**3GPP TSG-RAN4 Meeting #113 *R4-2419279***

**Orlando, US, 18th – 22nd November, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **5184** | **rev** |  | **Current version:** | **18.7.0** |  |
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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:***  | CR on core part of R18 SCell activation enhancement |
|  |  |
| ***Source to WG:*** | ZTE Corporation, Sanechips |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_RRM\_enh3-Core |  | ***Date:*** | 2024-11-08 |
|  |  |  |  |  |
| ***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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | 1st Change: The L3 measurement report should not be restricted to L3-RSRP report.2nd Change: How to specify the uncertainty part for the case of UE sends L1 reports earlier than L3 reports and L3 report is later than TCI activation command is still FFS. |
|  |  |
| ***Summary of change:*** | 1st Change: To capture all L3 reporting quality, change L3-RSRP report to L3 measurement report.2nd Change: Specify the uncertainty part for the case of UE sends L1 reports earlier than L3 reports and L3 report is later than TCI activation command. |
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| ***Consequences if not approved:*** | The spec is not complete and accurate enough. |
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| ***Clauses affected:*** | 8.3.12, 8.3.13, 8.3.18 |
|  |  |
|  | **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>

### 8.3.12 SCell Activation Delay Requirement for Deactivated PUCCH SCell

The requirements in this clause shall apply for the UE configured with one downlink SCell and when PUCCH is configured for the SCell being activated.

If the UE has a valid TA for transmitting on an SCell then the UE shall be capable to transmit valid CSI report and apply actions related to the activation command for the SCell being activated on the PUCCH SCell no later than in slot n+$\frac{T\_{HARQ}+T\_{activation\\_time}+max ((T\_{First\\_available\\_CSI} +T\_{CSI\\_processing}), 3\*T\_{target\\_PL-RS})+T\_{CSI\\_Reporting\\_after}}{NR slot length}$,

Where:

- A TA is considered to be valid provided that the *TimeAlignmentTimer* [2] associated with the TAG containing the PUCCH SCell is running.

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

- Tactivation\_time is the SCell activation delay in millisecond.

For the UE capable of *l3-MeasUnknownSCellActivation-r18*, if the UE is provided with *ReportOnScellActivation* and it reports valid L3 measurement results after receiving the SCell activation command for unknown SCell*,* the Tactivation\_time is the SCell activation delay with L3 reporting in millisecond as specified in section 8.3.17 except the definition of Tuncertainty\_MAC is replaced with:

- Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), UL spatial relation (for FR2) relative to

- SCell activation command for known case;

- First valid L3 measurement reporting for unknown case, when UE reports valid L3 measurement results;

- First valid L1-RSRP reporting for unknown case, when UE does not report L3 measurement results;

Otherwise, Tactivation\_time is the SCell activation delay in millisecond as specified in section 8.3.2 except the definition of Tuncertainty\_MAC is replaced with:

- Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), UL spatial relation (for FR2) relative to

- SCell activation command for known case;

- First valid L1-RSRP reporting for unknown case.

- Ttarget\_PL-RS is the periodicity of the target pathloss reference signal determined during PUCCH SCell activation.

- TFirst\_available\_CSI is the delay uncertainty (in ms) in acquiring the first available downlink CSI reference resource.

- TCSI\_processing is the UE processing time for CSI reporting.

- TCSI\_reporting\_after is the delay uncertainty (in ms) in acquiring the first available CSI reporting resources after end of max ((TFirst\_available\_CSI + TCSI\_processing), 3\*Ttarget\_PL-RS)

If the UE does not have a valid TA for transmitting on an SCell then the UE shall be capable to perform downlink actions related to the SCell activation command as specified in [7] for the SCell being activated on the PUCCH SCell no later than in slot n+$\frac{T\_{HARQ}+T\_{activation\\_time}}{NR slot length}$$\frac{T\_{HARQ}+T\_{activation\\_time+}T\_{CSI\\_Reporting}}{NR slot length}$, and shall be capable to perform uplink actions related to the SCell activation command as specified in [7] for the SCell being activated on the PUCCH SCell no later than in slot $n+\frac{T\_{HARQ}+T\_{delay\\_PUCCH\\_SCell}}{NR slot length}$ $n+\frac{T\_{HARQ}+T\_{delay\\_PUCCH\\_SCell}+T\_{CSI\\_Reporting\\_PUCCH\\_SCell}}{NR slot length}$and shall transmit valid CSI report for the SCell being activated on the PUCCH SCell no later than in slot $n+\frac{T\_{HARQ}+T\_{delay\\_PUCCH\\_SCell}}{NR slot length}$, where:

Tdelay\_PUCCH\_SCell = Tactivation\_time + max ((TFirst\_available\_CSI + TCSI\_processing), (T1+T2+T3), 3\*Ttarget\_PL-RS) + TCSI\_reporting\_after

Where:

- Tactivation\_time is the SCell activation delay in millisecond.

