|  |  |
| --- | --- |
| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
|  |  |
|  |  |
| PLENARY MEETING | **Addendum 9 to Document 28(Add.21)-E** |
|  | **3 October 2019** |
|  | **Original: Chinese** |
| China (People’s Republic of) | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 9.1(9.1.9) | |

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-15;

9.1 (9.1.9) Resolution **162 (WRC-15) -** Studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space)

Introduction

According to Resolution **162 (WRC-15)**,ITU-R has completed and approved studies considering additional spectrum needs for development of the fixed-satellite service (FSS), sharing and compatibility studies with existing services, and possible associated regulatory actions.

The results of studies of spectrum needs for the FSS show justification of the additional FSS allocation of 1 GHz (Earth-to-space) in the 51.4-52.4 GHz band. The conclusion of sharing and compatibility studies shows that it is feasible for FSS sharing with the fixed service (FS), mobile service (MS) (including potential IMT-2020 applications) in the same frequency band and compatible with the radio astronomy service (RAS) in the same and adjacent band by means of appropriate separation distances; it is also feasible to protect the Earth exploration-satellite service (EESS) (passive) in the nearby frequency band 52.6-54.25 GHz by revision of Resolution **750 (Rev.WRC-15)** of the Radio Regulations (RR).

In the part of CPM Report on agenda item 9.1 (9.1.9), an example of possible regulatory solution is given. In the example, a new primary allocation would be made to the FSS (Earth-to-space) in the frequency band 51.4‑52.4 GHz limited to FSS gateway links for geostationary orbit use, and relevant regulatory solutions are put forward, including modifications to Articles **5**, **21**, Appendices **4** and **7** as well as Resolution **750 (Rev.WRC-15)** of the Radio Regulations.

Taking into account the results of studies conducted by ITU-R with regard to WRC-19 agenda item 9.1 (9.1.9), China supports a new additional primary allocation to the FSS (Earth-to-space) in the frequency band 51.4-52.4 GHz in the Radio Regulations limited to geostationary satellite networks subject to protection of the currently allocated services, and supports modifications to Articles **5**, **21**, Appendices **4**, **7**, as well as Resolution **750 (Rev.WRC-15)** of the Radio Regulations as the example contained in the CPM Report to ensure the sharing and compatibility between the FSS and the existing allocated services, including EESS (passive) in the near frequency band.

Proposals

ARTICLE 5

Frequency allocations

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

MOD CHN/28A21A9/1#50166

5.338A In the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30‑31.3 GHz, 49.7‑50.2 GHz, 50.4-50.9 GHz, 51.4-52.4 GHz, 52.4-52.6 GHz, 81-86 GHz and 92‑94 GHz, Resolution **750 (Rev.WRC‑19)** applies.     (WRC‑19)

**Reasons:** To reflect that the limits for FSS Earth station’s unwanted emissions apply to the frequency band 51.4-52.4 GHz in the proposed revision to Resolution **750 (Rev.WRC-15).**

ADD CHN/28A21A9/2#50167

5.A919 The use of the frequency band 51.4-52.4 GHz by the fixed-satellite service (Earth-to-space) is limited to geostationary satellite networks and the fixed-satellite service earth stations shall have a minimum antenna diameter of 4.5 metres.     (WRC‑19)

**Reasons:** To limit the new additional allocation to gateways operating in GSO FSS networks.

MOD CHN/28A21A9/3#50165

51.4-55.78 GHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 51.4-52.4 FIXED  FIXED-SATELLITE (Earth-to-space) ADD 5.A919  MOBILE  5.547 5.556 MOD 5.338A | | |
| 52.4-52.6 FIXED MOD 5.338A  MOBILE  5.547 5.556 | | |

**Reasons:** An additional 1 GHz allocation to theFSS (Earth-to-space) is justified based on studies on additional spectrum needs as requested by Resolution **162 (WRC-15)**.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

Section II − Power limits for terrestrial stations

MOD CHN/28A21A9/4#50168

TABLE **21-2**     (Rev.WRC‑19)

|  |  |  |
| --- | --- | --- |
| Frequency band | Service | Limit as specified in Nos. |
| … | … | … |
| 10.7-11.7 GHz 5 (Region 1) 12.5-12.75 GHz 5 (Nos. 5.494 and 5.496) 12.7-12.75 GHz 5 (Region 2) 12.75-13.25 GHz 13.75-14 GHz (Nos. 5.499 and 5.500) 14.0-14.25 GHz (No. 5.505) 14.25-14.3 GHz (Nos. 5.505 and 5.508) 14.3-14.4 GHz 5 (Regions 1 and 3) 14.4-14.5 GHz 14.5-14.8 GHz 51.4-52.4 GHz | Fixed-satellite | 21.2**,** 21.3and21.5 |
| … | … | … |

**Reasons:** To include the frequency band proposed for the new additional allocation to FSS (Earth-to-space) for applicability of the limits in RR Nos. **21.2**, **21.3** and **21.5**.

