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| **40 MEETING OF PERMANENT**  **CONSULTATIVE COMMITTEE II:**  **RADIOCOMMUNICATIONS**  **October 31 to November 04, 2022**  **Port of Spain, Trinidad and Tobago** | | **OEA/Ser.L/XVII.4.2.39**  **CCP.II-RADIO /doc. /22**  **6 October 2022**  **Original: English** |
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|  | **DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**  **AGENDA ITEM 1.4** | |
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|  | **(Item on the Agenda: 3.1)**  **(Document submitted by the United States of America)** | |

**Impact on the sector:**

This document supports the CITEL PCCII WRC Working Group’s preparations for WRC-23.

**Executive Summary:**

This document contains a preliminary proposal from the United States for WRC-23 agenda item 1.4 on high-altitude platform stations as IMT base stations (HIBS) in the mobile service.

**UNITED STATES OF AMERICA**

**DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**

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**AGENDA ITEM 1.4**: *to consider, in accordance with Resolution* ***247 (WRC-19)****, the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands below 2.7 GHz already identified for IMT, on a global or regional level;*

**BACKGROUND:**

WRC-23 agenda item 1.4 proposed to study the use of HIBS in certain frequency bands below

2700 MHz, or portions thereof, in accordance with Resolution **247 (WRC-19)**.

HIBS are high-altitude platform IMT base stations. No. **1.66A** defines a high-altitude platform station as a station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth. No. **4.23** limits transmissions to or from high-altitude platform stations to bands specifically identified in Article 5.

WRC-2000 identified through No. **5.388A** the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2110-2170 MHz in Regions 1 and 3 and the bands 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2 that may be used by high-altitude platform stations as base stations to provide IMT, in accordance with Resolution **221 (Rev.WRC-07)**.

The ITU-R carried out sharing and compatibility studies between proposed HIBS systems and various incumbent services and systems in the bands proposed in WRC-23 Agenda Item 1.4 as well as in adjacent bands.  The United States has a number of important uses for the bands under consideration for WRC-23 Agenda Item 1.4, including:

* Commercial wireless IMT networks, public safety communications, and other private radio services in the 694-960 MHz range.
* Aviation safety systems in both the aeronautical radionavigation and aeronautical mobile (route) services in the 960-1164 MHz band. These systems operate in accordance with International Civil Aviation Organization standards in all phases of flight.
* Commercial wireless IMT networks within the 1710-1885 MHz band.
* Operational tactical radio relay, terrestrial telemetering operations, and fixed point-to-point microwave applications in the fixed and mobile/aeronautical mobile services and space operations Earth-to-space in the 1780-1850 MHz band.
* Commercial wireless IMT networks in the 2 500 – 2 690 MHz band.
* Radio astronomy observatories within the frequency 2 690-2 700 MHz band, subject to footnote RR **No. 5.340**.
* Aeronautical Radionavigation Service (ARNS) Air Traffic Control (ATC) radars and Meteorological radars within the frequency band 2 700-2 900 MHz.

**694-960 MHz:**

The studies that the ITU-R conducted between proposed HIBS systems and IMT terrestrial systems operating within the 694-960 MHz range show that separation distances larger than 500 km between the HIBS coverage center (nadir) and a ground based IMT network are required to protect IMT terrestrial networks from proposed HIBS co-channel operation in the 694-960 MHz frequency range. It was also observed that the increase in interference to IMT UEs due to co-channel HIBS transmissions leads to high average Down Link (DL) throughput degradation for a ground-based IMT network even at distances as large as 500 km between the HIBS coverage center and a ground-based IMT network. In addition, some neighboring administrations have differing frequency arrangements for terrestrial IMT in 694-960 MHz, which increases complexity relative to the introduction of HIBS systems.

Therefore, sharing between HIBS and IMT systems in the same geographical area is not feasible in this band.

**1 710‑1 885 MHz:**

The studies that the ITU-R conducted between proposed HIBS systems and IMT terrestrial systems operating in the 1 710‑1 885 MHzband show that separation distances larger than 300 km between the HIBS coverage center and a ground based IMT network are required to protect IMT terrestrial networks from proposed HIBS co-channel operation in the 1 710-1 885 MHz frequency band. The ITU-R studies conducted with the fixed service operating in the frequency band show that the protection criteria is exceeded at a distance of up to 300 km for point-to-point systems.

Therefore, sharing between HIBS and incumbent services in the same geographical area is not feasible in this band.

