**3GPP TSG-RAN WG4 Meeting #112 R4-2411561**

**Maastricht, Netherland, Aug 19-23, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.133** | **CR** | 4689 | **rev** | 1 | **Current version:** | **18.6.0**  |  |
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| *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:***  | 38.133 CR on multilple SCell activation with L3 reporting |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R4 |
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| ***Work item code:*** | NR\_RRM\_enh3-Core |  | ***Date:*** | 2024-8-22 |
|  |  |  |  |  |
| ***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 canbe 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | 1. There may be the case where not all the unknown SCells are reported hence cell detection is still needed as discussed in R4-24xxxxx. This will complicate the activation delay requirement with L3 reporting.
2. For Tuncertainty\_MAC, Tuncertainty\_RRC, Tuncertainty\_SP, in this clause it explicitly refers to L3 reporting hence the other cases would not happen.
3. TSMTC is not defined in this clause.
4. Some errors and format misalignment.
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| ***Summary of change:*** | 1. Adding condition to assume all unknown SCells are reported so that cell detection is not needed on the FR1 band.

*Online Agreement:** + *Not define RAN4 requirement for the case where not all the unknown to-be-activated SCells are reported in the L3 reporting and cell detection is still needed on some of the unknown SCells on the same FR1 band.*
1. For Tuncertainty\_MAC, Tuncertainty\_RRC, Tuncertainty\_SP, make it clear it refers to L3 reporting and remove the other two cases.
2. Define TSMTC as TSMTC\_MAX\_multiple\_scells in case of intra-band SCell activation.
3. Some small corrections and removing brackets.
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| ***Consequences if not approved:*** | The multiple SCell activation delay requirement with L3 reporting is not completely correct. |
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| ***Clauses affected:*** | 8.3.18 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

## << Start of changes >>

### 8.3.18 SCell Activation Delay Requirement for Deactivated SCell with Multiple Downlink SCells with L3 reporting

The requirements in this clause shall apply for the UE configured with more than one SCells and supporting *l3-MeasUnknownSCellActivation-r18*.

In EN-DC, NE-DC, standalone NR, or in one CG of NR-DC, the requirements in this clause shall apply when the following conditions are met:

- UE only receives one single MAC command for multiple SCell activation within the activation period defined in this clause, and

- in each single CG, there are no other SCell activation, deactivation, addition or release before activation is completed for all the SCells activated by the single MAC CE in this clause, and

- in EN-DC and NE-DC, there are no E-UTRAN SCell activation, deactivation, addition or release before multiple SCell activation is completed in this clause, and

- all to-be-activated SCells are unknown on the same FR2 band, and there is neither active serving cell(s) nor known SCell(s) on the same band, or,

- all to-be-activated SCells are unknown on the same FR1 band, and there is neither active serving cell contiguous to the SCell nor known SCell(s) contiguous to the to-be-activated SCell on the same band, and

- the UE reports valid L3 measurement results after receiving the SCell activation command for all the to-be-activated unknown SCells in FR1, or at least one unknown SCell in the same FR2 band

In two CGs of NR-DC, the requirements in this clause shall apply when the following conditions are met:

- UE receives one MAC command per CG for multiple SCell activation within the activation period defined in this clause, and

- UE supports per-FR measurement gap capability, and

- all to-be-activated SCells are unknown on the same FR2 band, and there is neither active serving cell(s) nor known SCell(s) on the same band, or,

- all to-be-activated SCells are unknown on the same FR1 band, and there is neither active serving cell contiguous to the SCell nor known SCell(s) contiguous to the to-be-activated SCell on the same band, and

- the UE reports valid L3 measurement results after receiving the SCell activation command for all the unknown to-be-activated SCells in FR1, or at least one unknown SCell in the same FR2 band

Otherwise, Clause 8.3.7 is applied.

Upon receiving SCell activation command in slot *n* for more than one SCell, for each of the to-be-activated SCell, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command for the SCell being activated no later than in slot $n+\frac{T\_{HARQ}+T\_{activation\\_time\\_multiple\\_scells}+T\_{CSI\\_Reporting}}{NR slot length}$, where:

 THARQ (in ms) is the timing between DL data transmission and acknowledgement as specified in TS 38.213 [3]

 Tactivation\_time\_multiple\_scells is the target SCell activation delay in millisecond in multiple SCell activation scenario.

Tactivation\_time\_multiple\_scells is:

- 10ms + THARQ + TL3 report + max(Tuncertainty\_MAC + TFineTiming + 2ms, Tuncertainty\_SP), if the semi-persistent CSI-RS is used for CSI reporting

- 7ms + TL3 report + max (THARQ + Tuncertainty\_MAC + 5ms + TFineTiming, Tuncertainty\_RRC + TRRC\_delay), if the periodic CSI-RS is used for CSI reporting

When the following conditions are met:

If the SCell being activated belongs to FR1 provided that the side condition Ês/Iot ≥ -2dB is fulfilled:

If the target SCell belongs to FR1 and none of the following conditions is met

- ‘ssb-PositionInBurst’ indicates only one SSB is being actually transmitted, or

- ‘ssb-PositionInBurst’ indicates multiple SSBs and TCI indication is provided in same MAC PDU with SCell activation;

If the SCell being activated belongs to FR2 and the PCell or PSCell is in FR1 provided that the side condition Ês/Iot ≥ -2dB is fulfilled.

Otherwise, Tactivation\_time\_multiple\_scells in clause 8.3.7 is applied.

where,

TL3 report is the delay to acquire the first available UL resource for L3 reporting from 7ms +THARQ after receiving the SCell activation command.

