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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 10 to Document 49(Add.21)-E** |
|  | **4 October 2019** |
|  | **Original: English** |
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| Cambodia (Kingdom of)/Lao People's Democratic Republic/Viet Nam (Socialist Republic of) | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 9.1 | |

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-15;

5.441B to review No. **5.441B** of the Radio Regulations taking into account the ITU-R studies on the use of IMT in the frequency band 4 800-4 990 MHz to ensure protection of the aeronautical mobile service

# 1 Background

WRC-15 agreed on footnote RR No. **5.441B** which identified the frequency band 4 800-4 990 MHz, or portions thereof, for IMT in three countries in Region 3. On the other hand, the bands 4 825-4 835 MHz, may be used for aeronautical mobile telemetry for flight testing by aircraft stations in some countries under footnotes RR Nos. **5.440A** and **5.442**.

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| **Region 1** | **Region 2** | **Region 3** |
| **4 800-4 990** FIXED  MOBILE 5.440A 5.441A 5.441B 5.442  Radio astronomy  5.149 5.339 5.443 | | |

***5.440A*** *In Region 2 (except Brazil, Cuba, French overseas departments and communities, Guatemala, Paraguay, Uruguay and Venezuela), and in Australia, the band 4 400-4 940 MHz may be used for aeronautical mobile telemetry for flight testing by aircraft stations (see No.* ***1.83****). Such use shall be in accordance with Resolution* ***416 (WRC-07)*** *and shall not cause harmful interference to, nor claim protection from, the fixed-satellite and fixed services. Any such use does not preclude the use of this band by other mobile service applications or by other services to which this band is allocated on a co-primary basis and does not establish priority in the Radio Regulations. (WRC-07)*

***5.442*** *In the frequency bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile, service. In Region 2 (except Brazil, Cuba, Guatemala, Mexico, Paraguay, Uruguay and Venezuela), and in Australia, the frequency band 4 825-4 835 MHz is also allocated to the aeronautical mobile service, limited to aeronautical mobile telemetry for flight testing by aircraft stations. Such use shall be in accordance with Resolution* ***416 (WRC-07)*** *and shall not cause harmful interference to the fixed service. (WRC-15)*

To protect aircraft stations from possible interference caused by IMT stations footnote RR No. **5.441B** contains two specific regulatory provisions:

– application of RR No. **9.21** of the Radio Regulations for protection of aeronautical mobile stations operated in the territory of the neighbouring countries to country deploying IMT, and

– application of a pfd value of −155 dB(W/m2 · 1 MHz) in order to protect stations in the aeronautical mobile service operating in the international airspace from possible interference from IMT stations.

This pfd limit introduced by WRC-15 and included into footnote RR No. **5.441B** at a very late stage without thorough studies, so WRC-19 was requested through RR No **5.441B** to review the second provision, namely the pfd criteria.

# 2 Summary of ITU-R studies

Resolution **223 (Rev.WRC-15)** invites ITU-R to study the technical and regulatory conditions for the use of IMT in order to protect the aeronautical mobile service. ITU-R Working Party (WP) 5D has carried out some studies in response to Resolution **223 (Rev.WRC-15)** regarding technical and regulatory conditions for the use of IMT in the frequency band 4 800‑4 990 MHz to protect the aeronautical mobile service. These studies were also relevant to RR No. **5.441B** and they were generally related to consideration of the pfd value applied in RR No. **5.441B**, but no consensus was reached in the WP 5D work.

CPM19-1 did not consider the request to identify as an Issue under agenda item 9 for study by the relevant ITU-R WPs contained in footnote RR No. **5.441B** to review at WRC-19 the pfd criteria to protect aeronautical mobile service (AMS) in the international airspace. Russia (in Document CPM19-2/89) proposed to CPM 19-2 to include an additional Issue under agenda item 9.1 dealing with revision of footnote RR No. **5.441B**, i.e. Russia's contribution concluded the pfd limit introduced by WRC-15 and included into footnote RR No. **5.441B** appeared not to be applicable to the AMS applications in the international airspace and proposed the pfd limit to be deleted from the footnote. After discussions, CPM19-2 recognized that “this criterion is subject to review at WRC‑19”, as per RR No. **5.441B**. CPM19-2 did not draw any conclusions on the matter. The Director of the Bureau may wish to consider this topic for the preparation of his Report to WRC-19, as appropriate. As requested by WRC-15, WRC‑19 was invited to review the matter and take appropriate action. **CPM19-2 encouraged administrations to consider the matter, if they deem appropriate, when preparing for WRC-19.** **CPM19-2 meeting agreed to include this issue into the CPM19-2 Report under agenda item 9.1 in Chapter 6 as an additional section dealing with review of footnote RR No. 5.441B to benefit the preparation of administrations for the WRC‑19**.

