**3GPP TSG-RAN WG4 Meeting #97-e *R4-2017138***

**Electronic Meeting, 2-13 Nov., 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** |  | **rev** | **1** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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 |  | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | RRM test cases for NR UE power saving | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Xiaomi | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_UE\_pow\_sav-Pref | | | | |  | ***Date:*** | | | 2020-10-23 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Add the RRM test case for Rel-16 NR UE cell re-selection to FR1 intra-frequency NR for UE fulfilling not-at-cell edge criterion | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Rel-16 NR UE power saving test case for cell re-selection to FR1 intra-frequency NR for UE fulfilling not-at-cell edge criterion | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The RRM test case for Rel-16 NR UE cell re-selection to FR1 intra-frequency NR for UE fulfilling not-at-cell edge criterion not be added. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.6.1.3 (New) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS38.521-3 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

|  |  |
| --- | --- |
| ***This CR's revision history:*** |  |

## **--------------Start of change-------------**

#### A.6.1.1.3 Cell re-selection to FR1 intra-frequency NR for UE fulfilling not-at-cell edge criterion

##### A.6.1.1.3.1 Test Purpose and Environment

This test is to verify the relaxed cell re-selection requirement for UEs configured with not-at-cell edge criterion specified in clause 4.2.2.9.3.

##### A.6.1.1.3.2 Test Parameters

The test scenario comprises of 1 NR carrier and 2 cells as given in tables A.6.1.1.3.2-1, A.6.1.1.3.2-2 and A.6.1.1.3.2-3. The test consists of two successive time periods, with time duration of T1 and T2 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.

Table A.6.1.1.3.2-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations. | |

Table A.6.1.1.3.2-2: General test parameters for intra frequency NR Cell re-selection test case

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial  condition | Active Cell |  | 1, 2, 3 | Cell1 | The UE camps on Cell 1 in the initial phase |
| Neighbour Cells |  | 1, 2, 3 | Cell2 |
| T1 end condition | Active Cell |  | 1, 2, 3 | Cell2 | The UE shall fulfil the not-at-cell edge criterion and reselect to cell 2 during T1 period during T1. |
| Neighbour Cells |  | 1, 2, 3 | Cell1 |
| T2 end condition | Active Cell |  | 1, 2, 3 | Cell1 | The UE shall perform reselection to Cell 1 during T2 |
| Neighbour Cells |  | 1, 2, 3 | Cell2 |
| RF Channel Number | |  | 1, 2, 3 | 1 |  |
| Time offset between Cells | |  | 1 | 3 ms | Asynchronous Cells |
| 2 | 3 μs | Synchronous Cells |
| 3 | 3 μs | Synchronous Cells |
| Access Barring Information | | - | 1, 2, 3 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR1 |  |
| 2 | SSB.1 FR1 |  |
| 3 | SSB.2 FR1 |  |
| SMTC configuration | |  | 1 | SMTC pattern 2 |  |
| 2 | SMTC pattern 1 |  |
| 3 | SMTC pattern 1 |  |
| DRX cycle length | | s | 1, 2, 3 | 0.64 | The value shall be used for all Cells in the test. |
| PRACH configuration index | |  | 1, 2, 3 | 102 | The detailed configuration is specified in TS 38.211 clause 6.3.3.2 |
| rangeToBestCell | |  | 1, 2, 3 | Not configured |  |
| T1 | | s | 1, 2, 3 | 17 | T1 needs to be defined so that Cell re-selection reaction time is taken into account. |
| T2 | | s | 1, 2, 3 | 17 | T2 needs to be defined so that Cell re-selection reaction time is taken into account. |

Table A.6.1.1.3.2-3: Cell specific test parameters for intra frequency NR Cell re-selection test case in AWGN

