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| **Radiocommunication Study Groups** |  |
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| Received: 7 September 2022  Subject: WRC-23 agenda item 7, Topic F Resolution **86 (Rev.WRC-07)** | **Document 4A/837-E** |
| **9 September 2022** |
| **English only** |
| Saudi Arabia (Kingdom of) | |
| WORKING DOCUMENT TOWARDS DRAFT CPM TEXT FOR WRC-23 AGENDA ITEM 7, TOPIC F | |
| Exclusion of service and coverage areas for feeder-links/uplinks in the bands subject to RR Appendix 30A and RR Appendix 30B | |

# 1 Background

Working Party (WP) 4A has received proposals to create provisions for the exclusion of the territory of an administration from the uplink service area in RR Appendix **30A** and **30B** for Regions 1 and 3. As a result of discussion within WP 4A, the subject was adopted as Topic F under WRC-23 agenda item 7 (see Annex 21 to Doc. [4A/392](https://www.itu.int/md/R19-WP4A-C-0392/en)) to address two closely related subjects:

– Exclusion of the territory of an administration from the uplink service area in RR Appendix **30A** for Regions 1 and 3;

– Obligation of the notifying Administration of an interfered-with satellite network to shape the coverage of the satellite receiving antenna of the interfered-with satellite network outside its service area in order not to create an obstacle for the deployment of national or sub-regional satellite networks of other countries in both RR Appendix **30A** and RR Appendix **30B.**

Saudi Arabia proposes the following material for inclusion in the draft CPM text on Topic F, as attached. It aims at merging the proposals made in Documents [4A/479](https://www.itu.int/md/R19-WP4A-C-0479/en) and [4A/664](https://www.itu.int/md/R19-WP4A-C-0664/en), with the aim of consolidating the draft CPM text on Topic F.

**Attachment:** 1

ATTACHMENT

CHAPTER 4

Satellite issues

(Agenda items 1.15, 1.16, 1.17, 1.18, 1.19, 7)

Agenda item 7

**(WP 4A / -)**

*7 to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on 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 the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;*

Resolution **86 (Rev.WRC-07)** – *Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference*

# 4/7/6 Topic F – Exclusion of service and coverage areas for feeder-links/uplinks in the bands subject to RR Appendix 30A and RR Appendix 30B

## 4/7/6.1 Executive summary

Resolution **2** **(Rev.WRC-03)** resolves that *“the registration with the Radiocommunication Bureau of frequency assignments for space radiocommunication services and their use* ***do not provide any permanent priority for any individual country or groups of countries and do not create an* obstacle to the establishment of space systems by other countries**”.

For the space-to-Earth direction, provisions such as RR No. **23.13** and § 6.16 of Article 6 of Appendix **30B** facilitate an Administration to coordinate the downlink and contribute to prevent one Administration from creating an obstacle to the establishment of space systems by other countries. These provisions do not provide a method for the feeder-link (AP**30A**) or uplink (AP**30B**), as noted in Resolution **170 (WRC-19)**.

This may be corrected by:

– Adding provisions to RR Appendix **30A** and **30B** to allow an Administration to request the exclusion of its national territory from the (Earth-to-space) service area of a satellite network(s) of another Administration, and;

– Requiring the notifying Administration of a satellite “List” system in both RR Appendix **30A** and Appendix **30B** to shape the coverage of its satellite receiving antenna to minimise gain towards Administrations outside its service area; further, remove any protection for such a system from harmful interference caused by existing or future satellite systems within those areas.

## 4/7/6.2 Background

The planned space services exist based on the principle of equitable access to the satellite orbit/frequency spectrum in accordance with Article 44 of the ITU Constitution. To this end, relevant provisions of RR Appendix **30/30A** and Appendix **30B** specifically aim at ensuring this principle.

In accordance with the Table of Frequency Allocations contained in Article **5** of the Radio Regulations, there are many frequency bands that are allocated to space services. Nevertheless, there are only few frequency bands that are used for the BSS and FSS Plans as contained in RR Appendices **30**, **30A** and **30B.**

Provision 3.4 of Article 3 of RR Appendix **30A** stipulates that: “The Regions 1 and 3 feeder-link Plan is based on national coverage from the geostationary-satellite orbit. The associated procedures contained in this Appendix are intended to promote long-term flexibility of the Plan and ***to avoid monopolization of the planned bands and orbit by a country or a group of countries***”.

Provision 2.6*bis* of RR Appendix **30B** stipulates that: “When submitting additional system(s), administrations shall fully comply with the requirements stipulated in Article 44 of the ITU Constitution. In particular, these administrations shall limit the number of orbital positions and associated spectrum so that:

a) the orbital/spectrum natural resources are used rationally, efficiently and economically; and

b) ***the use of multiple orbital locations to cover the same service area is avoided***.       (WRC‑07)”.Resolution **2 (Rev.WRC-03)** resolves that “the registration with the Radiocommunication Bureau of frequency assignments for space radiocommunication services and their use do not provide any permanent priority for any individual country or groups of countries **and do not create an obstacle to the establishment of space systems by other countries**”.

