**3GPP TSG-RN WG4 Meeting #99-e *R4-2108254***

Online, 19 – 27 May, 2021

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **2164** | **rev** | **1** | **Current version:** | **16.7.0** |  |
|  |
| *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:***  | SI reading time in RRC mobility control |
|  |  |
| ***Source to WG:*** | Qualcomm Inc. |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_unlic-Core |  | ***Date:*** | 2021-05-11 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 canbe 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)* |
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| ***Reason for change:*** | The CR updates clause 6.2.1A.2.1 based on agreements related to SI reading time  |
|  |  |
| ***Summary of change:*** | 1. Remove editor’s note
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|  |  |
| ***Consequences if not approved:*** | Incomplete specifications for NR-U |
|  |  |
| ***Clauses affected:*** | 6.2.1A.2.1 |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** |  |

**< Start of change >**

##### 6.2.1A.2.1 UE Re-establishment with CCA delay requirement

The UE re-establishment on the carrier with CCA delay (TUE\_re-establish\_delay\_CCA) is the time between the moments when any of the conditions requiring RRC re-establishment on the carrier with CCA as defined in clause 5.3.7 in TS 38.331 [2] is detected by the UE and when the UE sends PRACH to the target PCell on the carrier with CCA . The UE re-establishment delay requirement (TUE\_re-establish\_delay\_CCA) on the carrier with CCA shall be less than:

$$T\_{UE\\_re-establish\\_delay\\_CCA}=50 ms+T\_{identify\\_intra\\_NR\\_CCA}+\sum\_{i=1}^{N\_{freq}-1}T\_{identify\\_inter\\_NR\\_CCA,i}+T\_{SI-NR\\_CCA}+T\_{PRACH\\_CCA}$$

The intra-frequency target NR cell with CCA shall be considered detectable if each relevant SSB can satisfy that:

- SS-RSRP related side conditions given in clause 10.1.2 are fulfilled for a corresponding NR Band for FR1, and

- the conditions of SSB\_RP and SSB Ês/Iot according to Annex B.2.3 for a corresponding NR Band are fulfilled.

The inter-frequency target NR cell on the carrier with CCA shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in clause 10.1.4 are fulfilled for a corresponding NR Band for FR1, and

- the conditions of SSB\_RP and SSB Ês/Iot according to Annex B.2.2 for a corresponding NR Band are fulfilled.

Tidentify\_intra\_NR\_CCA: If the target intra-frequency carrier is the carrier without CCA, it is the time to identify the target intra-frequency NR cell which is defined in clause 6.2.1; otherwise it is the time to identify the target intra-frequency NR cell on the carrier with CCA and it depends on whether the target NR cell on the carrier with CCA is known cell or unknown cell and on the frequency range (FR) of the target NR cell on the carrier with CCA. If the UE is not configured with intra-frequency NR carrier with CCA for RRC re-establishment then Tidentify\_intra\_NR\_CCA=0; otherwise Tidentify\_intra\_NR\_CCA shall not exceed the values defined in Table 6.2.1A.2.1-1.

Tidentify\_inter\_NR\_CCA,i: If the target inter-frequency carrier is the carrier without CCA, it is the time to identify the target inter-frequency NR cell which is defined in clause 6.2.1; otherwise it is the time to identify the target inter-frequency NR cell on inter-frequency carrier *i* with CCA configured for RRC re-establishment and it depends on whether the target NR cell on the inter-frequency carrier with CCA is known or unknown. Tidentify\_inter\_NR\_CCA,i shall not exceed the values defined in Table 6.2.1A.2.1-2.

TSMTC: It is the periodicity of the SMTC occasion configured for the intra-frequency carrier. If the UE has been provided with higher layer in TS 38.331 [2] signaling of *smtc2*, Tsmtc follows *smtc1* or *smtc2* according to the physical cell ID of the target cell.

TSMTC,i: It is the periodicity of the SMTC occasion configured for the inter-frequency carrier *i*. If it is not configured, the UE may assume that the target SSB periodicity is not larger than 20 ms.

TSI-NR\_CCA: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 38.331 [2] for the target NR cell on the carrier with CCA.

TPRACH\_CCA is the delay uncertainty in acquiring the first available PRACH occasion in the target NR Cell on the carrier with CCA:

TPRACH\_CCA = (1+ K3)\*TSSB,RO + 10 ms, where:

- TSSB,RO is the SSB to PRACH occasion association period as defined inTable 8.1-1 of TS 38.213 [39].

- K3 is the number of consecutive SSB to PRACH occasion association periods during which no PRACH occasion is available for PRACH transmission due to UL CCA failure. K3 = 0 for Type 2C UL channel access procedure as defined in TS 37.213 [57].

Nfreq: It is the total number of NR frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target NR cell on the intra-frequency carrier with CCA is known, else Nfreq = 2 and Tidentify\_intra\_NR\_CCA = 0 if the target NR cell on the inter-frequency carrier with CCA is known.

There is no requirement if the target cell on the carrier with CCA does not contain the UE context.

In the requirement defined in the below tables, the target cell on the carrier with CCA is known if it has been meeting the relevant cell identification requirement during the last 8 seconds otherwise it is unknown.

Table 6.2.1A.2.1-1: Time to identify target NR cell for RRC connection re-establishment to NR intra-frequency cell with CCA

|  |  |  |
| --- | --- | --- |
| Serving cell | Frequency range | Tidentify\_intra\_NR\_CCA [ms] |
| SSB Ês/Iot (dB) | (FR) of target NR cell | Known NR cell | Unknown NR cell |
| ≥ -8 | FR1 | MAX (200 ms, (5+K1) x TSMTC) | MAX (800 ms, (10+ K1) x TSMTC) |
| < -8 | FR1 | N/A | (800+20 x K1)Note1 |
| Note 1: The UE is not required to successfullyidentify a cell on any NR frequency layer with CCA when TSMTC > 20 ms and serving cell SSB Ês/Iot < -8 dB.Note 2: K1 is the number of SMTC occasions not available at the UE due during RRC re-establishment period on the carrier with CCA. |

Table 6.2.1A.2.1-2: Time to identify target NR cell for RRC connection re-establishment to NR inter-frequency cell on the carrier with CCA

|  |  |  |
| --- | --- | --- |
| Serving cell SSB Ês/Iot (dB) | Frequency range | Tidentify\_inter\_NR\_CCA, i [ms] |
|  | (FR) of target NR cell | Known NR cell | Unknown NR cell |
| ≥ -8 | FR1 | MAX (200 ms, ([6]+K2,i) x TSMTC, i) | MAX (800 ms, ([13]+K2,i) x TSMTC, i) |
| < -8 | FR1 | N/A | (800+20 x K2,i) Note1 |
| Note 1: The UE is not required to successfully identify a cell on any NR frequency layer with CCA when TSMTC,i > 20 ms and serving cell SSB Ês/Iot < -8 dB.Note 2: K2,i is the number of SMTC occasions not available at the UE during RRC re-establishment period on the “i” th carrier with CCA, |

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