For the UE capable of *l3-MeasUnknownSCellActivation-r18*, if the UE is provided with *ReportOnScellActivation* and it reports valid L3 measurement results after receiving the SCell activation command for unknown SCell*,* the Tactivation\_time is the SCell activation delay with L3 reporting in millisecond as specified in section 8.3.17 except the definition of Tuncertainty\_MAC is replaced with:

- Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), UL spatial relation (for FR2) relative to

- SCell activation command for known case;

- First valid L3 measurement reporting for unknown case, when UE reports valid L3 measurement results;

- First valid L1-RSRP reporting for unknown case, when UE does not report L3 measurement results;

Otherwise, Tactivation\_time is the SCell activation delay in millisecond as specified in section 8.3.2 except the definition of Tuncertainty\_MAC is replaced with:

- Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), UL spatial relation (when applicable in FR2) relative to

- SCell activation command for known case;

- First valid L1-RSRP reporting for unknown case.

- Ttarget\_PL-RS is the periodicity of the target pathloss reference signal determined during PUCCH SCell activation.

- TFirst\_available\_CSI is the delay uncertainty (in ms) in acquiring the first available downlink CSI reference resource.

- TCSI\_processing is the UE processing time for CSI reporting.

- TCSI\_reporting\_after is the delay uncertainty (in ms) in acquiring the first available CSI reporting resources after end of max ((TFirst\_available\_CSI + TCSI\_processing), (T1+T2+T3), 3\*Ttarget\_PL-RS)

- T1 is the delay uncertainty in acquiring the first available PDCCH triggered PRACH occasion in the PUCCH SCell after the slot n+$\frac{T\_{HARQ}+T\_{activation\\_time}}{NR slot length}$.

- T1 is up to the summation of a delay uncertainty for reception of PDCCH order, SSB to PRACH occasion association period and 10 ms, where SSB to PRACH occasion association period is defined in the Table 8.1-1 of TS 38.213

- T2 is the delay from slot n+$\frac{T\_{HARQ}+T\_{activation\\_time}+T\_{1}}{NR slot length}$until UE has obtained a valid TA command for the target PUCCH Scell being activated. Slot n is the slot where the UE receives PUCCH SCell activation command.

- T3 is the delay for applying the received TA for uplink transmission on target PUCCH SCell being activated, as specified in clause 4.2 in TS 38.213.

The pathloss reference signal is known for known PUCCH SCell during activation if the following conditions are met during the period between the last transmission of the RS resource used for L3 measurement reporting and the completion of PUCCH SCell activation, where the RS resource is the target pathloss reference signal or QCLed (with Type D) to the target pathloss reference signal:

- The PUCCH SCell activation command is received within 1280 ms upon the last transmission of the RS resource used for L3 measurement reporting

- The target pathloss reference signal determination is based on the latest L3 measurement reporting

- The target pathloss reference signal remains detectable during the PUCCH SCell activation period

- SNR of the target pathloss reference signal≥-3dB

- The associated SSBs with the target pathloss reference signal remain detectable during the PUCCH SCell activation period

- SNR of the associated SSB ≥-3dB

For the UE capable of *l3-MeasUnknownSCellActivation-r18*, if the UE is provided with *ReportOnScellActivation* and it reports valid L3 measurement results after receiving the SCell activation command for unknown SCell*,* the pathloss reference signal is known for unknown PUCCH SCell during activation if the following conditions are met during the period between the last transmission of the RS resource used for L3 reporting after SCell activation command and the completion of PUCCH SCell activation, where the RS resource is the target pathloss reference signal or QCLed (with Type D) to the target pathloss reference signal.

- The PUCCH SCell activation command is received within 1280 ms upon the last transmission of the RS resource used for the L3 reporting after SCell activation command

- The target pathloss reference signal determination is based on the L3 reporting after SCell activation command, if UE only sends L3 reporting before receiving TCI activation command, or

- The target pathloss reference signal determination is based on either the latest L1-RSRP measurement reporting or the L3 reporting after SCell activation command, if UE reports both before receiving TCI activation command

- The target pathloss reference signal remains detectable during the PUCCH SCell activation period

- SNR of the target pathloss reference signal≥-3dB

- The associated SSBs with the target pathloss reference signal remain detectable during the PUCCH SCell activation period

- SNR of the associated SSB ≥-3dB

Otherwise, tpathloss reference signal is known for unknown PUCCH SCell during activation if the following conditions are met during the period between the last transmission of the RS resource used for L1-RSRP measurement reporting and the completion of PUCCH SCell activation, where the RS resource is the target pathloss reference signal or QCLed (with Type D) to the target pathloss reference signal.

