3GPP TSG-RAN WG4 Meeting #95-e R4-2008570

Electronic Meeting, May 25 – June 05, 2020

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **36.133** | **CR** | **6900** | **rev** | **3** | **Current version:** | **16.5.0** |  |
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| *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:*** | UE behaviour after measurement failure due to LBT for RRC\_IDLE state inter-RAT moblity requirements for NR-U | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_unlic-Core | | | | |  | ***Date:*** | | | 2020-05-25 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
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| ***Reason for change:*** | | UE behaviour after failing the measurements N times is unclear, and it is unclear how many times the UE is allowed to fail the measurements | | | | | | | | |
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| ***Summary of change:*** | | This CR contains changes to R4-2005368 which was endorsed at RAN4#94-bis-e meeting. The changes are highglighted in yellow. | | | | | | | | |
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| ***Consequences if not approved:*** | | UE behaviour due to LBT failure in the measurements is unclear. | | | | | | | | |
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| ***Clauses affected:*** | | New section: 4.2.2.5.7. | | | | | | | | |
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|  | | **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:*** | | This CR contains changes to already endorsed CR in R4-2005368. | | | | | | | | |
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| ***This CR's revision history:*** | | This CR contains changes to already endorsed CR in R4-2005368. | | | | | | | | |

Change 1

##### 4.2.2.5.7 Measurements of NR cells subject to CCA

The UE shall be able to identify new inter-frequency cells subject to CCA and perform SS-RSRP or SS-RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ then the UE shall search for inter-frequency layers of higher priority at least every Thigher\_priority\_search.

If Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below in this subclause.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS38.304 within Kcarrier \* Tdetect,NR\_Inter + Kcarrier\_CCA \* Tdetect,NR\_Inter\_CCA if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when Treselection = 0 provided that the reselection criteria is met by a margin of at least 5 dB in FR1 for reselections based on ranking or 6dB in FR1 for SS-RSRP reselections based on absolute priorities or 4dB in FR1 for SS-RSRQ reselections based on absolute priorities.

The parameter Kcarrier is the number of NR inter-frequency carriers on licensed band and Kcarrier\_CCA is the number of NR inter-frequency carriers on unlicensed band indicated by the serving cell. An inter-frequency cell is considered to be detectable according to the conditions defined in Annex B.x.y for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every Tmeasure,NR\_Inter\_CCA. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure SS-RSRP or SS-RSRQ at least every Kcarrier \* Tmeasure,NR\_Inter + Kcarrier\_CCA \* Tmeasure,NR\_Inter\_CCA (see table 4.2.2.5.7-1) for identified lower or equal priority inter-frequency cells. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

For a cell that is already identified, after N unsuccessful measurement attempts due to exceeding the max number of unavailable SMTC occasions, UE shall to detect cells on any of the configured serving- and/or non-serving carriers. If the UE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information for 10 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS 38.304 [1].

UE shall detect cells on the configured serving- and/or non-serving carriers after reaching N unsuccessful measurement attempts

The UE shall filter SS-RSRP or SS-RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least Tmeasure,NR\_Inter\_CCA/2.

The UE shall not consider a NR neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 38.304 within Kcarrier \* Tevaluate,NR\_Inter + Kcarrier\_CCA \* Tevaluate,NR\_Inter\_CCA when Treselection = 0as specified in table 4.2.2.5.7-1 provided that the reselection criteria is met by

- the condition when performing equal priority reselection and

when *rangeToBestCell* is not configured:

- the cell is at least 5dB better ranked in FR1 or.

when *rangeToBestCell* is configured:

- the cell has the highest number of beams above the threshold *absThreshSS-BlocksConsolidation* among all detected cells whose cell-ranking criterion R value [1] is within *rangeToBestCell* of the cell-ranking criterion R value of the highest ranked cell.

- if there are multiple such cells, the cell has the highest rank among them

- the cell is at least 5dB better ranked in FR1 if the current serving cell is among them. or

- 6dB in FR1 for SS-RSRP reselections based on absolute priorities or

- 4dB in FR1 for SS-RSRQ reselections based on absolute priorities.

When evaluating cells for reselection, the SSB side conditions apply to both serving and inter-frequency cells.

If Treselection timer has a non zero value and the inter-frequency cell is satisfied with the reselection criteria, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

The UE is not expected to meet the measurement requirements for an inter-frequency carrier under DRX cycle=320 ms defined in Table 4.2A.2.4-1 under the following conditions:

- TSMTC\_intra = TSMTC\_inter = 160 ms; where TSMTC\_intra and TSMTC\_inter are periodicities of the SMTC occasions configured for the intra-frequency carrier and the inter-frequency carrier respectively, and

- SMTC occasions configured for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the SMTC occasions configured for the intra-frequency carrier, and

- SMTC occasions configured for the intra-frequency carrier and for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the paging occasion [1].

Table 4.2.2.5.7-1: Tdetect,NR\_Inter\_CCA, Tmeasure,NR\_Inter\_CCA and Tevaluate,NR\_Inter\_CCA

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| --- | --- | --- | --- |
| **DRX cycle length [s]** | **Tdetect,NR\_Inter\_CCA [s] (number of DRX cycles)** | **Tmeasure,NR\_Inter\_CCA [s] (number of DRX cycles)** | **Tevaluate,NR\_Inter\_CCA [s] (number of DRX cycles)** |
|
| 0.32 | 0.32x([36]+Md)  {([36]+ Md) } | 0.32x([4]+Mm)  {([4]+ Mm) } | 0.32x([16]+Me)  {([16]+ Me) } |
| 0.64 | 0.64x([28]+ Md)  {[28]+ Md } | 0.64x([2]+ Mm)  {[2]+ Mm } | 0.64x([8]+ Me)  {[8]+ Me } |
| 1.28 | 1.28x([25]+ Md)  {[25]+ Md } | 1.28x([1]+ Mm)  {[1]+ Mm } | 1.28x([5]+ Me)  {[5]+ Me } |
| 2.56 | 2.56x([23]+ Md)  {[23]+ Md } | 2.56x([1]+ Mm)  {[1]+ Mm } | 2.56x([3]+ Me)  {[3]+ Me } |
| Note 1: Md, Mm, Me are the number of DRX cycles with at least one SMTC where there are no SSBs available during the Tdetect,NR\_Inter\_CCA,, **Tmeasure,NR\_Inter\_CCA**and **Tevaluate,NR\_Inter\_CCA**, and Mm,max, Md,max and Me,max are the maximum values of Mm, Md and Me.  Note 2: Mm ≤ Mm,max, where:  Mm,max = [16] for DRX cycle = 0.32 seconds,  Mm,max = [8] for DRX cycle = 0.64 seconds,  Mm,max = [4] for DRX cycle = 1.28 seconds,  Mm,max = [4] for DRX cycle = 2.56 seconds,  Note 3: Md ≤ Md,max, where:  Md,max = [4] \* Mm,max,  Note 4: Me ≤ Me,max, where:  Me,max = [2] \* Mm,max, | | | |

The UE shall restart the measurements upon exceeding Mm,max, Md.max, or Me,max.

End of change 1