**3GPP TSG-RAN4 Meeting #112 *R4-241xxxx***

**Maastricht, The Netherlands, 19 – 23 August, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | 4853 | **rev** | 1 | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** | CR on TCs for Case 1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_MG\_enh2-Perf | | | | |  | ***Date:*** | | | 2024-08-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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:*** | | There are some issues with Con-Pre-MG TC4:   1. The test requirements states that UE shall not be able to receive PDSCH in certain slot. This is not aligned with core requirements where UE is not required to receive PDSCH in those slot. 2. The test requirements on measurement delay are incorrect. 3. Some other error is test configuration, e.g. in Con-Pre-MG TC3 the Es/Iot for cell 3 should be same as Es/Noc as there is no other cell on the same carrier as cell 3; in Con-Pre-MG TC3 the gap offset 4 makes it impossible for UE to measure cell 1 and trigger A3 event. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update Con-Pre-MG TC4:   1. Improve the wording related to UE schedulability such that we define in which slots UE is not required to receive PDSCH. 2. Correct the test requirements on measurement delay. 3. Other corrections to the test configurations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Con-Pre-MG TC4 are incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.7.6.18.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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.7.6.18.1 Inter-frequency measurement test with SA event triggered reporting tests: with autonomous activation/deactivation of Pre-MGs in FR2

A.7.6.18.1.1 Test purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event with autonomous activation/deactivation of Pre-MGs within FR2 concurrent gaps. This test will partly verify the TDD inter-frequency cell search requirements in clause 9.2.6.and 9.3.4. Also, this test will also jointly verify pre-configured measurement gap activation/deactivation delay in clause 8.19.2.

A.7.6.18.1.2 Test parameters

Two cells are deployed in the test, which are FR2 PCell (Cell 1) in FR1 on NR RF channel 1 and a neighbour cell (Cell 2) in FR2 on NR RF channel 2. The supported test configurations are shown in Table A.7.6.18.1.2-1. The test parameters for the Cell 1 and Cell 2 are given in Table A.7.6.18.1.2-2, A.7.6.18.1.2-3 and A.7.6.x21.2-4 below.

Two pre-configured measurement gaps with same pattern (# 13) but different offset as defined in Table A.7.6.18.1.1-2 are provided for UE. The measurement object for NR RF channel 1 is associated with MG#1, and measurement object for NR RF channel 2 is associated with MG#2.

In the measurement control information, two measurement object is configured for the frequency of the PCell and neihghbour cell, and it is indicated to the UE that event-triggered reporting with Event A3 is used.

Before the test starts,

UE is connected to Cell 1 (PCell) on radio channel 1 (PCC).

UE is configured with 2 different UE-specific bandwidth parts for Cell 1 (PCell), BWP-1 and BWP-2, before starting the test.

BWP-1 includes bandwidth of the initial DL BWP and SSBs.

BWP-2 does not include bandwidth of the initial either switched DL BWP and SSBs.

UE is indicated in *firstActiveDownlinkBWP-Id* that the active DL BWPis BWP-1 in PCell.

The TE schedules continuous DL data on PCell throughout the test.

The test consists of 3 successive time periods, with durations of T1, T2 and T3, respectively.

During time period T1, BWP-1 is the active BWP. The Pre-MG#1 is expected to be deactivated and the Pre-MG#2 is expected to be activated. UE shall be able to measure Cell1 without gap but Cell2 with the activated Pre-MG#2.

The time period T2 starts when a DCI format 1\_1 command for PCell DL BWP switch, sent from the test equipment to the UE, is received at the UE side in PCell’s slot # denoted *i*.

During time period T3, BWP-2 is the active BWP. Both Pre-MG#1 and Pre-MG#2 expected to be activated. UE shall be able to measure Cell1 and Cell2 with the activated Pre-MG#1 and Pre-MG#2 respectively.

