|  |  |
| --- | --- |
| **33 MEETING OF PERMANENT****CONSULTATIVE COMMITTEE II:****RADIOCOMMUNICATIONS****April 8 to 12, 2019****Monterrey, Nuevo Leon, Mexico** | **OEA/Ser.L/XVII.4.2.33****CCP.II-RADIO/doc.** **XX March****Original: english** |
|  |
|  | **U.S. PROPOSAL ON WRC-19 AGENDA ITEM 1.3**  |  |
|  | **(Item on the Agenda: 3.1)** |  |
|  | **(Document submitted by the delegation of the United States of America)** |  |

Introduction

This document contains an attachment including the USA proposal on WRC-19 Agenda Item 1.3 for consideration in CITEL’s preparation to WRC-19 Agenda Item 1.3.

**ATTACHMENT**

**Agenda Item 1.3***:**to consider possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz, in accordance with Resolution* ***766 (WRC-15)***

**BACKGROUND**: The frequency band 460-470 MHz is currently allocated to the fixed and mobile services on a primary basis and is widely used by these services. Resolution **766 (WRC-15)** states that there is a need to protect the fixed and mobile services in the frequency band 460-470 MHz and not to constrain their future development. Furthermore, RR No. **5.286AA** identifies the frequency band 450-470 MHz for use by administrations wishing to implement International Mobile Telecommunications (IMT).

Within this frequency band the Argos Data Collection System (ADCS) monitors more than 21,000 active Argos platforms collecting data for over 2,000 distinct projects in 100+ countries. The administration of the Argos program is under a joint agreement between the National Oceanic and Atmospheric Administration (NOAA) within the United States and the French Space Agency, Centre National d’Etudes Spatiales (CNES). Additional partners include the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), and the Indian Space Research Organization (ISRO).

Critical applications of the ADCS include atmospheric and ocean monitoring/research, tropical cyclone forecasting, fishery management, oil spill tracking, fishing vessel tracking, search and rescue modeling (at sea), anti-piracy alerting, import/export and hazardous materials tracking, endangered species studies, migration mapping, and wildlife tracking and management.

The meteorological-satellite (space-to-Earth) service operates on a secondary basis relative to the fixed and mobile services and thus it must not interfere with these services. To protect the fixed and land mobile services within the United States, a power flux density (pfd) of -152 dB(W/(m2∙4kHz)) has been imposed on the meteorological-satellite (space-to-Earth) service.

In accordance with Resolution **766 (WRC-15)**, the ITU-R has conducted sharing studies to ensure the protection of incumbent services and has developed a pfd limit that will protect incumbent services globally from potential interference in the frequency band 460 – 470 MHz. The Report ITU-R SA.2429 provides the studies and compiles elements related to WRC-19 agenda item 1.3. This Report also includes initial technical considerations on EESS and MetSat in the 460-470 MHz band and other services allocated in this band

Studies have demonstrated that sharing is possible between meteorological-satellite (space-to-Earth)/earth-exploration-satellite (space-to-Earth) services and the incumbent services in the 460 – 470 MHz frequency band if the pfd limits proposed below are applied. Based on the results of sharing studies, this proposal supports an allocation upgrade from secondary to a primary for the meteorological-satellite service (space-to-Earth) and a new primary allocation to the earth-exploration-satellite (space-to-Earth) service in the frequency band 460 – 470 MHz band. This proposal applies a set of elevation angle dependent pfd limits to the meteorological-satellite and earth exploration-satellite services to protect the incumbent services globally.

