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| **World Radiocommunication Conference (WRC-19)Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Document 81-E** |
|  | **7 October 2019** |
|  | **Original: English** |
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| Bangladesh (People's Republic of)/Brunei Darussalam/Korea (Republic of)/Japan/Malaysia/Nepal (Federal Democratic Republic of)/New Zealand/Singapore (Republic of)/Thailand |
| Proposals for the work of the conference |
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| Agenda item 1.16 |

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)**;

Introduction

There has been considerable growth in the demand for WAS/RLAN applications with multimedia capabilities. As traffic on broadband WAS increases, the use of wider bandwidth channels in order to support high data rates creates a need for additional spectrum for indoor and outdoor use. Resolution **239 (WRC-15)** in its *recognizing b)* includes the results of ITU-R studies that estimate additional spectrum need for WAS/RLAN in the 5GHz frequency range in the year of 2018.

Resolution **229 (Rev. WRC-12)** does not allow outdoor WAS/RLAN operations in the 5 150-5 250 MHz band at any Region or country in the world. However, in some countries, additional spectrum for outdoor WAS/RLAN use is required to meet the increasing demand for outdoor use in order to provide flexible and large coverage.

Therefore, the Radio Regulation based on Resolution **229 (Rev. WRC-12)** should be modified to allow outdoor WAS/RLAN operations in the 5 150-5 250 MHz band with associated conditions to protect the existing services with mitigation measures.

As an example for mitigation measures, in some countries, the domestic regulation allows limited outdoor use of WAS/RLANs in the 5 150-5 250 MHz band under certain conditions, where the number of all outdoor WAS/RLAN access points are controlled by the administration with registration procedures to limit the total aggregated interference level to the existing services.

With regard to the Methods for the 5 150-5 250 MHz band in the CPM Report,

• The total interference level from WAS/RLANs should be limited to protect existing services, and the conditions should be the same as specified for the adjacent 5 250-5 350 MHz band since these sub-bands may be used at the same time (for example, 160 MHz channel mode in IEEE 802.11ac/ax).

• Among Methods A2, A3 and A6 that allow outdoor WAS/RLAN use, Method A3 satisfies the above requirement. It should be noted that some studies show that sharing between outdoor WAS/RLAN operations and the existing services is feasible under certain conditions of Method A3.

• Method A1 and Method A5 do not allow outdoor WAS/RLAN use. Method A4 allows outdoor WAS/RLAN use only for unmanned systems.

For these reasons, the proponents of this contribution propose to modify the Radio Regulations based on Method A3 in the CPM Report to allow outdoor WAS/RLAN operations in the 5 150-5 250 MHz band to meet the increasing demand on additional spectrum for WAS/RLAN with associated conditions to protect incumbent services as described below.

ARTICLE 5

Frequency allocations

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

MOD BGD/BRU/KOR/J/MLA/NPL/NZL/SNG/THA/81/1

4 800-5 250 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 5 150-5 250 FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile MOD 5.446A 5.446B AERONAUTICAL RADIONAVIGATION 5.446 5.446C MOD 5.447 5.447B 5.447C |

**Reasons:** To indicate revision of Resolution **229 (Rev.WRC-12)** at WRC-19.

MOD BGD/BRU/KOR/J/MLA/NPL/NZL/SNG/THA/81/2

5.446A The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile, except aeronautical mobile, service shall be in accordance with Resolution **229** **(Rev.WRC‑19)**.    (WRC‑19)

**Reasons:** To indicate revision of Resolution **229 (Rev.WRC-12)** at WRC-19.

MOD BGD/BRU/KOR/J/MLA/NPL/NZL/SNG/THA/81/3

5.447 *Additional allocation:* in Côte d'Ivoire, Egypt, Israel, Lebanon, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. 9.21.In this case, the provisions of Resolution **229** **(Rev.WRC‑19)** do not apply.    (WRC‑19)

**Reasons:** To indicate revision of Resolution **229 (Rev.WRC-12)** at WRC-19.

MOD BGD/BRU/KOR/J/MLA/NPL/NZL/SNG/THA/81/4#49951

RESOLUTION 229 (Rev.WRC‑19)

