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| **Radiocommunication Study Groups** |  |
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CHAPTER 2

Broadband applications in the mobile service

(Agenda items 1.13, 1.16, 9.1 (issues 9.1.1, 9.1.5, 9.1.8))

Agenda item 9.1(9.1.5)

# 2/9.1.5 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*

(**WP 5A** / **WP 5B**, (WP 3M))

# 2/9.1.5/1 Executive summary

Based on different studies regarding the technical and regulatory impacts of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in RR Nos. **5.447F** and **5.450A**, different approaches (as alternatives for addressing the issue) were suggested for regulatory examples.

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 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.

# 2/9.1.5/2 Background

WRC-03 allocated the 5 150-5 350 MHz and 5 470-5 725 MHz frequency ranges to the mobile service on a primary basis for the implementation of Wireless Access Systems (WAS) including Radio Local Area Networks (RLANs) subject to Resolution **229 (Rev.WRC-12)**. WRC-03 also decided that the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active) (RR No. **5.447F**) and the radiodetermination service (RR No. **5.450A**) shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638-0 and ITU-R RS.1632-0, which were incorporated by reference. Since WRC-03, millions of RLAN devices have been widely deployed worldwide.

During the WRC-15 study cycle, Recommendation ITU-R M.1638-0 was revised. 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 and are not included in Recommendation ITU-R M.1638-1 and were instead relocated to Recommendation ITU-R M.1849-1 and several new meteorological radars were added to Recommendation ITU-R M.1849-1 during this revision process (see also section 2/9.1.5/3.2).

Consistent with the provisions of Resolution **27 (Rev.WRC-12)**, for an ITU-R Recommendation (e.g. ITU-R M.1638), the reference in the Radio Regulations shall continue to apply to the earlier version incorporated by reference until such time as a competent WRC agrees to incorporate the new version. Given the potential impact on the widespread deployment of RLANs in the 5 250‑5 350 MHz and 5 470-5 725 MHz frequency ranges and the provisions of RR Nos. **5.447F** and **5.450A**, WRC-15 decided to study this matter under WRC-19 agenda item 9.1, issue 9.1.5.

If the references to the two Recommendations remain in the footnotes, the question of the revision of RR Nos. **5.447F** and **5.450A** would have to be re-addressed in the future (e.g. under agenda item 2) to consider the future updates of Recommendations ITU-R M.1638 and ITU-R M.1849, most probably with same arguments as those currently developed under WRC-19 agenda item 9.1, issue 9.1.5.

Recommendation ITU R M.1849-1 provides technical and operational aspects of ground-based meteorological radars. There were nine ground-based meteorological radars which were removed from Recommendation ITU-R M.1638-0. Eight of those radars were in Recommendation ITU-R M.1849-0 were retained in into Recommendation ITU-R M.1849-1. In addition, five other ground based meteorological radars from Recommendation ITU-R M.1849-0 were retained and one additional new radar was added into Recommendation ITU-R M.1849-1, resulting in six radars that were not previously in Recommendation ITU-R M.1638-0 being included in Recommendation ITU‑R M.1849-1. As a contributing group to this issue, Working Party 5B also provided a summary of the radars operating in the frequency bands 5 250-5 350 MHz and 5 470-5 725 MHz as contained in Recommendations ITU R M.1638-0, ITU-R M.1638-1, ITU‑R M.1849-0 and ITU-R M.1849-1.

# 2/9.1.5/3 Summary and analysis of the results of ITU-R studies

## 2/9.1.5/3.1 Summary of technical and operational studies

## 2/9.1.5/3.1.1 Approach A

With respect to Recommendation ITU-R M.1638:

To address the situation described in section 2/9.1.5/2 above, an initial study showed that in case of reference replacement of Recommendation ITU-R М.1638-0 by the Recommendation ITU‑R М.1638-1 in RR Nos. **5.447F** and **5.450А** the maximum permissible interference field strength in the frequency band 5 250-5 350 MHz is increased by 10 dB and by 7.2 dB in the frequency band 5 470-5 725 MHz. It should be noted that the protection requirements for meteorological radars are not included in Recommendation ITU-R M.1638-1.

Previous ITU-R studies (see section 1/1.1/3.2.11.2 of the [Report of the CPM to WRC-15](https://www.itu.int/md/R15-WRC15-C-0003/en)) showed that protecting certain new radar types contained in Recommendation ITU-R M.1638-1 would not be feasible. Therefore, the incorporation by reference to Recommendation ITU‑R M.1638‑0 should not be updated to Recommendation ITU‑R M.1638‑1 in RR Nos. **5.447F** and **5.450A** until further studies are completed.