**Proposal**:

ARTICLE 5

**Frequency allocations**

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

**MOD** USA/AI 1.3/1

**460-470 MHz**

|  |
| --- |
| **Allocation to services** |
| **Region 1** | **Region 2** | **Region 3** |
| **460-470** FIXED MOBILE 5.286AA METEOROLOGICAL-SATELLITE (space-to-Earth)EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.287 5.288 ADD 5.A13 ADD 5.B13  |
|  |

**SUP** USA/AI 1.3/2

**5.290** *Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, the Russian Federation, Japan, Kyrgyzstan, Tajikistan, and Turkmenistan, the allocation of the band 460‑470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.    (WRC‑12)

**ADD** USA/AI 1.3/3

**5.A13** In the frequency band 460-470 MHz, earth stations in the meteorological-satellite service (space-to-Earth) and Earth exploration-satellite service (space-to-Earth) shall not claim protection from stations of the fixed and mobile services in the frequency band 460-470 MHz unless other agreements were obtained under No. **9.21** prior to the end of WRC‑19. Resolution **[A13] (WRC‑19)** shall apply.

**ADD** USA/AI 1.3/4

**5.B13** that in the frequency band 460-470 MHz, space stations in the Earth exploration-satellite service (space-to-Earth) shall not cause harmful interference to earth stations in the meteorological-satellite service (space-to-Earth).

**MOD** USA/AI 1.3/5

**1 690-1 700 MHz**

|  |
| --- |
| **Allocation to services** |
| **Region 1**  | **Region 2**  | **Region 3** |
| **1 690-1 700**METEOROLOGICAL AIDSMETEOROLOGICAL-SATELLITE (space-to-Earth)FixedMobile except aeronautical mobileMOD 5.289 5.341 5.382 | **1 690-1 700**METEOROLOGICAL AIDSMETEOROLOGICAL-SATELLITE (space-to-Earth)MOD 5.289 5.341 5.381 |
| **1 700-1 710**FIXEDMETEOROLOGICAL-SATELLITE (space-to-Earth)MOBILE except aeronautical mobileMOD 5.289 5.341 | **1 700-1 710**FIXEDMETEOROLOGICAL-SATELLITE (space-to-Earth)MOBILE except aeronautical mobileMOD 5.289 5.341 5.384 |

**MOD** USA/AI 1.3/6

**5.289** Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the band 1 690-1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.     (Rev. WRC‑19)

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** USA/AI 1.3/7

TABLE 8a     (Rev.WRC‑19)

