**3GPP TSG-RAN WG2 Meeting #116bis-e *R2-220xxxx***

**Electronic Meeting , 17th - 25th January 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.321** | **CR** | **1182** | **rev** |  | **Current version:** | **16.7.0** |  |
|  | | | | | | | | |
| *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 | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Running CR to 38.321 for SCG activation/deactivation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NR\_DC\_enh2-Core | | | | |  | ***Date:*** | | | 2022-01-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | To introduce SCG activation/deactivation feature. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Capture the below related agreements on LTE\_NR\_DC\_enh2-Core WI.  **RAN2#112e**   * Continue RAN2 work with the assumption that when the SCG is deactivated, the UE does not monitor PDCCH on the PSCell. This assumption can be reconsidered if issues are found. * RAN2 assumes that UE will not perform SRS transmission while the SCG is deactivated. This assumption can be reconsidered if issues are found. * SCG RRC reconfiguration can select the SCG activation state (activated/deactivated) at PSCell addition/change, RRC resume or HO. * While the SCG is deactivated:   - there can be SCG SCells in deactivated state  - there cannot be SCG SCells in activated state  - it is FFS whether there can be SCells in SCG dormant state.  **RAN2#113e**   * SCG activation can be requested by MN/SN/UE. FFS on how to accept/reject the procedure. FFS which signalling is used. * SCG deactivation can be requested by MN/SN. FFS whether UE can request deactivation. FFS on how to accept/reject the procedure. FFS which signalling is used. * RRC signalling is defined for the interaction between UE/MN and MN/SN in SCG activation/deactivation. FFS if lower-layer signalling is needed. * Confirm that there is no PUSCH transmission on deactivated SCG. FFS if any other UL is allowed towards SCG. * Confirm that there is no PDCCH monitoring on PSCell of the deactivated SCG. * Confirm that there is no support of SCell dormancy for SCG SCells within a deactivated SCG. * NW-triggered SCG activation is indicated to the UE via the MCG. * NW-triggered SCG deactivation can be indicated to the UE via the MCG. FFS via SCG.   **RAN2#115e**   * We will support RACHless SCG activation in Rel-17. * UE-initiated activation is still FFS. * The TAT associated with the PSCell continues running when the SCG is switched from activated to deactivated state and the UE considers the TA as valid as long as it is still running. * If instructed by the network in the SCG activation indication, the UE performs random access towards the PSCell (even if the TAT is still running). * The SCG activation indication can indicate the TCI state (with or without BWP switching) for PDCCH/PDSCH reception. Otherwise, the UE uses the previously activated TCI states and the network should ensure that the relevant TCI states are configured and activated for the UE to monitor PDCCH at RACH-less SCG activation. * The UE performs RLM and BFD on PSCell while the SCG is deactivated if network configures it.   **RAN2#116e**   * At PSCell addition/change/HO/RRC resume, in case the SCG state is configured as deactivated, the UE does not perform random access. If the network wants the UE to perform random access, it can indicate the SCG as activated and deactivate it after the random access by RRC or MAC CE if supported. * Upon SCG deactivation, instruct the SCG MAC entity to perform partial MAC reset (FFS for the details).   **RAN2# 116bis e**   * 1. FFS if UE initializes Bj for each logical channel to zero upon SCG deactivation as a part of partial MAC reset. Should consider e.g. what to do with possible Bj increase while SCG is deactivated. * 2-1. UE stops (if running) all timers except beamFailureDetectionTimer associated with PSCell and timeAlignmentTimers upon SCG deactivation as a part of partial MAC reset. * 2-2. If BFD is not configured for deactivated SCG, UE stops (if running) beamFailureDetectionTimer associated with PSCell upon SCG deactivation as a part of partial MAC reset. * 4. UE resets BFI\_COUNTER associated with PSCell if BFD is not configured for deactivated SCG, upon SCG deactivation as a part of partial MAC reset. * 5. UE does the following actions upon SCG deactivation as a part of partial MAC reset:   + set the NDIs for all uplink HARQ processes to the value 0;   + stop, if any, ongoing Random Access procedure;   + flush Msg3 buffer;   + flush MSGA buffer;   + cancel, if any, triggered Scheduling Request procedure;   + cancel, if any, triggered Buffer Status Reporting procedure;   + cancel, if any, triggered Power Headroom Reporting procedure;   + cancel, if any, triggered Configured uplink grant confirmation;   + flush the soft buffers for all DL HARQ processes;   + for each DL HARQ process, consider the next received transmission for a TB as the very first transmission;   + release, if any, Temporary C-RNTI. * 7. CSI-RS reporting in the deactivated PSCell or for the deactivated PSCell is NOT supported. * 8. For deactivated PSCell, PHR is not reported. * 9-2. PHR is triggered upon SCG activation. * 10. PHR is triggered upon addition of PSCell not configured with deactivated state. * 3. FFS if UE discards explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any, upon SCG deactivation as a part of partial MAC reset. * 6. FFS if the BWP associated with PSCell is NOT deactivated upon SCG deactivation. * 5: Upon reception of a network SCG activation command, the UE shall perform RACH towards the SCG if any of the following condition is true: * - reconfigurationWithSync is included in the SCG activation command * - TA timer for the PSCell is expired * - RLF is declared * - BF is declared * 7: When the UE is configured to perform RLM/BFD when the SCG is deactivated, upon reception of a network activation command not including reconfigurationWithSync while the TA timer associated with the PSCell is running and BF/RLF is not declared, the UE shall activate the SCG without performing RACH towards the SCG. * 8: No guard timer is introduced for RACH-less SCG activation | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | SCG activation/deactivation is not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1.1a ,5.X | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

