**United States**

PROPOSALS FOR THE WORK OF THE CONFERENCE

# Agenda item 1.2

**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)** resolves to invite the WRC-19 to take into account the results of ITU-R studies and consider the possibility of establishing in-band power limits for Earth stations in the EESS and MetSat in the frequency bands 401- 403 MHz and in the MSS frequency band 399.9-400.05 MHz.

Earth stations operating in the Earth exploration-satellite service (EESS) and meteorological-satellite service (MetSat) in the frequency band 401-403 MHz and in the mobile-satellite service (MSS) in the frequency band 399.9-400.05 MHz are used for data collection systems (DCS) uplinks. These DCS usually operate most efficiently together by using moderate to low equivalent isotropic radiated power (e.i.r.p) levels, resulting in small link margins.

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).

Tens of thousands of DCS stations communicating with GSO and non-GSO satellites are deployed worldwide for the purpose of collecting essential weather and climate data. The Data Collection Platforms (DCP) 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, etc. The data collected by DCPs are transmitted to satellites in visibility of these platforms that relay the retrieved information to dedicated earth stations. EESS, MetSat, and MSS systems are indispensable for monitoring and predicting climate change; monitoring oceans, weather, and water resources. Additionally, these systems assist in protecting biodiversity, and improve maritime safety, and security.

There is a growing number of satellite operators planning to use these frequency bands for telecommand purposes under the EESS, MetSat, and MSS allocations. The output power levels of these Earth stations at the antenna port for telecommand links (Earth-to-space) can be much higher than the moderate to low power levels traditionally used for the operation of EESS, MetSat, and MSS DCS systems, in the frequency bands 401-403 MHz and 399.9-400.05 MHz.

ITU-R study is considering specific 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.

Proposal:

For the band 399.9-400.05, Method D in the draft CPM report is proposed with the proposal to increase the band segment free of eirp limits from 20 kHz to 30 kHz. It will accommodate a typical total assigned bandwidth (BW), which would be closer to 30 kHz (*e.g.*, minimum link BW of 9.6 kHz + Doppler shift of +/- 8 kHz) of an efficient telecommand link.)

For the band 401-403 MHz, Method E in the draft CPM report is proposed.

ARTICLE 5

**Frequency allocations**

**Section IV – Table of Frequency Allocations**

(See No. **2.1**)

**MOD**  **USA/AI 1.2/1**

|  |  |  |
| --- | --- | --- |
| 335.4-410 MHz | | |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 ADD 5.A102 | | |
| 400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL- SATELLITE (400.1 MHz)  5.261 5.262 | | |
| 400.15-401 METEOROLOGICAL AIDS  METEOROLOGICAL-SATELLITE (space-to-Earth)  MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209  SPACE RESEARCH (space-to-Earth) 5.263  Space operation (space-to-Earth)  5.262 5.264 | | |
| 401-402 METEOROLOGICAL AIDS  SPACE OPERATION (space-to-Earth)  EARTH EXPLORATION-SATELLITE (Earth-to-space) ADD 5.B102  5.C102  METEOROLOGICAL-SATELLITE (Earth-to-space) ADD 5.B102 5.C102  Fixed  Mobile except aeronautical mobile | | |
| 402-403 METEOROLOGICAL AIDS  EARTH EXPLORATION-SATELLITE (Earth-to-space) ADD 5.B102  5.C102  METEOROLOGICAL-SATELLITE (Earth-to-space) ADD 5.B102 5.C102  Fixed  Mobile except aeronautical mobile | | |

**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.

**ADD**  **USA/AI 1.2/2**

5.A102 In the frequency band 399.9-400.02 MHz, the maximum e.i.r.p. transmission at the input of the antenna from any Earth stations (Earth-to-space) in the mobile-satellite service shall not exceed 5 dBW. This limit shall apply after 22 November 2029 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 399.9-400.02 MHz prior to 22 November 2029.

**Reasons:** Establish Earth station maximum e.i.r.p. limit to ensure the continued operations of non-GSO data collection systems in the frequency band and allow for continued telecommand operations in the 30 kHz segment free of eirp limits.

**ADD**  **USA/AI 1.2/3**

5.B102 In the frequency band 401-403 MHz, the maximum e.i.r.p. transmission at the input of the antenna from any Earth stations (Earth-to-space) in themeteorological-satellite service and the Earth exploration-satellite service shall not exceed 22 dBW for geostationary-satellite orbit systems and non-geostationary-satellite orbit systems with an orbital apogee equal to or greater than 35 786 km and 7 dBW for non-geostationary-satellite orbit systems with an orbital apogee lower than 35 786 km.

These provisions shall apply to all Earth stations (Earth-to-space)in the meteorological-satellite service and the Earth exploration-satellite service operating in this frequency band after 1 January 2029. These limits shall not apply to all Earth stations (Earth-to-space)of associated satellite 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.

**Reasons:** 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 and provide sufficient transition-out period for telecommand systems operating in the band already.

**ADD**  **USA/AI 1.2/4**

5.C102 In the frequency band 401.898-402.522 MHz, the maximum e.i.r.p. transmission at the input of the antenna fromEarth stations (Earth-to-space)of associated satellite system for which complete notification information was received by the Radiocommunication Bureau on 28 April 2007, may continue to operate at their current level.

**Reasons:** This provision provide flexibility to existing Earth station(s) of associated non-GSO system and it ensure the continued operation of this non-GSO data collection systems.

SUP USA/AI 1.2/5

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

# Reasons: Consequential actions to establishing in-band power limits for Earth stations operating in the mobile-satellite service, the meteorological-satellite service and the Earth-exploration-satellite service in the frequency bands 399.9-400.05 MHz and 401-403 MHz.

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