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| **34 MEETING OF PERMANENT**  **CONSULTATIVE COMMITTEE II:**  **RADIOCOMMUNICATIONS**  **August 12 to 16, 2019**  **Ottawa, Canada** | **OEA/Ser.L/XVII.4.2.33**  **CCP.II-RADIO/doc. /19**  **11 July 2019**  **Original: English** |

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|  | **MODIFICATION OF DRAFT INTER-AMERICAN PROPOSAL FOR WRC-19** |  |
|  | **AGENDA ITEM 1.2** |  |
|  | **(Item on the Agenda: 3.1 (SGT-2B))**  **(Document submitted by the United States of America)** |  |

**Introduction**

The United States proposes to modify the Draft Inter-American Proposal (DIAP) on WRC-19 agenda item 1.2**.** These modifications are intended to further develop the proposed footnote No**. 5.B12** in the DIAP. These modifications are highlighted in turquoise.

**Agenda Item 1.2:** *to consider in-band power limits for earth stations operating in the mobile-satellite service, meteorological-satellite service and Earth exploration-satellite service in the frequency bands 401-403 MHz and 399.9-400.05 MHz, in accordance with Resolution* ***765 (WRC-15)****.*

**BACKGROUND**

Resolution **765 (WRC-15)** calls for the necessary technical, operational and regulatory consideration of the possibility of establishing in-band power limits for earth stations in the EESS and MetSat services in the frequency bands 401-403 MHz and in the MSS frequency band 399.9-400.05 MHz taking into account the results of ITU-R studies.

The frequency bands 401-403 MHz and 399.9-400.5 MHz are used for Earth station uplink transmission by the Data Collection System (DCS) under the Earth exploration-satellite service (EESS) and meteorological-satellite service (MetSat) and the mobile-satellite service (MSS) allocations. DCS Earth stations as knows as data collection platforms (DCP) are deployed worldwide and communicate with GSO and non-GSO satellites.

The Data Collection Platforms (DCP) is a network of sensors measuring and gather information activity related to the Earth, environmental and scientific applications, weather, environment observation: meteorological and oceanographic, seismic observation, volcanology, geodesy and geodynamics, fishing vessel monitoring, wildlife tracking, homeland security, law enforcement, test/evaluation, monitoring shipments of dangerous goods, humanitarian applications, managing water resources or tsunami warning system.

The data collected by DCPs are transmitted to GSO and non-GSO satellite networks using the non-GSO MSS allocation in the band 399.9-400.05 MHz or the meteorological satellite allocation in the band 401-403 MHz. These systems usually operate using moderate to low equivalent isotropically radiated power (e.i.r.p.) levels, resulting in small link margins.

These frequency bands are also used by non-geostationary satellites for telecommand space operations (see RR No 1.23) under the EESS, MetSat services, or under the MSS allocations and a growing number of these satellites are planned. The output power levels of the earth stations at the antenna port peak e.i.r.p. of these telecommand links (Earth-to-space) can be much higher than the moderate to low power levels used for the DCS service links, leading to potential harmful interference to DCS satellite receivers.

Recommendation ITU-R SA.2045 provides information on the performance and interference criteria for relevant geostationary-satellite orbit (GSO) and non-geostationary satellite (non-GSO) DCS in the frequency band 401-403 MHz. Recommendation ITU-R SA.2044 provides information on the current and future usage of non-GSO DCS in the frequency band 401-403 MHz, and the portioning of the frequency band to allow all DCS equal access to the spectrum. Recommendation ITU-R M.2046 provides a description, and the corresponding protection criteria for broadband noise and narrowband interference, of one MSS system that uses the frequency band 399.9-400.05 MHz (Earth-to-space).

ITU-R studies considered in-band power limits for earth stations operating in the frequency ranges 399.9-400.05 MHz in the MSS and 401-403 MHz in the EESS and MetSat services.

