**3GPP TSG-RAN4 Meeting #116 R4-2511750 Bengaluru, India, 25 – 29 August 2025**

**Title:** Reply LS on L-band NTN emission requirements

**Response to:**

**Release:** Release 19

**Work Item:** NR\_NTN\_combinedLband-Core

**Source:** RAN WG4

**To:** ETSI TC SES

**Cc:** RAN

**Contact Person:**

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**Send any reply LS to: 3GPP Liaisons Coordinator,** [**3GPPLiaison@etsi.org**](mailto:3GPPLiaison@etsi.org)

**Attachments: None**

**1. Overall Description:**

3GPP RAN4 thanks ETSI TC SES for providing an update on the progress being made on the updates and agreements reached with regards to the modification of the harmonized standards for better alignment with the 3GPP specifications.

3GPP is developing the specifications for NTN operation for the following L-bands as summarized in the table below as part of the Combined L-band work item (for the sake of clarity the corresponding ETSI sub-range is also indicated in the last column):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NTN satellite operating band | Uplink (UL) operating band Satellite Access Node receive / UE transmit  FUL,low – FUL,high | Downlink (DL) operating band Satellite Access Node transmit / UE receive  FDL,low – FDL,high | Duplex mode | ETSI sub-range |
| n251 | 1626.5 MHz – 1660.5 MHz | 1518 MHz – 1559 MHz | FDD | 1 |
| n253 | 1668 MHz – 1675 MHz | 1518 MHz – 1525 MHz | FDD | 2 |
| n250 | 1668 MHz – 1675 MHz | 1518 MHz – 1559 MHz | FDD | 2 |

3GPP has already developed the specifications for NTN operation for the following L-band as summarized in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NTN satellite operating band | Uplink (UL) operating band Satellite Access Node receive / UE transmit  FUL,low – FUL,high | Downlink (DL) operating band Satellite Access Node transmit / UE receive  FDL,low – FDL,high | Duplex mode | ETSI sub-range |
| n255 | 1626.5 MHz – 1660.5 MHz | 1525 MHz – 1559 MHz | FDD | 1 |

**2. Emission Requirements:**

In addition to the general spectrum emission requirements in TS 38.101-5, based on the information received in the LS from ETSI SES (R4-2509023) and in anticipation of updated harmonized standards for the NTN operation in the L-band(s), 3GPP RAN4 has decided to specify two sets of emissions requirements as part of its ongoing work related to Combined L-band specification work. Set 1 covers emission requirements in accordance with EN 301 681 to account for the time period when the new harmonized standard is not yet available. The second set 2 is aligned with the information in the LS and should be used to ensure UE support for the new requirements is in place when appropriate. In the future, 3GPP intends to follow only the relevant harmonized standard targeted for 3GPP technologies.

**Set 1 - In accordance with the existing ETSI harmonized standard: EN 301 681 v2.1.2**

**Table 1: In-band spectrum emission requirements for ETSI sub-range 1 and 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **ΔfOOB (kHz)** | **Spectrum emission limit (dBm)** | **Measurement bandwidth** | **Note (measurement method)** |
| ± 0-25 | 30 to 15 | 3 kHz | Average |
| ± 25-125 | 15 to -20 |
| ± 125-425 | -20 |
| ± 425-1500 | -20 to -35 |
| ± 1500-36000 | -25 | 30 kHz |
| NOTE 1: Spectrum emissions are linearly interpolated versus frequency offset.  NOTE 2: The EIRP requirement in regulation is converted to conducted requirement using a 0dBi antenna. | | | |

ΔfOOB is the frequency offset determined from the edge of the channel bandwidth

**Table 2: Out of band requirements for ETSI sub-range 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency range**  **(MHz)** | **Spectrum emission limit1 (dBm)** | **Measurement bandwidth** | **NOTE**  **(measurement method)** |
| 30 to 1000 | -36 | 100 kHz | Peak hold |
| 1000 to 1559 | -31 | 1 MHz | Average |
| 1559 to 1605 | -40 | 1 MHz | Average |
| 1605 to 1612.5 | -40 to -28.5 | 1 MHz | Average |
| 1612.5 to 1616.5 | -25 to -20 | 1 MHz | Average |
| 1616.5 to 1621.5 | -20 to -16 | 1 MHz | Average |
| 1621.5 to 1624.5 | -30 to -27.5 | 30 kHz | Average |
| 1624.5 to 1625.125 | -27.5 to -27.2 | 30 kHz | Average |
| 1625.125 to 1625.8 | -27.2 to -20 | 30 kHz | Average |
| 1625.8 to 1626 | -20 to -17 | 30 kHz | Average |
| 1626 to 1626.2 | -17 to -10 | 30 kHz | Average |
| 1626.2 to 1626.5 | -10 | 30 kHz | Average |
|  |  |  |  |
| 1660.5 to 1666.5 | -25 | 30 kHz | Average |
| 1666.5 to 1667.575 | -20 to -35 | 3 kHz | Average |
| 1667.575 to 1667.875 | -20 | 3 kHz | Average |
| 1667.875 to 1667.975 | 15 to - 20 | 3 kHz | Average |
| 1667.975 to 1668 | 30 to 15 | 3 kHz | Average |
|  |  | | |
| 1675 to 1675.025 | 30 to 15 | 3 kHz | Average |
| 1675.025 to 1675.125 | 15 to - 20 | 3 kHz | Average |
| 1675.125 to 1675.425 | -20 | 3 kHz | Average |
| 1675.425 to 1676.5 | -20 to -35 | 3 kHz | Average |
| 1676.5 to 1677 | -25 | 30 kHz | Average |
| 1677 to 1680 | -30 | 30 kHz | Average |
| 1680 to 1685 | -30 | 100 kHz | Average |
| 1685 to 1695 | -30 | 300 kHz | Average |
| 1695 to 1705 | -30 | 1 MHz | Average |
| 1705 to 2250 | -30 | 3 MHz | Average |
| 2250 to 12750 | -30 | 3 MHz | Peak hold |
| NOTE 1: Spectrum emissions are linearly interpolated versus frequency offset.  NOTE 2: The EIRP requirement in regulation is converted to conducted requirement using a 0dBi antenna.  NOTE 3: The average measurement method shall apply except that an averaging period of 20ms shall be used in the sub-band 1573.42 MHz to 1580.42 MHz | | | |