### 5.1.1a Initialization of variables specific to Random Access type

The MAC entity shall:

1> if *RA\_TYPE* is set to *2-stepRA*:

2> set *PREAMBLE\_POWER\_RAMPING\_STEP* to *msgA-PreamblePowerRampingStep*;

2> set *SCALING\_FACTOR\_BI* to 1;

2> apply *preambleTransMax* included in the *RACH-ConfigGenericTwoStepRA*;

2> if the Random Access procedure was initiated by *reconfigurationWithSync*or by SCG activation common where TA timer for the PSCell is expired or RLF or Beam failure for PSCell is declared during SCG is deactivated; and

2> if *cfra-TwoStep* is configured for the selected carrier:

3> if *msgA-TransMax* is configured in the *cfra-TwoStep*:

4> apply *msgA-TransMax* configured in the *cfra-TwoStep*.

2> else if *msgA-TransMax* is included in the *RACH-ConfigCommonTwoStepRA*:

3> apply *msgA-TransMax* included in the *RACH-ConfigCommonTwoStepRA*.

2> if the Random Access procedure was initiated for SpCell beam failure recovery (as specified in clause 5.17); and

2> if *beamFailureRecoveryConfig* is configured for the active UL BWP of the selected carrier; and

2> if *ra-PrioritizationTwoStep* is configured in the *beamFailureRecoveryConfig*:

3> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority* included in the *ra-PrioritizationTwoStep* in *beamFailureRecoveryConfig*;

3> if *scalingFactorBI* is configured in the *ra-PrioritizationTwoStep* in *beamFailureRecoveryConfig*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> else if the Random Access procedure was initiated by *reconfigurationWithSync*or by SCG activation common where TA timer for the PSCell is expired or RLF or Beam failure for PSCell is declared during SCG is deactivated; and

2> if *rach-ConfigDedicated* is configured for the selected carrier; and

2> if *ra-PrioritizationTwoStep* is configured in the *rach-ConfigDedicated*:

3> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority* included in the *ra-PrioritizationTwoStep* in *rach-ConfigDedicated*;

3> if *scalingFactorBI* is configured in *ra-PrioritizationTwoStep* in the *rach-ConfigDedicated*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> else if *ra-PrioritizationForAccessIdentityTwoStep* is configured for the selected carrier; and

2> if the MAC entity is provided by upper layers with Access Identity 1 or 2; and

2> if for at least one of these Access Identities the corresponding bit in the *ra-PrioritizationForAI* is set to *one*:

3> if *powerRampingStepHighPriority* is configured in the *ra-PrioritizationForAccessIdentityTwoStep*:

4> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority*.

3> if *scalingFactorBI* is configured in the *ra-PrioritizationForAccessIdentityTwoStep*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> set *MSGA\_PREAMBLE\_POWER\_RAMPING\_STEP* to *PREAMBLE\_POWER\_RAMPING\_STEP*.