- The PUCCH SCell activation command is received within 1280 ms upon the last transmission of the RS resource used for L1-RSRP measurement reporting

- The target pathloss reference signal determination is based on the latest L1-RSRP measurement reporting

- The target pathloss reference signal remains detectable during the PUCCH SCell activation period

- SNR of the target pathloss reference signal≥-3dB

- The associated SSBs with the target pathloss reference signal remain detectable during the PUCCH SCell activation period

- SNR of the associated SSB ≥-3dB

Otherwise, the pathloss reference signal is unknown.

The above delay requirement shall apply provided that:

- The target pathloss reference signal determined during PUCCH SCell activation is known otherwise longer activation time is expected if the pathloss reference signal is unknown; and

- The RA on PUCCH SCell is not interrupted by the RA on PCell otherwise additional delay to activate the SCell is expected; and

- No SRS carrier based switching or SRS antenna port switching occurs during the SCell activation procedure otherwise the PUCCH SCell activation delay can be extended.

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 the same as the interruption in single SCell activation requirement in clause 8.3.2.

In addition to the interruption due to RF retuning during PUCCH SCell activation, if the UE is not capable of *parallelTxPRACH-SRS-PUCCH-PUSCH*, and PRACH on PUCCH SCell and PUCCH/PUSCH/SRS on other active serving cell are fully or partially overlapping in time, the UE shall transmit PRACH on PUCCH SCell and is allowed to drop or cause interruption to SRS or PUCCH or PUSCH transmission on the SpCell or on any activated SCell. Otherwise, UE is not allowed to drop or cause any interruption to SRS or PUCCH or PUSCH transmission on SpCell or on any activated SCell.

For unknown PUCCH SCell activation in FR2, the requirement only applies when UE supports CSI reporting cross PUCCH group capability, and UE is configured with CSI reporting via SpCell. For unknown PUCCH SCell activation in FR1, the requirement only applies when UE supports CSI reporting cross PUCCH group capability, and UE is configured with CSI reporting via SpCell, if ‘ssb-PositionInBurst’ indicates multiple SSBs but TCI state indication is not provided in same MAC PDU with SCell activation.

The requirement for unknown PUCCH SCell applies provided that the PDCCH order (when applicable) and the activation commands for TCI, UL spatial relation and PL-RS (when applicable) are based on the latest valid L1-RSRP reporting or the L3 reporting after SCell activation command via Primary PUCCH group.

# <End of Change #1>

# <Start of Change #2>

### 8.3.13 SCell activation delay Requirement for Deactivated PUCCH SCell with Multiple SCells

The requirements in this clause shall apply for the UE configured with multiple deactivated downlink SCells and PUCCH is configured for a SCell, and when PUCCH SCell with downlink SCell(s) are activated by one MAC command.

For EN-DC, NE-DC, and standalone NR, 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

- 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

- any to-be-activated unknown non-PUCCH SCell in a different band from to-be-activated PUCCH SCell has active serving cell(s) or known to-be-activated non-PUCCH SCell(s) on the same band.

- All DL SCells being activated in the secondary PUCCH group are unknown if PUCCH SCell being activated is unknown.

- If the to-be-activated FR2 PUCCH SCell is unknown, and there is no to-be-activated FR1 SCell which is counted in N1 as defined in 8.3.7.

Upon receiving SCell activation command in slot *n* for more than one SCell and one among the multiple SCells is PUCCH SCell, the UE shall be able to transmit valid CSI report on PUCCH SCell and apply actions related to the SCell activation command as specified in [7] for the PUCCH SCell being activated no later than in slot *n*+ Tactivate\_total\_PUCCH\_SCell. The UE shall be capable to transmit valid CSI report of other SCell no later than in slot n+ Tactivate\_total\_other\_SCell.

Where:

- Tactivate\_total\_PUCCH\_SCell is $\frac{T\_{HARQ}+T\_{delay\\_multiple\\_SCells\\_PUCCH\\_SCell}}{NR slot length}$,

- Tactivate\_total\_other\_SCell is $\frac{T\_{HARQ}+T\_{delay\\_multiple\\_SCells\\_other\\_SCell}}{NR slot length}$

Where:

Tdelay\_multiple\_SCells\_other\_SCell is the SCell activation delay for other SCell when the other SCell is activated with multiple SCells and is given by Tactivation\_time\_multiple\_scells +TCSI\_Reporting.

