**3GPP TSG-RAN4 Meeting #111 *R4-2410235***

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4319** | **rev** | **1** | **Current version:** | **17.13.0** |  |
|  | | | | | | | | |
| *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\_MG\_enh-Perf) Correction to A.7.6.15.3 Event triggered reporting test for FR2 concurrent gap | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Anritsu Corporation, MediaTek inc. | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_MG\_enh-Perf | | | | |  | ***Date:*** | | | 2024-05-22 |
|  |  | | | |  | |  | | |  |
| ***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 Table A.7.6.15.3.1-3, Io values for Cell 1 and Cell 3 are not specified correctly at both T1 and T2.  Especially, Io values during T2 cannot be same with ones during T1 considering the same SSB configurations between Cell 1 and Cell 3. Since SSBs for cell 1 and 3 should become interferer each other during T2, the Io at T2 becomes bigger than T1.  In Table A.7.6.15.3.1-3, SSB Es/Noc for cell 2 at T2 has a mistake in calculation based on the current SSB\_RP and Noc. It should be 9 dB instead of 6.3 dB. ( SSB Es/Noc = -86.7 – (-95.7) = 9.0)  Table A.7.6.15.3.1-3 does not fit within the page.  As the test including PRS based measurement, Note 1 in Table A.7.6.15.3.1-3 should align with the description of Note 1 in Table A.7.6.9.1.1-4, indicating that OCNG is not filled at the symbols where PRS exists. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Corrected Io values for Cell 1 and Cell 3 as follows.  Cell 1 Io at T1  -58.56 dBm/95.04 MHz -> -59.05 dBm/95.04 MHz  Cell 1 Io at T2  -58.56 dBm/95.04 MHz -> -55.32 dBm/95.04 MHz  Cell 3 Io at T1  -58.56 dBm/95.04 MHz -> -59.05 dBm/95.04 MHz  Cell 3 Io at T2  -57.2 dBm/95.04 MHz -> -55.32 dBm/95.04 MHz  Corrected SSB Es/Noc for cell 2 at T2.  6.3 dB -> 9.0 dB  Adjusted a width of Table A.7.6.15.3.1-3.  Corerected Note 1 and Note 3 in Table A.7.6.15.3.1-3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Wrong Io values and SSB Es/Noc remain in A.7.6.15.3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.7.6.15.3  **Isolated impact analysis:**  No change to UE requirements, changes test parameters only. | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Revised from R4-2407175.  Undo removal of the term “partial”.  Modified the explanation of correction with cell Es/Noc on the Reason for change on the CR coversheet.  Modified Note 1 and Note 3 in Table A.7.6.15.3.1-3. | | | | | | | | |

<<Unchanged sections skipped>>

<<Start of change>>

A.7.6.15.3 SA event triggered reporting tests for FR2 concurrent gap with partially partial overlapping scenario for SSB-based measurements and PRS-based measurement

A.7.6.15.3.1 Test Purpose and Environment

The purpose of this test is to verify that the concurrent gap capable UE makes correct reporting of events. This test will partly verify the SA inter-frequency NR cell search requirements in clause 9.3.4 and PRS-RSRP measurement delay requirements specified in clause 9.9.3.5.

In this test, there are three cells: NR cell 1 as PCell in FR2 on NR RF channel 1, NR cell 2 as neighbour cell in FR2 on NR RF channel 2, and NR cell 3 as neighbour cell in FR2 on NR RF channel 1. The test parameters are given in Tables A.7.6.15.3.1-1, A.7.6.15.3.1-2 and A.7.6.15.3.1-3.

Two measurement gap patterns (MeasGapId #0 and MeasGapId #1) are configured with the gap pattern ID #0 and #1 as defined in Table A.7.6.15.3.1-2. MeasGapId #1 is configured with a higher priority than MeasGapId #0. MeasGapId #0 and MeasGapId #1 are associated with the MOs for RF channel numbers #1 and #2, respectively.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used for carrier 2. 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 2 and NR cell 3. Cell 1 and cell 3 transmit PRS during T2.

The *NR-DL-AoD-RequestLocationInformation* message and *NR-DL-AoD-ProvideAssistanceData* message as defined in TS 37.355 shall be provided to the UE during T1. The last slot containing the two messages for the assistance data and location information request is denoted as #n.

The beginning of the time interval T2 shall be aligned with the beginning of the first MG instance of MeasGapId #1 containing the PRS resources that is ΔT after slot #n, where ΔT = 50 ms is the maximum processing time of the assistance data and location information request.

**Table A.7.6.15.3.1-1: SA event triggered reporting tests for FR2**

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

**Table A.7.6.15.3.1-2: General test parameters for SA inter-frequency event triggered reporting for FR2 concurrent gap with partially partial overlapping scenario for SSB-based measurements and PRS measurement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Unit** | **Test configuration** | **Value** | **Comment** |
| NR RF Channel Number |  | Config 1 | 1: Cell 1 and Cell 3  2: Cell 2 | Two TDD carrier frequencies are used for the NR cells. |
| Active cell |  | Config 1 | NR cell 1 (Pcell) | Cell 1 is the PCell and the DL-AoD reference cell in the positioning assistance data. |
| Neighbour cell |  | Config 1 | NR cell 2, NR cell 3 | Cell 2 is an inter-frequency cell neighbor cell  Cell 3 is a neighbour cell in the positioning assistance data. |
| Gap Pattern Id |  | Config 1 | 0 for MeasGapId #0  1 for MeasGapId #1 | As specified in clause 9.1.2-1. |
| Measurement gap offset |  | Config 1 | 7 for MeasGapId #0  11 for MeasGapId #1 |  |
| A3-Offset | dB | Config 1 | -6 |  |
| 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 |
| Time offset between cell 1 and neighbour cell 2 |  | Config 1 | 3μs | Synchronous cells. |
| Time offset between cell 1 and neighbour cell 3 |  | Config 1 | 3μs | Synchronous cells. |
| Expected RSTD between cell 1 and cell 3 | μs | Config 1 | 3 |  |
| Expected RSTD uncertainty between cell 1 and cell 3 | μs | Config 1 | 5 |  |
| T1 | s | Config 1 | 5 |  |
| T2 | s | Config 1 | 11 |  |