**Table 3: Out of band requirements for ETSI sub-range 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency range**  **(MHz)** | **Spectrum emission limit1 (dBm)** | **Measurement bandwidth** | **NOTE**  **(measurement method)** |
| 30 to 1000 | -36 | 100 kHz | Peak hold |
| 1000 to 1559 | -31 | 1 MHz | Average |
| 1559 to 1605 | -40 | 1 MHz | Average |
| 1605 to 1612.5 | -40 to -28.5 | 1 MHz | Average |
| 1612.5 to 1616.5 | -25 to -20 | 1 MHz | Average |
| 1616.5 to 1621.5 | -20 to -16 | 1 MHz | Average |
| 1621.5 to 1624.5 | -30 to -27.5 | 30 kHz | Average |
| 1624.5 to 1625.125 | -27.5 to -27.2 | 30 kHz | Average |
| 1625.125 to 1625.8 | -27.2 to -20 | 30 kHz | Average |
| 1625.8 to 1626 | -20 to -17 | 30 kHz | Average |
| 1626 to 1626.2 | -17 to -10 | 30 kHz | Average |
| 1626.2 to 1626.5 | -10 | 30 kHz | Average |
|  |  | | |
| 1660.5 to 1660.525 | 30 to 15 | 3 kHz | Average |
| 1660.525 to 1660.625 | 15 to - 20 | 3 kHz | Average |
| 1660.625 to 1660.925 | -20 | 3 kHz | Average |
| 1660.925 to 1662 | -20 to -35 | 3 kHz | Average |
| 1662 to 1662.5 | -25 | 30 kHz | Average |
| 1662.5 to 1665.5 | -30 | 30 kHz | Average |
| 1665.5 to 1670.5 | -30 | 100 kHz | Average |
| 1670.5 to 1680.5 | -30 | 300 kHz | Average |
| 1680.5 to 1690.5 | -30 | 1 MHz | Average |
| 1690.5 to 2250 | -30 | 3 MHz | Average |
| 2250 to 12750 | -30 | 3 MHz | Peak hold |
| NOTE 1: Spectrum emissions are linearly interpolated versus frequency offset.  NOTE 2: The EIRP requirement in regulation is converted to conducted requirement using a 0dBi antenna.  NOTE 3: The average measurement method shall apply except that an averaging period of 20ms shall be used in the sub-band 1573.42 MHz to 1580.42 MHz | | | |

**Set 2 - Based on information received in the LS from ETSI TC SES (R4-2509023)**

**Table 4: Out of band requirements for ETSI sub-range 1 and 2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency range**  **(MHz)** | **Spectrum emission limit1 (dBm)** | **Measurement bandwidth** | **NOTE**  **(measurement method)** |
| 1559 to 1605 | -40 | 1 MHz | Average |
| 1605 to 1612.5 | -40 to -28.5 | 1 MHz | Average |
| 1612.5 to 1616.5 | -25 to -20 | 1 MHz | Average |
| 1616.5 to 1621.5 | -20 to -16 | 1 MHz | Average |
| 1621.5 to 1624.5 | -30 to -27.5 | 30 kHz | Average |
| 1624.5 to 1625.125 | -27.5 to -27.2 | 30 kHz | Average |
| 1625.125 to 1625.8 | -27.2 to -20 | 30 kHz | Average |
| 1625.8 to 1626 | -20 to -17 | 30 kHz | Average |
| 1626 to 1626.2 | -17 to -10 | 30 kHz | Average |
| 1626.2 to 1626.5 | -10 | 30 kHz | Average |
| NOTE 1: Spectrum emissions are linearly interpolated versus frequency offset.  NOTE 2: The EIRP requirement in regulation is converted to conducted requirement using a 0dBi antenna.  NOTE 3: The average measurement method shall apply except that an averaging period of 20ms shall be used in the sub-band 1573.42 MHz to 1580.42 MHz | | | |



**2. Actions:**

**To ETSI TC SES.**

**ACTION:** 3GPP RAN4 kindly asks ETSI TC SES to confirm at the earliest that no additional out of band emission requirements are expected beyond the 1610 - 1626.5 MHz frequency range.

**3. Date of Next TSG-RAN WG4 Meetings:**

TSG-RAN4 Meeting#116-bis 13th – 17th October 2025 Prague, CZ

TSG-RAN4 Meeting#117 17th – 21st November 2025 Dallas, USA