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| **World Radiocommunication Conference (WRC-15) Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Addendum 1 to Document 103-E** |
|  | **19 October 2015** |
|  | **Original: English** |
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| Japan | |
| Proposals for the work of the conference | |
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| Agenda item 1.1 | |

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC‑12)**;

Introduction

This contribution from Japan provides our views for WRC-15 agenda item 1.1, which are not fully covered in other several input documents co-signed by Japan.

Discussions

1) Issue of protection of EESS (passive) in the frequency band 1 400‑1 427 MHz

As a member of Asia-Pacific Telecommunity (APT), when identifying the frequency band 1 427‑1 452 MHz for IMT, Japan supports an APT common proposal (ACP) which proposes to specify the unwanted emission levels of IMT stations as “recommended values” in Resolution 750 with regard to protection of EESS (passive) in the frequency band 1 400-1 427 MHz due to the following reasons:

– To ensure protection of EESS (passive) sensors, Report ITU-R RS.2336 derived required unwanted emission levels of IMT stations (–65 dBW/27 MHz per IMT mobile station and –75 or –80 dBW/27 MHz per IMT base station). In the compatibility studies, these values are calculated by apportioning the allowable aggregated interference to unwanted emission level per each IMT mobile or base station in a certain IMT deployment scenario. This apportionment is conducted under the assumption that each IMT mobile (or base) station has the same unwanted emission level on average.

– However, in a real IMT network deployment, dynamic nature of each IMT station is observed, i.e., observed unwanted emission levels are different from the cases of respective IMT stations in the network. More specifically, the following aspects are not fully taken into account when deriving the above required unwanted emission levels of IMT stations:

i) mitigation effect by dynamic transmission power control of IMT stations, e.g., unwanted emission level would be reduced by approximately x dB corresponding to reduction of transmitting power of an IMT station by x dB;

ii) mitigation effect by dynamic resource allocation in the frequency domain in an IMT station, e.g., unwanted emission level of the IMT station in a network would vary in accordance with frequency separation from the frequency bands for the EESS (passive);

iii) etc.

– In order to assess aggregated interference from real IMT networks into the EESS (passive) band of 1 400-1 427 MHz, Japan has conducted a field experiment jointly with ESA and NASA in July and September 2014 in a certain area of Japan (within 35 kilometres radius circle including an urban city). According to this experiment, no change of noise temperature levels were observed on the EESS (passive) sensors comparing the cases in which IMT stations of three commercial IMT networks using the 3GPP Band 11 and 21 in the area were switched on and off. These experimental results demonstrated that there was no impact on the EESS (passive) station due to dynamic nature of real IMT stations.

– Considering the observations and field experimental results explained above, Japan believes that stipulating the unwanted emission levels of IMT stations (−65 dBW/27 MHz per IMT mobile stations and –75 dBW/27 MHz per IMT base station) as mandatory limits in the revision of Resolution 750 (Rev.WRC-12) is too stringent and excessive. In this sense, Japan supports the Option C1b in the CPM Report, i.e., to stipulate unwanted emission levels of IMT stations as “recommended” values as defined in current Resolution 750 (Rev.WRC-12). This will allow flexibility to take into account dynamic nature of IMT stations and improved unwanted emission level in real products of IMT stations associated with product margin compared to −30 dBW/27MHz in the current 3GPP specifications (in the case of a mobile station).

2) Proposed identification of the frequency band 3 700-3 800 MHz for IMT

It is proposed to identify this frequency band for IMT in those countries in Region 3 which would wish to do so due to the following reasons:

– As a regional group in other Region and some countries are proposing to identity this frequency band for IMT, there is high potential for harmonization of the band identified for IMT in many countries in the world.

– This frequency band is suitable for accommodating IMT to provide increased capacity and performance by using large contiguous bandwidths, in particular, in dense urban areas. This feature is suitable for accommodating increasing mobile traffic in IMT networks presented in Reports ITU-R M.2243 and ITU-R M.2290 and Recommendation ITU‑R M.2083. The small antenna size for IMT equipment in the band is a favourable feature to implement multiple-antenna techniques enabling high spectrum efficiency and high data rate.

It should also be noted that the proposed footnote includes the same regulatory conditions as contained in RR No. 5.433A for the frequency band 3 500‑3 600 MHz.

3) Proposed identification of the frequency band 4 500-4 800 MHz for IMT

It is proposed to identify the frequency band for IMT in those countries which would wish to do so due to the following reasons:

– This frequency band is allocated to the mobile service on a primary basis in all three ITU Regions.