**Table A.7.6.18.1.2-1: supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

**Table A.7.6.18.1.2-2: General test parameters for intra-frequency event triggered reporting with autonomous activation/deactivation of Pre-MG**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| Active cell |  | Config 1 | PCell (Cell 1) |  |
| Neighbour cell |  | Config 1 | Cell 2 | Cells to be identified. |
| RF Channel Number |  | Config 1 | 1: Cell 1 , 2: Cell 2 |  |
| SMTC configuration |  | Config 1 | SMTC.1 | Same configuration for MO1 and MO2 |
| A4-Threshold | dBm | Config 1 | -120 |  |
| CP length |  | Config 1 | Normal |  |
| Hysteresis | dB | Config 1 | 0 |  |
| Time To Trigger | s | Config 1 | 0 |  |
| Filter coefficient |  | Config 1 | 0 | L3 filtering is not used |
| DRX |  | Config 1 | OFF |  |
| Gap Pattern Id |  | Config 1 | 13 | For both pre-conifgured gaps |
| Measurement gap offset | ms | Config 1 | 9 for MeasGapId #1  19 for MeasGapId #2 | No overlapping cases |
| Time offset between serving and neighbour cells |  | Config 1 | 3 μs | Synchronous cells |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 0.2 |  |
| T3 | s | Config 1 | 10.4 for PC1 and PC5; 6.5 for other PC |  |

**Table A.7.6.18.1.2-3: NR Cell specific test parameters for intra-frequency event triggered reporting with autonomous activation/deactivation of Pre-MG**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
|  |  | **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| TDD configuration |  | TDDConf.3.1 | | | TDDConf.3.1 | | |
| BWchannel | MHz | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | |
| Data RBs allocated |  | 24 | | | 24 | | |
| Intial BWP configuration |  | DLBWP.0.1  ULBWP.0.1 | | | DLBWP.0.1  ULBWP.0.1 | | |
| BWP-1 Configuration |  | DLBWP.1.6  ULBWP.1.6 | | | N/A | | |
| BWP-2 Configuration |  | DLBWP.1.5  ULBWP.1.5 | | | N/A | | |
| RLM-RS |  | CSI-RS | | | N/A | | |
| PDSCH RMC configuration |  | SR.3.2 TDD | | | N/A | | |
| RMSI CORESET RMC configuration |  | CR.3.1 TDD | | | N/A | | |
| Dedicated CORESET RMC configuration |  | CCR.3.1 TDD | | | N/A | | |
| TRS configuration |  | TRS.2.1 TDD | | | N/A | | |
| PDSCH/PDCCH TCI states |  | TCI.State.2 | | | N/A | | |
| PDSCH/PDCCH subcarrier spacing | kHz | 120 | | | 120 | | |
| OCNG Patterns |  | OP.5 | | | N/A | | |
| cellIndividualOffset | dB | N/A | | | 16 | | |
| SSB |  | SSB.1 FR2 | | | SSB.7 FR2 | | |
| Propagation Condition |  | AWGN | | | AWGN | | |

**Table A.7.6.18.1.2-4: NR OTA Cell specific test parameters for intra-frequency event triggered reporting with automous activation/deactivation of Pre-MG**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Cell 1** | | | **Cell 2** | | |
| **T1** | **T2** | **T3** | **T1** | **T2** | **T3** |
| AoA setup |  | Setup 3 defined in A.3.15.3 | | | | | |
| AoA1 | | | AoA2 | | |
| Beam assumptionNote 3 |  | Rough | | | Rough | | |
| Es | dBm/SCS | -89 | -89 | -89 | -infinity | -89 | -89 |
| BB Note 4 | dB | -0.12 | -0.12 | -0.12 | -Infinity | -0.12 | -0.12 |
| SSB\_RP | dBm/SCS | -89 | -89 | -89 | -infinity | -89 | -89 |
|  | dBm/95.04MHz | -64.41 | -64.41 | -64.41 | -Infinity | -64.41 | -64.41 |
| Time multiplexing of the downlink transmissions from each AoA | | Defined in Figure A.7.6.1.1.1-1 | | | | | |
| Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.  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: Information about types of UE beam is given in B.2.1.3, and does not limit UE implementation or test system implementation  Note 4: 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 ΔMBP from TS 38.101-2 [19] Table 6.2.1.3-4. | | | | | | | |

A.7.6.18.1.3 Test Requirements

During T1, the UE shall be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots that are not overlapped with the Pre-MG#2 occasions.

During T2 and T3, the UE shall be able to receive PDSCH and report corresponding valid ACK/NACK for those PDSCHs scheduled in the slots that are not overlapped with the Pre-MG#1 or Pre-MG#2 occasions, starting from the 1st complete Pre-MG#1 occasion after the beginning of PCell’s DL slot (*i+TBWPswitchDelay*) + 5ms as defined in clause 8.19.5.

The UE shall send one Event A3 triggered measurement report for measurements on cell 2, with a measurement reporting delay less than Y ms from the beginning of time period T3, where Y is

- 5120ms for a UE supporting power class 1 and 5,

- 3200ms for a UE supporting power class 2, 3 and 4

The UE is not required to read the neighbour cell SSB index in this test.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

<End of Change 1>