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| **World Radiocommunication Conference (WRC-15) Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
|  |  |
| PLENARY MEETING | **Addendum 11 to Document 66-E** |
|  | **15 October 2015** |
|  | **Original: Spanish** |
|  | |
| Cuba | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 1.11 | |

1.11to consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with Resolution **650 (WRC‑12)**;

Introduction

Systems in the Earth exploration-satellite service (EESS) require the necessary spectrum to ensure transmission of the volume of data needed for operations plans and dynamic spacecraft software modification, taking into account the foreseeable increase in space missions that cannot be fully serviced by the existing EESS allocation for the Earth-to-space link in the frequency band 2 025-2 110 MHz.

Resolution 650 (WRC-12) invites WRC-15 to review the results of studies with a view to providing a worldwide primary allocation to EESS (Earth-to-space) in the range 7-8 GHz with priority to the band 7 145-7 235 MHz.

The frequency band 7 145-7 190 MHz is allocated on a primary basis to the space research service (Earth-to-space) and is used for communications in deep space. The studies conducted conclude that the coexistence of EESS and deep-space SRS uplinks would not be practical within the same operational frequency band; however, interference levels from EESS uplinks into near-Earth SRS satellite receivers in the frequency band 7 190-7 235 MHz are compliant with the applicable ITU criteria, and this type of operation is compatible without the need of any special mitigation techniques, such that there could be compatibility between SRS (Earth-to-space) and EESS (Earth-to-space) systems in the 7 190-7 235 MHz frequency band if frequency and earth station coordination takes place.

Based on the above, and taking into account the fact that, under No. 5.460, no emissions to deep space are to be effected in the frequency band 7 190-7 235 MHz, the frequency band 7 190-7 250 MHz could be allocated to the EESS (Earth-to-space), which would respond to the need to allocate a band of spectrum 56 MHz wide on a shared basis with other services, taking the required measures to ensure protection for other radiocommunication services already operating in that band (fixed and mobile services and the space operation service, which has an allocation under No. 5.459 of the Radio Regulations).

On the basis of the above, the Administration of Cuba is submitting the following proposal to WRC-15.

Proposals

ARTICLE 5

Frequency allocations

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

MOD CUB/66A11/1

5 570-7 250 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 7 145-7 190 FIXED  MOBILE  SPACE RESEARCH deep space (Earth-to-space)  5.458 MOD 5.459 | | |
| 7 190-7 235 FIXED  MOBILE  SPACE RESEARCH (Earth-to-space) MOD 5.460  EARTH EXPLORATION-SATELLITE (Earth-to-space) ADD 5.A111 ADD 5.B111  5.458 MOD 5.459 | | |
| 7 235-7 250 FIXED  MOBILE  EARTH EXPLORATION-SATELLITE (Earth-to-space) ADD 5.A111  5.458 | | |

MOD CUB/66A11/2

5.459 *Additional allocation:*in the Russian Federation, the frequency bands 7 100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. Obtaining agreement under No. **9.21** shall not be required in respect of the Earth exploration-satellite service.     (WRC-15)

MOD CUB/66A11/3

5.460 No emissions to deep space shall be effected in the frequency band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the frequency band 7 190-7 235 MHz shall not claim protection from stations of the fixed and mobile services and No. 5.43Adoes not apply.     (WRC-03)

ADD CUB/66A11/4

5.A111 The use of the frequency band 7 190-7 250 MHz by the Earth exploration-satellite service shall be limited to tracking, telemetry and command for the operation of spacecraft. In the frequency band 7 190-7 250 MHz, space stations in the Earth exploration-satellite service shall not claim protection from stations of the fixed and mobile services and No. **5.43A** does not apply.    (WRC-15)

ADD CUB/66A11/5

5.B111 In the frequency band 7 190-7 235 MHz, space stations in the Earth exploration-satellite service (Earth-to-space) shall not claim protection from the space research service or the space operation service operating in accordance with No. **5.459**.    (WRC-15)

**Reasons:** To allocate the spectrum required for EESS Earth-to-space operations, while taking the necessary steps to ensure due protection for existing services.

SUP CUB/66A11/6

RESOLUTION 650 (WRC‑12)

Allocation for the Earth exploration-satellite service   
(Earth-to-space) in the 7-8 GHz range

**Reasons:** No longer necessary.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

Section III − Power limits for earth stations

MOD CUB/66A11/7

TABLE **21-3**     (Rev.WRC‑15)