1> else (i.e. *RA\_TYPE* is set to *4-stepRA*):

2> set *PREAMBLE\_POWER\_RAMPING\_STEP* to *powerRampingStep*;

2> set *SCALING\_FACTOR\_BI* to 1;

2> set *preambleTransMax* to *preambleTransMax* included in the *RACH-ConfigGeneric*;

2> if the Random Access procedure was initiated for SpCell beam failure recovery (as specified in clause 5.17); and

2> if *beamFailureRecoveryConfig* is configured for the active UL BWP of the selected carrier:

3> start the *beamFailureRecoveryTimer*, if configured;

3> apply the parameters *powerRampingStep*, *preambleReceivedTargetPower*, and *preambleTransMax* configured in the *beamFailureRecoveryConfig*.

2> if the Random Access procedure was initiated for beam failure recovery (as specified in clause 5.17); and

2> if *beamFailureRecoveryConfig* is configured for the active UL BWP of the selected carrier; and

2> if *ra-Prioritization* is configured in the *beamFailureRecoveryConfig*:

3> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority* included in the *ra-Prioritization* in *beamFailureRecoveryConfig*;

3> if *scalingFactorBI* is configured in *ra-Prioritization* in the *beamFailureRecoveryConfig*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> else if the Random Access procedure was initiated by *reconfigurationWithSync*or by SCG activation common where TA timer for the PSCell is expired or RLF or Beam failure for PSCell is declared during SCG is deactivated; and

2> if *rach-ConfigDedicated* is configured for the selected carrier; and

2> if *ra-Prioritization* is configured in the *rach-ConfigDedicated*:

3> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority* included in the *ra-Prioritization* in *rach-ConfigDedicated*;

3> if *scalingFactorBI* is configured in *ra-Prioritization* in the *rach-ConfigDedicated*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> else if *ra-PrioritizationForAccessIdentity* is configured for the selected carrier; and

2> if the MAC entity is provided by upper layers with Access Identity 1 or 2; and

2> if for at least one of these Access Identities the corresponding bit in the *ra-PrioritizationForAI* is set to *one*:

3> if *powerRampingStepHighPriority* is configured in the *ra-PrioritizationForAccessIdentity*:

4> set *PREAMBLE\_POWER\_RAMPING\_STEP* to the *powerRampingStepHighPriority*.

3> if *scalingFactorBI* is configured in the *ra-PrioritizationForAccessIdentity*:

4> set *SCALING\_FACTOR\_BI* to the *scalingFactorBI*.

2> if *RA\_TYPE* is switched from *2-stepRA* to *4-stepRA* during this Random Access procedure:

3> set *POWER\_OFFSET\_2STEP\_RA* to (*PREAMBLE\_POWER\_RAMPING\_COUNTER* – 1) × (*MSGA\_PREAMBLE\_POWER\_RAMPING\_STEP* – *PREAMBLE\_POWER\_RAMPING\_STEP*).

## 5.X Activation/Deactivation of SCG

*Editor note: for terminology” activation/deactivation of SCG”, further discuss if a better wording is needed.*

The network may activate and deactivate the configured SCG. Upon configuration of an SCG, the SCG is activated unless the parameter *scg-State* is set to *deactivated* for the SCG by upper layers.

The configured SCG is deactivated by:

- receiving *scg-State* per SCG;

*Editor note: FFS if MAC CE is used for SCG activation/deactivation.*

The MAC entity shall for the configured SCG:

1> if an SCG is configured with *scg-State* set to activated upon SCG configuration: or

1> if activation command is received and not including *reconfigurationWithSync* while the TA timer associated with the PSCell is running and Beam failure or RLF is not declared:

2> activate the SCG according to the timing defined in TS 38.xxx [xx] for direct SCG activation; i.e. apply normal SCG operation including:

3> SRS transmissions on the PSCell;

3> CSI reporting for the PSCell;

3> PDCCH monitoring on the PSCell;

3> PUCCH transmissions on the PSCell.

1. else if upper layers indicate that the SCG is deactivated:

2> deactivate all the SCells of the configured SCG according to clause 5.9;

2> deactivate PSCell according to the timing defined in TS 38.xxx [xx], including:

3> not transmit SRS on the PSCell:

3> not report CSI for the PSCell:

3> not transmit on UL-SCH on the PSCell:

3> not transmit PUCCH on the PSCell:3> not monitor the PDCCH for the PSCell:

3> not monitor the PDCCH on the PSCell.