# 3 Analysis of ITU-R Regulation regarding No. 5.441B

The pfd limit of −155 dB(W/(m2 ·1 MHz)) was introduced in RR No. **5.441B** to protect AMS applications operating in international air space. The analysis of the relevant ITU-R documents showed that AMS in the band 4 800-4 940 MHz in some countries in Region 2 and Region 3 is limited to aeronautical telemetry systems described in Report ITU-R M.2286, and aeronautical data links (*broadband, airborne data-links to support remote sensing, e.g. earth sciences, land management, energy distribution, etc., applications*) specified in Recommendation ITU-R М.2116.

Concerning aeronautical telemetry, Resolution **416 (WRC-07)** limits its usage to transmission from aircraft stations only. Consequently, this pfd limit is not required for protection of aeronautical telemetry, and their ground-based receivers can be fully protected by the application of RR No. **9.21** already included in the footnote.

Concerning aeronautical data links, according to Recommendation ITU-R М.2116 the usage of such applications is restricted to national territories, as it's stated *“...aeronautical mobile data links are operated between aeronautical stations and aircraft stations, or between aircraft stations equipped with AMS data links (ADL) and can be deployed anywhere within a country whose administration has authorized their use in accordance with regulations.”*Therefore, the pfd limit, which was intended for protection of international air space, is not applicable to these applications. In addition, such applications are not related to safety of life and not standardized by ICAO for use in international air space.

Analysis or existing practice shows that Radio Regulations provides protection for aeronautical mobile stations in the international airspace (or outside national territories) only in the frequency bands specifically allocated to aeronautical mobile (R) service, which is safety-of-life service or aeronautical mobile (OR) service. For instance, protection in the international airspace for stations in aeronautical mobile (R) service provisions of Appendix **27** to the Radio Regulations applies and in aeronautical mobile (OR) service provisions of Appendix **26** to the Radio Regulations applies.

From the analysis of the Radio Regulations, it could be concluded that frequency band 4 800-4 990 MHz is not subject of any frequency allocation plan and as a result, there is no specific provisions to protect aeronautical stations in the Radio Regulations, which would require specific criteria or pfd value.

When looking at footnote RR No. **5.441A** for countries in Region 2, in the similar situation as in footnote RR No. **5.441B** for countries in Region 3, for the international airspace of Region 2 the pfd value for protection of the aeronautical mobile service stations in the band 4 800 4 900 MHz against possible interference from IMT stations is not used.

Thereby, the approach described in footnote RR No. **5.441A** contrary to the approach described in footnote RR No. **5.441B** ensures a flexible and efficient use of the frequency band 4 800-4 990 MHz and is in line with existing practice.

As a conclusion, **the pfd limit introduced by WRC-15 and included into footnote RR No. 5.441B, appears not to be applicable to the AMS applications that can operate in this band and, therefore, it should be deleted.**

# 4 Situation in Asia Pacific region (APT)

According to “APT REPORT ON SURVEY THE USAGE AND FUTURE PLAN OF THE BAND 4 800-4 990 MHZ IN ASIA PACIFIC REGION” ([APT/AWG/REP-82 (Rev.1)](https://www.apt.int/sites/default/files/2019/07/APT-AWG-REP-82Rev.1_4800-4900_MHz_Survey_Report_.docx)), most APT countries have only fixed links including government links on 4 800-4 990 MHz, and do not have any Aeronautical Mobile Service. The frequency band 4 800-4 990 MHz for IMT/5G is expected to be feasible for APT countries, with IMT and fixed links co-existing by suitable frequency or spatial separation. The frequency band 4 800-4 990 MHz has a potential for Regional harmonized 5G band (e.g. APAC and CIS) in the mid-term, as complementary 5G band in sub 6 GHz spectrum. APT countries usage of this band for IMT/5G, can benefit from the regional 5G ecosystem.

The pfd limit in the RR No. **5.441B** of 4 800-4 990 MHz regarding protection of AMS in the international airspace is a potential obstacle for APT countries to use this frequency band for 5G at national level. As analysed in section 3, the AMS in the international airspace is not entitled for protection, so the pfd limit should be deleted. During CPM 19-2 discussion, APT countries including China, India and Vietnam supported such deletion of pfd limit from RR No. **5.441B** of 4 800-4 990 MHz regarding the protection of AMS in the international airspace.

# 5 Proposal

The co-signed of this contribution, therefore proposes to remove the pfd limit from the RR footnote No. **5.441B** and modify other parts of this footnote No. **5.441B** accordingly.

ARTICLE 5

Frequency allocations

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

MOD CBG/LAO/VTN/49A21A10/1

5.441B In Cambodia, Lao P.D.R. and Viet Nam, the frequency band 4 800-4 990 MHz, or portions thereof, is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of this frequency band for the implementation of IMT is subject to agreement obtained under No. **9.21** with concerned administrations, and IMT stations shall not claim protection from stations of other applications of the mobile service. See Resolution **223 (Rev.WRC‑15)**.     (WRC‑19)

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