**3GPP TSG-RAN WG4 Meeting #116 R4-2510461**

**Bengaluru, India, August 25th – 29th, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **5829** | **rev** | **1** | **Current version:** | **17.18.1** |  |
|  | | | | | | | | |
| *For* ***[HELP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at  <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:*** | (NR\_redcap-Core) Handover for unknown inter-frequency cell | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE Corporation, Sanechips | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap-Core | | | | |  | ***Date:*** | | | 2025-08-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | For unknown inter-frequency cell, the value of ‘N’ is missed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add ‘N = 8’ for unknown inter-frequency cell | | | | | | | | |
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| ***Consequences if not approved:*** | | The requirement seems incomplete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.1D.1.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 Change 1>

##### 6.1D.1.3.2 Interruption time

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay.

When intra-frequency or inter-frequency handover is commanded, the interruption time shall be less than Tinterrupt

Tinterrupt = Tsearch + TIU + Tprocessing + T∆ + Tmargin ms

Where:

Tsearch is the time required to search the target cell which depends on whether the target cell is already known when the handover command is received by the UE.

- If the target cell is a known intra-frequency cell, Tsearch = 0 ms. If the target cell is an unknown intra-frequency cell and the target cell Es/Iot≥-2 dB, then Tsearch = N\*Trs ms.

- If the target cell is a known inter-frequency cell, then

if the measured SSB is the target SSB for HO of the target cell, Tsearch = 0 ms;

if the measured SSB and the target SSB for HO belong to the same NR target cell, Tsearch = Trs ms provided one of the following conditions is fulfilled:

* + - The measured SSB is the CD-SSB in the DL BWP and the target SSB for HO is the NCD-SSB in RedCap specific DL BWP, or
    - The measured SSB is the NCD-SSB in RedCap specific DL BWP and the target SSB for HO is the CD-SSB in DL BWP, or
    - The measured SSB is the NCD-SSB and the target SSB for HO is the NCD-SSB and both are within different RedCap specific DL BWPs

Otherwise, the target cell is an unknown inter-frequency cell. In this case, if the target cell Es/Iot≥-2 dB, then Tsearch = 3\*N\* Trs ms.

Where N = 8 when the target cell is in FR2-1.

Regardless of whether DRX is in use by the UE, Tsearch shall still be based on non-DRX target cell search times.

T∆ is time for fine time tracking and acquiring full timing information of the target cell. T∆ = Trs for both known and unknown target cell.

Tprocessing is time for UE processing. Tprocessing can be up to 20 ms.

Tmargin is time for SSB post-processing. Tmargin can be up to 2 ms.

TIU is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. TIU can be up to the summation of SSB to PRACH occasion association period and 10 ms. SSB to PRACH occasion associated period is defined in the table 8.1-1 of TS 38.213 [3].

Trs is the SMTC periodicity of the target NR cell if the UE has been provided with an SMTC configuration for the target cellin the handover command, otherwise,

- Trs is the SMTC configured in the measObjectNR having the same SSB frequency and subcarrier spacing as NCD-SSB indicated by *nonCellDefiningSSB-r17* if the first active DL BWP included in handover command is configured with *nonCellDefiningSSB-r17*, otherwise, as CD-SSB indicated by *absoluteFrequencySSB* in *frequencyInfoDL* in handover command.

- If the UE is not provided SMTC configuration or measurement object on this frequency, the requirement in this clause is applied with Trs=5 ms assuming the SSB transmission periodicity is 5 ms. There is no requirement if the SSB transmission periodicity is not 5 ms. If the UE has been provided with higher layer in TS 38.331 [2] signalling of *smtc2*prior to the handover command, Trs follows *smtc1* or *smtc2* according to the physical cell ID of the target cell.

In FR2, the target cell is known if it has been meeting the following conditions:

- At least one of the SSBs measured belongs to the same NR target cell,

- During the last 5 seconds before the reception of the handover command:

- the UE has sent a valid measurement report for the target cell and

- at least one of the SSBs measured which belongs to the same NR target cell remains detectable according to the cell identification requirements as described in clause 9.2B for intra-frequency measurements and clause 9.3B for inter-frequency measurements,

- The reference SSB of the NR target cell also remains detectable during the handover delay according to the cell identification requirements are described in clause 9.2B for intra-frequency handover and clause 9.3B for inter-frequency handover.

Otherwise, it is unknown.

<End of Change 1>