|  |  |  |
| --- | --- | --- |
| Frequency band | | Services |
| 2 025-2 110 MHz  5 670-5 725 MHz  5 725-5 755 MHz6 | (for the countries listed in No. 5.454 with respect to the countries listed in Nos. 5.453 and 5.455)  (for Region 1 with respect to the countries listed in Nos. 5.453 and 5.455) | Earth-exploration-satellite  Fixed-satellite  Meteorological-satellite  Mobile-satellite  Space operation |
| 5 755-5 850 MHz6 | (for Region 1 with respect to the countries listed in Nos. 5.453, 5.455 and 5.456) | Space research |
| 5 850-7 075 MHz |  |  |
| 7 190-7 250 MHz |  |  |
| 7 900-8 400 MHz |  |  |
| 10.7-11.7 GHz6 | (for Region 1) |  |
| 12.5-12.75 GHz6 | (for Region 1 with respect to the countries listed in No. 5.494) |  |
| 12.7-12.75 GHz6 | (for Region 2) |  |
| 12.75-13.25 GHz |  |  |
| 14.0-14.25 GHz | (with respect to the countries listed in No. 5.505) |  |
| 14.25-14.3 GHz | (with respect to the countries listed in Nos. 5.505, 5.508 and 5.509) |  |
| 14.3-14.4 GHz6 | (for Regions 1 and 3) |  |
| 14.4-14.8 GHz |  |  |

**Reasons:** To update the table with the new allocation to the Earth exploration-satellite service.

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

MOD CUB/66A11/8

TABLE 7b    (Rev.WRC‑12)

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transmitting space radiocommunication  service designation | | Fixed-satellite, mobile-satellite | Aero-nautical mobile-satellite (R) service | Aero-nautical mobile-satellite (R) service | Fixed- satellite | Fixed- satellite | Fixed- satellite | Fixed- satellite | | Earth exploration-satellite, space  operation, space  research | | Fixed-satellite, mobile-satellite, meteorological- satellite | | Fixed- satellite | | Fixed- satellite | | Fixed- satellite | Fixed- satellite 3 | Fixed- satellite | Fixed- satellite 3 |
| Frequency bands (GHz) | | 2.655-2.690 | 5.030-5.091 | 5.030-5.091 | 5.091-5.150 | 5.091-5.150 | 5.725-5.850 | 5.725-7.075 | | 7.100-7.250 5 | | 7.900-8.400 | | 10.7-11.7 | | 12.5-14.8 | | 13.75-14.3 | 15.43-15.65 | 17.7-18.4 | 19.3-19.7 |
| Receiving terrestrial service designations | | Fixed, mobile | Aeronautical radio- navigation | Aeronautical mobile (R) | Aeronautical radio- navigation | Aeronautical mobile (R) | Radiolocation | Fixed, mobile | | Fixed, mobile | | Fixed, mobile | | Fixed, mobile | | Fixed, mobile | | Radiolocation radionavigation (land only) | Aeronautical radionavigation | Fixed, mobile | Fixed, mobile |
| Method to be used | | § 2.1 | § 2.1, § 2.2 | § 2.1, § 2.2 |  |  | § 2.1 | § 2.1 | | § 2.1, § 2.2 | | § 2.1 | | § 2.1 | | § 2.1, § 2.2 | | § 2.1 |  | § 2.1, § 2.2 | § 2.2 |
| Modulation at terrestrial station 1 | | A |  |  |  |  |  | A | N | A | N | A | N | A | N | A | N | − |  | N | N |
| Terrestrial station interference parameters and criteria | *p0* (%) | 0.01 |  |  |  |  |  | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 |  | 0.005 | 0.005 |
| *n* | 2 |  |  |  |  |  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |  | 2 | 2 |
| *p* (%) | 0.005 |  |  |  |  |  | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.01 |  | 0.0025 | 0.0025 |
| *NL* (dB) | 0 |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |
| *Ms* (dB) | 26 2 |  |  |  |  |  | 33 | 37 | 33 | 37 | 33 | 37 | 33 | 40 | 33 | 40 | 1 |  | 25 | 25 |
| *W* (dB) | 0 |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |
| Terrestrial station parameters | *Gx* (dBi) 4 | 49 2 | 6 | 10 | 6 | 6 |  | 46 | 46 | 46 | 46 | 46 | 46 | 50 | 50 | 52 | 52 | 36 |  | 48 | 48 |
| *Te* (K) | 500 2 |  |  |  |  |  | 750 | 750 | 750 | 750 | 750 | 750 | 1 500 | 1 100 | 1 500 | 1 100 | 2 636 |  | 1 100 | 1 100 |
| Reference bandwidth | *B* (Hz) | 4 × 103 | 150 × 103 | 37.5 × 103 | 150 × 103 | 106 |  | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 107 |  | 106 | 106 |
| Permissible interference power | *Pr*( *p*) (dBW) in *B* | −140 | −160 | −157 | −160 | −143 |  | −131 | −103 | −131 | −103 | −131 | −103 | −128 | −98 | −128 | −98 | −131 |  | −113 | −113 |

1 A: analogue modulation; N: digital modulation.

2 The parameters for the terrestrial station associated with transhorizon systems have been used. Line-of-sight radio-relay parameters associated with the frequency band 5 725‑7 075 MHz may also be used to determine a supplementary contour with the exception that Gx = 37 dBi.

3 Feeder links of non-geostationary-satellite systems in the mobile‑satellite service.

4 Feeder losses are not included.

5 Actual frequency bands are 7 190-7 250 MHz for the Earth exploration-satellite service, 7 100-7 155 MHz and 7 190-7 235 MHz for space operation service and 7 145-7 235 MHz for the space research service.

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