Section III − Power limits for earth stations

MOD CHN/28A21A9/5#50169

TABLE **21-3**     (Rev.WRC‑19)

|  |  |  |
| --- | --- | --- |
| Frequency band | | Services |
| … | … | … |
| 14.3-14.4 GHz 6 | (for Regions 1 and 3) |  |
| 14.4-14.8 GHz |  |  |
| 17.7-18.1 GHz |  | Fixed-satellite |
| 22.55-23.15 GHz |  | Earth exploration-satellite |
| 27.0-27.5 GHz 6 | (for Regions 2 and 3) | Mobile-satellite |
| 27.5-29.5 GHz |  | Space research |
| 31.0-31.3 GHz | (for the countries listed in No. 5.545) |  |
| 34.2-35.2 GHz | (for the countries listed in No. 5.550 with respect to the countries listed in No. 5.549) |  |
| 51.4-52.4 GHz |  | Fixed-satellite |

**Reasons:** To include the frequency band proposed for the new additional allocation to FSS (Earth-to-space) for applicability of the limitsinRR No. **21.8**.

APPENDIX 4 (REV.WRC‑15)

Consolidated list and tables of characteristics for use in the  
application of the procedures of Chapter III

ANNEX 2

Characteristics of satellite networks, earth stations  
or radio astronomy stations[[1]](#footnote-1)2    (Rev.WRC‑12)

Footnotes to Tables A, B, C and D

MOD CHN/28A21A9/6#50170

**TABLE C**

CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS   
FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR   
RADIO ASTRONOMY ANTENNA      (Rev.WRC‑19)

| **Items in Appendix** | ***C \_ CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY  ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR  AN EARTH STATION OR RADIO ASTRONOMY ANTENNA*** | **Advance publication of a geostationary- satellite network** | **Advance publication of a non-geostationary-satellite network subject to coordination under Section II  of Article 9** | **Advance publication of a non-geostationary-satellite network not subject to coordination under Section II  of Article 9** | **Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)** | **Notification or coordination of a non-geostationary-satellite network** | **Notification or coordination of an earth station (including notification under  Appendices 30A or 30B)** | **Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)** | **Notice for a satellite network  (feeder-link) under Appendix 30A  (Articles 4 and 5)** | **Notice for a satellite network in the fixed- satellite service under Appendix 30B  (Articles 6 and 8)** | **Items in Appendix** | **Radio astronomy** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ... | ... |  |  |  |  |  |  |  |  |  |  |  |
| C.10.d.7 | the antenna diameter, in metres  In cases other than Appendix **30A**, required for fixed-satellite service networks operating in the frequency bands 13.75-14 GHz, 14.5-14.75 GHz (in countries listed in Resolution **163 (WRC‑15)** not for feeder links for the broadcasting-satellite service), 14.5-14.8 GHz (in countries listed in Resolution **164 (WRC‑15)** not for feeder links for the broadcasting-satellite service), 24.65‑25.25 GHz (Region 1), 24.65-24.75 GHz (Region 3) and 51.4-52.4 GHz and for maritime mobile-satellite service networks operating in the frequency band 14‑14.5 GHz |  |  |  | **+** | **+** |  |  | **X** |  | C.10.d.7 |  |
| ... | ... |  |  |  |  |  |  |  |  |  |  |  |

**Reasons:** The limitation for antenna diameter for the frequency band 51.4-52.4 GHz is proposed in footnote RR No. **5.A919**.

APPENDIX 7 (REV.WRC‑15)

Methods for the determination of the coordination area around an earth  
station in frequency bands between 100 MHz and 105 GHz

ANNEX 7

System parameters and predetermined coordination distances for determination of the coordination area around an earth station

# 3 Horizon antenna gain for a receiving earth station with respect to a transmitting earth station

MOD CHN/28A21A9/7#50171

TABLE 7c    (Rev.WRC‑19)

Parameters required for the determination of coordination distance for a transmitting earth station