– This frequency band is suitable for accommodating IMT to provide increased capacity and performance by using large contiguous bandwidths, in particular, in dense urban areas. This feature is suitable for accommodating increasing mobile traffic in IMT networks presented in Reports ITU-R M.2243 and ITU-R M.2290 and Recommendation ITU-R M.2083. The small antenna size for IMT equipment in the band is a favourable feature to implement multiple-antenna techniques enabling high spectrum efficiency and high data rate.

– As explained in section 1/1.1/4.1.9.3 of the CPM report, this band is applied by RR Appendix 30B and its 4/6 GHz Plan, which are envisaged and used as a supporting backbone to the telecommunication infrastructure of many developing countries, in particular those which are located in high rain fall zones/areas of the globe. However, deployment of IMT networks in a country would be feasible by stipulating appropriate technical and regulatory conditions in the ITU Radio Regulations to protect FSS earth stations in neighbouring countries in this frequency band. IMT small cell deployment using low transmission power and antenna height could meet these conditions more easily compared to IMT macro cell deployment. It should be noted that the technical and regulatory conditions as agreed at WRC-07[[1]](#footnote-1) have been effective to protect FSS earth stations in neighbouring countries when the band 3 400-3 600 MHz was identified for IMT in some countries in Regions 1 and 3.

– It should be recognized that even when bands are identified for IMT in the ITU Radio Regulations, flexibility of the use of the identified bands can still be afforded to each Administration.

Proposals

1) Issue of protection of EESS (passive) in the frequency band 1 400-1 427 MHz

– Japan supports the Option C1b in the CPM Report, i.e., to stipulate unwanted emission levels of IMT stations as “recommended” values in Resolution 750 (Rev.WRC-12), which is indicated in the APT common proposals.

– In addition, Japan considers that “for stations of IMT systems brought into use prior to WRC-15 and stations of future development of these IMT systems, the regulatory provisions stipulated in Resolution 750(Rev. WRC-12) shall continue to be applied.”

2) For the frequency band 3 700-3 800 MHz

ARTICLE 5

Frequency allocations

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

MOD J/103A1/1

2 700-4 800 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| … | … | … |
| … | … |
| 3 600-4 200  FIXED  FIXED-SATELLITE (space-to-Earth)  Mobile | … |
|  | 3 700-3 800  FIXED  FIXED-SATELLITE (space to-Earth)  MOBILE except aeronautical mobile ADD 5.A11 | |
| 3 800-4 200  FIXED  FIXED-SATELLITE (space to-Earth)  MOBILE except aeronautical mobile | |

**Reasons:** This proposal is only related to the frequency band 3 700-3 800 MHz in Region 3, which is associated with addition of a new footnote indicated below.

ADD J/103A1/2

5.A11 In Japan, [*additional country names*], the frequency band 3 700-3 800 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos.**9.17** and **9.18** also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m2 ⋅ 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 3 700-3 800 MHz shall not claim more protection from space stations than that provided in Table **21‑4** of the Radio Regulations (Edition of 2012).     (WRC‑15)

**Reasons:** To identify the frequency band 3 700-3 800 MHz for IMT in those countries in Region 3 which would wish to do so.

3) For the frequency band 4 500-4 800 MHz

MOD J/103A1/3

2 700-4 800 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 4 500-4 800 FIXED  FIXED-SATELLITE (space-to-Earth) 5.441  MOBILE 5.440A ADD 5.C11 | | |

**Reasons:** To identify the frequency band 4 500-4 800 MHz for IMT in those countries which would wish to do so.

ADD J/103A1/4

5.C11 In Japan, [*additional country names*], the frequency band 4 500-4 800 MHz is identified for International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos.**9.17** and **9.18** also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m2 ⋅ 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service in the band 4 500-4 800 MHz shall not claim more protection from space stations than that provided in Table **21‑4** of the Radio Regulations (Edition of 2012).     (WRC‑15)

**Reasons:** To identify the frequency band 4 500-4 800 MHz for IMT in those countries which would wish to do so. Deployment of IMT networks in a country would be feasible by stipulating appropriate regulatory conditions in the ITU Radio Regulations. IMT small cell deployment using low transmission power and antenna height could meet these conditions more easily compared to IMT macro cell deployment.

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1. Application of RR Nos. 9.17 and 9.18, RR Table 21-4 pfd limits for the FSS, and the pfd limits for the MS. [↑](#footnote-ref-1)