**3GPP TSG-RAN WG2 Meeting #119-e *R2-2209138***

**eMeeting, 17th – 26th August, 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | **3477** | **rev** | **-** | **Current version:** | **17.1.0** |  |
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| *For* [***HELP***](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 | **X** | Core Network |  |

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| ***Title:*** | Correction to additionalSpectrumEmission for UL CA in n77 for the US | | | | | | | | | |
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| ***Source to WG:*** | Ericsson, Nokia, Nokia Shanghai Bell, T-Mobile USA | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core, TEI16 | | | | |  | ***Date:*** | | | 2022-08-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | The solution to the extended use of n77 sub-bands in the USA included introduction of:   * New UE capability (*extendedBand-n77-r16* indicated by UE that support both the original n77 sub-range and the added (or extended) sub-range. * New NS value (NS\_55), indicated in system information in cells of the extended subrange to prevent idle mode UEs (that do not indicate support of the *extendedBand-n77-r16* to camp and access the cell. Note that NS\_55 do not imply any additional spectrum emission requirement (ie, same as NS\_01).   In RRC, the gNb indicates the cell’s NS value in the field *additionalSpectrumEmission*. For NR CA, the field description of the field *additionalSpectrumEmission* requires that the ”*Network configures the same value in additionalSpectrumEmission for all uplink carrier(s) of the same band with UL configured*”. This ensures that a UE can unambiguously determine which additional spectrum emission table to apply across all carriers of the band. The UL emission requirements for intra-band cases for each are described by the NS\_CA (intra-band contiguous case) and NS\_NC\_CA (intra-band non-contiguous case) in TS 38.101-1 [15], clause 6.2A.3 and TS 38.101-2 [39], clause 6.2A.3.  Furthermore, gNB is expected to signal the same values in dedicated signalling to UE (ServingCellConfigCommon) as is signalled in SIB1 (ServingCellConfigCommonSIB).  In combination, these two requirements are conflicting on how to configure UL CA in n77 (with at least one cell from original subrange and at least one cell from the extended subrange).  RAN2 agreed that for UL CA in n77. the network may configure either NS\_55 or NS\_01 for UL carrier(s) in the extended subrange, and NS\_01 for the remaining uplink carrier(s) in this band. | | | | | | | | |
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| ***Summary of change:*** | | Specify in the field description for *additionalSpectrumEmission* that if NS\_55 is applicable for at least one uplink carrier for the extended in a CA configuration, the network may configure either NS\_55 or NS\_01 for the UL carrier(s) and NS\_01 for the remaining uplink carrier(s) of the same band.  Both UEs and Networks operating in n77 extended sub-band (supporting *extendedBand-n77-r16*)are expected to support this CR.  **Implementation of this CR by a Rel-15 or Rel-16 UE will not cause compatibility issues.**  **Impact Analysis**  Impacted 5G architecture options: NR SA, (NG)EN-DC, NE-DC,NR-DC  Impacted functionality: Intra-band UL CA in n77  Inter-operability:  1. If the network is implemented according to the CR and the UE is not, the UE may reject the configuration and trigger re-establishment, since UE does not expect different NS values for UL carriers of the same band.  2. If the UE is implemented according to the CR and the network is not, there are no interoperability problems. However, the network may still not configure UL CA for n77 in some case. | | | | | | | | |
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| ***Consequences if not approved:*** | | The network cannot configure n77 UL CA with one cell in n77 original subrange and one cell in extended subrange. | | | | | | | | |
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| ***Clauses affected:*** | | 6.3.2. Appendix C | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
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| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

### 6.3.2 Radio resource control information elements

#### <First change>

#### – *FrequencyInfoUL*

The IE *FrequencyInfoUL* provides basic parameters of an uplink carrier and transmission thereon.

*FrequencyInfoUL* information element

-- ASN1START

-- TAG-FREQUENCYINFOUL-START

FrequencyInfoUL ::= SEQUENCE {

frequencyBandList MultiFrequencyBandListNR OPTIONAL, -- Cond FDD-OrSUL

absoluteFrequencyPointA ARFCN-ValueNR OPTIONAL, -- Cond FDD-OrSUL

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

additionalSpectrumEmission AdditionalSpectrumEmission OPTIONAL, -- Need S

p-Max P-Max OPTIONAL, -- Need S

frequencyShift7p5khz ENUMERATED {true} OPTIONAL, -- Cond FDD-TDD-OrSUL-Optional

...

