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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 69-E** |
|  | **11 November 2015** |
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| Argentine Republic/Brazil (Federative Republic of)/Nicaragua/ Uruguay (Eastern Republic of)/Venezuela (Bolivarian Republic of) | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 1.6.2 | |

1.6 to consider possible additional primary allocations:

1.6.2 to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz;

and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU‑R studies, in accordance with Resolutions **151 (WRC‑12)** and **152 (WRC‑12)**, respectively;

Introduction

The unplanned FSS bands in the 10-15 GHz frequency range are extensively used for a myriad of applications. Very small aperture terminal (VSAT) services, video distribution, broadband networks, internet services, satellite newsgathering, and backhaul links have triggered the rapid rise in demand for this spectrum. Satellite traffic is typically symmetrical, i.e. similar amounts of Earth-to-space (uplink) and space-to-Earth (downlink) traffic are transmitted. However, in ITU Regions 2 and 3 respectively, there is 250 MHz and 300 MHz less FSS spectrum allocated in the uplink direction, as compared to the downlink direction. In Region 1, while there are equal amounts of spectrum allocated to both the uplink and downlink directions, there is a deficit of 250 and 300 MHz of unplanned FSS spectrum overall, when compared with Regions 2 and 3, respectively. It should be noted that a world-wide allocation for the FSS has a significant advantage over a regional one. For example, the same and/or equal FSS allocations for Regions 1, 2 and 3 is important in terms of planning and construction of satellite networks and the efficient use of the orbit/spectrum resource.

In the band 14.5-14.8 GHz, the fixed-satellite, mobile, and fixed services are allocated on a co-primary basis, and the space research service is allocated on a secondary basis. Technical studies conducted between the fixed-satellite and mobile (including aeronautical) services demonstrate that interference can occur at distances of 50 to 470 km, which is consistent with the predetermined coordination distance that is described in Table 10 of Appendix 7 of the Radio Regulations. Statistical analyses demonstrate that interference within the 470 km distance is likely to occur approximately 1.65% of the time. This result suggests coordination between the fixed-satellite (Earth-to-space) and mobile (including aeronautical) services would be feasible. With respect to the fixed service, there is a well-established history of sharing with the fixed-satellite service based on Appendix 7. The required separation distances depend on the parameters of both systems, such as transmitter power density, minimum operational elevation angles, off-axis antenna performance and the terrain topography. With respect to sharing with the secondary space research allocation, the sharing studies indicate that sharing with data relay feeder links in the Earth-to-space direction currently operating in 14.5-14.8 GHz can be achieved through regular coordination.

Provisions are required to protect the Regions 1 and 3 feeder-link Plan and List assignments. To address this, coordination procedures between Appendix 30A networks and the new fixed-satellite service utilization of the band are identified.

ARTICLE 5

Frequency allocations

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

ADD ARG/B/NCG/URG/VEN/69/1

5.FSSA Stations in the space research service (Earth-to-space) shall not cause harmful interference to, nor claim protection from, stations in the fixed and mobile services, and stations in the fixed-satellite service providing feeder links for the broadcasting-satellite service.     (WRC‑15)

**Reasons:** To retain the secondary status of the space research service with regard to the fixed and mobile services, and to stations in the fixed-satellite service providing feeder links for the broadcasting-satellite service, while at the same time ensuring that with regard to other fixed-satellite services the space research service has co-primary status.

MOD ARG/B/NCG/URG/VEN/69/2

14-15.4 GHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 14.5-14.8 FIXED  FIXED-SATELLITE (Earth-to-space) MOD 5.510  MOBILE  SPACE RESEARCH (Earth-to-space)  Space research (space-to-Earth) (space-to-space)  ADD 5.FSSA | | |

**Reasons:** To remove the constraint on the existing fixed-satellite service allocation and address consequential sharing requirements.

MOD ARG/B/NCG/URG/VEN/69/3

5.510 The use of the band 14.5-14.8 GHz by the fixed-satellite service (Earth-to-space) for feeder links for the broadcasting-satellite service in Regions 1 and 3 is subject to the provisions of Appendix **30A** and is limited to countries outside Europe.     (WRC‑15)

**Reasons:** To clarify which uses of 14.5-14.8 GHz are governed by Appendix 30A.

APPENDIX 5 (REV.WRC‑12)

Identification of administrations with which coordination is to be effected or  
agreement sought under the provisions of Article 9

MOD ARG/B/NCG/URG/VEN/69/4

TABLE 5-1     (Rev.WRC‑15)

