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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 102-E** |
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| PROPOSALS FOR THE WORK OF THE CONFERENCE | |
|  | |
| Agenda item 9.1(9.1.1) | |

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;

9.1 (9.1.1) Resolution **212 (Rev.WRC-15)** - Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz

Introduction

This document contains a proposal for WRC-19 Agenda item 9.1, issue 9.1.1 on behalf of the ECOWAS sub-regional group for consideration by the Conference.

Background

Agenda item 9.1, issue 9.1.1 was adopted at WRC-15 and, as per Resolution **212** **(WRC-15)**, *invites ITU-R* to study technical and operational measures to ensure coexistence and compatibility of the satellite and terrestrial components of IMT in the 1 980-2 010 MHz and the 2 170-2 200 MHz bands (the S band).

The S band is allocated on a co-primary basis to both the mobile satellite service (MSS) and the mobile service (MS). There is no constraint on the frequency band arrangement, whether uplink or downlink for the MS allocation to these bands. Both MSS and MS have already deployed in the S band in accordance with Resolution **212 (WRC-15)** through successful bilateral coordination between neighbouring countries.

In accordance with *invites ITU-R* under Resolution **212 (WRC-15)**, WRC-19 agenda item 9.1, issue 9.1.1 is:

*… to study possible technical and operational measures to ensure coexistence and compatibility between the terrestrial component of IMT (in the mobile service) and the satellite component of IMT (in the mobile service and the mobile-satellite service) in the frequency bands 1 980‑2 010 MHz and 2 170-2 200 MHz where those frequency bands are shared by mobile service and the mobile-satellite service in different countries, in particular for the deployment of independent satellite and terrestrial components of IMT and to facilitate development of both the satellite and terrestrial components of IMT.*

Resolution **212 (WRC-15)** also noted:

*…when the satellite and terrestrial components of IMT are deployed in the frequency bands 1 980‑2 010 MHz and 2 170-2 200MHz in adjacent geographical areas, technical or operational measures may need to be implemented to avoid harmful interference, and further studies by ITU-R are required in this regard.*

The agenda item is limited to studying only technical and operational measures needed for deployments in adjacent geographic areas to achieve coexistence and compatibility between the terrestrial and satellite components of IMT. Changes to the Radio Regulations (RR) are outside its scope, and discussion at WRC-19 should be confined to identifying technical and operational measures that can achieve coexistence.

ITU-R studies overview

Studies in ITU-R WP 4C (focusing on the protection of the satellite component of IMT) and ITU-R WP 5D (focusing on protecting the terrestrial component of IMT) evaluated the coexistence and compatibility of terrestrial and satellite components of IMT – with different characteristics – deployed in adjacent geographic areas in different environments.

Taken together, the results indicate that coexistence and compatibility of terrestrial and satellite IMT components in adjacent countries can be achieved through application of identified technical and operational measures that depend on the actual deployment characteristics of the two systems involved. The table below provides an overview of some of these technical and operational measures:

Table 1

Examples of technical and operational measures identified for the IMT satellite component

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| For the IMT Satellite component |
| – narrower spot beams and steeper roll-off from the boresight of the antenna  – antenna steering  – beam forming and beam nulling  – dynamic frequency management |

Table 2

Examples of technical and operational measures identified for the IMT terrestrial component

|  |
| --- |
| For the IMT terrestrial component |
| – Dynamic frequency resource blocks assignment  – use of antennas with improved performance  – orientation of the IMT BS antenna  – actual activity factor values  – realistic deployment environments and propagation effects (clutter and terrain loss) |

As a guiding principle, the results illustrate that utmost flexibility should be afforded to administrations to resolve potential interference issues between the two services. The current RR, together with the measures identified, provide sufficient basis for this flexibility through bilateral coordination. No change to the RR is therefore called for, in addition to any change being outside the scope of the Resolution.

The results of these ITU-R studies vary depending on the assumptions made about the characteristics of the IMT terrestrial and satellite systems used in the studies, as well as the methodologies used to perform the studies. The Working Document (WD) towards PDNR ITU-R M.[MSS&IMT-ADVANCED SHARING] was not elevated by WP 4C or WP 5D to a Report for consideration by the Conference as the conclusions of the studies could not be agreed among different administrations. Therefore, there is no technical justification for regulatory change at WRC-19.

Changes are outside the scope

Contrary to Resolution **212 (WRC-15)**, an opposing view seeks regulatory changes to the RR to introduce mandatory measures to protect IMT satellites from potential interference from terrestrial IMT transmissions in the 1 980-2 010 MHz frequency band.

However, the regulatory modifications proposed would (i) prevent the use of this frequency band by IMT base stations, or (ii) would establish strict e.i.r.p. limits on IMT base stations inconsistent with those in Article **21** of the RR for terrestrial systems in the band.

