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| **Radiocommunication Study Groups** |  |
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| Agenda item 9.1 – Issue 9.1.5 |

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

*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*

# 2/9.1.5/1 Executive summary

*[Text of the executive summary, not more than half a page of text to describe briefly the purpose of the issue, summarize the results of the studies carried out and provide a conclusion.]*

# 2/9.1.5/2 Background

*[Text of the background, not more than half a page of text to provide general information in a concise manner, in order to describe the rationale of the issue.]*

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**. 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](http://www.itu.int/rec/R-REC-M.1638/en) and ITU-R [RS.1632-0](http://www.itu.int/rec/R-REC-RS.1632/en), 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](http://www.itu.int/rec/R-REC-M.1849/en) 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 (WRC-07)**, for an ITU-R Recommendation
(e.g. ITU-R [M.1638](http://www.itu.int/rec/R-REC-M.1638/en)), 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. **5447F** and **5.450A**, WRC-15 decided to study this matter under WRC-19 agenda item 9.1, issue 9.1.5.

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

*[This section should contain a summary of the technical and operational studies performed within ITU-R, including a list of relevant ITU-R Recommendations. The results of the ITU-R studies should also be analysed with respect to the possible conclusions, and presented in a concise manner.]*

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

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.

A similar analysis addressing meteorological radars showed that:

– incorporation by reference of Recommendation ITU-R [M.1849-1](http://www.itu.int/rec/R-REC-M.1849/en) in RR No. **5.447F** will result in imposing additional constraints on systems in the mobile service operating in the frequency band 5 250-5 350 MHz and will 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** will not result in imposing additional constraints on systems in the mobile service operating in the frequency band 5 470-5 725 MHz and will not result in changes of the conditions under which the frequency band 5 470-5 725 MHz is allocated to radio services since Recommendation ITU-R М.1638-0 includes all meteorological radars which require the most protection from interference.

Another study/Previous ITU-R studies *[Editor’s note: Add reference to studies for WRC-15 agenda item 1.1]* 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.

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 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 that adding a new reference to Recommendation ITU-R M.1849 1 to RR Nos **5.447F** and **5.450A** will not impose more stringent protection criteria on the mobile service, in particular RLAN/WAS, and will keep unchanged the protection of meteorological radars.

Therefore, a reference to Recommendation ITU-R [M.1849-1](http://www.itu.int/rec/R-REC-M.1849/en) in RR No. **5.450A** will not lead to any changes of the conditions under which the frequency band 5 470-5 725 MHz is allocated to the incumbent radio services.

Possible reference of Recommendation ITU-R M.1849-1 in RR No. **5.447F** related to the band 5 250-5 350 MHz is still under consideration.

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

1 Recommendation [ITU-R M.1638-0](http://www.itu.int/rec/R-REC-M.1638/en) – “Characteristics of and protection criteria for sharing studies for radiolocation, aeronautical radionavigation and meteorological radars operating in the frequency bands between 5 250 and 5 850 MHz”;

2 Recommendation [ITU-R M.1638-1](http://www.itu.int/rec/R-REC-M.1638/en) – “Characteristics of and protection criteria for sharing studies for radiolocation (except ground based meteorological radars) and aeronautical radionavigation radars operating in the frequency bands between 5 250 and 5 850 MHz”;

3 Recommendation [ITU-R M.1849-0](http://www.itu.int/rec/R-REC-M.1849/en) – “Technical and operational aspects of ground-based meteorological radars”;

4 Recommendation [ITU-R M.1849-1](http://www.itu.int/rec/R-REC-M.1849/en) – “Technical and operational aspects of ground-based meteorological radars”.

# 2/9.1.5/4 Conclusions

[One study showed that:

– reference to Recommendation ITU-R М.1638-0 should be kept in RR No. **5.447F** since incorporation of references to updated Recommendations ITU-R М.1638-1 and ITU-R М.1849-1 in this footnote will lead to significant changes of the conditions under which the frequency band 5 250-5 350 MHz is allocated;

– with respect to RR No. **5.450A** two options can be considered: to keep the reference to Recommendation ITU-R М.1638-0 or to add the reference to Recommendation ITU-R M.1849-1. Both options do not change the conditions under which the frequency band 5 470-5 725 MHz is allocated to the mobile service.

Another study showed that the incorporation by reference of Recommendation ITU‑R M.1638‑0 should not be updated in RR Nos. **5.447F** and **5.450A** until the studies are completed.

A further study showed that Recommendation ITU-R M.1849-1 can be referenced in RR No. **5.450A** without changes to the conditions under which the frequency band 5 470-5 725 MHz is allocated to the incumbent radio services.]

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