- The L3 reporting requirement is defined at clause 9.2.4

- UE is ready to report the L3 measurement result no later than 7ms + THARQ ms from receiving the SCell activation command,

- UE is not required to report the L3 measurement results after 3ms + THARQ+ M ms from receiving the SCell activation command where

For FR1,

- M=2\*TSSB + TL1-RSRP,report for UE supporting *shortMeasInterval-r18* capability,

- Otherwise, M =TSMTC+TSSB + TL1-RSRP,report,

For FR2-1,

- M=(X1+X2)\*TSSB + TL1-RSRP,report for UE supporting *reduceForCellDetection* and/or *reduceForSSB-L1-RSRP-Meas* and *shortMeasInterval-r18* capability,

- M=X1\*TSMTC +X2\*TSSB + TL1-RSRP,report for UE supporting *reduceForCellDetection* and/or *reduceForSSB-L1-RSRP-Meas* without supporting *shortMeasInterval-r18* capability,

- M=16\*TSSB + TL1-RSRP,report for UE supporting *shortMeasInterval-r18* without supporting *reduceForCellDetection* and *reduceForSSB-L1-RSRP-Meas* capability,

- Otherwise,M=8\*TSMTC +8\*TSSB + TL1-RSRP,report

Where, X1 and X2 are the values indicated by *reduceForCellDetection* and/or *reduceForSSB-L1-RSRP-Meas* in UE capability.

 TFineTiming is the time period between UE finish processing the last activation command for PDCCH TCI, PDSCH TCI (when applicable) and the timing of first complete available SSB corresponding to the TCI state.

 Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable) relative to

- First valid L3 report for unknown case, when UE reports valid L3 report and L3 report is earlier than TCI command

 Tuncertainty\_RRC is the time period between reception of the RRC configuration message for TCI of periodic CSI-RS for CQI reporting (when applicable) relative to

- First valid L3-RSRP reporting for unknown case, when UE reports valid L3-RSRP and L3 report is earlier than TCI command

 Tuncertainty\_SP is the time period between reception of the activation command for semi-persistent CSI-RS resource set for CQI reporting relative to

- First valid L3 reporting for unknown case, when UE reports valid L3-RSRP and L3 report is earlier than TCI command

 TRRC\_delay is the RRC procedure delay as specified in TS38.331 [2].

 TSMTC is the same as TSMTC\_MAX\_multiple\_scells in case of intra-band SCell activation as specified in 8.3.7.

 When *absoluteFrequencySSB* is not configured in *DownlinkConfigCommon* for target SCell but SMTC for target SCell is configured, no requirement would be applied.

TCSI\_reporting is the delay (in ms) including uncertainty in acquiring the first available downlink CSI reference resource, UE processing time for CSI reporting and uncertainty in acquiring the first available CSI reporting resources as specified in TS 38.331 [2].

The condition of known SCell in FR1 or FR2 is defined in clause 8.3.2.

If the UE has been provided with higher layer in TS 38.331 [2] signaling of *smtc2*prior to the activation command, TSMTC follows *smtc1* or *smtc2* according to the physical cell IDs of the target cells being activated and the active serving cells.

The starting point and the end-point of an interruption window on PCell or any activated SCell in MCG for NR standalone mode, or on PSCell or any activated SCell in SCG for EN-DC mode is same as single SCell activation requirement in clause 8.3.2.

Starting from the slot specified in clause 4.3 of TS 38.213 [3] (timing for secondary Cell activation/deactivation) and until the UE has completed the SCell activation, the UE shall report out of range if the UE has available uplink resources to report CQI for the SCell.

Upon receiving SCell activation command in slot *n,* if the start of the first complete SSB used in the *TX* in the different bands which have SCells being activated after *n*+$\frac{T\_{HARQ}+3ms}{NR slot length}$ are not aligned on time domain among

- SCells in different bands being activated by the same MAC CE if UE does not support per FR gap, or

- SCells in different FR1 bands being activated by the same MAC CE if UE supports per FR gap,

additional interruptions may be expected for the activated serving cells, where

- The number of additional interruptions is no more than the number of FR1 bands which have both SCell being activated for which the activation requirements involve *TFirstSSB\_MAX* *multiple\_scells* with *Trs* and the active serving cell, and

- In each interruption occasion, the interruption length is defined in clause 8.2.2.2.2, and

- Longer activation delay may be expected for multiple SCell activation under one MAC CE with multiple interruptions, and

- *TX* is:

- TFirstSSB, for any scenario where Tactivation\_time multiple\_scells includes TFirstSSB;

- TFirstSSB\_MAX multiple\_scells, for any scenario where Tactivation\_time multiple\_scells includes TFirstSSB\_MAX multiple\_scells;

- Tuncertainty\_MAC+TFineTiming or Tuncertainty\_MAC multiple\_scells+TFineTiming, for any scenario where Tactivation\_time multiple\_scells includes TFineTiming.

Otherwise, no additional interruption is expected due to activation of multiple SCells.

Starting from slot *n* + THARQ + 3 ms where slot *n* is the slot where SCell activation command is received (as specified in clause 4.3 of TS 38.213 [3]) and until the SCell activation completion at UE, after at least one CSI-RS transmission occasion for the channel measurement and reporting (specified in clause 5.2.2.5 of TS 38.214 [26]), the UE shall report out of range if the UE has available uplink resources to report CQI for the SCell.

Starting from the slot specified in clause 4.3 of TS 38.213 [3] (timing for secondary Cell activation/deactivation) and until the UE has completed a first L1-RSRP measurement, the UE shall report lowest valid L1 SS-RSRP range if the UE has available uplink resources to report L1-RSRP for the SCell.

## << End of changes >>