**3GPP TSG-RAN4 Meeting #111 *R4-2408175***

**Fukuoka City, Fukuoka , Japan, 20th – 24th May, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** |  | **rev** |  | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](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 |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | DraftCR on inter-frequency subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CMCC | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_Mob\_enh2-Perf | | | | |  | ***Date:*** | | | 2024-05-07 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | The endorsed draftCR on test case on inter-frequency CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC was endorsed in last meeting and was captured in the draft Big CR (R4-2406514). However, it was found that TEvent\_DU is missing for subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | TEvent\_DU is added for subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC. The changes are based on the endorsed draft Big CR (R4-2406514). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The spec is not correct. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.7.5.X.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## << Start of 1st change >>

#### A.7.5.X.2 Inter-frequency subsequent CPA from FR1-FR2 NR-DC to FR1-FR2 NR-DC

##### A.7.5.X.2.1 Test Purpose and Environment

The purpose of this test is to verify that the sunsequent conditional NR PSCell addition under NR-DC are within the requirements stated in clause 8.9C.2.

Supported test configurations are shown in A.7.5.X.2.1-1. The test parameters for the NR cell 1 are given in Table A.3.7A. The NR cell 1 once set up is not changed across time.

The test parameters for NR cell 2, NR cell 3 are given in Tables A.7.5.X.2.1-2, cell-specific parameters in A.7.5.X.2.1-3 and OTA parameters in A.7.5.X.2.1-4 below. The test comprises of three NR carrier. There are three cells and one cell on each carrier. Before the test starts the UE is connected to Cell 1 (NR PCell) on radio channel 1, but is not aware of Cell 2 (NR candidate NR PSCell 1) on radio channel 2 and Cell 3 (NR candidate PSCell 2) on radio channel 3. The test consists of four successive time periods with duration of T1, T2, T3, T4.

During T1, the UE does not have any timing information of Cell 2 and Cell 3. The TE shall configure subsequent conditional PSCell addition/change with Cell 2 and Cell 3 as target PSCells during T1, at a time earlier than TRRC\_delay before the beginning of T2.

At the start of T2, Cell 2 becomes detectable and meets the PSCell addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which the UE shall transmit the PRACH preamble to Cell 2. Upon PSCell addition complete (UE transmits SN RRCReconfigurationcomplete message), T3 starts.

During T3, the TE shall send a RRC message to the UE to release PSCell (Cell 2) on radio channel 2. Upon PSCell release complete (UE transmits SN RRCReconfigurationcomplete message), T4 starts.

At the start of T4, Cell 3 becomes detectable and meets the addition condition. UE shall be able to measure and detect that the condition is fulfilled, after which UE shall send PRACH to the PSCell (Cell 3).

Table A.7.5.X.2.1-1: Supported test configurations for FR2 PSCell

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | Cell 1: FDD15 kHz SSB SCS, 10 MHz bandwidth,  Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidth  Cell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| 2 | Cell 1: TDD 15 kHz SSB SCS, 10 MHz bandwidth,  Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidth  Cell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| 3 | Cell 1: TDD 30 kHz SSB SCS, 40 MHz bandwidth,  Cell 2: TDD 120kHz SSB SCS, 100MHz bandwidth  Cell 3: TDD 120kHz SSB SCS, 100MHz bandwidth |
| Note: The UE is only required to be tested in one of the supported test configurations | |

Table A.7.5.X.2.1-2: General Test Parameters for subsequent CPA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Value** | **Comment** |
| RF Channel Number | |  | 1, 2, 3 | Three NR radio channels are used for this test. |
| Initial | Active serving cells |  | Cell1, Cell2 | Cell1: NR PCell on RF channel number 1  Cell2:NR PSCell on RF channel number 2 |
| Condition | Neighbour cell |  | Cell3 | Neighbour cell on RF channel number 3 |
| Final | Active serving cells |  | Cell1, Cell3 | Cell1: PCell on RF channel number 1  Cell3:NR PSCell on RF channel number 3 |
| Condition | Neighbour Cell |  | Cell2 | Neighbour cell on RF channel number 2. |
| A1 | Hysteresis | dB | 0 | Hysteresis for evaluation of event A1. |
|  | Threshold RSRP | dBm | -118 | Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in clause 10.1.4.1 into account plus margin. |
|  | Time to Trigger | s | 0 |  |
| DRX | |  | OFF | Continuous monitoring of primary cell |
| Gap pattern ID | |  | gp0 |  |
| PRACH configuration on cell3 | |  | FR2 configuration 2 | Captured in A.3.8.3.2 |
| Cell-individual offset for cells on RF channel number 1 | | dB | 0 | Individual offset for cells on primary component carrier. |
| Cell-individual offset for cells on RF channel number 2 | | dB | 0 | Individual offset for cells on carrier frequency of cell2. |
| Cell-individual offset for cells on RF channel number 3 | | dB | 0 | Individual offset for cells on carrier frequency of cell3. |
| T1 | | s | 1 | UE is connected to Cell 1 (NR PCell) on radio channel 1, but is not aware of Cell 2 (NR PSCell 1) on radio channel 2 and Cell (NR PSCell 2) on radio channel 3 |
| T2 | |  | <7 | During this time PSCell 1 meets the PSCell addition condition and the UE adds the PSCell (cell 2). |
| T3 | | s | 1 | During this time the UE releases the PSCell (cell 2). |
| T4 | | s | <7 | During this time PSCell 2 meets the PSCell addition condition and the UE adds the PSCell (cell 3). |

