**3GPP TSG-RAN WG4 Meeting # 112 *R4-2412182***

**Maastricht, Netherlands, 19th – 23rd August, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4775** | **rev** | **1** | **Current version:** | **17.14.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](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 | **X** | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | (NR\_RRM\_enh2-Perf) CR on TC maintenance for PUCCH Scell activation R17 (Cat F) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_RRM\_enh2-Perf | | | | |  | ***Date:*** | | | 2024-08-01 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | In TC A.5.5.3.12 there are following errors:   * The TC is for unknown PUCCH + unknown SCell activation, the description about the transmission time of activation MAC CE is unnecessary. * There is TBD in the table. * X value shall be updated to 3 which is agreed in the core discussion. * Some typo correction. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Remove unnecessary description about the transmission time of activation MAC CE. * Update the TBD value in the table. * Update X value to 3 which is agreed in the core discussion. * Typo correction. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The TC can not be correctly implemented. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.5.5.3.12 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 Change 1>

A.5.5.3.12 SCell Activation and deactivation of unknown PUCCH SCell and unknown DL SCell in FR2 in non-DRX

A.5.5.3.12.1 Test Purpose and Environment

The purpose of this test is to verify that the PUCCH SCell and DL SCell activation and deactivation times are within the requirements stated in clause 8.3.13, when the PUCCH SCell in FR2 and DL SCell in FR2 is unknown to the UE at the time of activation.

The supported test configurations are shown in table A.5.5.3.12.1-1 below. The test parameters are given in Tables A.5.5.3.12.1-2 and cell-specific parameters in A.5.5.3.12.1-3 below. OTA related test parameters are shown in table A.5.5.3.12.1-4.

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are four carriers, each with one cell. Before the test starts the UE is connected to Cell 1(PCell) on the E-UTRA carrier and Cell 2 (PSCell) on the NR carrier in FR1, but is not aware of Cell3 (PUCCH SCell1) and Cell4(DL SCell2) on the NR carriers both in FR2. The UE is monitoring the PCell and PSCell. The UE shall be continuously scheduled in the PCell and PSCell throughout the whole test. SCC of Cell 3 and SCC of Cell 4 are on a same band.

At the beginning of T1 the UE receives an RRC message by which the Cell 3 and Cell 4 becomes configured on NR. The test equipment sends a single MAC message for activation of both SCells.

The point in time at which the MAC message is received at the UE antenna connector, in a slot # denoted m, defines the start of time period T2. In the same MAC PDU, the test equipment activates the TCI state of RMC CORESET. In slot #m, the test equipment also sends an RRC message to configure the CSI-RS resources for Cell3 and Cell4.

Time period T3 starts when a MAC message for deactivation of SCell, sent from the test equipment to the UE in a slot # denoted n, is received at the UE antenna connector.

The test equipment verifies the activation time by counting the slots from the time when the SCell activation command is sent until a CSI report with other than CQI index 0 is received.

The test equipment verifies the deactivation time by counting the slots from the time when the SCell deactivation command is sent until CSI reporting for SCell is discontinued.

**Table A.5.5.3.12.1-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | LTE FDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| 2 | LTE TDD, NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to be tested in one of the supported test configurations | |

**Table A.5.5.3.12.1-2: General test parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Unit** | **Value** | **Comment** |
| RF Channel Number |  | 1,2,3,4 | One E-UTRAN radio channel (1) and three NR radio channels (2,3,4) are used for this test |
| Active PCell |  | Cell 1 | Primary cell on E-UTRAN RF channel number 1.  As specified in clause A.3.7.2.2 |
| Active PSCell |  | Cell 2 | Primary secondary cell on NR RF channel number 2 in FR1. |
| Configured deactivated SCells |  | Cell 3 (PUCCH SCell 1), Cell 4(DL SCell 2) | Configured deactivated secondary cell on NR RF channel number 3 and RF channel number 4, both in FR2 |
| CP length |  | Normal |  |
| DRX |  | OFF | Continuous monitoring of primary cell |
| SCell measurement cycle (measCycleSCell) | ms | 160 | For both Cell 3 and Cell 4 |
| TimeAlignmentTimer | ms | 1280 | Cell 1 and Cell 2 in pTAG. |
| TimeAlignmentTimerSTAG | ms | 1280 | Cell 3 and Cell 4 in sTAG |
| T1 | s | 1 | During this time Cell 3 and Cell 4 is configured and undetected. |
| T2 | s | 2 | During this time the UE shall activate the SCell. |
| T3 | s | 1 | During this time the UE shall deactivate the SCell. |
| THARQ | ms | k1NR slot length | k1 is a number of slots indicated by the PDSCH-to-HARQ\_feedback timing indicator field in a corresponding DCI format or provided by *dl-DataToUL-ACK* if the PDSCH-to-HARQ feedback timing field is not present in the DCI format, the value is defined in 38.213 [3] |
| k | slot |  | As specified in clause 4.3 of TS 38.213 [3] |

