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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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|  | CPG(19)073 ANNEX V-03 |
| PLENARY MEETING | **Addendum 3 to Document X-E** |
|  | **Date** |
|  | **Original: English** |
|  | |
| European Common Proposals | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 1.3 | |

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)**;

**Introduction**

This agenda item proposes 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.

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) systems in the frequency band 401-403 MHz (uplink) and 460-470 MHz (downlink). DCS systems are essential for monitoring and predicting climate change, monitoring ocean, and water resources, weather forecasting and assisting in protecting biodiversity, as well as improving maritime security.

Data collection systems in the MetSat service have been operating globally under a secondary allocation and on a primary basis in some countries under No. **5.290**, but this use is subject to agreement obtained under Article **9.21**. This has led to different limitations and has posed a barrier to implementation of essential DCS components on a global basis. According to No. **5.289**, Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460‑470 MHz and 1 690-1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the RR Article **5**.

A primary allocation to the MetSat service and EESS in the frequency band 460-470 MHz would provide confidence to space and meteorological agencies deeply involved in Satellite Data Collection Programs and the public sectors funding the development and operation of such systems. Regulatory measures need to be developed to protect the mobile and fixed service.

Sharing studies undertaken in accordance with Resolution **766 (WRC-15)** have shown that the protection of existing services allocated in the 460-470 MHz and adjacent bands will be ensured provided that MetSat and EESS satellites are compliant with the following pfd masks:

For non-GSO satellites:

For GSO satellites:

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

*Editor´s note: The above pfd mask for GSO is still under review and has not been approved yet at WP7B.*

In addition, the following conditions are proposed:

− priority of MetSat over EESS as currently expressed in the RR is retained;

− MetSat and EESS earth stations will not claim protection from stations in the fixed and mobile services, consistently with recognizing f) of Res 766;

CEPT recognises the need for a harmonized spectrum partitioning (GSO vs. NGSO DCS) of the global operating environment to allow full development of DCS.

**Proposal**

ARTICLE 5

**Frequency allocations**

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

**MOD EUR/XXXA3/1**

**460-890 MHz**

|  |  |  |
| --- | --- | --- |
| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **460-470**  FIXED  EARTH EXPLORATION-SATELLITE (space-to-Earth)  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOBILE 5.286AA  5.287 5.288 ADD 5.D13 | | |

**Reasons:** According to studies under Resolution **766 (WRC-15)**, the secondary allocation to meteorological satellite service (space-to-Earth) in the band 460-470 MHz is upgraded to primary and a new primary Earth exploration-satellite service (space-to-Earth) allocation is added.

**MOD EUR/XXXA3/2**

|  |  |  |  |
| --- | --- | --- | --- |
| **1690 – 1710 MHzAllocation to services** | | | |
| **Region 1** | **Region 2** | **Region 3** | |
| **1 690-1 700**  METEOROLOGICAL AIDS  METEOROLOGICAL-SATELLITE (space-to-Earth)  Fixed  Mobile except aeronautical mobile  MOD 5.289 5.341 5.382 | **1 690-1 700**  METEOROLOGICAL AIDS  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOD 5.289 5.341 5.381 | | |
| **1 700-1 710**  FIXED  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOBILE except aeronautical mobile  MOD 5.289 5.341 | | | **1 700-1 710**  FIXED  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOBILE except aeronautical mobile  MOD 5.289 5.341 5.384 |

**MOD EUR/XXXA3/3**

**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.     (WRC‑19)

**Reasons:** Due to the new primary status of EESS and MetSat service, the reference to the frequency band 460-470 MHz is no longer needed in this footnote.

**SUP EUR/XXXA3/4**

**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)

**Reasons:** To reflect the implications of the upgrade from secondary to primary: since the band 460-470 MHz has been upgraded from secondary to primary for MetSat service (space-to-Earth) and EESS (space-to-Earth), there is no need to keep a reference to No. **9.21**, and footnote No. **5.290** is deleted.

**ADD EUR/XXXA3/5**

**5.D13** In the band 460-470 MHz, Resolution **[B13] (WRC-19)** shall apply.     (WRC-19)

**Reasons:** The Resolution includes the regulatory measures to protect the fixed and mobile services, the regulatory measure to assure priority of MetSat service over EESS and the grandfathering measures for existing data collection systems.

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 EUR/XXXA3/6**

TABLE 8a     (Rev.WRC‑19)

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Receiving space radiocommunication service 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 | 1 518-1 530 1 555-1 559 2 160-2 200 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, broad casting | 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 station interference parameters and 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. | | | | | | | | | | | | | | | | | | | |

**Reasons:** No parameters for the MetSat and EESS systems to calculate coordination distances are needed.

**ADD EUR/XXXA3/7**

Draft New Resolution [B13] (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 widely used by these services;

*f)* that the World Radiocommunication Conference 2019 (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 the power flux-density (pfd) masks to provide protection of existing terrestrial services to which the frequency band is already allocated and in the adjacent frequency bands;

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 has deleted No. **5.290** and the relevant parameters in Table 8a of Appendix **7**, which identified some administrations that already had 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 measures for the satellite systems which was in accordance with No. **5.290** to retain their regulatory status as of the end of WRC-19,

*noting*

*a)* that several EESS and MetSat satellite networks and systems in the frequency band 460-470 MHz were notified and brought into use before 22 November 2019;

*b)* that some of these EESS and MetSat satellite networks and systems above may not meet the pfd masks in *considering f),* but they will continue their operation,

*resolves*

1. that in the frequency band 460-470 MHz, space stations in the meteorological-satellite (space-to-Earth) and Earth exploration-satellite (space-to-Earth) services shall comply with the following power flux density limits:

For non-GSO space stations:

And for GSO space stations:

where ɑ 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 for non-geostationary satellite networks or coordination request for geostationary satellite networks is 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 coordination request for geostationary satellite networks or notification information for non-geostationary satellite networks has been received by the Radiocommunication Bureau prior to the end of WRC-19 are allowed to continue to operate with the same parameters under Appendix **4** submitted for coordination or notification and No. **11.50** is not applicable.

3 that the frequency assignment of MetSat (space-to-Earth) and EESS (space-to-Earth) satellite network in the frequency band 460-470 MHz for which complete notification information for non-geostationary satellite networks or coordination request for geostationary satellite networks was received by the Radiocommunication Bureau prior to the end of WRC‑19 and which 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 g)* for which complete coordination information related to No. **9.21** has been received by the Radiocommunication Bureau prior to the end of WRC-19 can 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 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;

6 In the frequency band 460-470 MHz stations in the Earth exploration-satellite service (space-to-Earth) shall not cause harmful interference to nor claim protection from stations in the meteorological-satellite service (space-to-Earth),

**Reasons:** The Resolution includes the regulatory measures to protect the fixed and mobile services, the regulatory measure to assure priority of MetSat service over EESS and the grandfathering measures for existing data collection systems.

**SUP EUR/XXXA3/8**

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**

**Reasons:** The Resolution is no longer necessary.

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