2> reset MAC according to clause 5.12:

*Editor note: FFS if the BWP associated with PSCell is NOT deactivated upon SCG deactivation.*

### 5.4.6 Power Headroom Reporting

The Power Headroom reporting procedure is used to provide the serving gNB with the following information:

- Type 1 power headroom: the difference between the nominal UE maximum transmit power and the estimated power for UL-SCH transmission per activated Serving Cell;

- Type 2 power headroom: the difference between the nominal UE maximum transmit power and the estimated power for UL-SCH and PUCCH transmission on SpCell of the other MAC entity (i.e. E-UTRA MAC entity in EN-DC, NE-DC, and NGEN-DC cases);

- Type 3 power headroom: the difference between the nominal UE maximum transmit power and the estimated power for SRS transmission per activated Serving Cell;

- MPE P-MPR: the power backoff to meet the MPE FR2 requirements for a Serving Cell operating on FR2.

RRC controls Power Headroom reporting by configuring the following parameters:

- *phr-PeriodicTimer*;

- *phr-ProhibitTimer*;

- *phr-Tx-PowerFactorChange*;

- *phr-Type2OtherCell*;

- *phr-ModeOtherCG*;

- *multiplePHR*;

- *mpe-Reporting-FR2*;

- *mpe-ProhibitTimer*;

- *mpe-Threshold*.

A Power Headroom Report (PHR) shall be triggered if any of the following events occur:

- *phr-ProhibitTimer* expires or has expired and the path loss has changed more than *phr-Tx-PowerFactorChange* dB for at least one activated Serving Cell of any MAC entity of which the active DL BWP is not dormant BWP which is used as a pathloss reference since the last transmission of a PHR in this MAC entity when the MAC entity has UL resources for new transmission;

NOTE 1: The path loss variation for one cell assessed above is between the pathloss measured at present time on the current pathloss reference and the pathloss measured at the transmission time of the last transmission of PHR on the pathloss reference in use at that time, irrespective of whether the pathloss reference has changed in between. The current pathloss reference for this purpose does not include any pathloss reference configured using pathlossReferenceRS-Pos in TS 38.331 [5].

- *phr-PeriodicTimer* expires;

- upon configuration or reconfiguration of the power headroom reporting functionality by upper layers, which is not used to disable the function;

- activation of an SCell of any MAC entity with configured uplink of which *firstActiveDownlinkBWP-Id* is not set to dormant BWP;

- activation of an SCG;

- addition of the PSCell which is not configured with deactivated state (i.e. PSCell is newly added or changed);

- *phr-ProhibitTimer* expires or has expired, when the MAC entity has UL resources for new transmission, and the following is true for any of the activated Serving Cells of any MAC entity with configured uplink:

- there are UL resources allocated for transmission or there is a PUCCH transmission on this cell, and the required power backoff due to power management (as allowed by P-MPRc as specified in TS 38.101-1 [14], TS 38.101-2 [15], and TS 38.101-3 [16]) for this cell has changed more than *phr-Tx-PowerFactorChange* dB since the last transmission of a PHR when the MAC entity had UL resources allocated for transmission or PUCCH transmission on this cell.

- Upon switching of activated BWP from dormant BWP to non-dormant DL BWP of an SCell of any MAC entity with configured uplink;

- if *mpe-Reporting-FR2* is configured, and *mpe-ProhibitTimer* is not running:

- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] is equal to or larger than *mpe-Threshold* for at least one activated FR2 Serving Cell since the last transmission of a PHR in this MAC entity; or

- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] has changed more than *phr-Tx-PowerFactorChange* dB for at least one activated FR2 Serving Cell since the last transmission of a PHR due to the measured P-MPR applied to meet MPE requirements being equal to or larger than *mpe-Threshold* in this MAC entity.

in which case the PHR is referred below to as 'MPE P-MPR report'.

NOTE 2: The MAC entity should avoid triggering a PHR when the required power backoff due to power management decreases only temporarily (e.g. for up to a few tens of milliseconds) and it should avoid reflecting such temporary decrease in the values of PCMAX,f,c/PH when a PHR is triggered by other triggering conditions.

NOTE 3: If a HARQ process is configured with *cg-RetransmissionTimer* and if the PHR is already included in a MAC PDU for transmission on configured grant by this HARQ process, but not yet transmitted by lower layers, it is up to UE implementation how to handle the PHR content.

If the MAC entity has UL resources allocated for a new transmission the MAC entity shall:

1> if it is the first UL resource allocated for a new transmission since the last MAC reset:

2> start *phr-PeriodicTimer*.