 Tdelay\_multiple\_SCells\_PUCCH\_SCell = Tactivation\_time\_multiple\_scells + max ((TFirst\_available\_CSI + TCSI\_processing), (T1+T2+T3), 3\*Ttarget\_PL-RS) + TCSI\_reporting\_after

- If UE has a Valid TA for transmitting on PUCCH SCell,

- A TA is considered to be valid provided that the *TimeAlignmentTimer* [2] associated with the TAG containing the PUCCH SCell is running.

 Tdelay\_multiple\_SCells\_PUCCH\_SCell = Tactivation\_time\_multiple\_scells + max ((TFirst\_available\_CSI + TCSI\_processing), 3\*Ttarget\_PL-RS) + TCSI\_reporting\_after

- If UE does not have valid TA for PUCCH SCell,

 Tdelay\_multiple\_SCells\_PUCCH\_SCell = Tactivation\_time\_multiple\_scells + max ((TFirst\_available\_CSI + TCSI\_processing), (T1+T2+T3), 3\*Ttarget\_PL-RS) + TCSI\_reporting\_after

Where:

- For UE which is capable of *l3-MeasUnknownSCellActivation-r18*, Tactivation\_time\_multiple\_scells is equal to Tactivation\_time which is the SCell activation delay in millisecond as specified in section 8.3.18 except the definition of Tuncertainty\_MAC and Tuncertainty\_RRC are replaced with:

- Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), UL spatial relation (for FR2) relative to

- First valid L3 measurement reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3 measurement reporting

- 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 L3measurement reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3measurement reporting.

Otherwise, when the to-be-activated PUCCH SCell is FR2 unknown SCell, Tactivation\_time\_multiple\_scells is as defined in 8.3.12; otherwise, Tactivation\_time\_multiple\_scells is the target SCell activation delay in millisecond in multiple SCell activation scenario as specified in section 8.3.7.

- Ttarget\_PL-RS is the periodicity of PL-RS resource when PL-RS of target PUCCH SCell is known

- Tfirst\_available\_CSI: the delay uncertainty in acquiring the first available downlink CSI reference resources for secondary PUCCH group.

- TCSI\_processing: the UE processing time for CSI reporting of secondary group PUCCH SCells.

- TCSI\_reporting\_after the delay uncertainty in acquiring the first available CSI reporting resource after end of max ((TFirst\_available\_CSI + TCSI\_processing), 3\*Ttarget\_PL-RS) if UE has a valid TA for PUCCH SCell or after end of max ((TFirst\_available\_CSI + TCSI\_processing), (T1+T2+T3), 3\*Ttarget\_PL-RS) if UE does not have a valid TA for PUCCH SCell.

- T1 is the delay uncertainty in acquiring the first available PDCCH triggered PRACH occasion in the PUCCH SCell after Tactivation\_time\_multiple\_scells.

- T1 is up to the summation of a delay uncertainty for reception of PDCCH order, SSB to PRACH occasion association period and 10 ms, where SSB to PRACH occasion association period is defined in the Table 8.1-1 of TS 38.213

- T2 is the delay from slot n + (THARQ + Tactivation\_time\_multiple\_scells + T1)/NR slot length until UE has obtained a valid TA command for the target PUCCH SCell being activated. Slot n is the slot where the UE receives PUCCH SCell activation command.

- T3 is the delay for applying the received TA for uplink transmission on target PUCCH SCell being activated, and greater than or equal to k+1 slot, where k is defined in clause 4.2 in TS 38.213. The starting point and the endpoint 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 slot n + THARQ + 3 ms where 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.

In addition to the interruption due to RF retuning during multiple SCell activation, if the UE is not capable of *parallelTxPRACH-SRS-PUCCH-PUSCH* for inter-band CA, and PRACH on PUCCH SCell and PUCCH/PUSCH/SRS on other active serving cell are fully or partially overlapping in time, the UE shall transmit PRACH on PUCCH SCell and is allowed to drop or cause interruption to SRS or PUCCH or PUSCH transmission on the SpCell or on any activated SCell. Otherwise, UE is not allowed to drop or cause any interruption of SRS or PUCCH or PUSCH transmission on SpCell or on any activated 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 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 Change #2>

# <Start of Change #3>

### 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 to-be-activated unknown 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 9.2.4.4

- 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, if UE reports valid L3 report and L3 report is earlier than TCI command

- First valid L1-RSRP reporting for unknown case, if UE reports valid L3 report after 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 report for unknown case, if UE reports valid L3 report and L3 report is earlier than TCI command

- First valid L1-RSRP reporting for unknown case, if UE reports valid L3 report after 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, if UE reports valid L3 report and L3 report is earlier than TCI command

- First valid L1-RSRP reporting for unknown case, if UE reports valid L3 report after 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 Change #3>