

## UNITED STATES OF AMERICA

### DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

**Agenda Item 1.1:** *to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12);*

Background Information: NASA operates Earth exploration-satellite service (passive) sensors in the 1 400-1 427 MHz band. The Aquarius passive sensor is currently flying on an Argentinian satellite, SAC-D. NASA recently launched the Soil Moisture Active Passive (SMAP) satellite, which will begin operations in the near future. SMAP carries a passive sensor that operates across the 1 400-1 427 MHz band. Joint Task Group 4-5-6-7 completed compatibility studies regarding IMT and EESS (passive) in 1 400-1 427 MHz band that are contained in Report ITU-R RS.2336 jointly approved by ITU-R Study Group 7 and Study Group 5. The draft CPM Report provides the following text regarding the summary of studies on unwanted emissions in the 1 400-1 427 MHz band:

“Draft new Report ITU-R RS.[EESS-IMT 1.4 GHz] (now Report ITU-R RS.2336) shows that, in order to protect EESS (passive) systems, the unwanted emission level of –60 dBW/27 MHz as currently recommended in Resolution **750 (Rev. WRC-12)** is not sufficient and that the following levels of unwanted emissions in the 1 400-1 427 MHz frequency band are required:

**For base stations:**

- –80 dBW/27 MHz in the case both 1 375-1 400 MHz and 1 427-1 452 MHz frequency bands are considered to be used simultaneously by IMT systems;
- –75 dBW/27 MHz in the case only one of the 1 375-1 400 MHz or 1 427-1 452 MHz frequency bands is to be considered for IMT systems.

**For user equipment:**

- –65 dBW/27 MHz (This value is derived under the assumption that one UE is transmitting at an average output power of 15 dBm (over all resource blocks (RB)) per sector. It would therefore have to be verified consistently according to these conditions.)

To protect U.S. spaceborne assets operating in the 1 400-1 427 MHz band from potential harmful interference by IMT operations in the adjacent 1 427-1 518 MHz band, these OOB limits are required for IMT and need to be made mandatory in the Radio Regulations.

**Proposal:**

## RESOLUTION 750 (REV.WRC-15)

## Compatibility between the Earth exploration-satellite service (passive) and relevant active services

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TABLE 1-1

EESS (passive) band	Active service band	Active service	Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band <sup>1</sup>
<u>1 400 – 1427 MHz</u>	<u>1 427 – 1452 MHz</u>	<u>Mobile</u>	<p><u>For IMT base stations:</u>  <u>-75 dBW/27 MHz</u>  <u>{Editor's note: This may have to be revised if both bands around 1400 – 1427 MHz are used for IMT.}</u>  <u>For IMT user equipment:</u>  <u>-65dBW/27 MHz</u></p>
23.6-24.0 GHz	22.55-23.55 GHz	Inter-satellite	–36 dBW in any 200 MHz of the EESS (passive) band for non-geostationary (non-GSO) inter-satellite service (ISS) systems for which complete advance publication information is received by the Bureau before 1 January 2020, and –46 dBW in any 200 MHz of the EESS (passive) band for non-GSO ISS systems for which complete advance publication information is received by the Bureau on or after 1 January 2020
31.3-31.5 GHz	31-31.3 GHz	Fixed (excluding HAPS)	For stations brought into use after 1 January 2012: –38 dBW in any 100 MHz of the EESS (passive) band. This limit does not apply to stations that have been authorized prior to 1 January 2012
50.2-50.4 GHz	49.7-50.2 GHz	Fixed-satellite (E-to-s) <sup>2</sup>	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi
50.2-50.4 GHz	50.4-50.9 GHz	Fixed-satellite (E-to-s) <sup>2</sup>	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi
52.6-54.25 GHz	51.4-52.6 GHz	Fixed	For stations brought into use after the date of entry into force of the Final Acts of WRC-07: –33 dBW in any 100 MHz of the EESS (passive) band

<sup>1</sup> The unwanted emission power level is the level measured at the antenna port.

<sup>2</sup> The limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.

TABLE 1-2

EESS (passive) band	Active service band	Active service	Recommended maximum level of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band <sup>1</sup>
1 400-1 427 MHz	1 350-1 400 MHz	Radiolocation <sup>2</sup>	–29 dBW in the 27 MHz of the EESS (passive) band
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
		Mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except transportable radio-relay stations –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations
	1 427-1 429 MHz	Space operation (E-to-s)	–36 dBW in the 27 MHz of the EESS (passive) band
	1 427-1 429 MHz	Mobile except aeronautical mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except <u>IMT stations and</u> transportable radio-relay stations <sup>3</sup> –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
	1 429-1 452 MHz	Mobile	–60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except <u>IMT stations and</u> transportable radio-relay stations <sup>3</sup> –45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations –28 dBW in the 27 MHz of the EESS (passive) band for aeronautical telemetry stations <sup>4</sup>
		Fixed	–45 dBW in the 27 MHz of the EESS (passive) band for point-to-point
31.3-31.5 GHz	30.0-31.0 GHz	Fixed-satellite (E-to-s) <sup>5</sup>	–9 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 56 dBi –20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 56 dBi
86-92 GHz <sup>6</sup>	81-86 GHz	Fixed	–41 – 14( $f$ – 86) dBW/100 MHz for $86.05 \leq f \leq 87$ GHz –55 dBW/100 MHz for $87 \leq f \leq 91.95$ GHz where $f$ is the centre frequency of the 100 MHz reference bandwidth expressed in GHz
	92-94 GHz	Fixed	–41 – 14(92 – $f$ ) dBW/100 MHz for $91 \leq f \leq 91.95$ GHz –55 dBW/100 MHz for $86.05 \leq f \leq 91$ GHz

			where $f$ is the centre frequency of the 100 MHz reference bandwidth expressed in GHz
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- <sup>1</sup> The unwanted emission power level is the level measured at the antenna port.
- <sup>2</sup> The mean power is to be understood here as the total power measured at the antenna port (or an equivalent thereof) in the band 1 400-1 427 MHz, averaged over a period of the order of 5 s.
- <sup>3</sup> Stations of the mobile service for cellular systems, including those complying with Recommendation ITU-R M.1457 or IMT standards, are likely to meet this unwanted emission power level.
- <sup>4</sup> The band 1 429-1 435 MHz is also allocated to the aeronautical mobile service in eight Region 1 administrations on a primary basis exclusively for the purposes of aeronautical telemetry within their national territory (No. 5.342).
- <sup>5</sup> The recommended maximum levels apply under clear-sky conditions. During fading conditions, these levels may be exceeded by earth stations when using uplink power control.
- <sup>6</sup> Other maximum unwanted emission levels may be developed based on different scenarios provided in Report ITU-R F.2239 for the band 86-92 GHz.

**Reasons:** Appropriate unwanted emission limits are required to protect EESS passive systems operating in the band 1 400-1 427 MHz from IMT stations operating in the adjacent band. Canada is currently assessing the impact of the new limits. As such, in the proposal above, the unwanted emission limits contained in Report ITU-R RS-2336 are shown in square brackets.

#### **MOD USA/1.1/2**

**5.338A** In the bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750** (Rev.WRC-15) applies. (WRC-~~12~~15)

[NOTE: consequential changes to the Table of Allocations will also be required.]

**Reasons:** The changes to the references in No. 5.338A are consequential to the revision of Resolution **750**.