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | Cell 2 | |
| T1 | T2 | T1 | T2 |
| TDD configuration |  | 1 | N/A | | N/A | |
| 2 | TDDConf.1.1 | | TDDConf.1.1 | |
| 3 | TDDConf.2.1 | | TDDConf.2.1 | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | N/A | |
| 2 | SR.1.1 TDD | |
| 3 | SR.2.1 TDD | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 FDD | | CR.1.1 FDD | |
| 2 | CR.1.1 TDD | | CR.1.1 TDD | |
| 3 | CR.2.1 TDD | | CR.2.1 TDD | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 FDD | | CCR.1.1 FDD | |
| 2 | CCR.1.1 TDD | | CCR.1.1 TDD | |
| 3 | CCR.2.1 TDD | | CCR.2.1 TDD | |
| OCNG Pattern |  | 1, 2, 3 | OP.1 defined in A.3.2.1 | | OP.1 defined in A.3.2.1 | |
| Initial DL BWP configuration |  | 1, 2, 3 | DLBWP.0.1 | | DLBWP.0.1 | |
| Initial UL BWP configuration |  | 1, 2, 3 | ULBWP.0.1 | | ULBWP.0.1 | |
| RLM-RS |  | 1, 2, 3 | SSB | | SSB | |
| Qrxlevmin | dBm/SCS | 1, 2 | -140 | | -140 | |
| 3 | -137 | | -137 | |
| Pcompensation | dB | 1, 2, 3 | 0 | | 0 | |
| Qhysts | dB | 1, 2, 3 | 0 | | 0 | |
| Qoffsets, n | dB | 1, 2, 3 | 0 | | 0 | |
| Cell\_selection\_and\_  reselection\_quality\_measurement |  | 1, 2, 3 | SS-RSRP | | SS-RSRP | |
|  | dB | 1 | -3.11 | 2.79 | 2.79 | -3.11 |
| 2 |
| 3 |
| Note2 | dBm/SCS | 1 | -98 | | | |
| 2 | -98 | | | |
| 3 | -95 | | | |
| Note2 | dBm/15 kHz | 1 | -98 | | | |
| 2 |
| 3 |
|  | dB | 1 | 13 | 16 | 16 | 13 |
| 2 |
| 3 |
| SS-RSRP Note3 | dBm/SCS | 1 | -85 | -82 | -82 | -85 |
| 2 | -85 | -82 | -82 | -85 |
| 3 | -82 | -79 | -79 | -82 |
| Io | dBm/9.36 MHz | 1 | -52.21 | -52.21 | -52.21 | -52.21 |
| dBm/9.36 MHz | 2 | -52.21 | -52.21 | -52.21 | -52.21 |
| dBm/38.16 MHz | 3 | -46.12 | -46.12 | -46.12 | -46.12 |
| Treselection | s | 1, 2, 3 | 0 | 0 | 0 | 0 |
| Sintrasearch | dB | 1, 2, 3 | 60 | | 60 | |
| SsearchDeltaP | dB | 1, 2, 3 | Not sent | Not sent | Not sent | Not sent |
| SsearchThresholdP | dB | 1, 2, 3 | 50 | Not sent | Not sent | 50 |
| Propagation Condition |  | 1, 2, 3 | 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.6.1.1.3.3 Test Requirements

The Cell re-selection delay to an already detected Cell for UE configured with *cellEdgeEvaluation* criterion is defined as the time from the beginning of time period T1, 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 an already detected Cell for UE configured with *cellEdgeEvaluation* criterion shall be less than 17s.

NOTE: The Cell re-selection delay to an already detected Cell for UE configured with relaxed measurement criterion can be expressed as: Tevaluate, NR\_ intra + TSI-NR,

Where:

Tevaluate, NR\_ intra See Table 4.2.2.9.3-1 for UE fulfilling not-at-cell edge criterion in clause 4.2.2.9.3.

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

This gives a total of 16.64s, allow 17s for the Cell re-selection delay to an already detected Cell for UE fulfilling *cellEdgeEvaluation* criterion in the test case.

## **--------------End of change-------------**