**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 NR TN | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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 NR TN shall be defined for related requirements.  NTN-TN inter-frequency cell reselection | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce test case for NTN-TN inter-frequency 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.X** Cell re-selection to FR1 inter-frequency NR case with TN carrier

## A.14.1.X.1Test purpose and Environment

This test is to verify the requirement for the inter frequency NR NTN to TN cell re-selection requirements specified in clause 4.2C.3.1.

## A.14.1.X.2Test parameters

The test scenario comprises of 2 cells on 2 different NR carriers, including NR NTN cell/carrier and NR TN cell/carrier respectively as given in tables A.14.1.X.2-1, A.14.1.X.2-2 and A.14.1.X.3-3. The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1.

Table A.14.1.X.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |

TableA.14.1.X.2-2: General test parameters for inter frequency NR cell re-selection test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
|  | |  |
| Initial condition | Active cell |  | 1 | Cell1 |  |
| T2 end condition | Active cell |  | 1 | Cell2 |  |
|  | Neighbour cells |  | 1 | Cell1 |  |
| Final condition | Active cell |  | 1 | Cell1 |  |
|  | Neighbour cells |  | 1 | Cell2 |  |
| RF Channel Number | |  | 1 | 1 |  |
| Time offset between cells | |  | 1 | 3 ms | Asynchronous cells |
| Access Barring Information | | - | 1 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR1 |  |
| SMTC configuration#1 | |  | 1 | SMTC.2 | Configured in SIB2 of Cell 1 |
| SMTC.6 | Configured in SIB4 of Cell 2 |
| SMTC configuration#2 | |  | 1 | SMTC.2 | Configured in SIB2 of Cell 1 |
| SMTC.6 | Configured in SIB4 of Cell 2 |
| DRX cycle length | | s | 1 | 1.28 | The value shall be used for all cells in the test. |
| PRACH configuration index | |  | 1 | 102 | The detailed configuration is specified in TS 38.211 clause 6.3.3.2 |
| rangeToBestCell | |  | 1 | Not configured |  |
| Ephemeris information | |  | 1 | [TBD] | The detailed configuration is specified in SIB19 |
| 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.X.3-3: Cell specific test parameters for inter frequency NR cell re-selection test case

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| Satellite information |  | 1 | SSC.1 for GSO test  SSC.2 for NGSO test | | | SSC.1 for GSO test  SSC.2 for NGSO test | | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | | SR.1.1 FDD | | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 FDD | | | CR.1.1 FDD | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 FDD | | | CCR.1.1 FDD | | |
| OCNG Pattern |  | 1 | OP.1 defined in A.3.2.1 | | | OP.1 defined in A.3.2.1 | | |
| Initial DL BWP configuration |  | 1 | DLBWP.0.1 | | | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1 | ULBWP.0.1 | | | ULBWP.0.1 | | |
| RLM-RS |  | 1 | SSB | | | SSB | | |
| Qrxlevmin | dBm/SCS | 1 | -130 | | | -130 | | |
| Pcompensation | dB | 1 | 0 | | | 0 | | |
| Qhysts | dB | 1 | 0 | | | 0 | | |
| Qoffsets, n | dB | 1 | 0 | | | 0 | | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | 1 | SS-RSRP | | | SS-RSRP | | |
|  | dB | 1 | 16 | -3.11 | 2.79 | -infinity | 2.79 | -3.11 |
| Note2 | dBm/SCS | 1 | -98 | | | | | |
| Note2 | dBm/15 kHz | 1 | -98 | | | | | |
|  | dB | 1 | 16 | 13 | 16 | -infinity | 16 | 13 |
| SS-RSRP Note3 | dBm/SCS | 1 | -82 | -85 | -82 | -infinity | -82 | -85 |
| Io | dBm/9.36 MHz | 1 | -53.94 | -52.21 | -52.21 | Same as parameters specified in Cell 1 columns- | | |
| Treselection | s | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SintersearchP | dB | 1 | 60 | | | 60 | | |
| 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: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | |

## A.14.1.X.3 Test requirements

The cell reselection delay to a higher priority cell is defined as the time from the beginning of time period T3, to the moment when the UE camps again on cell 2, and starts to send preambles on the PRACH for sending the *RRCSetupRequest* message to perform a Registration procedure for mobility and periodic registration update on cell 2.

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

The cell reselection delay to a lower priority cell is defined as the time from the beginning of time period T1, to the moment when the UE camps on cell 1, and starts to send preambles on the PRACH for sending the *RRCSetupRequest* message to perform a Registration procedure for mobility and periodic registration update on cell 1.

The cell re-selection delay to a lower priority cell shall be less than 8 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, NR\_ inter + TSI-NR, and to a lower priority cell can be expressed as: Tevaluate, NR\_ inter + TSI-NR,

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-NR 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

#### < END OF CHANGE 1>