**2 500-2 690 MHz:**

The studies that the ITU-R conducted between proposed HIBS systems and IMT terrestrial systems operating in the 2500-2690 MHz band show that separation distances larger than 500 km between the HIBS coverage center and a ground based IMT network are required to protect IMT terrestrial networks from proposed HIBS co-channel operation in the 2 500-2 690 MHz frequency band. In addition, some neighboring administrations have differing frequency arrangements for terrestrial IMT in 2500-2690 MHz, which increases complexity relative to the introduction of HIBS systems.

Therefore, sharing between HIBS and IMT systems in the same geographical area is not feasible in this band.

**Proposal**:

ARTICLE 5

Frequency allocations

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

Issue A: 694-960 MHz

NOC USA/1.4/1

460-890 MHz

| Allocation to services | | |
| --- | --- | --- |
| Region 1 | Region 2 | Region 3 |
| … | | |
| **470-694**  BROADCASTING  5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.312 | **614-698**  BROADCASTING  Fixed  Mobile  5.293 5.308 5.308A 5.309 | **610-890**  FIXED  MOBILE 5.296A 5.313A  5.317A  BROADCASTING  5.149 5.305 5.306 5.307 5.320 |
| **694-790**  MOBILE except aeronautical mobile 5.312A 5.317A  BROADCASTING  5.300 5.312 |
| **698-806**  MOBILE 5.317A  BROADCASTING  Fixed  5.293 5.309 |
| **790-862**  FIXED  MOBILE except aeronautical mobile 5.316B 5.317A  BROADCASTING  5.312 5.319 |
| **806-890**  FIXED  MOBILE 5.317A  BROADCASTING  5.317 5.318 |
| **862-890**  FIXED  MOBILE except aeronautical mobile 5.317A  BROADCASTING 5.322  5.319 5.323 |

890-1 300 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 890-942  FIXED  MOBILE except aeronautical mobile 5.317A  BROADCASTING 5.322  Radiolocation  5.323 | 890-902  FIXED  MOBILE except aeronautical mobile 5.317A  Radiolocation  5.318 5.325 | 890-942  FIXED  MOBILE 5.317A  BROADCASTING  Radiolocation  5.327 |
| 902-928  FIXED  Amateur  Mobile except aeronautical mobile 5.325A  Radiolocation  5.150 5.325 5.326 |
| 928-942  FIXED  MOBILE except aeronautical mobile 5.317A  Radiolocation 5.325 |
| 942-960  FIXED  MOBILE except aeronautical mobile 5.317A  BROADCASTING 5.322  5.323 | 942-960  FIXED  MOBILE 5.317A | 942-960  FIXED  MOBILE 5.317A  BROADCASTING  5.320 |
| … | | |

**Reasons**: The results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (e.g., terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

Issue B: 1 710-1 885 MHz

NOC USA/1.4/2

1 710-2 170 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| **1 710-1 930** FIXED  MOBILE 5.384A 5.388A 5.388B  5.149 5.341 5.385 5.386 5.387 5.388 | | |
| **…** | | |

**Reasons**: The results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (e.g., terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

Issue C: 1 885-1 980 MHz, 2 010-2 025 MHz, 2 110-2 170 MHz

NOC USA/1.4/3

1 710-2 170 MHz

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| --- | --- | --- |
| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **1 710-1 930** FIXED  MOBILE 5.384A 5.388A 5.388B  5.149 5.341 5.385 5.386 5.387 5.388 | | |
| **1 930-1 970**  FIXED  MOBILE 5.388A 5.388B | **1 930-1 970**  FIXED  MOBILE 5.388A 5.388B  Mobile-satellite (Earth-to-space) | **1 930-1 970**  FIXED  MOBILE 5.388A 5.388B |
| 5.388 | 5.388 | 5.388 |
| **1 970-1 980** FIXED  MOBILE 5.388A 5.388B  5.388 | | |
| **1 980-2 010** FIXED  MOBILE  MOBILE-SATELLITE (Earth-to-space) 5.351A  5.388 5.389A 5.389B 5.389F | | |
| **2 010-2 025**  FIXED  MOBILE 5.388A 5.388B | **2 010-2 025**  FIXED  MOBILE  MOBILE-SATELLITE (Earth-to-space) | **2 010-2 025**  FIXED  MOBILE 5.388A 5.388B |
| 5.388 | 5.388 5.389C 5.389E | 5.388 |
| **2 025-2 110** SPACE OPERATION (Earth-to-space) (space-to-space)  EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)  FIXED  MOBILE 5.391  SPACE RESEARCH (Earth-to-space) (space-to-space)  5.392 | | |
| **2 110-2 120** FIXED  MOBILE 5.388A 5.388B  SPACE RESEARCH (deep space) (Earth-to-space)  5.388 | | |
| **2 120-2 160**  FIXED  MOBILE 5.388A 5.388B | **2 120-2 160**  FIXED  MOBILE 5.388A 5.388B  Mobile-satellite (space-to-Earth) | **2 120-2 160**  FIXED  MOBILE 5.388A 5.388B |
| 5.388 | 5.388 | 5.388 |
| **2 160-2 170**  FIXED  MOBILE 5.388A 5.388B | **2 160-2 170**  FIXED  MOBILE  MOBILE-SATELLITE (space-to-Earth) | **2 160-2 170**  FIXED  MOBILE 5.388A 5.388B |
| 5.388 | 5.388 5.389C 5.389E | 5.388 |