Table A.7.5.X.2.1-3: Cell Specific Parameters for subsequent CPA (cell 2, cell 3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Config** | **Test** | | | |
|  |  |  | **T1** | **T2** | **T3** | **T4** |
| NR Channel Number |  | 1,2,3 | 2 for cell 2, 3 for cell 3 | | | |
| Duplex Mode |  | 1,2,3 | TDD | | | |
| TDD configuration |  | 1,2,3 | TDDConf.3.1 | | | |
| BWchannel | MHz | 1,2,3 | 100: NRB,c = 66 | | | |
| Data RBs allocated |  | 1,2,3 | 48 | | | |
| Initial BWP Configuration |  | 1,2,3 | DLBWP.0.1  ULBWP.0.1 | | | |
| Dedicated BWP Configuration |  | 1,2,3 | DLBWP.1.1  ULBWP.1.1 | | | |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD | | | |
| PDSCH/PDCCH TCI state |  | 1,2,3 | TCI.State.2 | | | |
| PDSCH Reference measurement channel |  | 1,2,3 | SR.3.3 TDD | | | |
| RMSI CORESET Reference Channel |  | 1,2,3 | CR.3.2 TDD | | | |
| Dedicated CORESET Reference Channel |  | 1,2,3 | CCR.3.7 TDD | | | |
| OCNG Patterns |  | 1,2,3 | OP.3 | | | |
| SSB configuration |  | 1,2,3 | SSB.2 FR2 | | | |
| SMTC configuration |  | 1,2,3 | SMTC.2 | | | |
| PDSCH/PDCCH subcarrier spacing | kHz | 1,2,3 | 120 | | | |
| TRS Configuration |  | 1,2,3 | TRS.2.1 TDD | | | |
| CSI-RS configuration for CSI reporting |  | 1,2,3 | CSI-RS.3.1 TDD | | | |
| reportConfigType |  | 1,2,3 | periodic | | | |
| reportQuantity |  | 1,2,3 | cri-RI-PMI-CQI | | | |
| CSI reporting periodicity | slot | 1,2,3 | 40 | | | |
| CSI reporting offset | slot | 1,2,3 | 4 | | | |
| EPRE ratio of PSS to SSS | dB | 1,2,3 | 0 | | | |
| EPRE ratio of PBCH DMRS to SSS |  |  |  | | | |
| EPRE ratio of PBCH to PBCH DMRS |  |  |  | | | |
| EPRE ratio of PDCCH DMRS to SSS |  |  |  | | | |
| EPRE ratio of PDCCH to PDCCH DMRS |  |  |  | | | |
| EPRE ratio of PDSCH DMRS to SSS |  |  |  | | | |
| EPRE ratio of PDSCH to PDSCH |  |  |  | | | |
| EPRE ratio of OCNG DMRS to SSS(Note 1) |  |  |  | | | |
| EPRE ratio of OCNG to OCNG DMRS (Note 1) |  |  |  | | | |
| Propagation condition |  | 1,2,3 | AWGN | | | |

Table A.7.5.X.2.1-4: OTA related test parameters

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 2** | | | | | **Cell 3** | | | |
| **T1** | | **T2** | **T3** | **T4** | **T1** | **T2** | **T3** | **T4** |
| Angle of arrival configuration |  | Setup 2a according to clause A.3.15.2.1 | | | | | Setup 2a according to clause A.3.15.2.1 | | | |
| Assumption for UE beamsNote 6 |  | Rough | | | | | Rough | | | |
| Ês Note2 | dBm/SCS | -∞ | -81 | | -∞ | | -∞ | | | -81 |
| SSB\_RPNote2, Note 4 | dBm/SCS | -∞ | -81 | | -∞ | | -∞ | | | -81 |
| BB Note 2, Note 7 | dB | -∞ | 4.88 | | -∞ | | -∞ | | | 4.88 |
| IoNote 2, Note 4 | dBm/95.04 MHz | N/A | -56.41 | | N/A | | N/A | | | -56.41 |
| Note 1: Void  Note 2: Es/Iot, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: Void  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: Void  Note 6: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 7: Calculation of Es/IotBB includes the effect of UE internal noise up to the value assumed for the associated Refsens requirement in clause 7.3.2 of TS 38.101-2 [19], and an allowance of 1dB for UE multi-band relaxation factor ΔMBS from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | | | | |

##### A.7.5.X.2.2 Test Requirements

TRRC\_delay + TEvent\_DU for PSCell addition (Cell 2) occurs during T1 as the PSCell addition condition becomes satisfied at the start of T2. The test shall verify that there are no interruptions during T1.

The UE shall transmit the PRACH to PSCell (Cell 2) less than Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms from the start of T2.

The UE shall transmit the PRACH to PSCell (Cell 3) less than Tconfig\_PSCell\_Addition\_Conditional Note1 from the start of T4.

All the above test requirements shall be fulfilled for the observed PSCell addition delay and PSCell release delay to be counted as correct. The rate of correct observed PSCell addition delay and PSCell release delay during repeated tests shall be at least 90%.

Note 1: The PSCell addition delay during T4 can be expressed as follows:

Tconfig\_PSCell\_Addition\_Conditional = TEvent\_DU + Tmeasure + TUE\_preparation + Tprocessing + T∆ + TPSCell\_ DU + 2 ms

Where:

TEvent\_DU = 0

Tmeasure = 6720ms for power class 1 or 4160 for power class 2/3/4

TUE\_preparation = 10ms

Tprocessing = 40ms

T∆ = 20ms

TPSCell\_ DU = 1\*10+10 = 20 ms

<< End of 1st change >>