolution* ***958 (WRC-15)***

*Harmonised use of spectrum to support the implementation of narrowband and broadband machine-type communication infrastructures*

**1. Background**

The Internet of Things (IoT) is a topic that is already being discussed across different sectors of the ITU in the context of the development of a whole range of technologies and networks.

It was agreed at RA-15 that the ITU-R would formally recognise the need for studies on IoT by adopting Resolution ITU-R 66 “Studies related to wireless systems and applications for the development of the Internet of Things”. Particularly, *recognizing d)* in this Resolution states that

*the implementation of IoT currently does not require specific regulatory provisions in the Radio Regulations.*

This discussion was continued at WRC-15 and it was agreed that the following scope as outlined in Issue 3) in the Annex to Resolution **958 (WRC-15)** would be considered:

*Studies on the technical and operational aspects of radio networks and systems, as well as spectrum needed, including possible harmonized use of spectrum to support the implementation of narrowband and broadband machine-type communication infrastructures, in order to develop Recommendations, Reports and/or Handbooks, as appropriate, and to take appropriate actions within the ITU Radiocommunication Sector (ITU-R) scope of work.*

WP 5D, as the responsible group, with WPs 1B and 5A as the concerned groups, have developed the following documents:

* Draft new Report ITU-R M.[IMT.MTC] “*The use of the terrestrial component of International Mobile Telecommunication (IMT) for Narrowband and Broadband Machine-Type Communication*”, as contained in Document [5/99](https://www.itu.int/md/R15-SG05-C-0099/en);
* Preliminary draft new Report ITU-R M.[NON\_IMT.M2M\_USAGE] “*Technical and operational aspects of Internet of Things and Machine-to-Machine applications by systems in the Mobile Service (excluding IMT)”*, as contained in Document [5A/976 Annex 23](https://www.itu.int/dms_pub/itu-r/md/15/wp5a/c/R15-WP5A-C-0976!N23!MSW-E.docx).

The conclusions in the draft CPM report for WRC-19 Agenda Item 9.1, Issue 9.1.8, state that there is no need for any regulatory action in the Radio Regulations, but there may be other ways to address the harmonised use of spectrum to support the implementation of machine-type communication through the course of the work in ITU-R Study Groups including the development of ITU-R Recommendations, Reports and/or Handbooks, as appropriate

**2. Preliminary Views**

New Zealand supports no change to the Radio Regulations. New Zealand is of the view that there is no need to identify dedicated spectrum for Internet of Things (IoT) or Machine-type communication (MTC) in the Radio Regulations. IoT/MTC could be deployed in frequency bands already allocated to Mobile Service, or already identified for IMT use. Such applications can be clarified through development of appropriate ITU-R Recommendations, Reports and/or Handbooks.

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