In spite of the purpose of the planned space services together with their current associated procedures, submissions of global uplink coverage area or submissions in which the coverage area extended well beyond the service area which poses a real obstacle for an Administration or a group of named Administrations to deploy its national system or their sub-regional systems, as appropriate. Therefore, Topic F was created in order to address this obstacle.

## 4/7/6.3 Summary and analysis of the results of ITU-R studies

In case an Administration or a group of named Administrations (new comer) wish to implement a satellite network with a service area limited to its or their territories, as appropriate, RR No. **23.13** of the Radio Regulations and § 6.16 of Article 6 of RR Appendix **30B** provide these Administrations with an effective measure to coordinate in the downlink because its territory or their national territories are excluded from the service area of the interfered-with network (existing). With regard to the downlink service area of the interfered-with network situated outside the excluded territories of notifying Administration(s), shaped beam technology could be applied to meet the protection criteria with respect to the interfered-with network (existing). The shaped beam is to be applicable to the satellite network of those notifying Administrations and is thus independent of the Administration of the interfered-with satellite network (existing). Paragraph 2 of Rule of Procedure on § 6.16 of Article 6 of Appendix **30B** has been adopted by the Radio Regulations Board to this effect.

With regard to the feeder link/up-link, the interference is normally calculated at the output of receiving satellite antenna of an interfered-with satellite network. It is therefore dependent on the satellite receiving antenna coverage of the interfered-with satellite and the location of interfering earth stations of the other satellite network. More specifically, the roll-off of the satellite receiving antenna of the interfered-with satellite is a determining factor because interfering earth stations cannot be placed outside the corresponding uplink service area, which is limited to the national territories of an Administration or a group of named Administrations.

Statistics submitted by the Bureau indicates that almost all submissions under Article 6 of Appendix **30B** for additional uses have global coverage or coverage extended well beyond the service area, which poses a real obstacle for an Administration or a group of named Administrations to deploy its national system or their sub-regional systems, as appropriate. While this problem has been recognized, to date, there has been no provision in the Radio Regulations to solve that problem.

There is a definition for the BSS downlink in § 1.2 of Annex 5 of RR Appendix **30**. Similar provision may be implemented in RR Appendix **30A**. It has been recognized that shaped beam technology is widely applicable. Nevertheless, it is applicable only to solve the difficulty of the notifying Administrations and not the others.

## 4/7/6.4 Methods to satisfy Topic F

Method [F.1]: In respect of Appendix **30A**:

– Amend Article 4 to require explicit agreement of those Administrations whose territory may be covered or affected by a proposed additional system.

Method [F.2]: In respect of Appendix **30B**:

– Amend Article 9 of Appendix **30B** to remove the right to claim protection from harmful interference from additional systems which have not indicated their agreement to inclusion in the given service area.

4/7/6.5 Regulatory and procedural considerations

4/7/6.5.1 Method [F.1]

APPENDIX 30A (REV.WRC‑19)\*

**Provisions and associated Plans and List**1 **for feeder links for the broadcasting-satellite service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz  
in Region 2 and 11.7-12.2 GHz in Region 3) in the frequency bands  
14.5-14.8 GHz**2 **and 17.3-18.1 GHz in Regions 1 and 3,  
and 17.3-17.8 GHz in Region 2**     (WRC‑03)

ARTICLE 4     (Rev.WRC‑19)

Procedures for modifications to the Region 2 feeder-link Plan   
or for additional uses in Regions 1 and 3

## 4.1 Provisions applicable to Regions 1 and 3

MOD

4.1.1 An administration proposing to include a new or modified assignment in the feeder-link List shall seek the agreement of those administrations whose current or future services are considered to be affected, i.e. administrations4, 5:

*e)* whose territory is partially or wholly covered by an antenna relative gain contour of [‑20 dB or greater].

*[Editor’s Note: the value of -20 dB is proposed here as a mid-point between a high isolation of ‑30 dB and coverage at -10 dB. Further discussions on the most appropriate value are necessary.]*

ADD

4.1.10e An administration may at any time during or after the above-mentioned four-month period inform the Bureau about its objection to being included in the service area of any assignment, even if this assignment has been entered in the List. The Bureau shall then inform the administration responsible for the assignment and exclude the territory and test pointsthat are within the territory of the objecting administration from the service area. The Bureau shall update the reference situation without reviewing the previous examinations.     (WRC-23)

ARTICLE 10

Interference

ADD

10.2 An Administration shall not claim protection from harmful interference to a new or modified assignment included in the feeder-link List, where such interference results from the territory of an Administration that has not provided its agreement under § 4.1.1.     (WRC-23)

4/7/6.5.2 Method [F.2]

Method [F.2]: An example of possible implementation of Method [F.2] for RR AP**30B** is given below.

APPENDIX 30B (REV.WRC‑19)

Provisions and associated Plan for the fixed-satellite service  
in the frequency bands 4 500-4 800 MHz, 6 725-7 025 MHz,  
10.70-10.95 GHz, 11.20-11.45 GHz and 12.75-13.25 GHz

ARTICLE 9     (REV.WRC‑07)

General provisions

ADD

9.2 An Administration that implements a multinational service shall not claim protection from harmful interference from the Earth-to-space emissions from the territory/territories of an Administration(s) that has informed the Bureau of its objection to being included in the service area of such assignment under § 6.16. § 6.29 does not apply.

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