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| **US Radiocommunication Sector**  **FACT SHEET** | |
| **Working Party:** ITU-R WP 5C | **Document No:** USWP5C33-02 |
| **Reference:** | **Date:** September 26, 2025 |
| **Document Title:** Working document towards Draft CPM Text for WRC-27 agenda item 1.10 | |
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| **Purpose/Objective:** The purpose of this document is to begin developing the CPM text for WRC-27 Agenda Item 1.10 in accordance with Resolution 775 (WRC-23). | |
| **Abstract:** This contribution seeks to begin developing the CPM text for WRC-27 Agenda Item 1.10 in accordance with Resolution 775 (WRC-23). | |
| **Fact Sheet Preparer:** Victory Nguyen | |

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| **Radiocommunication Study Groups** | A blue logo with a black background  AI-generated content may be incorrect. |
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| Source:  Subject: WRC-27 Agenda Item 1.10 | **Document 5C/XX** |
| **XX November 2025** |
| **English only** |
| United States of America | |
| **Working document Towards Draft CPM Text for WRC-27 agenda item 1.10** | |
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**Introduction**

WRC-27 Agenda Item 1.10 considers developing power flux-density and equivalent isotropically radiated power limits for inclusion in Article 21 of the Radio Regulations for the fixed-satellite, mobile-satellite and broadcasting-satellite services to protect the fixed and mobile services in the frequency bands 71-76 GHz and 81-86 GHz, in accordance with Resolution 775 (Rev.WRC-23).

Currently, there is no CPM text in the Chair’s Report. This contribution proposes draft CPM text.

Attachment: 1

|  |
| --- |
| **ATTACHMENT**  Agenda Item 1.10 |
| **(WP 5C / WP 3M, WP 5A, WP 5B, WP 5C, WP 7A, WP 7B, WP 7C)** |

RESOLUTION 775 (REV.WRC-23)

**Power flux-density and equivalent isotropically radiated power limits**

**for inclusion in Article 21 for the fixed-satellite, mobile-satellite**

**and broadcasting-satellite services to protect the fixed and mobile services**

**in the frequency bands 71-76 GHz and 81-86 GHz**

*1.10 to consider developing power flux-density and equivalent isotropically radiated power limits for inclusion in Article 21 of the Radio Regulations for the fixed-satellite, mobile-satellite and broadcasting-satellite services to protect the fixed and mobile services in the frequency bands 71-76 GHz and 81-86 GHz, in accordance with Resolution* ***775 (Rev.WRC-23)****;*

# 3/1.11/1 Executive summary

TBD

# 3/1.12/2 Background

WRC-2000 made changes to the allocations in the frequency bands 71-76 GHz and 81-86 GHz based on the information known at that time. However, due to lack of information, the sharing conditions between fixed service, mobile service, and satellite services could not be fully developed.

Due to the current and ongoing development of the terrestrial and satellite services in the 71-76 GHz and 81-86 GHz bands, the bands have become increasingly more important.

# 3/1.12/3 Summary and analysis of the results of ITU‑R studies

## 3/1.12/3.1 Study to determine PFD limits of satellite systems operating in the 71-76 GHz frequency range

The frequency band 71-76 GHz has co-primary allocations to fixed service, mobile service, fixed-satellite service (space-to-Earth), mobile-satellite service (space-to-Earth), and broadcasting-satellite service.

A number of studies were conducted to determine the maximum permissible PFD limits for each individual service and their respective orbits. A summary of those studies is provided below.

### 3/1.12/3.1.1 Fixed Satellite Service into Fixed Service

[A study was carried out to determine the PFD limit of a FSS GSO Satellite without any other satellite systems considered. The conducted study showed that a PFD mask of -115 dBW/m2/MHz was able to satisfy the protection of fixed and mobile services.

According to footnote 1 of Article 21, RR No. 21.2.1, for the protection of receiving stations in the fixed and mobile service operating in frequency bands shared with space radiocommunication services (space-to-Earth), the terrestrial stations should avoid directing their antennas towards the geostationary-satellite orbit. A study was conducted to explore how the PFD limit would change, based on the assumption that the provisions in RR No.21.2.1 were followed. Assuming that a GSO avoidance angle of 1.5° was applied to the terrestrial systems, the permissible PFD mask can go up to -92 dBW/m2/MHz.]

### 3/1.12/3.1.2 Fixed Satellite Service into Mobile Service

[TBD]

### 3/1.12/3.1.3 Mobile Satellite Service into Fixed Service

[TBD]

### 3/1.12/3.1.4 Mobile Satellite Service into Mobile Service

[TBD]

### 3/1.12/3.1.5 Broadcasting Satellite Service into Fixed Service

[TBD]

### 3/1.12/3.1.6 Broadcasting Satellite Service into Mobile Service

[TBD]

## 3/1.12/3.2 Study to determine EIRP limits of satellite systems operating in the 81-86 GHz frequency range

### The frequency band 81-86 GHz has co-primary allocations to fixed service, mobile service, fixed-satellite service (Earth-to-space) and mobile-satellite service (Earth-to-space). 3/1.12/3.2.1 Fixed Satellite Service into Fixed Service

[A study was carried out to determine the EIRP limit of a FSS GSO Earth Station without any other satellite systems considered under agenda item 1.10. The conducted study showed that the current EIRP limit stipulated in RR No. 21.8 is sufficient to protect the fixed and mobile services in the 81-86 GHz band.]