**Support:**

**Canada, Mexico, United States**

MOD DIAP/1.2/1

335.4-410 MHz

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| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 399.9-400.05 MOBILE SATELLITE (Earth-to-space) 5.209 5.220 ADD 5.C12 | | |

***Reason:*** *ITU-R studies results have shown a need to provide in-band power limits applicable to Earth stations in order to ensure the existing and future operation of DCS in the MSS, EESS, and MetSat service will continue to operate without interference.*

**Option 1**

**Support:**

**Canada, Mexico**

**ADD DIAP/1.2/1**

5.C12 In the frequency band 399.9-400.02 MHz, the maximum e.i.r.p. of earth stations in the mobile-satellite service shall not exceed 5 dBW. Until 22 November 2029, this limit shall not apply to satellite systems for which complete notification information has been received by the Radiocommunication Bureau by 22 November 2019 and that have been brought into use by that date. Administrations are encouraged to make all practicable efforts to comply with the limits in the frequency band 399.9-400.02 MHz prior to 22 November 2029.     (WRC‑19)]

***Reasons:*** *A frequency range of 30 kHz without e.i.r.p. limits would accommodate a typical telecommand link taking account of Doppler shift effects (e.g. typical link bandwidth of 9.6 kHz + Doppler shift of +/- 8 kHz). Existing and planned telecommand functions for satellite systems notified and in service by the end of the conference would continue to operate at their existing power levels for 10 years, which corresponds to the end of life of existing satellite systems.*

**Option 2**

ADD USA/1.2/1

**5.C12** In the frequency band 399.9-399.99 MHz, the maximum e.i.r.p. transmission from any Earth stations (Earth-to-space) in the mobile-satellite service shall not exceed 5 dBW. This limit shall apply after 22 November 2024 for which complete notification information is received by the Radiocommunication Bureau before 22 November 2019. Administrations are encouraged to take all efforts to comply with the maximum e.i.r.p. limits in the frequency band 399.9-399.99 MHz prior to 22 November 2024.

***Reason:*** *Establish Earth station maximum e.i.r.p. limit to ensure the continued operations of non-GSO data collection systems in the frequency band.*

**Option A**

ARTICLE 5

**Frequency allocations**

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

**MOD CAN/1.2/1**

**401-410 MHz**

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| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **401-402** METEOROLOGICAL AIDS  SPACE OPERATION (space-to-Earth)  EARTH EXPLORATION-SATELLITE (Earth-to-space)  METEOROLOGICAL-SATELLITE (Earth-to-space)  Fixed  Mobile except aeronautical mobile  ADD 5.B12 ADD 5.B12bis | | |
| **402-403**  METEOROLOGICAL AIDS  EARTH EXPLORATION-SATELLITE (Earth-to-space)  METEOROLOGICAL-SATELLITE (Earth-to-space)  Fixed  Mobile except aeronautical mobile  ADD 5.B12 ADD 5.B12bis | | |

***Reason:*** *Add relevant footnotes to frequency bands 399.9-400.05 MHz and 401-403 MHz*

**ADD CAN/1.2/2**

**5.B12** In the frequency band 401-401.7 MHz and 402.850-403 MHz, the maximum e.i.r.p. of earth stations in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary systems and non-geostationary systems with an orbit of apogee equal or greater than 35 786 km and 7 dBW for non-geostationary systems with an orbit of apogee lower than 35 786 km. Until 22 November 2029, this limit shall not apply to systems for which complete Advanced Publication Information has been received by the Radiocommunication Bureau prior to 22 November 2019.

***Reasons:*** *The frequency bands identified in this new footnote are intended for operation of non-GSO DCS. Therefore, the long-term deployment of new telecommand earth stations in these frequency bands is to be avoided. Existing and planned telecommand functions for satellite systems notified and in service by the end of the conference would continue to operate at their existing power levels for 10 years, which corresponds to the end of life of existing satellite systems.*

**ADD CAN/1.2/3**

**5.B12bis** In the frequency band 401.7-402.850 MHz, the maximum e.i.r.p. of earth stations in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary systems and non-geostationary systems with an orbit of apogee equal to or greater than 35 786 km and 7 dBW for non-geostationary systems with an orbit of apogee lower than 35 786 km. The maximum e.i.r.p. density of earth stations shall not exceed −17.8 dBW/Hz for non-geostationary systems used for telecommand operations. Until 22 November 2029, this limit shall not apply to systems for which complete Advanced Publication Information has been received by the Radiocommunication Bureau prior to 22 November 2019.

