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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 82-E** |
|  | **7 October 2019** |
|  | **Original: English** |
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| Australia/Japan | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | |
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| Agenda item 7(J) | |

7 to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)**, in order to facilitate rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

7(J) Issue J - Pfd limit in Section 1, Annex 1 of RR Appendix **30**

Introduction

Although WRC-2000 adopted a revised Plan that generally assigned ten channels per administration in Region 1 and twelve channels per administration in Region 3, this channel capacity may not be enough to meet a national requirement in terms of spectrum for UHDTV or any future generation of HDTV.

In order to provide the advanced BSS applications like UHDTV (see Recommendation ITU-R BT.2020), a modulation scheme with high spectrum efficiency (e.g. APSK) and high required C/N (carrier-to-noise ratio) is necessary (see Recommendation ITU-R BO.2098 and Report ITU-R BO.2397). In that situation, a pfd value exceeding the limit of −103.6 dB(W/(m2 · 27 MHz)) within the service area is required in order to achieve the same service availability as the conventional BSS.

The Japan and Australia Administrations support Method J1 (the exceedance of the power flux-density (pfd) limit for the broadcasting-satellite service (BSS) networks in the List).

APPENDIX 30 (REV.WRC‑15)[[1]](#footnote-1)\*

Provisions for all services and associated Plans and List[[2]](#footnote-2)1 for  
the broadcasting-satellite service in the frequency bands  
11.7-12.2 GHz (in Region 3), 11.7-12.5 GHz (in Region 1)  
         and 12.2-12.7 GHz (in Region 2)    (WRC‑03)

ANNEX 1     (REV.WRC‑15)

Limits for determining whether a service of an administration is affected  
by a proposed modification to the Region 2 Plan or by a proposed  
new or modified assignment in the Regions 1 and 3 List  
or when it is necessary under this Appendix to seek  
the agreement of any other administration[[3]](#footnote-3)25

MOD AUS/J/82/1#50131

# 1 Limits for the interference into frequency assignments in conformity with the Regions 1 and 3 Plan or with the Regions 1 and 3 List or into new or modified assignments in the Regions 1 and 3 List

Under assumed free-space propagation conditions, the power flux-density of a proposed new or modified assignment in the List shall not exceed the value of −103.6 dB(W/(m2 · 27 MHz))[[4]](#footnote-4)26.

**Reasons:**

1 Purpose of Issue J

In order to provide the advanced BSS applications like UHDTV (see Recommendation ITU-R BT.2020), a modulation scheme with high spectrum efficiency (e.g. APSK) and high required C/N (carrier-to-noise ratio) is necessary (see Recommendation ITU-R BO.2098 and Report ITU-R BO.2397). In that situation, a pfd value exceeding the limit of −103.6 dB(W/(m2 · 27 MHz)) within the service area is required in order to achieve the same service availability as the conventional BSS.

2 Summary and analysis of the results of ITU-R studies

§ 5.2.1 d) of RR Appendix **30**, specifies that the limit of −103.6 dB(W/(m2 · 27 MHz)) for Plan assignments could be exceeded under some conditions during the notification procedure.

Similar provision exists in RR No. **21.17** that the pfd limits to protect the terrestrial may be exceeded on the territory of any country whose administration has so agreed.

The Rules of Procedure addresses implementation of the pfd limit referred to in the first paragraph of Section 1 of Annex 1 to RR Appendix **30** as a hard limit that shall not be exceeded in order to protect BSS assignments from interference that may be caused by BSS networks located outside an arc of ±9degrees around a wanted BSS network.

In the case that an administration applies the relevant provisions of RR Article **23** to request the exclusion of its territory from the service areas of BSS networks of other administrations, such BSS networks of other administrations are not entitled to be protected within the territory of the objecting administration (i.e. the notifying administration mentioned above). It should be also noted that coordination among BSS networks belonging to the same notifying administration is an internal matter of that administration.

From the viewpoint of spectrum, the frequency assignment should not overlap with the guardbands in order to ensure the protection of services in adjacent frequency bands.

3 Method

Section 1, Annex 1 of RR Appendix **30** needs to be modified in order to allow List assignments to exceed the pfd limit given in Section 1 of Annex 1 to RR Appendix **30** only within the national territory of the notifying administration under the condition that the assignment does not overlap with the Regions 1 and 3 guardbands as defined in § 3.9 of Annex 5 to RR Appendix **30** and also under the condition that, on the border areas and other territory of another country, this pfd limit is not exceeded.

The pfd values outside of the notifying administration are below the limits, then the satellite networks of the other administrations are protected as same as before. The current coordination procedures are applied when the satellite networks are within the coordination arc.

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| Figure 1  Plan beam for Japan | Figure 2  Example of shaped beam for Japan (High power within the national territory) |
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Figure 1 shows the Plan beam for Japan. When increasing a transmitting power toward Japan by using a shaped beam in Fig. 2, the transmitting power toward outside of Japan becomes lower than the Plan beam in Fig. 1. The administration which operates assignments with exceedance of pfd upon receipt of the report of exceedance of the pfd shall immediately reduce the exceedance to an acceptable level over the territory of the administration which reported the exceedance of pfd.

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1. \* The expression “frequency assignment to a space station”, wherever it appears in this Appendix, shall be understood to refer to a frequency assignment associated with a given orbital position. See also Annex 7 for the orbital limitations.     (WRC‑2000) [↑](#footnote-ref-1)
2. 1 The Regions 1 and 3 List of additional uses is annexed to the Master International Frequency Register (see Resolution **542 (WRC‑2000)**\*\*).     (WRC‑03)

   \*\* *Note by the Secretariat*: This Resolution was abrogated by WRC‑03.

   *Note by the Secretariat*: Reference to an Article with the number in roman is referring to an Article in this Appendix. [↑](#footnote-ref-2)
3. 25 With respect to this Annex, except for Section 2, the limits relate to the power flux‑density which would be obtained assuming free-space propagation conditions.

   With respect to Section 2 of this Annex, the limit specified relates to the overall equivalent protection margin calculated in accordance with § 2.2.4 of Annex 5. [↑](#footnote-ref-3)
4. 26 The limit of −103.6 dB(W/(m2 · 27 MHz)) may be exceeded only within the territory under the jurisdiction of the notifying administration, under the condition that the frequency assignment does not overlap with the Regions 1 and 3 guardbands. This power flux-density (pfd) exceedance is limited to assignments submitted by an administration acting on its own behalf.

   The limit of −103.6 dB(W/(m2 · 27 MHz)) on the border areas and other territory under jurisdiction of any other administration shall not be exceeded. In the case that any administration reports that this limit is exceeded over the territory under its jurisdiction, the administration which operates assignments with exceedance of pfd upon receipt of the report of exceedance of the pfd shall immediately reduce the exceedance to an acceptable level over the territory of the administration which reported the exceedance of pfd.     (WRC-19) [↑](#footnote-ref-4)