1> if the Power Headroom reporting procedure determines that at least one PHR has been triggered and not cancelled; and

1> if the allocated UL resources can accommodate the MAC CE for PHR which the MAC entity is configured to transmit, plus its subheader, as a result of LCP as defined in clause 5.4.3.1:

2> if *multiplePHR* with value *true* is configured:

3> for each activated Serving Cell with configured uplink associated with any MAC entity of which the active DL BWP is not dormant BWP; and

3> for each activated Serving Cell with configured uplink associated with E-UTRA MAC entity:

4> obtain the value of the Type 1 or Type 3 power headroom for the corresponding uplink carrier as specified in clause 7.7 of TS 38.213 [6] for NR Serving Cell and clause 5.1.1.2 of TS 36.213 [17] for E-UTRA Serving Cell;

4> if this MAC entity has UL resources allocated for transmission on this Serving Cell; or

4> if the other MAC entity, if configured, has UL resources allocated for transmission on this Serving Cell and *phr-ModeOtherCG* is set to *real* by upper layers:

5> obtain the value for the corresponding PCMAX,f,c field from the physical layer.

5> if *mpe-Reporting-FR2* is configured and this Serving Cell operates on FR2 and this Serving Cell is associated to this MAC entity:

6> obtain the value for the corresponding MPE field from the physical layer.

3> if *phr-Type2OtherCell* with value *true* is configured:

4> if the other MAC entity is E-UTRA MAC entity:

5> obtain the value of the Type 2 power headroom for the SpCell of the other MAC entity (i.e. E-UTRA MAC entity);

5> if *phr-ModeOtherCG* is set to *real* by upper layers:

6> obtain the value for the corresponding PCMAX,f,c field for the SpCell of the other MAC entity (i.e. E-UTRA MAC entity) from the physical layer.

3> instruct the Multiplexing and Assembly procedure to generate and transmit the Multiple Entry PHR MAC CE as defined in clause 6.1.3.9 based on the values reported by the physical layer.

2> else (i.e. Single Entry PHR format is used):

3> obtain the value of the Type 1 power headroom from the physical layer for the corresponding uplink carrier of the PCell;

3> obtain the value for the corresponding PCMAX,f,c field from the physical layer;

3> if *mpe-Reporting-FR2* is configured and this Serving Cell operates on FR2:

4> obtain the value for the corresponding MPE field from the physical layer.

3> instruct the Multiplexing and Assembly procedure to generate and transmit the Single Entry PHR MAC CE as defined in clause 6.1.3.8 based on the values reported by the physical layer.

2> if this PHR report is an MPE P-MPR report:

3> start or restart the *mpe-ProhibitTimer*;

3> cancel triggered MPE P-MPR reporting for Serving Cells included in the PHR MAC CE.

2> start or restart *phr-PeriodicTimer*;

2> start or restart *phr-ProhibitTimer*;

2> cancel all triggered PHR(s).

## 5.12 MAC Reset

If a reset of the MAC entity is requested by upper layers, the MAC entity shall:

1> initialize *Bj* for each logical channel to zero;

1> initialize *SBj* for each logical channel to zero if Sidelink resource allocation mode 1 is configured by RRC;

1> stop (if running) all timers when the CG is activated;

1> stop (if running) all timers except *beamFailureDetectionTimer* associated with PSCell if BFD is configured for deactivated SCG and *timeAlignmentTimers* upon SCG deactivation;

1> consider all *timeAlignmentTimer*s as expired and perform the corresponding actions in clause 5.2 when the CG is activated;

1> set the NDIs for all uplink HARQ processes to the value 0;

1> sets the NDIs for all HARQ process IDs to the value 0 for monitoring PDCCH in Sidelink resource allocation mode 1;

1> stop, if any, ongoing Random Access procedure;

1> discard explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any;

1> flush Msg3 buffer;

1> flush MSGA buffer;

1> cancel, if any, triggered Scheduling Request procedure;

1> cancel, if any, triggered Buffer Status Reporting procedure;

1> cancel, if any, triggered Power Headroom Reporting procedure;

1> cancel, if any, triggered consistent LBT failure;

1> cancel, if any, triggered BFR;

1> cancel, if any, triggered Sidelink Buffer Status Reporting procedure;

1> cancel, if any, triggered Pre-emptive Buffer Status Reporting procedure;

1> cancel, if any, triggered Recommended bit rate query procedure;

1> cancel, if any, triggered Configured uplink grant confirmation;

1> cancel, if any, triggered configured sidelink grant confirmation;

1> cancel, if any, triggered Desired Guard Symbol query;

1> flush the soft buffers for all DL HARQ processes;

1> for each DL HARQ process, consider the next received transmission for a TB as the very first transmission;

1> release, if any, Temporary C-RNTI;

1> reset all *BFI\_COUNTER*s when the CG is activated;

1> reset the *BFI\_COUNTER* associated with PSCell if BFD is not configured for deactivated SCG upon SCG deactivation;1> reset all *LBT\_COUNTERs*.