**Table A.5.5.3.12.1-3: Cell specific test parameters**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Cell 2** | | | **Cell 3** | | | **Cell 4** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| **SSB ARFCN** | |  | **freq1** | | | **freq2** | | | **freq3** | | |
| Duplex mode | Config 1,2 |  | TDD | | | | | | | | |
| TDD configuration | Config 1,2 |  | TDDConf.3.1 | | | | | | | | |
| BWchannel | Config 1,2 | MHz | 100: NRB,c = 66 | | | | | | | | |
| DL initial BWP configuration | Config 1,2 |  | DLBWP.0.1 | | | | | | | | |
| DL dedicated BWP configuration | Config 1,2 |  | DLBWP.1.1 | | | | | | | | |
| UL initial BWP configuration | Config 1,2 |  | ULBWP.0.1 | | | | | | | | |
| UL dedicated BWP configuration | Config 1,2 |  | ULBWP.1.1 | | | | | | | | |
| Timing offset to Cell 2 | | ms | Not Applicable | | | 0 | | | 0 | | |
| PDSCH Reference measurement channel | Config 1,2 |  | SR.3.1 TDD | | | SR.3.1 TDD | | | SR.3.1 TDD | | |
| RMSI CORESET Reference Channel | Config 1,2 |  | CR.3.1 TDD | | | CR.3.1 TDD | | | CR.3.1 TDD | | |
| RMC CORESET Reference Channel | Config 1,2 |  | CCR.3.1 TDD | | | CCR.3.1 TDD | | | CCR.3.1 TDD | | |
| TRS configuration | Config 1,2 |  | TRS.2.1 TDD | | | TRS.2.1 TDD | | | TRS.2.1 TDD | | |
| CSI-RS configuration | Config 1,2 |  | CSI-RS.3.1 TDD | | | N/A | CSI-RS.3.1 TDD | | N/A | CSI-RS.3.1 TDD | |
| CSI reporting periodicity | Config 1,2 | ms | 5 | | | 5 | | | 5 | | |
| OCNG Patterns | |  | OP.1 | | | | | | | | |
| SMTC configuration | |  | SMTC.1 | | | | | | | | |
| SSB configuration | Config 1,2 |  | SSB.1 FR2 | | | SSB.1 FR2 | | | N/A | SSB.1 FR2 | |
| EPRE ratio of PSS to SSS | | dB | 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 | | - | 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. | | | | | | | | | | | |

**Table A.5.5.3.12.1-4: OTA related test parameters**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ParameterNote 6** | **Unit** | **Cell 2** | | | **Cell 3** | | | **Cell 4** | | |
|  |  | **T1** | **T2** | **T3** | **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| Angle of arrival configuration |  | NA | | | Setup 1 according to A.3.15.1 | | | | | |
| Assumption for UE beamsNote 7 |  | NA | | | Rough | | | Rough | | |
| Note1 | dBm/15kHzNote4 | Link only, see clause  A.3.7A | | | -112 | | | -112 | | |
| Note1 | dBm/SCSNote3 | -102.97 | | | -102.97 | | |
|  | dB | - | 14 | 14 | - | 14 | 14 |
| SS-RSRPNote2 | dBm/SCS Note4 | - | -88.97 | -88.97 | - | -88.97 | -88.97 |
|  | dB | - | 14 | 14 | - | 14 | 14 |
| IoNote2 | dBm/95.04 MHz Note4 | -73.98 | -59.81 | -59.81 | -73.98 | -59.81 | -59.81 |
| Note 1: 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 2: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 3: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 4: Equivalent power received by an antenna with 0dBi gain at the centre of the quiet zone  Note 5: As observed with 0dBi gain antenna at the centre of the quiet zone  Note 6: All parameters apply for configuration 1 and 2  Note 7: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation | | | | | | | | | | |

A.5.5.3.12.2 Test Requirements

During T2 the UE shall send the first CSI report for SCell in the first available uplink resource after slot (m+k). UE is allowed to postpone CSI report to next available UL resource if an available uplink resource is subject to interruption. Whether CSI report in a slot was interrupted is checked by monitoring ACK/NACK sent in PSCell in the slot.

During T2 the UE shall start sending CSI reports for SCell1 with non-zero CQI index in the configured slots for CSI reporting no later than slot , where

THARQ is defined in Table A.5.5.3.12.1-2

Tdelay\_multiple\_SCells\_PUCCH\_SCell is defined in section 8.13.13.1. In this test case, both valid TA and invalid TA cases shall be tested.

Test for case when UE has valid TA: the *TimeAlignmentTimer* [2] associated with the TAG containing the PUCCH SCell is running, and Tdelay\_multiple\_SCells\_PUCCH\_SCell = Tactivation\_time\_multiple\_scells + 3\*Ttarget\_PL\_RS + TCSI\_Reporting .

Test for case when UE do not have valid TA: Tdelay\_multiple\_SCells\_PUCCH\_SCell = Tactivation\_time\_multiple\_scells + max ((TFirst\_available\_CSI + TCSI\_processing), 3\*Ttarget\_PL\_RS,(T1+T2+T3)) + TCSI\_reporting\_after

Tactivation\_time\_multiple\_scells is the target SCell activation delay in millisecond in multiple SCell activation scenario as specified in section 8.3.7

TCSI\_Reporting = 10ms

- NR slot length is 0.125ms.

During T2 the UE shall start sending CSI reports for SCell2 with non-zero CQI index in the configured slots for CSI reporting no later than slot where

THARQ is defined in Table A.5.5.3.12.1-2

Tdelay\_multiple\_SCells\_other\_SCell = Tactivation\_time\_multiple\_scells +TCSI\_Reporting.

- Tactivation\_time\_multiple\_scells is the target SCell activation delay in millisecond in multiple SCell activation scenario as specified in section 8.3.7

TCSI\_Reporting = 10ms

NR slot length is 0.125ms.

During T3 the UE shall stop sending CSI reports for both SCells no later than slot , as defined in clause 8.3.14.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

NOTE: During T2 if there are no uplink resources for reporting the valid CSI in a slot , as defined in clause 8.3.13 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

### <End of Change 1>