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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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|  | CPG(19)143ANNEXVIII-16A |
| PLENARY MEETING | **Addendum 1 to Addendum 16 to Document 16-E** |
|  | **28 June 2019** |
|  | **Original: English** |
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| European Common Proposals | |
| 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)**;

Part 1: Frequency band 5 150 – 5 250 MHz

Introduction

The frequency band 5 150-5 250 MHz is allocated, inter alia, to fixed-satellite service (earth-to-space) limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service (MSS), to the aeronautical radionavigation (ARNS) and to the aeronautical telemetry (AMT) transmissions pursuant to RR No. **5.446C**.

Wireless access systems, including radio local area networks (WAS/RLAN)usage in the frequency band 5 150-5 250 MHz is limited to indoor use. Within Europe, indoor is defined as inside a building. Recently, CEPT decided to clarify that WAS/RLAN usage in this band is allowed inside cars and trains, subject to certain conditions. WAS/RLAN use is also allowed inside aircraft under ECC Decision (04) 08. The use inside the vehicles described above is expected to be for passenger entertainment purposes only.

Studies conducted with regards to the MSS feeder uplink have shown that WAS/RLAN outdoor operation (up to 5.3%) would cause harmful interference to the MSS feeder link. However, a parametric investigation allowed to show that up to 3% maximum outdoor WAS/RLAN can be deployed with a maximum e.i.r.p. of 200 mW. In that case, limited WAS/RLAN outdoor applications can be envisaged. This study also assessed in-vehicle usage (for in-cars and in-trains). Simulations have shown that the same level of protection offered by the indoor usage is achieved for MSS when combining a low e.i.r.p. up to 40 mW and restricted to in-car usage and up to 200 mW for in-train usage.

Studies conducted with regards to aeronautical radionavigation have shown that the same level of protection offered by the indoor usage is achieved when combining a low e.i.r.p. up to 40 mW and restricted to in-car usage and up to 200 mW for in-train usage.

Dynamic aggregate studies have shown that allowing outdoor relaxation up to 200 mW would not constitute any more interference to the ARNS than the 1% accidental outdoor usage that is currently assumed under the provisions of Resolution **229 (Rev.WRC-12)**.

Studies conducted with regards to AMT have shown that the same level of protection offered by the indoor usage is achieved when combining a low e.i.r.p. up to 40 mW and restricted to in-car usage and up to 200 mW for in-train usage, as well. Controlled outdoor usage around AMT ground stations could be managed on national levels.

CEPT notes that the current studies have shown that RLAN operation inside cars is possible if associated with e.i.r.p. levels up to 40 mW and under condition that the additional propagation loss due to the car hull provides the same level of protection established by Resolution **229 (Rev.WRC-12)** to incumbent services.

Given the above results some studies show that outdoor deployment in this band would be possible only if the number of outdoor WAS/RLAN is limited. In-car and in-train usage have been proven to satisfy the same level of protection provided by provisions in Resolution **229 (Rev.WRC-12)**, under certain conditions and respect of the e.i.r.p. levels cited above.

Based on these studies, CEPT supports modifying Resolution **229 (Rev.WRC-12)** to reflect this WAS/RLAN usage and suppress Resolution **239 (WRC-15)**.

CEPT invites WRC-19 to take into account the solution proposed below.

Proposals

MOD EUR/16A16A1/1

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 results of studies indicate that the attenuation offered by the car and train hull when WAS, including RLANs, operate inside automobiles and trains with a mean e.i.r.p. of 40 mW and 200 mW, respectively, enables the same level of protection of incumbent services when WAS, including RLANs, are used indoor with a mean e.i.r.p. of 200 mW,

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

*c)* 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;

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

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

*f)* 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;

*g)* 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;

*h)* 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;

*i)* 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;

*j)* that WAS, including RLANs, provide effective broadband solutions;

*k)* 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 will be for the implementation of WAS, including RLANs, as described in the most recent version of Recommendation ITU‑R M.1450;

2 that in the band 5 150-5 250 MHz, stations in the mobile service shall be restricted to indoor use, including inside trains and aircraft, with a maximum mean e.i.r.p.[[2]](#footnote-2)1 of 200 mW and a maximum mean e.i.r.p. density of 10 mW/MHz in any 1 MHz band or equivalently 0.25 mW/25 kHz in any 25 kHz band. Mobile stations inside automobiles shall operate with a maximum e.i.r.p. of 40 mW;

3 that administrations may exercise some flexibility by adopting appropriate regulatory measures, including mitigation techniques, that would allow limited outdoor usage (up to 200 mW mean e.i.r.p.) maintaining protection to the incumbents services in the frequency band 5 150‑5 250 MHz;

4 that administrations may monitor whether the aggregate pfd levels given in Recommendation ITU‑R S.1426[[3]](#footnote-3)2 have been, or will be exceeded in the future, in order to enable a future competent conference to take appropriate action;

5 that in the band 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;

6 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;

7 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[[4]](#footnote-4)3 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;

8 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;

9 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 adopt appropriate regulation if they intend to permit the operation of stations in the mobile service using the e.i.r.p. elevation angle mask in *resolves*4, to ensure the equipment is operated in compliance with this mask,

invites ITU‑R

1 to continue work on regulatory mechanisms and further mitigation techniques to avoid incompatibilities which may result from aggregate interference into the FSS in the band 5 150‑5 250 MHz from a possible prolific growth in the number of WAS, including RLANs;

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

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

**Reasons:** Motivations explained in the Introduction above.

SUP EUR/16A16A1/2

RESOLUTION 239 (Rev.WRC‑12)

Studies concerning Wireless Access Systems including radio local   
area networks in the frequency bands between   
5 150 MHz and 5 925 MHz

**Reasons:** No longer needed.

1. \* *Note by the Secretariat:* This Resolution was revised by WRC-12. [↑](#footnote-ref-1)
2. 1 In the context of this Resolution, “mean e.i.r.p.” refers to the e.i.r.p. during the transmission burst which corresponds to the highest power, if power control is implemented. [↑](#footnote-ref-2)
3. 2 −124 − 20 log10 (*hSAT*/1 414) dB(W/(m2 · 1 MHz)), or equivalently,

   −140 − 20 log10 (*hSAT*/1 414) dB(W/(m2 · 25 kHz)), at the FSS satellite orbit, where *hSAT* is the altitude of the satellite (km). [↑](#footnote-ref-3)
4. 3 Administrations with existing regulations prior to WRC‑03 may exercise some flexibility in determining transmitter power limits. [↑](#footnote-ref-4)