**3GPP TSG-RAN WG4 Meeting #95-e  *DRAFT* R4-200xxxx**

**Electronic Meeting, 25th May. 2020 – 5th June. 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.101-1** | **CR** | **draft** | **rev** | **-** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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 on Guardband design for NR-U | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Core | | | | |  | ***Date:*** | | | 2020-06-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As per RAN4 agreement, R4-1916160, specific intra-cell guardbands are defined for wideband operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This draftCR is based on the running CR for NR-U R4-2008126.  In clause 5.3, clause 5.3F is included with the NR-U requirements related to intra-cell guardbands for 15kHz and 30kHz SCS. Requirements for intra-cell guardbands for 60kHz SCS left TBD and will be added to Table 5.3F.3.1-1 and Table 5.3F.3.1-2 after descussion related to 60kHz SCS have been finalized. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The will be no intra-cell guardbands specified for NR-U operation with 15kHz or 30kHz SCS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.521 series | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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## 5.3F UE channel bandwidth for for operation with shared spectrum channel access

### 5.3F.1 General

Unless otherwise specified the general requirements of clause 5.3 applies for NR-U operation.

### 5.3F.2 Void

### 5.3F.3 Minimum guardband and transmission bandwidth configuration

#### 5.3F.3.1 Nominal intra-cell guard band

If a UE supporting wideband operation is configured with channel bandwidths of 20 MHz or greater as specified in 38.214, the nominal intra-cell guard band(s), if any, and the corresponding sizes (transmission bandwidth configuration) of the RB sets separated by the said guard bands are as specified in Table 5.3F.3.1-1 for each UE channel bandwidth and sub-carrier spacing for the downlink and uplink. The intra-cell guard band(s), if any, in Table 5.3F.3.1-1 is applicable when the IE *intraCellGuardBandUL-r16/intraCellGuardBandDL-r16* in TS 38.331 is not provided.

Table 5.3F.3.1-1: Nominal intra-cell guard bands for wideband operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SCS  (kHz) | 20 MHz | 40 MHz | 60 MHz | 80 MHz |
| 15 | 106  (106) | 105-6-105  (216) | N/A | N/A |
| 30 | 51  (51) | 50-6-50  (106) | 50-6-50-6-50  (162) | 50-6-50-5-50-6-50  (217) |
| 60 | TBD | TBD | TBD | TBD |
| NOTE 1: The intra-cell guard band is denoted TBW0-GB0-…-GBN\_RBset-2-TBWN\_RBset-1 for N\_RBset > 1 number of RB-sets with TBW*r* the maximum transmission bandwidth (PRB) of RB-set *r* and GB*r* the guard band (PRB) above the upper edge of RB-set *r*. The RB-set 0 is starting at the first common resource block (CRB) of the carrier as indicated by *offsetToCarrier*. The total transmission bandwidth configuration (size of resource grid) including guard bands is given in between parentheses.  NOTE 2: For 20 MHz channel bandwidth, there are no intra-cell guard bands for the carrier, and N\_RBset = 1 | | | | |

For each UE channel bandwidth and sub-carrier spacing given by Table 5.3F.3.1-1, the maximum transmission bandwidth configuration including intra-cell guard band(s), if configured by IE *intraCellGuardBandUL-r16/intraCellGuardBandDL-r16* in TS 38.331 in the uplink and/or downlink, and corresponding RB-set(s) shall be in accordance with clause 5.3.2 with a minimum inter-cell guard band of the UE channel bandwidth as specified in Table 5.3.3-1 for the uplink and downlink. Minimum requirements specified for wideband operation in Clause 6 and Clause 7 also apply for intra-cell guard bands larger than the nominal sizes in Table 5.3F.3.1-1 as listed in Table 5.3F.3.1-2 for each sub-carrier spacing; each guard band in order of CRB index must be larger than or equal to the corresponding nominal guard band specified in Table 5.3F.3.1-1 for each channel bandwidth.

Table 5.3F.3.1-2: Applicable intra-cell guard bands for wideband operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | SCS | | |
|  |  | 15 kHz | 30 kHz | 60 kHz |
| Intra-cell guard band (size) | PRB | 6,7 | 5,6,7 | TBD |
| Transmission bandwidth (size) of RB-set | PRB | 104,105 | 49,50,51 | TBD |

If the UE is configured with zero intra-cell guard bands by IE *intraCellGuardBandUL-r16/intraCellGuardBandDL-r16* in 38.331 in the uplink and/or downlink on a carrier greater than 20 MHz, the maximum transmission bandwidth configuration for the uplink and downlink shall be in accordance with clause 5.3.2 with a minimum inter-cell guard band for the UE channel bandwidth as specified in Table 5.3.3-1.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*