**3GPP TSG- RAN4 Meeting # 111 *R4-2408593***

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **-** | **rev** |  | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Test case for SA event triggered reporting for Rel-18 FR2 HST inter-frequency measurement with SSB time index detection when DRX is not used (Pcell in FR2) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_HST\_FR2\_enh-Perf | | | | |  | ***Date:*** | | | 2024-04-29 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | On top of endorsed big CR [R4-2403320], update the test case for SA event triggered reporting for Rel-18 FR2 HST inter-frequency measurement with SSB time index detection when DRX is not used (Pcell in FR2). In original test, three cells are configured where cell1 is PCell, Cell2 is SCell (intra-band CA) and cell 3 is inter-frequency neighbor cell. In RAN4#110bis meeting, it is agreed to simplify the test, and not to verify intra-band CA. Therefore two cells are set in the TC. | | | | | | | | |
| ***s*** | |  | | | | | | | | |
| ***Summary of change:*** | | Update the test case for SA event triggered reporting for Rel-18 FR2 HST inter-frequency measurement with SSB time index detection when DRX is not used (Pcell in FR2). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | SA event triggered reporting requirements for Rel-18 FR2 HST inter-frequency measurement with SSB time index detection when DRX is not used (Pcell in FR2) is not verified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | New Clause A.7.6.2.X | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS38.533 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

#### A.7.6.2.X SA event triggered reporting tests with SSB time index detection when DRX is not used (PCell in FR2) for FR2 power class 6 UE configured with *highSpeedMeasFlagFR2-r17*

##### A.7.6.2.X.1 Test Purpose and Environment

The purpose of this test is to verify that the PC6 UE makes correct reporting of an event when UE supporting *measEnhCAInterFreqFR2-r18*is configured with *highSpeedMeasInterFreq-r17*. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.4.

In this test, there are two cells: NR cell 1 as PCell in FR2 on NR carrier 1(RF channel 1) and NR cell2 as neighbor cell in FR2 on NR carrier 2(RF channel 2).. The test parameters and configurations are given in Tables A.7.6.2.X.1-1, A.7.6.2.X.1-2, and A.7.6.2.X.1-3.

Measurement gap pattern configuration defined in Table A.7.6.2.X.1-2 is provided for a UE that does not support per-FR gap, and no gap pattern (Gap Pattern Id and Measurement gap offset) is configured for a UE capable of per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 3.

Supported test configurations are shown in table A.7.6.2.X.1-1.

Table A.7.6.2.X.1-1: SA event triggered reporting tests with SSB index reading for FR2 power class 6 UE configured with highSpeedMeasFlagFR2-r17

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

Table A.7.6.2.X.1-2: General test parameters for SA inter-frequency event triggered reporting with SSB time index detection for R2 power class 6 UE configured with highSpeedMeasFlagFR2-r17

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Value | Comment |
| NR RF Channel Number |  | Config 1 | 1, 2 | Three FR2 NR carrier frequencies are used. |
| Active cell |  | Config 1 | NR cell 1 (Pcell) | NR Cell 1 is on NR RF channel number 1. |
| Neighbour cell |  | Config 1 | NR cell 2 | NR cell 2 is on NR RF channel number 2. |
| Gap Pattern Id |  | Config 1 | 13 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1 | 39 |  |
| SMTC-SSB parameters |  | Config 1 | SSB.3 FR2 | As specified in clause A.3.10.2 |
| offsetMO | dB | Config 1 | 16 | Applied to NR Cell 2 measurement object |
| A3-Offset | dB | Config 1 | -11 |  |
| Hysteresis | dB | Config 1 | 0 |  |
| CP length |  | Config 1 | Normal |  |
| TimeToTrigger | s | Config 1 | 0 |  |
| Filter coefficient |  | Config 1 | 0 | L3 filtering is not used |
| DRX |  | Config 1 | OFF | DRX is not used |
| *highSpeedMeasFlagFR2-r17* |  | Config 1 | Set 2 |  |
| Time offset between serving and neighbour cells |  | Config 1 | 3μs | Synchronous cells. |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 4.5 for PC6 |  |

Table A.7.6.2.X.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR2 with SSB time index detection for FR2 power class 6 UE configured with highSpeedMeasFlagFR2-r17

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | |  | |  | |
|  | |  |  |  |  |  |  |  |  |
|  | |  |  |  | | | | | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  |  |  |  |  | |  | |  | |
|  |  |  |  |  | |  | |  | |
|  |  |  |  |  | |  | |  | |
|  |  |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  | |  | |  | |
|  | |  |  |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |  |  |
|  | |  |  |  |  |  |  |  |  |
|  | |  |  |  | | | |  | |
|  | | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Cell 1 | | Cell 2 | |
|  | |  |  | T1 | T2 | T1 | T2 |
| AoA setup | |  | Config 1 | Setup 3 as specified in clause A.3.15 | | | |
| AoA1 | | AoA2 | |
| Beam AssumptionNote 7 | |  | Config 1 | Rough | | Rough | |
| NR RF Channel Number | |  | Config 1 | 1 | | 2 | |
| Duplex mode | |  | Config 1 | TDD | | TDD | |
| TDD configuration | |  | Config 1 | TDDConf.3.1 | | TDDConf.3.1 | |
| BWchannel | | MHz | Config 1 | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| Data RBs allocated | |  | Config 1 | 66 | | 66 | |
| BWP BW | | MHz | Config 1 | 100: NRB,c = 66 | | 100: NRB,c = 66 | |
| BWP configuration | Initial DL BWP |  | Config 1 | N/A | | DLBWP.0.1 | |
|  | Initial UL BWP |  |  | N/A | | ULBWP.0.1 | |
|  | Dedicated DL BWP |  |  | N/A | | DLBWP.1.1 | |
|  | Dedicated UL BWP |  |  | N/A | | ULBWP.1.1 | |
| OCNG Patterns defined in A.3.2.1.1 | |  | Config 1 | OP.1 | | OP.1 | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.3.1 TDD | | - | |
| CORESET Reference Channel | |  | Config 1 | CR.3.1 TDD | | - | |
| SMTC configuration defined in A.3.11.1 and A.3.11.2 | |  | Config 1 | SMTC.1 | | SMTC.1 | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1 | 120 | | 120 | |
| TRS configuration | |  | Config 1 | TRS.2.1 TDD | | N/A | |
| PDSCH/PDCCH TCI state | |  | Config 1 | TCI.State.2 | | N/A | |
| EPRE ratio of PSS to SSS | |  |  |  | |  | |
| 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 | |  | Config 1 | 0 | | 0 | |
| 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) | |  |  |  | |  | |
| Ês | | dBm/SCS | Config 1 | -87 | -87 | -Infinity | -87 |
| SSBRP Note 3 | | dBm/SCS Note5 | Config 1 | -87 | -87 | -Infinity | -87 |
| BB Note 8 | | dB | Config 1 | 1.89 | 1.89 | -Infinity | 1.89 |
| Io Note3 | | dBm/95.04 MHz Note5 | Config 1 | -58.01 | -58.01 | -Infinity | -58.01 |
| Propagation Condition | |  | Config 1 | AWGN | | AWGN 19444Hz | |
| 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: Void  Note 3: SBRP, Es/Iot and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 5: As observed with 0 dBi gain antenna at the centre of the quiet zone  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.7.6.2.X.2 Test Requirements

In test 1 with per-UE gap and in test 2 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is 2160 ms according to the requirements defiend in Table 9.3.4-9 and Table 9.3.4-10 in clause 9.3.4

The UE is required to report SSB time index. 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>