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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 3 to Document 92-E** |
|  | **7 October 2019** |
|  | **Original: English** |
|  | |
| India (Republic of) | |
| 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)**;

# 1 Background

When considering protection of existing fixed and mobile terrestrial services, Public Protection Disaster Relied (PPDR) requires higher protection in comparison to other mobile systems. The nature of deployment of such systems is typically coverage limited as they are built to provide services to a larger geographic area.

Proposal

ARTICLE 5

Frequency allocations

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

MOD IND/92A3/1#50192

460-890 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 460-470 EARTH EXPLORATION-SATELLITE (space-to-Earth)  FIXED  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOBILE 5.286AA 5.287 5.288 ADD 5.A13 ADD 5.B13 ADD 5.C13 | | |

ADD IND/92A3/2#50196

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, and shall not claim protection from broadcasting service in the adjacent bands.     (WRC‑19)

ADD IND/92A3/3#50197

5.B13 In the frequency band 460-470 MHz, space stations in the meteorological-satellite (space-to-Earth) and Earth exploration-satellite (space-to-Earth) shall comply with the following power flux-density limits.

For GSO and non-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 a complete notification information or coordination request was received by the Radiocommunication Bureau after the end of WRC‑19. Resolution **[IND/A13] (WRC‑19)** shall apply.      (WRC‑19)

**Reasons:** Recommendation ITU-R M.1808 provides for more protection (*I*/*N*= −10 dB) to PPDR systems in comparison to other mobile systems when considering sharing studies. In Report ITU-R SA.2429 protection levels used we based on *I/N* = −6 dB only. Moreover, no studies of cumulative effect of multiple GSO and non-GSO satellites interfering with mobile station were assessed. Taking this into account, the figures of new footnote RR No. **5.B13** were revised accordingly.

ADD IND/92A3/4#50198

5.C13 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).     (WRC‑19)

MOD IND/92A3/5#50193

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)

SUP IND/92A3/6#50194

5.290

MOD IND/92A3/7

APPENDIX 7 (REV.WRC‑19)

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

MOD IND/92A3/8

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 IND/92A3/9#50199

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. | | | | | | | | | | | | | | | | | | | |

SUP IND/92A3/10#50200

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

ADD IND/92A3/11#50201

Draft New Resolution [IND/A13] (WRC-19)

Transitional measures for existing 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) systems 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 and 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 in the provision of No. **5.B13** to provide protection of existing terrestrial services to which the frequency band is already allocated and in the adjacent frequency bands;

*g)* 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;

*b)* that some of these EESS and MetSat satellite networks and systems above may not meet the pfd masks in *considering f),* but there is a need to authorize them to continue their operation,

resolves

1 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 or notification information 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;

2 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 or coordination request 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 No. **5.B13** shall be used on a secondary basis with respect to the fixed and mobile service stations;

3 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,

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 proposal to the administration that it submit a new assignment to replace the previous one. The date of such assignment original recording in the Master International Frequency Register (MIFR) shall be kept.

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