**Parameters required for the determination of coordination distance for a receiving earth station**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Receiving spaceradiocommunicationservice designation** | **Space operation, space research** | **Meteoro-logical- satellite, mobile-satellite** | **Space research** | **Space research, space operation** | **Space operation** | **Mobile-satellite** | **Meteoro-logical-satellite** | **Mobile-satellite** | **Space research** | **Space operation** |  | **Broad-casting- satellite** | **Mobile-satellite** | **Broadcasting- satellite(DAB)** | **Mobile-satellite,land-mobile satellite, maritime mobile-satellite** |
| Frequency bands (MHz) | 137-138 | 137-138 | 143.6-143.65 | 174-184 | 163-167 272-273 5 | 335.4-399.9 | 400.15-401 | 400.15-401 | 400.15-401 | 401-402 |  | 620-790 | 856-890 | 1 452-1 492 | 1 518-1 5301 555-1 5592 160-2 200 1 |
| Transmitting terrestrial service designations | Fixed,mobile | Fixed,mobile | Fixed, mobile, radio-location | Fixed, mobile,broad-casting | Fixed, mobile | Fixed, mobile | Meteoro-logical aids | Meteoro-logical aids | Meteoro-logical aids | Meteoro-logical aids,fixed, mobile |  | Fixed, mobile,broad-casting | Fixed, mobile,broadcasting | Fixed, mobile,broadcasting | Fixed, mobile |
| Method to be used | § 2.1 | § 2.1 | § 2.1 | § 2.1 | § 2.1 | § 1.4.6 | § 1.4.6 | § 1.4.6 | – | § 2.1 |  | § 1.4.5 | § 1.4.6 | § 1.4.5 | § 1.4.6 |
| Modulation at earth station 2 | N |  | N |  | N |  |  |  | N | N |  |  |  | N | N |
| Earth stationinterferenceparametersand criteria | *p*0 (%) |  | 0.1 |  | 0.1 |  | 1.0 |  | 0.012 |  | 0.1 | 0.1 |  |  |  |  | 10 |
| *n* |  | 2 |  | 2 |  | 1 |  | 1 |  | 2 | 2 |  |  |  |  | 1 |
| *p* (%) |  | 0.05 |  | 0.05 |  | 1.0 |  | 0.012 |  | 0.05 | 0.05 |  |  |  |  | 10 |
| *NL* (dB) |  | 0 |  | 0 |  | 0 |  | 0 |  | 0 | 0 |  |  |  |  | 0 |
| *Ms* (dB) |  | 1 |  | 1 |  | 1 |  | 4.3 |  | 1 | 1 |  |  |  |  | 1 |
| *W* (dB) |  | 0 |  | 0 |  | 0 |  | 0 |  | 0 | 0 |  |  |  |  | 0 |
| Terrestrial station parameters | *E* (dBW)in *B* 3 | A | – |  | – |  | 15 |  |  |  | – | – |  |  |  | 38 | 37 4 |
| N | – |  | – |  | 15 |  |  |  | – | – |  |  |  | 38 | 37 |
| *Pt* (dBW) in *B* | A | – |  | – |  | –1 |  |  |  | – | – |  |  |  | 3 | 0 |
| N | – |  | – |  | –1 |  |  |  | – | – |  |  |  | 3 | 0 |
| *Gx* (dBi) |  | – |  | – |  | 16 |  |  |  | – | – |  |  |  | 35 | 37 |
| Reference bandwidth | *B* (Hz) |  | 1 |  | 1 |  | 103 |  | 177.5 × 103 |  | 1 | 1 |  |  |  | 25 × 103 | 4 × 103 |
| Permissible interference power | *Pr*( *p*) (dBW)in *B* |  | −199 |  | −199 |  | −173 |  | −148 |  | −208 | −208 |  |  |  |  | −176 |
| 1 In the band 2 160-2 200 MHz, the terrestrial station parameters of line-of-sight radio-relay systems have been used. If an administration believes that, in this band transhorizon systems need to be considered, the parameters associated with the frequency band 2 500-2 690 MHz may be used to determine the coordination area.2 A: analogue modulation; N: digital modulation.3 *E* is defined as the equivalent isotropically radiated power of the interfering terrestrial station in the reference bandwidth.4 This value is reduced from the nominal value of 50 dBW for the purposes of determination of coordination area, recognizing the low probability of high power emissions falling fully within the relatively narrow bandwidth of the earth station.5 The fixed-service parameters provided in the column for 163-167 MHz and 272-273 MHz are only applicable to the band 163-167 MHz. |

**ADD** USA/AI 1.3/8

Draft New Resolution [A13] (WRC-19)

**Implementation of satellite networks and systems of the meteorological-satellite service (space-to-Earth) and the Earth exploration-satellite service
(space-to-Earth) in the frequency band 460-470 MHz**

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

*considering*

*a)* that data collection systems (DCS) operate on geostationary and non-geostationary orbits in the meteorological-satellite service (MetSat) and the Earth exploration-satellite service (EESS) (Earth-to-space) in the frequency band 401-403 MHz;

*b)* that DCS are essential for monitoring and predicting climate change, monitoring oceans, and water resources, weather forecasting and assisting in protecting biodiversity, improving maritime security;

*c)* that most of these DCS have implemented satellite downlinks (space-to-Earth) in the frequency band 460-470 MHz which bring significant improvements to the operation of satellite DCS, such as the transmission of information to optimize the usage of the terrestrial data collection platforms;

*d)* that the frequency band 460-470 MHz is also used for the downlink of mission and telemetry data for meteorological and Earth-exploration purposes;

*e)* that the frequency band 460-470 MHz is allocated to the fixed and mobile services on a primary basis and is identified for IMT on a global basis;