Use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz
by the mobile service for the implementation of wireless access systems
including radio local area networks

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

considering

*a)* that WRC‑03 allocated the bands 5 150-5 350 MHz and 5 470-5 725 MHz on a primary basis to the mobile service for the implementation of wireless access systems (WAS), including radio local area networks (RLANs);

*b)* that WRC‑03 decided to make an additional primary allocation for the Earth exploration-satellite service (EESS) (active) in the band 5 460-5 570 MHz and space research service (SRS) (active) in the band 5 350-5 570 MHz;

*c)* that WRC‑03 decided to upgrade the radiolocation service to a primary status in the 5 350-5 650 MHz band;

*d)* that the band 5 150-5 250 MHz is allocated worldwide on a primary basis to the fixed‑satellite service (FSS) (Earth-to-space), this allocation being limited to feeder links of non‑geostationary-satellite systems in the mobile-satellite service (No. **5.447A**);

*e)* that the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, in some countries (No. **5.447**) subject to agreement obtained under No. **9.21**;

*f)* that the band 5 250-5 460 MHz is allocated to the EESS (active) and the band 5 250-5 350 MHz to the SRS (active) on a primary basis;

*g)* that the band 5 250-5 725 MHz is allocated on a primary basis to the radiodetermination service;

*h)* that there is a need to protect the existing primary services in the 5 150-5 350 MHz and 5 470-5 725 MHz bands;

*i)* that results of studies in ITU‑R indicate that sharing in the band 5 150-5 250 MHz between WAS, including RLANs, and the FSS is feasible under specified conditions;

*j)* that studies have shown that sharing between the radiodetermination and mobile services in the bands 5 250-5 350 MHz and 5 470-5 725 MHz is only possible with the application of mitigation techniques such as dynamic frequency selection;

*k)* that there is a need to specify an appropriate e.i.r.p. limit and, where necessary, operational restrictions for WAS, including RLANs, in the mobile service in the bands 5 250-5 350 MHz and 5 470-5 570 MHz in order to protect systems in the EESS (active) and SRS (active);

*l)* that the deployment density of WAS, including RLANs, will depend on a number of factors including intrasystem interference and the availability of other competing technologies and services;

*m)* that the means to measure or calculate the aggregate pfd level at FSS satellite receivers specified in Recommendation ITU‑R S.1426 are currently under study;

*n)* that certain parameters contained in Recommendation ITU‑R M.1454 related to the calculation of the number of RLANs tolerable by FSS satellite receivers operating in the band 5 150-5 250 MHz require further study;

*o)* that an aggregate pfd level has been developed in Recommendation ITU‑R S.1426 for the protection of FSS satellite receivers in the 5 150-5 250 MHz band,

further considering

*a)* that the interference from a single WAS, including RLANs, complying with the operational restrictions under *resolves*2 will not on its own cause any unacceptable interference to FSS receivers on board satellites in the band 5 150-5 250 MHz;

*b)* that such FSS satellite receivers may experience an unacceptable effect due to the aggregate interference from these WAS, including RLANs, especially in the case of a prolific growth in the number of these systems;

*c)* that the aggregate effect on FSS satellite receivers will be due to the global deployment of WAS, including RLANs, and it may not be possible for administrations to determine the location of the source of the interference and the number of WAS, including RLANs, in operation simultaneously,

noting

*a)* that, prior to WRC‑03, a number of administrations have developed regulations to permit indoor and outdoor WAS, including RLANs, to operate in the various bands under consideration in this Resolution;

*b)* that, in response to Resolution **229 (WRC‑03)[[1]](#footnote-1)\***, ITU‑R developed Report ITU‑R M.2115, which provides testing procedures for implementation of dynamic frequency selection,

recognizing

*a)* that in the band 5 600-5 650 MHz, ground-based meteorological radars are extensively deployed and support critical national weather services, according to footnote No. **5.452**;

*b)* that the performance and interference criteria of spaceborne active sensors in the EESS (active) are given in Recommendation ITU‑R RS.1166;