Technical conditions for coordination

(see Article 9)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference of Article 9 | Case | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition | Calculation  method | Remarks |
| No. **9.7** GSO/GSO | A station in a satellite network using the geostationary-satellite orbit (GSO), in any space radiocommunication service, in a frequency band and in a Region where this service is not subject to a Plan, in respect of any other satellite network using that orbit, in any space radiocommunication service in a frequency band and in a Region where this service is not subject to a Plan, with the exception of the coordination between earth stations operating in the opposite direction of transmission | 1) 3 400-4 200 MHz 5 725-5 850 MHz (Region 1) and 5 850-6 725 MHz 7 025-7 075 MHz | i) Bandwidth overlap, and  ii) any network in the fixed-satellite service (FSS) and any associated space operation functions (see No. **1.23**) with a space station within an orbital arc of ±8° of the nominal orbital position of a proposed network in the FSS |  | With respect to the space services listed in the threshold/condition column in the bands in 1), 2), 3), 4), 5), 6), 7) and 8), an administration may request, pursuant to No. **9.41**, to be included in requests for coordination, indicating the networks for which the value of Δ*T*/*T* calculated by the method in § 2.2.1.2 and 3.2 of Appendix **8** exceeds 6%. When the Bureau, on request by an affected administration, studies this information pursuant to No. **9.42**, the calculation method given in § 2.2.1.2 and 3.2 of Appendix **8** shall be used |
| 2) 10.95-11.2 GHz 11.45‑11.7 GHz  11.7-12.2 GHz  (Region 2) 12.2-12.5 GHz  (Region 3) 12.5‑12.75 GHz (Regions 1 and 3) 12.7‑12.75 GHz (Region 2) and  13.75‑14.8 GHz | i) Bandwidth overlap, and  ii) any network in the FSS or broadcasting-satellite service (BSS), not subject to a Plan, and any associated space operation functions (see No. **1.23**) with a space station within an orbital arc of ±7° of the nominal orbital position of a proposed network in the FSS or BSS, not subject to a Plan |

APPENDIX 30A (REV.WRC‑12)\*

Provisions and associated Plans and List1 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 GHz2 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‑03)

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

MOD ARG/B/NCG/URG/VEN/69/5

## 4.1 Provisions applicable to Regions 1 and 3

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 services are considered to be affected, i.e. administrations4, 5:

*...*

*d)* having a feeder-link frequency assignment in the band 17.8-18.1 GHz in Region 2 in the fixed-satellite service (Earth-to-space) to a space station in the broadcasting-satellite service or a frequency assignment in the band 14.5-14.8 GHz in the fixed-satellite service (Earth-to-space) not subject to this Appendix which is recorded in the Master Register or which has been coordinated or is being coordinated under the provisions of No. 9.7, or under § 7.1 of Article 7, with a necessary bandwidth, any portion of which falls within the necessary bandwidth of the proposed assignment.     (WRC‑15)

*...*

**Reasons:** To add mechanisms for coordination between fixed-satellite service allocation in 14.5-14.8 GHz with the Regions 1 and 3 feeder-link Plan or List as requested in *resolves* 2 of Resolutions 151 (WRC-12) and 152 (WRC-12).

MOD ARG/B/NCG/URG/VEN/69/6

ARTICLE 7     (Rev.WRC‑15)

Coordination, notification and recording in the Master International   
Frequency Register of frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in   
Regions 2 and 3 in the band 17.7-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in all Regions in the band 14.5-14.8 GHz where those stations are not subject to the Regions 1 and 3 feeder-link Plan or List and to stations  
in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz  
when frequency assignments to feeder links for broadcasting-satellite  
stations in the 17.3-18.1 GHz band in Regions 1 and 3 or in the  
band 17.3-17.8 GHz in Region 2 are involved[[1]](#footnote-1)28

MOD ARG/B/NCG/URG/VEN/69/7

Section I – Coordination of transmitting space or earth stations in the fixed-satellite   
service or transmitting space stations in the broadcasting-satellite service  
with assignments to broadcasting-satellite service feeder links

7.1 The provisions of No. 9.7[[2]](#footnote-2)29and the associated provisions under Articles 9 and 11 are applicable to transmitting space stations in the fixed-satellite service in Region 1 in the band 17.3-18.1 GHz, to transmitting space stations in the fixed-satellite service in Regions 2 and 3 in the band 17.7-18.1 GHz, to transmitting earth stations in the fixed-satellite service in Region 2 in the band 17.8‑18.1 GHz, to transmitting earth stations in the fixed-satellite service in all Regions in the band 14.5-14.8 GHz where those stations are not subject to the Regions 1 and 3 feeder-link Plan or List and to transmitting space stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz.     (WRC‑15)

7.2 In applying the procedures referred to in § 7.1, the provisions of Appendix 5 are replaced by the following:

7.2.1 The frequency assignments to be taken into account are:

*a)* the assignments in conformity with the appropriate Regional feeder-link Plan in Appendix 30A;

*b)* the assignments included in the Regions 1 and 3 feeder-link List;

*c)* the assignments for which the procedure of Article 4 has been initiated as from the date of receipt of the complete Appendix 4 information under § 4.1.3 or 4.2.6.     (WRC‑03)

7.2.2 The criteria to be applied are those given in Annex 4.

ADD ARG/B/NCG/URG/VEN/69/8

7.2*bis* In applying the procedures referred to in § 7.1 for FSS frequency assignments in the band 14.5-14.8 GHz not subject to this Appendix, the provision of No. **11.41** is replaced by the following provision. No. **11.41.2** continues to apply.

