**3GPP T****SG-RAN WG4 Meeting #110bis R4-24XXXXX**

**Changsha, China, April 15 – April 19, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** | - | **rev** | - | **Current version:** | 18.5.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Draft CR to 38.101-1 on Aerial Specific Pmax Values | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | RAN WG4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_UAV | | | | |  | ***Date:*** | | | 2024-04-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. Introduce support for new aerial specific Pmax Values 2. Clause 6.2K.3.1 seems to have duplicated text that is likely source of confusion when interpreting this clause. 3. Square brackets from Table 6.2K.3.1-1 needs to be removed | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. New subclause added (6.2K.4) to include the determination of UE confiured power for aerial UEs 2. Remove duplicated text from clause 6.2K.3.1 3. Remove square brackets from Table 6.2K.3.1-1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 1. There will be no support for the aerial specific Pmax Values 2. Text on 6.2K.3.1 will remain confusing. 3. Values on Table will remain as “provisory” | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2K.3.1, 6.2K.4 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 6.2K.3.1 General

Additional emission requirements can be signalled by the network. Each additional emission requirement is associated with a unique network signalling (NS) value indicated in RRC signalling by an NR frequency band number of the applicable operating band and an associated value in the field *additionalSpectrumEmission* In this specification, NS\_UAV refers to a network signalling value applicable only for Aerial UEs, as described in [7]. The the notion of indication or signalling of an NS\_UAV value refers to the corresponding indication of an NR frequency band number of the applicable operating band, the IE field *frequencyBandListAerial* and an associated value of *additionalSpectrumEmission* in the relevant RRC information elements [7]*.*

To meet the additional requirements, additional maximum power reduction (A-MPR) is allowed for the maximum output power as specified in Table 6.2.1-1. Unless stated otherwise, the total reduction to UE maximum output power is max(MPR, A-MPR) where MPR is defined in clause 6.2.2. Outer and inner allocation notation used in clause 6.2K.3 are defined in clause 6.2.2. Unless stated otherwise, Edge RB allocations get the same AMPR as Outer RB allocations. In absence of modulation and waveform types the A-MPR applies to all modulation and waveform types.

Table 6.2K.3.1-1 specifies the additional requirements with their associated Network Signalling label and the allowed A-MPR and applicable operating band(s). The mapping of NR frequency band numbers and values of the *additionalSpectrumEmission* to network signalling labels is specified in Table 6.2.3.1-1A.

For almost contiguous allocations in CP-OFDM waveforms in power class 3, the allowed A-MPR defined in clause 6.2K.3 is increased by CEIL{ 10 log10(1 + NRB\_gap / NRB\_alloc), 0.5 } dB, where CEIL{x, 0.5} means x rounding upwards to closest 0.5dB, NRB\_gap is the total number of unallocated RBs between allocated RBs and NRB\_alloc is the total number of allocated RBs, and the parameter LCRB is replaced by NRB\_alloc + NRB\_gap in specifying the RB allocation regions.

Table 6.2K.3.1-1: Additional Maximum Power Reduction (A-MPR) for Uncrewed Aerial UE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Network signalling label | Requirements (clause) | NR Band | Channel bandwidth (MHz) | Resources blocks (*N*RB) | A-MPR (dB) |
| NS\_UAV\_44 | 6.5K.3.3.1 | 38 | 25, 30, 40 | Table 6.2K.3.2-1 | Table 6.2K.3.2-2 |
| NS\_UAV\_46 | 6.5K.3.3.2 | 7 | 5, 10, 15, 20, 25, 30, 35, 40, 50 |  | N/A |
| NS\_UAV\_70 | 6.5K.3.3.3 | 3 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 | Table 6.2K.3.3-1 | Table 6.2K.3.3-2 |

Table 6.2K.3.1-1A: Mapping of network signalling label

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR band | Value of *additionalSpectrumEmission* | | | | | | | |
|  | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| n3 | NS\_UAV\_01 | NS\_UAV\_70 |  |  |  |  |  | Reserved |
| n7 | NS\_UAV\_01 | NS\_UAV\_46 |  |  |  |  |  | Reserved |
| n38 | NS\_UAV\_01 | NS\_UAV\_44 |  |  |  |  |  | Reserved |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Unchanged Clauses have been Omitted \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 6.2K.4 Configured transmitted power for Aerial UE

For the Aerial UE, the requirements in clause 6.2.4 apply with the following modifications:

* only requirements related to Power Class 3 UEs are applicable for Aerial UEs. In the current Release Aerial UEs that are not PC3 are not considered; and
* when *NR-NS-PmaxValueAerial* is configured for the applicable operating band, the UE shall not consider the value of the *additionalPmax* of the *NR-NS-PmaxList IE*. In such case, the value of *additionalPmax* to be considered is the one related to *NR-NS-PmaxValueAerial*, when configured, according to TS 38.331[7]; and
* when determining the parameters in the formulas used to calculate the UE configured transmitted power, use clause 6.2K.3 for A-MPR determination instead of clause 6.2.3, whenever *frequencyBandListAerial* is configured for the operating band.

Note: When the aerial UE is not configured with *NR-NS-PmaxValueAerial* the determination of whether to use and which value to use for *additionalPmax* shall be performed as described in clause 6.2.4.