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| **World Radiocommunication Conference (WRC-15) Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Addendum 2 to Document 9(Add.22)-E** |
|  | **15 October 2015** |
|  | **Original: English** |
|  | |
| European Common Proposals | |
| Proposals for the work of the conference | |
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| Agenda item 9.1(9.1.2) | |

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‑12;

9.1(9.1.2) Resolution **756 (WRC-12)** − Studies on possible reduction of the coordination arc and technical criteria used in application of No. **9.41** in respect of coordination under No. **9.7**

Introduction

This document contains the European common proposal concerning both *resolves* 1 and *resolves* 2 of Resolution 756 (WRC-12). Regarding *resolves* 1, Europe proposes no changes to Article 9, including Nos. 9.7 and 9.41, as well as Appendix 5. Furthermore, in respect of Article 11, Europe proposes changes only for the 6/4 GHz and 10/11/12/14 GHz bands and only in respect of the examination carried out under No. 11.32A where the criterion is proposed to be changed from the application of a *C*/*I*-based criterion only, to providing the notifying administration with the choice between a criterion based on *C*/*I* and one based on pfd levels with regard to the examination vis-à-vis each of the satellite networks identified under No. 9.36.2. In fact, Europe notes that in the bands above there are a large number of satellites operating close to each other; in such a scenario it is noted that the relative networks tend to adapt to comparable technical parameters. It should also be noted that, if a given frequency band has been in use by various satellite networks for a long period, their applications and usage tend to become harmonized and technical characteristics such as TVRO antenna sizes and VSAT parameters tend to stabilize and align against each other. Taking this into account, Europe is of the view that the use of pfd thresholds in the examination under No. 11.32A would allow to ensure an harmonised level of protection among satellite networks, avoiding that networks characterised by unrealistic parameters would unnecessarily affect the notification process under Article 11.

The pfd levels have been computed by taking into account the following parameters for the affected earth and space stations.

|  |  |  |
| --- | --- | --- |
| Downlink | 4 GHz | 10/11/12 GHz |
| Earth station antenna diameter | 1.2-18 m | 0.45-11 m |
| Earth station antenna diagram | Main lobe: According to Appendix 8, Section III  Sidelobes: 29-25logθ dBi  (Recommendation ITU-R BO.1213, which implements these main and sidelobe characteristics, was used for the calculations) | |
| Earth station noise temperature | 95 K | 125 K |
| Earth station antenna efficiency | 70% | 70% |
| Equivalent Δ*T*/*T* | 6% | 6% |

|  |  |  |
| --- | --- | --- |
| Uplink | 6 GHz | 14 GHz |
| Maximum satellite *G*/*T* | 0 dB/K | 11 dB/K |
| Equivalent Δ*T*/*T* | 6% | 6% |

Regarding *resolves* 2 of Resolution 756 (WRC-12), Europe is of the view that, in certain frequency bands allocated to the FSS where the coordination arc applies, a new satellite network would likely be required to effect coordination with a large number of existing and proposed satellite networks, with an orbital separation less than the associated coordination arc. Europe also notes that studies conducted by the ITU-R have demonstrated that a reduction to the coordination arc may be possible while concurrently ensuring adequate protection to other existing and proposed satellite networks. If the coordination arc values are selected such that they more accurately reflect the operational satellite environment, this might also have the effect of reducing the need for provisional recording under No. 11.41.

Taking into account that a reduction of the size of the coordination arc in a given band requires that a considerable number of satellite networks should have been operated for a long time, in order for them to have characteristics similar to each other, Europe proposes to reduce the size of the coordination arc by two degrees in the 6/4 GHz and 14/10/11/12 GHz bands, whilst leaving it unchanged in the 30/20 GHz band.

Proposals regarding *resolves* 1 of Resolution 756 (WRC-12)

NOC EUR/9A22A2/1

ARTICLE 9

Procedure for effecting coordination with or obtaining agreement of other administrations1, 2, 3, 4, 5, 6, 7, 8, 8*bis*    (WRC‑12)

**Reasons:** No changes to the provisions of Article 9 are required.

ARTICLE 11

Notification and recording of frequency   
assignments1, 2, 3, 4, 5, 6, 7, 7*bis*    (WRC‑12)

Section II − Examination of notices and recording of frequency assignments   
in the Master Register

MOD EUR/9A22A2/2

11.32A *c)* with respect to the probability of harmful interference that may be caused to or by assignments recorded with a favourable finding under Nos. 11.36 and 11.37 or 11.38, or recorded in application of No. 11.41, or published under Nos. 9.38 or 9.58 but not yet notified, as appropriate, for those cases for which the notifying administration states that the procedure for coordination under Nos. 9.7, 9.7A, 9.7B, 9.11, 9.12, 9.12A, 9.13 or 9.14, could not be successfully completed (see also No. 9.65);14, ADD 14*bis* or     (WRC‑2000)

NOC

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14 11.32A.1

ADD EUR/9A22A2/3

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14*bis* 11.32A.2 For the application of No. **11.32A** with respect to coordination under No. **9.7** in the bands 3 400-4 200 MHz, 5 725-6 725 MHz, 7 025-7 075 MHz, 10.95-11.2 GHz, 11.45‑12.75 MHz and 13.75-14.5 GHz, see Resolution **[EUR-A912] (WRC-15)**.