***Reasons:*** *A non-GSO system with a telecommand earth station operating with an e.i.r.p. density of −17.8 dBW/Hz would be able to meet the protection criteria of DCS systems using GSO or HEO satellite systems. This value is based on the sharing analysis conducted by the ITU-R taking into account possible mitigation measures that can be used by the telecommand operations to minimize potential interference to DCS systems. Furthermore, an e.i.r.p. limit is proposed for non-GSO DCS with an orbit of apogee lower than 35 786 km for the band 401.7-402.850 MHz even though there are no such operations according to the DCS band plan, since non-GSO DCS stations could nonetheless operate in this band under the METSAT and EESS allocations. Finally, existing and planned telecommand functions for satellite systems notified and in service by the end of the conference would continue to operate at their existing power levels for 10 years, which corresponds to the end of life of existing satellite systems.*

**Option B**

**Support:**

**Mexico, United States**

MOD DIAP/1.2/1

335.4-410 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 401-402 METEOROLOGICAL AIDS  SPACE OPERATION (space-to-Earth)  EARTH EXPLORATION-SATELLITE (Earth-to-space)  METEOROLOGICAL-SATELLITE (Earth-to-space)  Fixed  Mobile except aeronautical mobile  ADD 5.B12 ADD 5.C12 | | |
| 402-403 METEOROLOGICAL AIDS  EARTH EXPLORATION-SATELLITE (Earth-to-space)  METEOROLOGICAL-SATELLITE (Earth-to-space)  Fixed  Mobile except aeronautical mobile  ADD 5.B12 ADD 5.C12 | | |

**Support:**

**Mexico, United States**

ADD DIAP/1.2/2

**5.B12** In the frequency band 401-403 MHz, the maximum e.i.r.p. transmission from any Earth stations (Earth-to-space) in the meteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary-satellite systems and non-geostationary-satellite systems with an orbital apogee equal to or greater than 35 786 km and 7 dBW for non-geostationary-satellite systems with an orbital apogee lower than 35 786 km.

These provisions shall not apply to all systems in the meteorological-satellite service and the Earth exploration-satellite service in this frequency band for which complete notification information has been received by the Radiocommunication Bureau before 22 November 2019 and that have been brought into use prior to 22 November 2019. However, all satellite systemsin the meteorological-satellite service and the Earth exploration-satellite service operating in this frequency band shall comply with these provisions after 22 November [2029][MEX][ 2026][USA].

***Reason:*** *Establish Earth station e.i.r.p. limits to ensure the operations of both GSO and non-GSO data collection systems in the 401-403 MHz frequency band.*

**Support:**

**Mexico, United States**

**ADD**  **DIAP/AI 1.2/3**

**5.C12** In the frequency band 401.898-402.522 MHz, the maximum e.i.r.p. transmission fromsatellite systems for which complete notification information was received by the Radiocommunication Bureau before 29 April 2007, may continue to operate at their current level.

***Reason:*** *This provision provides flexibility to existing Earth station(s) of associated non-GSO system and it ensures the continued operation of these non-GSO data collection systems.*

**Support:**

**Canada, Mexico, United States**

SUP DIAP/1.2/4

RESOLUTION **765 (WRC-15)**

Establishment of in-band power limits for earth stations operating   
in mobile-satellite service, the meteorological-satellite service and   
the Earth exploration-satellite service in the frequency bands   
401-403 MHz and 399.9-400.05 MHz

***Reason:*** *ITU-R studies associated with this Resolution have been completed and reflected in the relevant ITU-R Reports.*

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