**Table A.7.6.15.3.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 concurrent gap with partially-partial overlapping scenario for SSB-based measurements and PRS measurement**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Cell 1** | | | **Cell 2** | | | **Cell 3** | | |
|  | |  | **T1** | **T2** | | **T1** | **T2** | | **T1** | | **T2** |
| AoA setup | |  | Config 1 | Setup 1 as specified in clause A.3.15 | | | | | | | | |
| Beam AssumptionNote 7 | |  | Config 1 | Rough | | | Rough | | | Rough | | |
| TDD configuration | |  | Config 1 | TDDConf.3.1 | | | TDDConf.3.1 | | | TDDConf.3.1 | | |
| Duplex mode | |  | Config 1 | TDD | | | TDD | | | TDD | | |
| BWchannel | | MHz | Config 1 | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | |
| BWP BW | | MHz | Config 1 | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | | 100: NRB,c = 66 | | |
| BWP configuration | Initial DL BWP |  | Config 1 | DLBWP.0.1 | | | N/A | | |  | | |
|  | Initial UL BWP |  |  | ULBWP.0.1 | | | N/A | | |  | | |
|  | Dedicated DL BWP |  |  | DLBWP.1.1 | | | N/A | | |  | | |
|  | Dedicated UL BWP |  |  | ULBWP.1.1 | | | N/A | | |  | | |
| OCNG Patterns | |  | Config 1 | OP.1 | | | OP.1 | | | OP.1 | | |
| PDSCH Reference measurement channel | |  | Config 1 | SR.3.1 TDD | | | - | | | - | | |
| CORESET Reference Channel | |  | Config 1 | CR.3.1 TDD | | | - | | | - | | |
| Dedicated CORESET RMC configuration | |  | Config 1 | CCR.3.1 TDD | | | - | | | - | | |
| TRS configuration | |  | Config 1 | TRS.2.1 TDD | | | - | | | - | | |
| PDSCH/PDCCH subcarrier spacing | | kHz | Config 1 | 120 | | | 120 | | | 120 | | |
| SSB parameters | |  | Config 1 | SSB.1 FR2 | | | SSB.1 FR2 | | | SSB.1 FR2 | | |
| SMTC configuration defined in A.3.11 | |  | Config 1 | SMTC.1 | | | SMTC.4 | | | SMTC.1 | | |
| PRS configuration | |  | Config 1 | PRS.1.1 FR2 | | | N/A | | | PRS.1.2 FR2 | | |
| PRS muting configuration | |  | Config 1 | ‘10’ | | | N/A | | | ‘01’ | | |
| 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 | | | 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) | |  |  |  | | |  | | |  | | |
| Note2 | | dBm/15kHz Note5 |  | -102 | | | -104.7 | | | -102 | | |
| Note2 | | dBm/SCS Note4 | Config 1 | -93 | | | -95.7 | | | -93 | | |
| SSB\_-RP Note 3 | | dBm/SCS Note5 | Config 1 | -89.7 | -89.7 | | -Infinity | | -86.7 | -Infinity | | -86.7 |
| SSB | | dB | Config 1 | 3.3 | 3.3 | | -Infinity | | 9.0 | -Infinity | | 6.3 |
| PRS-RSRP Note 3 | | dBm/SCS Note5 | Config 1 | -Infinity | -96 | | N/A | | N/A | -Infinity | | -103 |
| PRS | | dB | Config 1 | -Infinity | -3 | | N/A | | N/A | -Infinity | | -10 |
| PRS | | dB | Config 1 | -Infinity | -3 | | N/A | | N/A | -Infinity | | -10 |
|  | |  |  |  | | |  | |  |  | | |
| IoNote3 | | dBm/95.04 MHz Note5 | Config 1 | -59.05 | | -55.32 | -66.7 | | -57.2 | -59.05 | -55.32 | |
| Propagation Condition | |  | Config 1 | AWGN | | | | | | | | |
| Note 1: OCNG shall be used such that active cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the slots with transmitted PRS.  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/PRS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values were derived for symbols without PRS.  Note 4: PRS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.  Note 5: Equivalent power received by an antenna with 0 dBi gain at the centre of the quiet zone  Note 6: As observed with 0 dBi gain antenna at the centre of the quiet zone  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.7.6.15.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than X ms from the beginning of time period T2, where X is

10240 for UE supporting power class 1 and 5, or

6400 for UE supporting other power class.

The PRS RSRP measurement time fulfils the requirements specified in Clause 9.9.3.5. The UE shall perform and report the PRS RSRP measurements for Cell 3 with respect to the reference cell in the DL-AoD assistance data, Cell 1, within the time duration specified in section 9.9.3.5 starting from the beginning of time interval T2.

The rate of the correct events for the neighbour cell observed during repeated tests shall be at least 90%, where the reported PRS RSRP measurement for each correct event shall be within the PRS RSRP reporting range specified in Clause 10.1.24.3, i.e., between PRS RSRP\_0 and PRS RSRP\_126.

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%.

IUE is not required to report SSB time index.

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 >>