### 3/1.12/3.2.2 Fixed Satellite Service into Mobile Service

[TBD]

### 3/1.12/3.2.3 Mobile Satellite Service into Fixed Service

[TBD]

### 3/1.12/3.2.4 Mobile Satellite Service into Mobile Service

[TBD]

### 3/1.12/3.2.5 Broadcasting Satellite Service into Fixed Service

[TBD]

### 3/1.12/3.2.6 Broadcasting Satellite Service into Mobile Service

[TBD]

# 3/1.11/4 Methods to satisfy the agenda item

## 3/1.11/4.1 Method A

- 71-76 GHz, modifications to Table 21-4 to include a power-flux density mask of [TBD] dBW/m2/MHz for the [TBD]

[- 81-86 GHz, modifications to Table 21-3 to include the 81-86 GHz band for the [services]]

# 3/1.11/5 Regulatory and procedural considerations

## 3/1.11/5.1 For Method A

MOD

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

Section III − Power limits for earth stations

TABLE **21-3**     (Rev.WRC‑19)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band | | Services | |
| 2 025-2 110 MHz  5 670-5 725 MHz  5 725-5 755 MHz [[1]](#footnote-2)6 | (for the countries listed in No. 5.454 with respect to the countries listed in Nos. 5.453 and 5.455)  (for Region 1 with respect to the countries listed in Nos. 5.453 and 5.455) | Earth exploration-satellite  Fixed-satellite  Meteorological-satellite  Mobile-satellite  Space operation | |
| 5 755-5 850 MHz 6 | (for Region 1 with respect to the countries listed in Nos. 5.453 and 5.455) | Space research | |
| 5 850-7 075 MHz |  |  | |
| 7 190-7 250 MHz |  |  | |
| 7 900-8 400 MHz |  |  | |
| 10.7-11.7 GHz 6 | (for Region 1) |  | |
| 12.5-12.75 GHz 6 | (for Region 1 with respect to the countries listed in No. 5.494) |  | |
| 12.7-12.75 GHz 6 | (for Region 2) |  | |
| 12.75-13.25 GHz |  |  | |
| 14.0-14.25 GHz | (with respect to the countries listed in No. 5.505) |  | |
| 14.25-14.3 GHz | (with respect to the countries listed in Nos. 5.505 and 5.508) |  | |
| 14.3-14.4 GHz 6 | (for Regions 1 and 3) |  |
| 14.4-14.8 GHz |  |  |
| 17.7-18.1 GHz |  | Fixed-satellite |
| 22.55-23.15 GHz |  | Earth exploration-satellite |
| 27.0-27.5 GHz 6 | (for Regions 2 and 3) | Mobile-satellite |
| 27.5-29.5 GHz |  | Space research |
| 31.0-31.3 GHz | (for the countries listed in No. 5.545) |  |
| 34.2-35.2 GHz | (for the countries listed in No. 5.550 with respect to the countries listed in No. 5.549) |  |
| 51.4-52.4 GHz  [81.0-86.0 GHz] |  | Fixed-satellite [TBD] |

**Section V − Limits of power flux-density from space stations**

TABLE **21-4**  (*end*)     (Rev.WRC‑23)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frequency band | Service\* | Limit in dB(W/m2) for angles of arrival (δ) above the horizontal plane | | | | Reference bandwidth |
| 0°-5° | 5°-25° | | 25°-90° |
| 40.5-42 GHz | Fixed-satellite (geostationary-satellite orbit)  Broadcasting-satellite  (geostationary-satellite orbit) | −12021 | **5°-15°** | **15°-25°** | −105 21 | 1 MHz |
| −120 +  (d − 5)21 | −110 + 0.5 (d − 15)21 |
| 42-42.5 GHz | Fixed-satellite (non-geostationary-satellite orbit)  Broadcasting-satellite  (non-geostationary-satellite orbit) | −12011, 21 | **5°-25°** | | −105 11, 21 | 1 MHz |
| −120 + 0.75(d − 5)11, 21 | |
| 42-42.5 GHz | Fixed-satellite (geostationary-satellite orbit)  Broadcasting-satellite  (geostationary-satellite orbit) | −12721 | **5°-20°** | **20°-25°** | −10521 | 1 MHz |
| −127 + (4/3) (d − 5)21 | −107 + 0.4 (d − 20)21 |
| In Region 1: 47.5-47.9 GHz 48.2-48.54 GHz 49.44-50.2 GHz | Fixed-satellite (geostationary-satellite orbit) | −115 | **5°-25°** | | −105 | 1 MHz |
| −115 + 0.5(δ − 5) | |
| 71-76 GHz | [TBD] | [TBD] | [TBD] | | [TBD] | 1 MHz |

1. 6 21.12.1 The equality of right to operate when a band of frequencies is allocated in different Regions to different services of the same category is established in No. **4.8**. Therefore any limits concerning inter-Regional interference which may appear in ITU‑R Recommendations should, as far as practicable, be observed by administrations. [↑](#footnote-ref-2)