}

-- TAG-FREQUENCYINFOUL-STOP

-- ASN1STOP

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| *FrequencyInfoUL* field descriptions |
| ***absoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. Note that the lower edge of the actual carrier is not defined by this field but rather in the *scs-SpecificCarrierList* (see TS 38.211 [16], clause 4.4.4.2). |
| ***additionalSpectrumEmission***  The additional spectrum emission requirements to be applied by the UE on this uplink. If the field is absent, the UE uses value 0 for the *additionalSpectrumEmission* (see TS 38.101-1 [15], table 6.2.3.1-1A, and TS 38.101-2 [39], table 6.2.3.1-2). Network configures the same value in *additionalSpectrumEmission* for all uplink carrier(s) of the same band with UL configured, except for *additionalSpectrumEmission* value corresponding to NS\_55. If NS\_55 (see TS 38.101-1 [15], table 6.2.3.1-1) is applicable for at least one uplink carrier, the network may configure either NS\_55 or NS\_01 for these uplink carriers, and NS\_01 for the remaining uplink carrier(s) of band n77. The *additionalSpectrumEmission* is applicable all uplink carriers of the same band with UL configured. |
| ***frequencyBandList***  List containing only one frequency band to which this carrier(s) belongs. Multiple values are not supported. |
| ***frequencyShift7p5khz***  Enable the NR UL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***p-Max***  Maximum transmit power allowed in this serving cell. The maximum transmit power that the UE may use on this serving cell may be additionally limited by *p-NR-FR1* (configured for the cell group) and by *p-UE-FR1* (configured total for all serving cells operating on FR1). If absent, the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if p-Max is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. Value in dBm. This field is ignored by IAB-MT, the IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [63]. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A. The network configures a *scs-SpecificCarrier* at least for each numerology (SCS) that is used e.g. in a BWP (see TS 38.211 [16], clause 5.3). |

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| Conditional Presence | Explanation |
| *FDD-OrSUL* | The field is mandatory present if this *FrequencyInfoUL* is for the paired UL for a DL (defined in a *FrequencyInfoDL*) or if this *FrequencyInfoUL* is for a supplementary uplink (SUL). It is absent, Need R, otherwise (if this *FrequencyInfoUL* is for an unpaired UL (TDD). |
| *FDD-TDD-OrSUL-Optional* | The field is optionally present, Need R, if this *FrequencyInfoUL* is for the paired UL for a DL (defined in a *FrequencyInfoDL*), or if this *FrequencyInfoUL* is for an unpaired UL (TDD) in certain bands (as defined in clause 5.4.2.1 of TS 38.101-1 and in clause 5.4.2.1 of TS 38.104 [12]), or if this *FrequencyInfoUL* is for a supplementary uplink (SUL). It is absent, Need R, otherwise. |

#### <Skip>

Annex C (normative): List of CRs Containing Early Implementable Features and Corrections

This annex lists the Change Requests (CRs) whose changes may be implemented by a UE of an earlier release than which the CR was approved in (i.e. CRs that contain on their coversheets the sentence "Implementation of this CR from Rel-N will not cause interoperability issues").

Table C-1: List of CRs Containing Early Implementable Features and Corrections

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| --- | --- | --- | --- | --- |
| TDoc Number (RP-xxxxxx): CR Title | CR Number(s) | CR Revision Number(s) | Earliest Implementable Release | Additional Information |
| RP-200335: Correction on usage of access category 2 for UAC for RNA update | 1141 | 2 | Release 15 |  |
| RP-201185: Introduction of signalling for high-speed train scenarios | 1464 | 5 | Release 15 |  |
| RP-201216: Release-16 UE capabilities based on RAN1, RAN4 feature lists and RAN2 | 1665 | 2 | Release 15 | Early implementation part is referring to the aspect covered by R2-2006203: Extension of CSI-RS capabilities per codebook type |
| RP-202768: UE behaviour when UL 7.5KHz shift is not supported | 2107 | 2 | Release 15 |  |
| RP-202790: Correction on uac-AccessCategory1-SelectionAssistanceInfo | 2130 | 1 | Release 15 |  |
| RP-211483: Clarification on the initiation of RNA update | 2581 | 1 | Release 15 |  |
| RP-201190: Introduction of eCall over IMS for NR | 1670 | - | Release 15 |  |
| RP-212598: Distinguishing support of extended band n77 | 2810 | 2 | Release 15 |  |
| RP-213342: Duty cycle signalling for power class 1.5 | 2817 | 1 | Release 15 |  |
| RP-213345: CR on 38.331 for introducing UE capability of txDiversity | 2859 | 1 | Release 15 |  |
| RP-220497: Introduction of function for RRM enhancements for Rel-17 NR FR1 HST | 2898 | 2 | Release 16 |  |
| RP-221721: CR on the CBM/IBM reporting-38331 | 2916 | 2 | Release 16 |  |
| RP-221736: Distinguishing support of band n77 restrictions in Canada [n77 Canada] | 3078 | 2 | Release 15 |  |
| RP-22xxxx: Correction to additionalSpectrumEmission for UL CA in n77 for the US | 3477 | - | Release 15 |  |

#### <End of changes>