*c)* that a mitigation technique to protect radiodetermination systems is given in Recommendation ITU‑R M.1652;

*d)* that Recommendation ITU‑R RS.1632 identifies a suitable set of constraints for WAS, including RLANs, in order to protect the EESS (active) in the 5 250-5 350 MHz band;

*e)* that Recommendation ITU‑R M.1653 identifies the conditions for sharing between WAS, including RLANs, and the EESS (active) in the 5 470-5 570 MHz band;

*f)* that the stations in the mobile service should also be designed to provide, on average, a near-uniform spread of the loading of the spectrum used by stations across the band or bands in use to improve sharing with satellite services;

*g)* that WAS, including RLANs, provide effective broadband solutions, future demand has increased since the frequency range was first identified for this application;

*h)* that there is a need for administrations to ensure that WAS, including RLANs, meet the required mitigation techniques, for example, through equipment or standards compliance procedures,

resolves

1 that the use of these bands by the mobile service is for the implementation of WAS, including RLANs, as described in the most recent version of Recommendation ITU‑R M.1450;

2 that in the bands 5 150-5 250 MHz and 5 250-5 350 MHz, stations in the mobile service shall be limited to a maximum mean e.i.r.p. of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band. Administrations are requested to take appropriate measures that will result in the predominant number of stations in the mobile service being operated in an indoor environment. Furthermore, stations in the mobile service that are permitted to be used either indoors or outdoors may operate up to a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band, and, when operating above a mean e.i.r.p. of 200 mW, these stations shall comply with the following e.i.r.p. elevation angle mask where θ is the angle above the local horizontal plane (of the Earth):

 −13 dB(W/MHz) for 0° ≤ θ < 8°

 −13 − 0.716(θ − 8) dB(W/MHz) for 8° ≤ θ < 40°

 −35.9 − 1.22(θ − 40) dB(W/MHz) for 40° ≤ θ ≤ 45°

 −42 dB(W/MHz) for 45° < θ;

3 that administrations may exercise some flexibility in adopting other mitigation techniques, provided that they develop national regulations to meet their obligations to achieve an equivalent level of protection to the EESS (active) and the SRS (active) based on their system characteristics and interference criteria as stated in Recommendation ITU‑R RS.1632;

4 that in the band 5 470-5 725 MHz, stations in the mobile service shall be restricted to a maximum transmitter power of 250 mW[[2]](#footnote-4)1 with a maximum mean e.i.r.p. of 1 W and a maximum mean e.i.r.p. density of 50 mW/MHz in any 1 MHz band;

5 that in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, systems in the mobile service shall either employ transmitter power control to provide, on average, a mitigation factor of at least 3 dB on the maximum average output power of the systems, or, if transmitter power control is not in use, then the maximum mean e.i.r.p. shall be reduced by 3 dB;

6 that, in the bands 5 250-5 350 MHz and 5 470-5 725 MHz, the mitigation measures found in Annex 1 to Recommendation ITU‑R M.1652‑1 shall be implemented by systems in the mobile service to ensure compatible operation with radiodetermination systems,

invites administrations

to consider appropriate measures when allowing the operation of stations in the mobile service using the e.i.r.p. elevation angle mask referred in *resolves*2 above, to ensure the equipment is operated in compliance with this mask,

invites ITU‑R

1 to continue studies on mitigation techniques to provide protection of EESS from stations in the mobile service;

2 to continue studies on suitable test methods and procedures for the implementation of dynamic frequency selection, taking into account practical experience.

**Reasons:** To modify Resolution **229 (Rev.WRC-12)** based on Method A3 in CPM Report to allow outdoor WAS/RLAN use in the 5 150-5 250 MHz band with associated conditions to protect incumbent services.

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1. \* *Note by the Secretariat:* This Resolution was revised by WRC‑12. [↑](#footnote-ref-1)
2. 1 Administrations with existing regulations prior to WRC‑03 may exercise some flexibility in determining transmitter power limits. [↑](#footnote-ref-4)