*f)* that WRC‑19 has upgraded the secondary allocation of the MetSat (space-to-Earth) to primary status and added a primary allocation to the EESS (space-to-Earth) in the frequency band 460-470 MHz, and established a power flux-density (pfd) limit to provide protection of existing terrestrial services;

*g)* that the priority of MetSat systems over EESS systems in the frequency band 460-470 MHz is provided to ensure protection of MetSat systems from interference from the increasing number of small satellite systems operating in the EESS;

*h)* that WRC‑19 suppressed No. **5.290** and the relevant parameters in Table **8a** of Appendix **7**, which identified some administrations that already have a primary allocation to the MetSat (space-to-Earth), subject to agreement obtained under No. **9.21,** in the light of the upgrade mentioned in *considering f)* above, and that it is necessary to provide some regulatory measures for satellite systems which operate in accordance with No. **5.290** to retain their regulatory status after the end of WRC‑19,

*noting*

*a)* that frequency assignments for several EESS and MetSat satellite systems in the frequency band 460-470 MHz were notified and brought into use;

*b)* that some of these EESS and MetSat satellite systems above may not meet the pfd limit in *considering f)*, but there is a need to continue to authorize them for operations as secondary services in order to continue their operations,

*resolves*

1. that in the frequency band 460-470 MHz the power flux-density at the Earth’s surface produced by stations in the meteorological-satellite (space-to-Earth) and Earth exploration-satellite (space-to-Earth) services shall comply with the limits listed below under assumed free-space propagation conditions for all methods of modulation:

For non-GSO space stations:

 

And for GSO space stations:

 

where α is the angle of arrival above the horizontal plane, in degrees.

These limits apply to all space stations in the meteorological-satellite service and Earth exploration‑satellite service in this frequency band for which complete notification information or coordination request or advance publication information was received by the Radiocommunication Bureau after the end of WRC‑19;

2 that the satellite networks and systems in the meteorological-satellite (space-to-Earth) and Earth exploration-satellite (space-to-Earth) services in the frequency band 460-470 MHz for which a complete notification information or advance publication information or coordination request has been received by the Radiocommunication Bureau prior to the end of WRC‑19, and whose space stations meet the pfd limits given in *resolves*1, may to continue to operate with the same parameters under Appendix **4** submitted for coordination or notification;

3 that the frequency assignment of MetSat (space-to-Earth) and EESS (space-to-Earth) satellite network and systems in the frequency band 460-470 MHz for which complete notification information or coordination request or advance publication information was received by the Radiocommunication Bureau prior to the end of WRC‑19 and whose space stations do not meet the pfd limits given in *resolves*1 shall be used on a secondary basis with respect to the fixed and mobile service stations;

4 that the satellite systems in the meteorological-satellite service (space-to-Earth) referred to in *considering h)* for which complete coordination information related to No. **9.21** has been received by the Radiocommunication Bureau prior to the end of WRC‑19 shall operate on a primary basis, and that, for those systems, the relevant provisions of Articles **9** and **11** continue to apply, and the relevant agreements obtained under No. **9.21** remain in force after the end of WRC‑19;

5 that the MetSat and EESS in the 460-470 MHz band shall not limit the development or the deployment of the fixed, mobile and broadcast services allocated in the 460-470 MHz and adjacent bands;

*instructs the Director of the Radiocommunication Bureau*

for the frequency assignment of MetSat (space-to-Earth) and EESS (space-to-Earth) satellite network for which complete notification information or coordination request was received by the Radiocommunication Bureau prior to the end of WRC‑19, the Bureau shall review the finding under No. **11.50** without requiring the administration to submit a new assignment. The date of such assignment’s original recording in the Master International Frequency Register (MIFR) shall remain unchanged.

SUP USA/AI 1.3/9

RESOLUTION 766 (WRC-15)

Consideration of possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary
status and a primary allocation to the Earth exploration-
satellite service (space-to-Earth) in the
frequency band 460-470 MHz

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