APPENDIX 5 (REV.WRC‑12)

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

NOC EUR/9A22A2/4

TABLE 5-1     (Rev.WRC‑12)

Technical conditions for coordination

(see Article 9)

ADD EUR/9A22A2/5

Draft New Resolution [EUR-A912] (WRC-15)

Application of pfd criteria to assess the potential for harmful interference under No. 11.32A for fixed-satellite and broadcasting-satellite service networks in the 4/6 GHz and 10/11/12/14 GHz bands not subject to a plan

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that the 4/6 GHz and 10/11/12/14 GHz frequency ranges, not subject to a Plan, are extensively used with operational satellites about every 2-3° around the geostationary arc;

*b)* that there currently are a very large number of satellite networks submitted to ITU-R for these frequency bands;

*c)* that these above factors have led to significant difficulties for administrations to introduce new satellite networks;

*d)* that more precise criteria to assess the probability of harmful interference under No. **11.32A** have the potential to reduce undue protection requirements for assignments in respect of incoming assignments;

*e)* that reduction of undue protection requirements will facilitate coordination of submissions of new networks;

*f)* that due to the congestion in these frequency bands and due to the maturity of the technology and applications in these frequency bands, practical satellite implementations are seen to in practice use relatively homogeneous technical parameters;

*g)* that use of more homogeneous technical parameters will facilitate efficient spectrum usage and support introduction of new networks;

*h)* that the use of pfd thresholds will encourage use of more homogeneous technical parameters and support efficient spectrum usage,

resolves

1 that the notifying administration shall, for its entire satellite network with respect to each of the satellite networks identified under No. **9.36.2**, explicitly request the Bureau to use either the procedure indicated in this Resolution or the method included in a relevant Rule of Procedure when carrying out the examination under No. **11.32A**;

2 that the notifying administration shall accept the interference caused by any satellite network for which the examination under No. **11.32A** is requested according to this Resolution;

3 that, taking into account *resolves* 1 and 2, the Bureau shall proceed as follows:

i) in the frequency band 3 400-4 200 MHz (space-to-Earth), the probability of harmful interference of assignments to a fixed-satellite service (FSS) space station with respect to other incumbent FSS networks shall be considered to be negligible and the Bureau’s finding shall be favourable if the pfd produced under assumed free space propagation conditions, does not exceed the levels shown below, anywhere within the service area of the potentially affected assignment:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | θ | ≤ | 0.09° | −243.5 | (dBW/m2 ∙ Hz) |
| 0.09° | < | θ | ≤ | 3° | −243.5 + 20log(θ/0.09) | (dBW/m2 ∙ Hz) |
| 3° | < | θ | ≤ | 5.5° | −219.8 + 0.75∙θ2 | (dBW/m2 ∙ Hz) |
| 5.5° | < | θ | ≤ | 20.9° | −196.8 + 25log(θ/5.6) | (dBW/m2 ∙ Hz) |
| 20.9° | < | θ |  |  | −182.6 | (dBW/m2 ∙ Hz) |

where θ is the minimum nominal geocentric orbital separation, in degrees, between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies;

ii) in the frequency bands 5 725-5 850 MHz (Region 1), 5 850-6 725 MHz and 7 025‑7 075 MHz (Earth-to-space), the probability of harmful interference of assignments to a FSS earth station with respect to other incumbent FSS networks shall be considered to be negligible and the Bureau’s finding shall be favourable if the pfd produced at the geostationary orbit location of the other FSS network under assumed free space propagation conditions, does not exceed −204.0 dBW/m2 ∙ Hz, taking into account the respective East-West station-keeping accuracies;

iii) in the frequency bands 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz (Region 2), 12.2‑12.5 GHz (Region 3), 12.5-12.7 GHz (Regions 1 and 3) and 12.7‑12.75 GHz (space-to-Earth), the probability of harmful interference of assignments to a FSS or broadcasting-satellite service (BSS) space station with respect to other incumbent FSS or BSS networks shall be considered to be negligible and the Bureau’s finding shall be favourable if the pfd produced under assumed free space propagation conditions, does not exceed the levels shown below, anywhere within the service area of the potentially affected assignment:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | θ | ≤ | 0.05° | −238.0 | (dBW/m2 ∙ Hz) |
| 0.05° | < | θ | ≤ | 3° | −238.0 + 20log(θ/0.05) | (dBW/m2 ∙ Hz) |
| 3° | < | θ | ≤ | 5° | −210.0 + 0.95∙θ2 | (dBW/m2 ∙ Hz) |
| 5° | < | θ | ≤ | 20.9° | −187.2 + 25log(θ/5) | (dBW/m2 ∙ Hz) |
| 20.9° | < | θ |  |  | −171.9 | (dBW/m2 ∙ Hz) |

where θ is the minimum nominal geocentric orbital separation, in degrees, between the wanted and interfering space stations, taking into account the respective East-West station-keeping accuracies;

iv) in the frequency band 13.75-14.5 GHz (Earth-to-space), the probability of harmful interference of assignments to a FSS earth station with respect to other incumbent FSS networks shall be considered to be negligible and the Bureau’s finding shall be favourable if the pfd produced at the geostationary orbit location of the other FSS network under assumed free space propagation conditions, does not exceed −208 dBW/m2 ∙ Hz, taking into account the respective East West station-keeping accuracies.

Proposals regarding *resolves* 2 of Resolution 756 (WRC-12)

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 EUR/9A22A2/6

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 ±6° 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  13.75‑14.5 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 ±5° of the nominal orbital position of a proposed network in the FSS or BSS, not subject to a Plan |

NOC EUR/9A22A2/7

(remaining) TABLE 5-1     (Rev.WRC‑12)

Technical conditions for coordination

(see Article 9)

SUP EUR/9A22A2/8

RESOLUTION 756 (WRC‑12)

Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7

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