This view is outside of the scope of agenda item 9.1, issue 9.1.1 in that it prescribes regulatory priority for the IMT satellite component over the IMT terrestrial component. Both components of IMT are in active use and technical and operational measures, identified by ITU-R studies, sufficiently ensure the coexistence and compatibility between the terrestrial and satellite components of IMT when deployed in adjacent geographic areas.

Proposal

ECOWAS Member States support no change (NOC) to the RR Articles and Appendices for agenda item 9.1, issue 9.1.1 (i.e. view 2 of the CPM text). ECOWAS Member States also propose the modification of Resolution **212 (WRC-15)** as presented in Annex 1 of this contribution.

Reasons

The scope of agenda item 9.1. (and, accordingly, issue 9.1.1) does not include regulatory changes to the RR. Even if issue 9.1.1 contemplated such changes, the conclusions of the studies, and the assumptions for systems characteristics employed in the studies have not been agreed in ITU-R Working Party (WP) 4C and WP 5D, the relevant ITU-R working parties. Further, in the Spectrum Analyzer Measurement study presented at the ITU WP level, the results do not corroborate the trends of results presented in the sharing studies and for key assumptions for verification are missing. Based on the foregoing, the studies presented arguing for regulatory changes are both outside the scope of issue 9.1.1 and are not supported by the facts.

The studies conducted in ITU-R WPs identify technical and operational measures that can be employed to continue to enable both terrestrial and satellite components of IMT, taking into account actual deployment characteristics.

Terrestrial and satellite technologies are often complementary, and measures should be considered that support the continued deployment of both systems. A change to the RR would limit the flexibility for deployments by individual countries and therefore it is not necessary to make changes to the RR.

Availability of both satellite and terrestrial IMT services is critical. Different operators have invested heavily in the development of satellite and terrestrial IMT and systems showed proof of coexistence with applying the suitable technical and operational measures. The ITU-R studies responsive to this agenda issue document technical and operational measures to promote compatibility between the terrestrial and satellite components of IMT in different countries.

5G and IoT in particular are driving innovation in terrestrial networks that will power increased connectivity solutions at reduced cost, with extended coverage and the ability to support many more connected devices than legacy solutions.

NOC BEN/BFA/CPV/CTI/GMB/GHA/GUI/GNB/LBR/MLI/NGR/NIG/SEN/SRL/TGO/102/1

ARTICLES

**Reasons:** A change to the Radio Regulations would limit the flexibility for deployments by individual countries and therefore it is not necessary to make changes to the Radio Regulations.

NOC BEN/BFA/CPV/CTI/GMB/GHA/GUI/GNB/LBR/MLI/NGR/NIG/SEN/SRL/TGO/102/2

APPENDICES

**Reasons:** A change to the Radio Regulations would limit the flexibility for deployments by individual countries and therefore it is not necessary to make changes to the Radio Regulations.

MOD BEN/BFA/CPV/CTI/GMB/GHA/GUI/GNB/LBR/MLI/NGR/NIG/SEN/SRL/TGO/102/3

RESOLUTION 212 (Rev.WRC‑19)

Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz

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

considering

*a)* that Resolution ITU‑R 56 defines the naming for International Mobile Telecommunications (IMT);

*b)* that the ITU Radiocommunication Sector (ITU‑R), for WRC‑97, recommended approximately 230 MHz for use by the terrestrial and satellite components of IMT;

*c)* that ITU‑R studies forecast that additional spectrum may be required to support the future services of IMT and to accommodate future user requirements and network deployments;

*d)* that ITU‑R has recognized that space techniques are an integral part of IMT;

*e)* that, in No. **5.388**, WARC‑92 identified frequency bands to accommodate certain mobile services, now called IMT,

noting

*a)* that the terrestrial component of IMT has already been deployed or is being considered for deployment in the frequency bands 1 885-2 025 MHz and 2 110-2 220 MHz;

*b)* that the satellite components of IMT has already been deployed or is being considered for deployment in the frequency bands 1 980-2 010 MHz and 2 170‑2 200 MHz;

*c)* that the availability of the satellite component of IMT in the frequency bands 1 980‑2 010 MHz and 2 170-2 200 MHz simultaneously with the terrestrial component of IMT in the frequency bands identified in No. **5.388** would improve the overall implementation and the attractiveness of IMT;

*d)* that ITU-R studies have identified technical and operational measures that may be implemented to allow co-existence and compatibility between satellite and terrestrial components of IMT when deployed in the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in adjacent geographic areas, and that such measures do not constrain the operation of these components,

resolves

that administrations which implement IMT:

*a)* should make the necessary frequencies available for system development;

*b)* should use those frequencies when IMT is implemented;

*c)* should use the relevant international technical characteristics, as identified by ITU‑R and ITU‑T Recommendations,

encourages administrations

to give due consideration to the accommodation of other services currently operating in these frequency bands when implementing IMT,

invites ITU‑R

to continue providing guidance to facilitate worldwide use and roaming of IMT, and ensure that IMT can also meet the telecommunication needs of the developing countries and rural areas.

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