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| **World Radiocommunication Conference (WRC‑15)Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Revision 1 to****Document 81-E** |
|  | **16 October 2015** |
|  | **Original: English** |
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| Denmark, France, Greece, Hungary, Iceland, Czech Republic, United Kingdom of Great Britain and Northern Ireland, Slovenia (Republic of), Sweden, Turkey,  |
| Proposals for the work of the conference |
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| Agenda item 10 |

10to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention,

Introduction

Agenda item 10 requests WRC‑15 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its view on the preliminary agenda for the subsequent Conference and on possible agenda items for future conferences, taking into account Resolution 808 (WRC‑12).

The Administrations co-signing this contribution propose an agenda item for WRC‑19 to consider spectrum sharing technologies, additional in band sharing mechanisms and mitigation techniques that could be applied to Wireless Access Systems (WAS) including radio local area networks (RLAN) in the 5 GHz range.

In preparation for WRC‑15 agenda item 1.1, Joint Task Group 4-5-6-7 considered sharing and compatibility studies between RLAN systems and the services in the frequency bands 5 350-5 470 MHz and 5 725-5 850 MHz, and looked at a number of potential mitigation techniques. Further mitigation measures have also been considered in Working Party 5A but these studies have not concluded.

The proponents of this agenda item are of the view that there is a need to broaden the studies to encompass the frequency range 5 150-5 925 MHz. This would include continuing the studies on mitigation techniques for in-band sharing between WAS and services in the frequency bands 5 350-5 470 MHz and 5 725-5 850 MHz, as well as studying the bands 5 150-5 350 MHz and 5 850-5 925 MHz as potential frequency bands for outdoor WAS (incl. RLAN) operations under the existing mobile allocations.

Proposals

ADD DNK/F/GRC/HNG/ISL/CZE/G/SVN/S/TUR/81/1

Draft New Resolution [81-A24] (WRC‑15)

Agenda for the 2019 World Radiocommunication Conference

1.[5 GHz] to consider spectrum sharing technologies, additional in band sharing mechanisms and mitigation techniques that could be applied to Wireless Access Systems (WAS) including radio local area networks in the 5 GHz range, and take the appropriate actions in accordance with draft new Resolution **[81-B24-5GHz] (WRC‑15)**;

**Reasons:** to continue existing studies on potential WAS (including RLAN) use of the frequency bands 5 350-5 470 MHz and 5 725-5 850 MHz under a new mobile allocation, considering in particular further studies on possible additional mitigation techniques, and to study the bands 5 150-5 350 MHz and 5 850-5 925 MHz as potential frequency bands for outdoor WAS (incl. RLAN) operations under the existing mobile allocations, taking into account the protection of existing services.

ADD DNK/F/GRC/HNG/ISL/CZE/G/SVN/S/TUR/81/2

Draft New Resolution [81-B24-5GHZ] (WRC‑15)

Studies on spectrum sharing technologies, additional in band sharing mechanisms or mitigation techniques for wireless access systems
including radio local area networks in the 5 GHz range

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that there has been considerable growth in the demand for broadband wireless access systems (WAS) including radio local area network (RLAN) applications with multimedia capabilities;

*b)* that in all countries where broadband WAS including RLAN applications are deployed there is a continuing significant growth in the number of users of these systems and in the quantity and rate of data carried, the latter being driven to a large extent by audiovisual content;

*c)* that broadband WAS including RLAN applications contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications;

*d)* that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;

*e)* that as technology evolves to meet increasing performance demands and traffic on broadband WAS increases, the use of wider bandwidth channels in order to support high data rates create a need for additional spectrum,

considering further

*a)* that adequate and timely availability of spectrum and supporting regulatory provisions are essential to support future growth of broadband WAS including RLAN applications;

*b)* that harmonized worldwide bands that support future growth of broadband WAS including RLAN applications are highly desirable in order to achieve the benefits of economies of scale,

noting

*a)* that the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz are allocated to the mobile service for the implementation of WAS including RLAN applications in accordance with Resolution **229 (Rev.WRC‑12)**;

*b)* that in the band 5 725-5 850 MHz there is no primary mobile allocation for WAS including RLANs use but the band is allocated by footnote to the fixed and mobile service in some countries, and additionally WAS including RLANs use is already authorized in some countries situated in each of the ITU‑R regions;

*c)* that there is interest in using the frequency bands 5 350-5 470 MHz and 5 725-5 925 MHz for broadband WAS including RLAN applications on a global basis as extension bands since it may be easier to implement broadband WAS including RLAN applications in frequency blocks that are continuous within the 5 GHz range;