**Reasons**: The results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (e.g., terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

Issue D: 2 500-2 690 MHz

NOC USA/1.4/4

2 170-2 520 MHz

| Allocation to services | | |
| --- | --- | --- |
| Region 1 | Region 2 | Region 3 |
| **…** | | |
| **2 500-2 520**  FIXED 5.410  MOBILE except aeronautical mobile 5.384A  5.412 | **2 500-2 520**  FIXED 5.410  FIXED-SATELLITE  (space-to-Earth) 5.415  MOBILE except aeronautical mobile 5.384A | **2 500-2 520**  FIXED 5.410  FIXED-SATELLITE  (space-to-Earth) 5.415  MOBILE except aeronautical mobile 5.384A  MOBILE-SATELLITE  (space-to-Earth) 5.351A 5.407 5.414 5.414A  5.404 5.415A |

2 520-2 700 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 2 520-2 655  FIXED 5.410  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.413 5.416 | 2 520-2 655  FIXED 5.410  FIXED-SATELLITE (space-to-Earth) 5.415  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.413 5.416 | 2 520-2 535  FIXED 5.410  FIXED-SATELLITE (space-to-Earth) 5.415  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.413 5.416 |
|  |  | 5.403 5.414A 5.415A |
|  |  | 2 535-2 655  FIXED 5.410  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.413 5.416 |
| 5.339 5.412 5.418B 5.418C | 5.339 5.418B 5.418C | 5.339 5.418 5.418A 5.418B 5.418C |
| 2 655-2 670  FIXED 5.410  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.208B 5.413 5.416  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) | 2 655-2 670  FIXED 5.410  FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.413 5.416  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) | 2 655-2 670  FIXED 5.410  FIXED-SATELLITE (Earth-to-space) 5.415  MOBILE except aeronautical mobile 5.384A  BROADCASTING-SATELLITE 5.208B 5.413 5.416  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) |
| 5.149 5.412 | 5.149 5.208B | 5.149 5.420 |
| 2 670-2 690  FIXED 5.410  MOBILE except aeronautical mobile 5.384A  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) | 2 670-2 690  FIXED 5.410  FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.208B 5.415  MOBILE except aeronautical mobile 5.384A  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) | 2 670-2 690  FIXED 5.410  FIXED-SATELLITE (Earth-to-space) 5.415  MOBILE except aeronautical mobile 5.384A  MOBILE-SATELLITE (Earth-to-space) 5.351A 5.419  Earth exploration-satellite (passive)  Radio astronomy  Space research (passive) |
| 5.149 5.412 | 5.149 | 5.149 |
| … | | |

**Reasons**: The results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (e.g., terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

NOC USA/1.4/5

**1.66A** *high altitude platform station:* A *station* located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

Reasons: Modification of the definition of No. 1.66A would impact previous WRC decisions beyond the scope of WRC-23 AI 1.4.

NOC USA/1.4/6

RESOLUTION 221 (REV. WRC-07)

Use of high altitude platform stations providing IMT in the bands 1 885‑1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3   
and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2

**Reasons**: The results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (*e.g.,* terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

NOC USA/1.4/7

5.338AIn the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30-31.3 GHz, 49.7‑50.2 GHz, 50.4-50.9 GHz, 51.4-52.4 GHz, 52.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750** **(Rev.WRC‑19)** applies.     (WRC‑19)

**Reasons**: That the results of ITU-R sharing and compatibility studies between HIBS and incumbent IMT terrestrial systems show that compatibility between HIBS and incumbent services (*e.g.,* terrestrial IMT systems) in the same geographical area is not feasible. The United States therefore proposes no change to the ITU Radio Regulations.

SUP USA/1.4/8

RESOLUTION 247 (WRC-19)

Facilitating mobile connectivity in certain frequency bands below 2.7 GHz   
using high-altitude platform stations as International Mobile Telecommunications base stations

**Reasons**: Consequential action