ADD ARG/B/NCG/URG/VEN/69/9

7.2*ter* If, after a notice is returned under No. **11.38**, should the notifying administration resubmit the notice and insist upon its reconsideration, and the assignment which was the basis of the unfavourable finding is not an assignment in the Regions 1 and 3 Plan, the Bureau shall enter the assignment in the Master Register with an indication of those administrations whose assignments were the basis of the unfavourable finding (see also No. **11.42**).

**Reasons:** To add mechanisms for coordination between the fixed-satellite service allocation in 14.5-14.8 GHz with the Regions 1 and 3 feeder-link Plan or List as requested in *resolves* 2 of Resolution 151 (WRC-12) and 152 (WRC-12).

ANNEX 1

Limits for determining whether a service of an administration is considered  
to be affected by a proposed modification to the Region 2 feeder-link Plan  
or by a proposed new or modified assignment in the Regions 1 and 3  
feeder-link List or when it is necessary under this Appendix to seek  
the agreement of any other administration     (Rev.WRC‑03)

MOD ARG/B/NCG/URG/VEN/69/10

# 6 Limits applicable to protect a frequency assignment in the band 17.8-18.1 GHz (Region 2) to a receiving feeder-link space station in the fixed-satellite service (Earth-to-space) or a frequency assignment in the band 14.5-14.8 GHz (all Regions where the frequency assignment is not subject to this Appendix) to a receiving space station in the fixed-satellite service (Earth-to-space)     (WRC‑15)

With respect to § 4.1.1 *d)* of Article 4, an administration is considered affected by a proposed new or modified assignment in the Regions 1 and 3 feeder-link List when the power flux-density arriving at the receiving space station of a broadcasting-satellite feeder-link in Region 2 or at the receiving space station of the unplanned fixed-satellite service uplinks not subject to this Appendix in all Regions of that administration would cause an increase in the noise temperature of the receiving space station which exceeds the threshold value of Δ*T*/*T* corresponding to 6%, where Δ*T*/*T* is calculated in accordance with the method given in Appendix 8, except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the uplink carriers.     (WRC‑15)

**Reasons:** To apply the existing coordination trigger between assignments in the Regions 1 and 3 feeder-link List and unplanned assignments in the 17 GHz to assignments in the Regions 1 and 3 feeder-link List and unplanned assignments in the band 14.5-14.8 GHz.

ADD ARG/B/NCG/URG/VEN/69/11

# **7** Threshold values for determining when coordination is required between, transmitting earth stations in the fixed-satellite service in 14.5-14.8 GHz not subject to the Regions 1 and 3 feeder-link Plan or List and a receiving space station in the Regions 1 and 3 feeder-link Plan or List or a proposed new or modified receiving space station in the List, in the frequency band 14.5-14.8 GHz     (WRC‑15)

With respect to § 7.1, Article 7, coordination of a transmitting earth station in the fixed-satellite service with a receiving space station in a broadcasting-satellite feeder link in the Regions 1 and 3 feeder-link Plan or List, or a proposed new or modified receiving space station in the List, is required when the power flux-density arriving at the receiving space station of a broadcasting-satellite service feeder link of another administration exceeds the value of [−193.9 dB(W/(m2 · Hz))/mask (see below)].     (WRC‑15)

|  |  |
| --- | --- |
| *Orbital separation (degrees)* | *Maximal pfd value (dB(W/(m2 · Hz)))* |
| [0 ≤ θ < 2] | [−193.9] |
| [2 ≥ θ ≥ 9] | [−185.1 − 25 · log(topocentric separation)] |

**Reasons:** To apply a new coordination trigger developed to protect the Appendix 30A Plan assignments to coordination between fixed-satellite service allocation in 14.5-14.8 GHz with the Regions 1 and 3 feeder-link Plan or List, in order to address the request in resolves 2 of Resolution 151 (WRC-12) and 152 (WRC-12).

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1. 28 These provisions do not replace the procedures prescribed in Articles **9** and **11** when stations other than those for feeder links in the broadcasting-satellite service subject to a Plan are involved.     (WRC‑03) [↑](#footnote-ref-1)
2. 29 The provisions of Resolution **33 (Rev.WRC‑97)**\* are applicable to space stations in the broadcasting-satellite service for which the advance publication information or the request for coordination has been received by the Bureau prior to 1 January 1999.

   \* *Note by the Secretariat*: This Resolution was revised by WRC‑03. [↑](#footnote-ref-2)