*d)* that the Earth exploration-satellite service (active) allocations in the bands 5 350-5 460 MHz and 5 460-5 470 MHz are essential for Earth-observation programmes such as Copernicus (Sentinel-1 and Sentinel-3), Jason and RADARSAT and that the data these provide is vital for reliable and up-to-date information on how our planet and its climate are changing,

recognizing

*a)* that frequency bands in the range from 5 150 MHz to 5 925 MHz are allocated on a co-primary basis to various radiocommunication services including the fixed satellite service (Earth-to-space), Earth exploration-satellite service (active), radiolocation, aeronautical radionavigation and space research (active);

*b)* that the compatibility studies performed by ITU‑R in preparation for WRC‑15 indicate that when assuming WAS including RLAN use parameters in line with the regulatory provisions of Resolution **229 (Rev.WRC‑12)**, sharing between RLAN and the EESS (active) systems in the 5 350-5 470 MHz frequency band would not be feasible, and are insufficient to ensure protection of certain radar types in the 5 350-5 470 MHz frequency band. Sharing may be feasible if additional RLAN mitigation measures are implemented, however, no agreement was reached on the applicability of any additional RLAN mitigation techniques;

*c)* that no agreement was reached on the appropriate RLAN parameters and any of the compatibility studies considered in the ITU‑R in preparation for WRC‑15 for the band 5 725-5 850 MHz in particular concerning the protection of certain types of radar;

*d)* that the application of possible additional RLAN mitigation measures referred to in *recognizing b)*, may also be relevant to enable RLANs outdoor operation in the band 5 150-5 350 MHz and 5 725-5 925 MHz;

*e)* that the 5 725-5 875 MHz band is also designated for industrial, scientific and medical (ISM) applications and that radiocommunication services operating within this band must accept harmful interference which may be caused by these applications in accordance with No. **5.150;**

*f)* that in the studies for the 5 150-5 350 MHz and 5 470-5 725 MHz bands, the WAS including RLAN use parameters from the regulatory provisions of Resolution **229 (Rev.WRC‑12)** are to be taken account of,

resolves to invite ITU‑R

1 to study and assess the 5 GHz WAS (incl. RLAN) operational requirements such as spectrum requirements and technical/operational characteristics, including those of new mobile service technologies, over the whole range 5 150-5 925 MHz;

2 to study the bands 5 350-5 470 MHz and 5 725-5 850 MHz as potential frequency bands for WAS (incl. RLAN) operations under a new mobile allocation considering in particular further studies on possible additional mitigation techniques, taking into account compatibility studies carried out in preparation for WRC‑15 (see r*ecognizing b)* and *c)*), the due protection of existing services and the need for global harmonization as well as *noting b)*;

3 to study the bands 5 150-5 350 MHz and 5 850-5 925 MHz as potential frequency bands for outdoor WAS (including RLAN) operations under the existing mobile allocations, taking into account, the existing usage and the future spectrum requirements for all the primary services in these bands, in particular where the operational requirements of WAS including RLAN are looking to evolve from *recognizing f)*, the results of the compatibility studies, including where relevant new mitigation techniques, the due protection of existing services and the need for global harmonization,

resolves to invite WRC‑19

to consider the results of the above studies and take appropriate actions,

encourages administrations

to submit contributions during the study period on their assessment of the impact on the existing services, based on the studies carried out under this Resolution,

invites administrations

to participate in the studies by submitting contributions to ITU‑R.

ANNEX 2 TO RESOLUTION 804 (WRC‑07)

Proposal for agenda item on spectrum sharing technologies, additional in band sharing mechanisms or mitigation techniques for wireless access systems including radio local area networks in the 5 GHz range