With respect to Recommendation ITU-R M.1849:

An initial study addressing meteorological radars showed that:

– incorporation by reference of Recommendation ITU-R M.1849-1 in RR No. **5.447F** would result in imposing additional constraints on systems in the mobile service operating in the frequency band 5 250-5 350 MHz and would lead to changes of the conditions under which this frequency band is allocated to radio services. It is due to the fact that Recommendation ITU‑R M.1638-0 does not include all meteorological radars that are incorporated in Recommendation ITU-R M.1849-1;

– incorporation by reference of Recommendation ITU-R M.1849-1 in RR No. **5.450A** would not result in imposing additional constraints on systems in the mobile service operating in the frequency band 5 470-5 725 MHz and would not impact the coexistence between radars and WAS/RLAN in the frequency band 5 470-5 725 MHz.

– The comparison of the technical characteristics of the meteorological radars given in Recommendation ITU-R M.1638-0 and Recommendation ITU-R M.1849-1, operating in the frequency band 5 470-5 725 MHz, showed that the technical characteristics of the meteorological radars leading to the most stringent interference protection requirements are covered in both Recommendations.

In addition, analysis of the relevant Dynamic Frequency Selection (DFS) detection by WAS/RLAN comparing the meteorological radars described in Recommendations ITU-R M.1638-0 and ITU-R M.1849-1 shows that adding a new reference to Recommendation ITU-R M.1849-1 to RR No. **5.450A** would not impose undue constraints on systems in the mobile service, in particular RLAN/WAS. The meteorological radars protection criteria was changed from -6 dB to -10 dB when transferring the meteorological radar technical and operational characteristics to Recommendation ITU-R M.1849-1 but these radars can be protected by the existing DFS mechanisms.

Therefore, a reference to Recommendation ITU-R M.1849-1 in RR No. **5.450A** would not impact the coexistence between radars WAS/RLAN in the frequency band 5 470-5 725 MHz.

## 2/9.1.5/3.1.2 Approach B

To address the situation described in section 2/9.1.5/2 above, an alternative approach is to delete the second sentence of the footnotes, where the Recommendations are referenced, and clarify that the provisions of RR No. **5.43A** do not apply in this case, such as presented in section 2/9.1.5/4.2 below.

This approach is a long-term solution that would avoid re-opening the issue of technical and regulatory impacts of referencing new Recommendations versions in RR Nos. **5.447F** and **5.450A**. This should in particular be seen in the light of the fact that, in practice, the coexistence between WAS/RLAN and radars is not driven by those 2 footnotes but by Resolution **229 (Rev.WRC-12)** that defines the conditions for the mobile service to operate in these bands.

## 2/9.1.5/3.1.3 Approach C

Another alternative that was suggested is that no changes are done to the Radio Regulations in relation the issue 9.1.5, except suppression of Resolution **764 (WRC-15)**, such as presented in section 2/9.1.5/4.3.1 below.

## 2/9.1.5/3.2 List of relevant ITU-R Recommendations

Recommendations ITU-R M.1638-0, ITU-R M.1638-1, ITU-R M.1849-0 and ITU-R M.1849-1.

# 2/9.1.5/4 Conclusions

Some approaches were suggested to address WRC-19 agenda item 9.1, issue 9.1.5 as outlined in the sub-sections 2/9.1.5/4.1, 2/9.1.5/4.2 and 2/9.1.5/4.3 below. In any case, Resolution **764 (WRC-15)** should be suppressed as shown in sub-section 2/9.1.5/4.4 below.

## 2/9.1.5/4.1 Approach A

Approach A updates the reference to Recommendation ITU-R M.1849-1 in RR No. **5.450A** and leaves all other references unchanged as shown the regulatory example below:

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations
(See No. 2.1)

NOC

5.447F In the frequency band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU‑R M.1638‑0 and ITU‑R RS.1632‑0.     (WRC‑15)

MOD

5.450A In the frequency band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU‑R M.1638‑0 and ITU-R M.1849-1.     (WRC‑19)

## 2/9.1.5/4.2 Approach B

To delete the second sentence of the footnotes, where the Recommendations are referenced, and introduce the sentence “No. **5.43A** does not apply” as shown the regulatory example below:

MOD

5.447F In the frequency band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). No. **5.43A** does not apply.     (WRC‑19)

MOD

5.450A In the frequency band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. No. **5.43A** does not apply.     (WRC‑19)

## 2/9.1.5/4.3 Approach C

No change to the Radio Regulations as shown the regulatory example below:

NOC

5.447F In the frequency band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU‑R M.1638‑0 and ITU‑R RS.1632‑0.     (WRC‑15)

NOC

5.450A In the frequency band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU‑R M.1638‑0.     (WRC‑15)

## 2/9.1.5/4.4 For all Approaches A, B and C

SUP

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

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