**3GPP TSG-WG4 Meeting # 111 *R4-240xxxx***

**Fukuoka, Japan, 20- 24 May 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **Draft CR** | **rev** | **1** | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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:*** | Draft CR on NTN To LTE TN inter-RAT cell re-selection | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE Corporation, Sanechips | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_enh-Perf | | | | |  | ***Date:*** | | | 2024-05-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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:*** | | Test case for NTN To LTE TN shall be defined for related requirements.  NTN-TN inter-RAT cell reselection | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce test case for NTN-LTE TN inter-RAT cell reselection. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Agreed test case is not implemented | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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>

# **A.14.1.Y** Cell reselection to FR1 inter-RAT for NR NTN carrier

## A.14.**1.Y.1** Test purpose and Environment

This test is to verify the requirement for the NR NTN to E-UTRAN TN inter-RAT cell reselection requirements specified in clause 4.2C.3.1 when the E-UTRAN cell is of higher priority.

## A.14.1.Y.2 Test parameters

The test scenario comprises of one NR cell and one E-UTRAN cell as given in tables A.14.1.Y.2-1, A.14.1.Y.2-2, A.14.1.Y.2-3 and A.14.1.Y.2-4. The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively. NR cell 1 is already identified by the UE prior to the start of the test. E-UTRAN cell 2 is of higher priority than cell 1.

A.14.1.Y.2-1: Supported test configurations

|  |  |  |
| --- | --- | --- |
| Configuration | Description of serving cell | Description of target cell |
| 1 | NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode | LTE 10 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | | |

Table A.14.1.Y.2-2: General test parameters for NR to E-UTRAN cell re-selection test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial condition | Active cell |  | 1 | Cell1 | The UE camps on cell 1 in the initial phase and during T2 period the UE reselects to cell 2. |
| T2 end | Active cell |  | 1 | Cell2 | The UE shall perform reselection to cell |
| condition | Neighbour cell |  | 1 | Cell1 | 2 during T2. |
| T3 end | Active cell |  | 1 | Cell1 | The UE shall perform reselection to cell |
| condition | Neighbour cell |  | 1 | Cell2 | 1 during T3 for iteration of the tests. |
| Access Barring Information | | - | 1 | Not Sent | No additional delays in random access procedure. |
| DRX cycle length | | s | 1 | 1.28 | The value shall be used for all cells in the test. |
| NR PRACH configuration index | |  | 1 | 102 | The detailed configuration is specified in TS 38.211 clause 6.3.3.2 |
| E-UTRAN PRACH configuration index | |  | 1 | 53 | As specified in table 5.7.1-2 in TS 36.211 [23] |
| E-UTRAN PRACH | |  | 1 | 53 | As specified in table 5.7.1-2 in |
| T1 | | s | 1 | >7 | During T1, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2. |
| T2 | | s | 1 | 40 | T2 needs to be defined so that cell re-selection reaction time is taken into account. |
| T3 | | s | 1 | 15 | T3 needs to be defined so that cell re-selection reaction time is taken into account. |

Table A.14.1.Y.2-3: Cell specific test parameters for NR cell 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | |
|  |  |  | T1 | T2 | T3 |
| TDD configuration |  | 1, | N/A | | |
| PDSCH parameters |  | 1, | SR.1.1 FDD | | |
| RMSI CORESET parameters |  | 1, | CR.1.1 FDD | | |
| Dedicated CORESET parameters |  | 1 | CCR.1.1 FDD | | |
| SSB parameters |  | 1 | SSB.1 FR1 | | |
| NR SMTC parameters |  | 1 | SMTC.2 | | |
| OCNG Pattern |  | 1 | OP.1 defined in A.3.2.1 | | |
| Initial DL BWP configuration |  | 1 | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1 | ULBWP.0.1 | | |
| RLM-RS |  | 1 | SSB | | |
| Qrxlevmin | dBm/SCS | 1 | -140 | | |
|  | dBm/SCS | 1 | -98 | | |
|  | dBm/15 kHz | 1 | -98 | | |
| SS-RSRP | dBm/SCS | 1 | -84 | -84 | -84 |
|  | dB | 1 | 14 | 14 | 14 |
|  | dB | 1 | 14 | 14 | 14 |
| Io | dBm/9.36 MHz | 1 | -55.88 | -55.88 | -55.88 |
| Treselection | S | 1 | 0 | | |
| SnonintrasearchP | dB | 1 | 50 | | |
| Threshx, highP (Note 2) | dB | 1 | 48 | | |
| Threshserving, lowP | dB | 1 | 44 | | |
| Threshx, lowP | dB | 1 | 50 | | |
| Propagation Condition |  | 1 | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: This refers to the value of Thresh**x, high** which is included in NR system information, and is a threshold for the E-UTRA target cell | | | | | |

Table A.14.1.Y.2-4: Cell specific test parameters for E-UTRA cell 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 2** | | |
|  |  | **T1** | **T2** | **T3** |
| E-UTRA RF Channel number |  | 1 | | |
| BWchannel | MHz | 10 | | |
| OCNG Patterns defined in TS 36.133 [15] clause A.3.2 |  | OP.2 TDD for test configuration 1, 2, 3;  OP.2 FDD for test configuration 4, 5, 6 | | |
| PBCH\_RA | dB | 0 | | |
| PBCH\_RB | dB |  | | |
| PSS\_RA | dB |  | | |
| SSS\_RA | dB |  | | |
| PCFICH\_RB | dB |  | | |
| PHICH\_RA | dB |  | | |
| PHICH\_RB | dB |  | | |
| PDCCH\_RA | dB |  | | |
| PDCCH\_RB | dB |  | | |
| PDSCH\_RA | dB |  | | |
| PDSCH\_RB | dB |  | | |
| OCNG\_RANote 1 | dB |  | | |
| OCNG\_RBNote 1 | dB |  | | |
| Qrxlevmin | dBm | -140 | | |
|  | dBm/15 kHz | -98 | | |
| RSRP | dBm/15 KHz | -infinity | -86 | -102 |
|  | dB | -infinity | 12 | -4 |
|  | dB | -infinity | 12 | -4 |
| TreselectionEUTRAN | S | 0 | | |
| SnonintrasearchP | dB | Not sent | | |
| Threshx, highP | dB | 48 | | |
| Threshserving, lowP | dB | 44 | | |
| Threshx, lowP (Note 2) | dB | 50 | | |
| Propagation Condition |  | AWGN | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: This refers to the value of Thresh**x, Low** which is included in E-UTRA system information, and is a threshold for the NR target cell | | | | |

## A.14.1.Y.2 Test requirements

The cell reselection delay to a higher priority E-UTRAN cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the *RRCSetupRequest* message to perform a Tracking Area Update procedure on cell 2.

The cell re-selection delay to a higher priority cell shall be less than 68 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a higher priority cell can be expressed as: Thigher\_priority\_search + Tevaluate, E-UTRAN + TSI-E-UTRA,

Where:

Thigher\_priority\_search See clause 4.2.2.7

Tevaluate, NR\_ inter See Table 4.2C.2.4-1 in clause 4.2C.2.4

TSI-E-UTRA Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 67.68 s, allow 68 s for the cell re-selection delay to a higher priority E-UTRAN cell.

#### < END OF CHANGE 1>