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| **Subject:**  | To consider spectrum sharing technologies, additional in band sharing mechanisms or mitigation techniques that could be applied to Wireless Access Systems (WAS) including radio local area networks in the 5 GHz range and take the appropriate actions, in accordance with Draft New Resolution **[81-B24-5GHz] (WRC‑15)**. |
| **Origin:** | Denmark, France, Greece, Hungary, Iceland, Czech Republic, United Kingdom of Great Britain and Northern Ireland, Slovenia (Republic of), Sweden, Turkey |
| **Proposal:**to consider spectrum sharing technologies, additional in band sharing mechanisms or mitigation techniques that could be applied to Wireless Access Systems (WAS) including radio local area networks in the 5 GHz range and take the appropriate actions, in accordance with draft new Resolution **[81-B24-5GHz] (WRC‑15)**. |
| **Background/reason:**In preparation for WRC‑15, the ITU‑R undertook studies in accordance with Resolution **233 (WRC‑12)**. Resolution **233 (WRC‑12)** calls for studies on frequency-related matters on International Mobile Telecommunications and other terrestrial mobile broadband applications. There has been considerable growth in the demand for broadband wireless access systems (WAS) including radio local area network (RLAN) applications with multimedia capabilities and that in all countries where broadband WAS including RLAN applications are deployed there is a continuing significant growth in the number of users of these systems and in the quantity and rate of data carried, the latter being driven to a large extent by audio visual content. In addition broadband WAS including RLAN applications contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications. The technology is also evolving to meet increasing performance demands and traffic loads and the use of wider bandwidth channels in order to support high data rates create a need for additional spectrum.Adequate and timely availability of spectrum and supporting regulatory provisions are essential to support future growth of broadband WAS including RLAN applications. The results of ITU‑R studies indicated that the future minimum spectrum requirement for RLANs using the 5 GHz frequency range is estimated to be 880 MHz. This figure includes 455-580 MHz of spectrum already utilized by non-IMT mobile broadband applications operating in the 5 GHz frequency range in certain countries resulting in 300-425 MHz of additional spectrum being required. The ranges above are due to some of the frequency bands being identified for RLAN only in some countries. It should also be noted that harmonized worldwide bands that support future growth of broadband WAS including RLAN applications are highly desirable in order to achieve the benefits of economies of scale.Currently, within the 5 GHz range, RLAN devices utilize the following frequency bands: 5 150-5 250 MHz, 5 250-5 350 MHz, 5 470-5 725 MHz and 5 725-5 850 MHz (in some countries). Pursuant to Resolution **229 (Rev.WRC‑12)**, operation in the 5 150-5 250 MHz frequency band is limited to indoor use while dynamic frequency selection rules apply in the 5 250-5 350 MHz and 5 470-5 725 MHz frequency bands. An allocation to WAS (including RLAN) in the 5 350-5 470 MHz and 5 725-5 925 MHz frequency ranges would provide contiguous spectrum with the existing spectrum allocations for RLANs. The compatibility studies performed by the ITU‑R in preparation for WRC‑15 indicate that when assuming WAS including RLAN use parameters in line with the regulatory provisions of Resolution **229 (Rev.WRC‑12)**, sharing between RLAN and the EESS (active) systems in the 5 350-5 470 MHz frequency band would not be feasible, and are insufficient to ensure protection of certain radar types in the 5 350-5 470 MHz frequency band. Sharing may be feasible if additional RLAN mitigation measures are implemented, however, no agreement was reached on the applicability of any additional RLAN mitigation techniques and further study was considered necessary by some administrations. In addition, no agreement was reached on the appropriate RLAN parameters and any of the compatibility studies considered in the ITU‑R in preparation for WRC‑15 for the band 5 725-5 850 MHz in particular concerning the protection of certain types of radar.It is proposed to consider spectrum sharing technologies, additional in band sharing mechanisms or mitigation techniques that could be applied to Wireless Access Systems (WAS) including radio local area networks in the 5 GHz range, and take the appropriate actions, in accordance with Draft New Resolution **[81-B24-5GHz] (WRC‑15)**. |
| **Radiocommunication services concerned:**Fixed, fixed-satellite, mobile, aeronautical radionavigation, Earth exploration-satellite service, radiolocation, space research, radionavigation and amateur and amateur-satellite. |
| **Indication of possible difficulties:**The Earth exploration-satellite service (active) allocations in the bands 5 350-5 460 MHz and 5 460-5 470 MHz are essential for the European Earth observation programme Copernicus, previously known as GMES (Global Monitoring for Environment and Security).The European Space Agency (ESA) is responsible for the space component of the Copernicus programme and coordinates the delivery of data from upwards of 30 satellites.Environmental information provided by the Copernicus programme is of crucial importance to European and international organizations.The results of studies of interference mitigation techniques must be practically implementable and ensure the protection of the Copernicus programme and other uses and services to which the bands are allocated. |
| **Previous/ongoing studies on the issue:**During the study period 2012-2015 and in preparation for WRC‑15, the ITU‑R undertook studies in accordance with Resolution **233 (WRC‑12)**. Resolution **233 (WRC‑12)** calls for studies on frequency-related matters on International Mobile Telecommunications and other terrestrial mobile broadband applications. |
| **Studies to be carried out by:**Administrations and Sector Members of the ITU‑R | **with the participation of:** |
| **ITU‑R Study Groups concerned:**SG 4, SG 5, SG 7 |

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| **I*TU resource implications, including financial implications (refer to CV126):***This proposed agenda item will be studied within the normal ITU‑R procedures and planned budget. |
| ***Common regional proposal:*** No | ***Multicountry proposal:*** Yes***Number of countries:*** 10 |
| **Remarks** |

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