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transmitting space radiocommunication service designation | | Fixed- satellite | Fixed- satellite 2 | Fixed- satellite 3 | Space research | Earth  exploration-satellite, space research | Fixed-satellite, mobile-satellite, radionavigation-satellite | Fixed-satellite | Fixed- satellite 2 | |
| Frequency bands (GHz) | | 24.65-25.25 27.0-29.5 | 28.6-29.1 | 29.1-29.5 | 34.2-34.7 | 40.0-40.5 | 42.5-47 47.2-50.2 50.4-51.4 | 51.4-52.4 | 47.2-50.2 | |
| Receiving terrestrial  service designations | | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile, radiolocation | Fixed, mobile | Fixed, mobile, radionavigation | Fixed, mobile | Fixed, mobile | |
| Method to be used | | § 2.1 | § 2.2 | § 2.2 |  | § 2.1, § 2.2 | § 2.1, § 2.2 | § 2.1 | § 2.2 | |
| Modulation at terrestrial station 1 | | N | N | N |  | N | N | N | N | |
| Terrestrial station interference parameters and criteria | *p*0 (%) | 0.005 | 0.005 | 0.005 |  | 0.005 | 0.005 | 0.005 | 0.001 | |
| *n* | 1 | 2 | 1 |  | 1 | 1 | 1 | 1 | |
| *p* (%) | 0.005 | 0.0025 | 0.005 |  | 0.005 | 0.005 | 0.005 | 0.001 | |
| *NL* (dB) | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | |
| *Ms* (dB) | 25 | 25 | 25 |  | 25 | 25 | 25 | 25 | |
| *W* (dB) | 0 | 0 | 0 |  | 0 | 0 | 0 | 0 | |
| Terrestrial station parameters | *Gx* (dBi) 4 | 50 | 50 | 50 |  | 42 | 42 | 42 | 46 | |
| *Te* (K) | 2 000 | 2 000 | 2 000 |  | 2 600 | 2 600 | 2 600 | 2 000 | |
| Reference bandwidth | *B* (Hz) | 106 | 106 | 106 |  | 106 | 106 | 106 | 106 | |
| Permissible interference power | *Pr*( *p*) (dBW) in *B* | −111 | −111 | −111 |  | −110 | −110 | −110 | −111 | |
| 1 A: analogue modulation; N: digital modulation.  2 Non-geostationary satellites in the fixed-satellite service.  3 Feeder links to non-geostationary-satellite systems in the mobile-satellite service.  4 Feeder losses are not included. | | | | | | | | | |

**Reasons:** To include the parameters required for the determination of coordination distance for a transmitting earth station in the frequency band 51.4-52.4 GHz proposed for the new additional allocation to FSS (Earth-to-space).

MOD CHN/28A21A9/8#50172

RESOLUTION 750 (Rev.WRC‑19)

Compatibility between the Earth exploration-satellite service (passive) and relevant active services

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

…

noting

*a)* that the compatibility studies between relevant active and passive services operating in adjacent and nearby frequency bands are documented in Report ITU-R SM.2092 and in Report ITU‑R S.2463-0;

*b)* that the compatibility studies between IMT systems in the frequency bands 1 375-1 400 MHz and 1 427-1 452 MHz and EESS (passive) systems in the frequency band 1 400-1 427 MHz are documented in Report ITU‑R RS.2336;

*c)* that Report ITU‑R F.2239 provides the results of studies covering various scenarios between the fixed service, operating in the frequency band 81-86 GHz and/or 92-94 GHz, and the Earth exploration-satellite service (passive), operating in the frequency band 86-92 GHz;

*d)* that Recommendation ITU‑R RS.2017 provides the interference criteria for satellite passive remote sensing,

…

TABLE 1-1

| EESS (passive) band | Active service band | Active service | Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band1 |
| --- | --- | --- | --- |
| … | … | … | … |
| 52.6-54.25 GHz | 51.4-52.6 GHz | Fixed | For stations brought into use after the date of entry into force of the Final Acts of WRC‑07:  −33 dBW in any 100 MHz of the EESS (passive) band |
| 52.6-54.25 GHz | 51.4-52.4 GHz | Fixed-satellite (E‑to‑s) | For stations brought into use after the date of entry into force of the Final Acts of WRC-19:  a power level between −39 to −34 dBW in any 100 MHz of the EESS (passive) band for earth stations with antenna elevation angles lower than a value between 74° to 78°;  a power level between −52 to −49 dBW in any 100 MHz of the EESS (passive) band for earth stations with antenna elevation angles equal or higher than a value between 74° to 78°.  For earth stations operating with an FSS space station whose orbital separation Δ is equal or smaller than 3.2° from the GSO EESS (passive) space stations with nominal orbital positions: 0°, 3.5° E, 9.5° E, 41.5° E, 76° E, 79° E, 86.5° E, 99.5° E, 105° E, 112° E, 123.5° E, 133° E, 165.8° E, 3.2° W, 14.5° W, 75° W and 137° W:  −84 + 200 Δ (dBW/100 MHz) for 0°≤ Δ < 0.1°  −67 + 22.8 Δ (dBW/100 MHz) for 0.1°≤ Δ < 0.5°  −61 + 11.3 Δ (dBW/100 MHz) for 0.5° ≤ Δ < 1.9°  −47 + 4 Δ (dBW/100MHz） for 1.9° ≤ △ ≤ 3.2° |

**Reasons:** To limit the unwanted emissions from the FSS Earth stations falling in the frequency band 52.6‑54.25 GHz to protect the NGSO EESS (passive) according to their elevation angle and to protect the GSO EESS (passive) according to the orbital separation between a FSS space station and a GSO EESS (passive) space station.

SUP CHN/28A21A9/9

RESOLUTION 162 (WRC‑15)

Studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space)

**Reasons:** Consequential suppression of Resolution **162 (WRC‑15)** after the allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space) is approved by WRC‑19.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 2 The Radiocommunication Bureau shall develop and keep up-to-date forms of notice to meet fully the statutory provisions of this Appendix and related decisions of future conferences. Additional information on the items listed in this Annex together with an explanation of the symbols is to be found in the Preface to the BR IFIC (Space Services).    (WRC‑12) [↑](#footnote-ref-1)