If a Sidelink specific reset of the MAC entity is requested for a PC5-RRC connection by upper layers, the MAC entity shall:

1> flush the soft buffers for all Sidelink processes for all TB(s) associated to the PC5-RRC connection;

1> consider all Sidelink processes for all TB(s) associated to the PC5-RRC connection as unoccupied;

1> cancel, if any, triggered Scheduling Request procedure only associated to the PC5-RRC connection;

1> cancel, if any, triggered Sidelink Buffer Status Reporting procedure only associated to the PC5-RRC connection;

1> cancel, if any, triggered Sidelink CSI Reporting procedure associated to the PC5-RRC connection;

1> stop (if running) all timers associated to the PC5-RRC connection;

1> reset the *numConsecutiveDTX* associated to the PC5-RRC connection;

1> initialize *SBj* for each logical channel associated to the PC5-RRC connection to zero.

*Editor note: FFS if UE initializes Bj for each logical channel to zero upon SCG deactivation as a part of partial MAC reset. Should consider e.g. what to do with possible Bj increase while SCG is deactivated.*

*Editor note: FFS if UE discards explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any, upon SCG deactivation as a part of partial MAC reset.*

## ANNEX

### RAN2#112

**Agreements**

* The work will focus on a single deactivated SCG.
* FFS if SCG RRC reconfiguration can select the SCG activation state (activated/deactivated) at PSCell addition/change, RRC resume or HO.
* Continue RAN2 work with the assumption that when the SCG is deactivated, the UE does not monitor PDCCH on the PSCell. This assumption can be reconsidered if issues are found.
* As a baseline, MN-configured RRM measurement/reporting procedures do not depend on the SCG activation state (deactivated or activated). Further optimisations are not precluded.
* While the SCG is deactivated, PSCell mobility is supported. MN- and SN-configured measurements are supported for deactivated SCG.
* FFS1: Details on the performed measurements (e.g. all SN configured measurements or subset based on certain criteria, restrictions on inter-frequency/RAT)
* FFS2: Support for SCell addition/mobility
* FFS3: Reporting procedure
* FF4: PSCell mobility procedure
* RAN2 assumes that UE will not perform SRS transmission while the SCG is deactivated. This assumption can be reconsidered if issues are found.
* FFS if RACH is needed for SCG reactivation

**Agreements**

**1 SCG RRC reconfiguration can select the SCG activation state (activated/deactivated) at PSCell addition/change, RRC resume or HO.**

**Agreements**

**5: When the SCG is in deactivated state, the UE sends MeasurementReport messages for measurement results of SN-configured measurements embedded in the E-UTRA (if the MCG is EUTRA) or in the NR (if the MCG is NR) ULInformationTransferMRDC message via SRB1**

**6a: When the SCG is in deactivated state, the UE can receive an SCG RRCReconfiguration message embedded in an MCG RRC(Connection)Reconfiguration message on SRB1, like when the SCG is activated, and then the UE**

**- processes the SCG RRCReconfiguration message according to Rel-15/16 procedures (FFS if any restriction/difference)**

**- sends an SCG RRCReconfigurationComplete message in the MCG RRC(Connection)ReconfigurationComplete message according to Rel-15/16 procedures**

**6b: The SCG RRCReconfiguration can change the PSCell. FFS if the UE does RACH towards the target PSCell, in that case.**

**7a: While the SCG is deactivated:**

**- there can be SCG SCells in deactivated state**

**- there cannot be SCG SCells in activated state**

**- it is FFS whether there can be SCells in SCG dormant state.**

**7b: FFS whether SCell can be added/reconfigured/released while the SCG is deactivated or this can be done only at SCG activation or after SCG activation.**

**8a: It is FFS whether the network can configure the UE stop certain configured RRM measurements while the SCG is deactivated, or can release certain RRM measurements at SCG deactivation.**

**8b: Relaxation of RRM measurement requirements (as compared with non-DRX activated cell requirements) while the SCG is deactivated is FFS.**

### RAN2#113

Agreements

1a SCG activation can be requested by MN/SN/UE. FFS on how to accept/reject the procedure. FFS which signalling is used.

1b SCG deactivation can be requested by MN/SN. FFS whether UE can request deactivation. FFS on how to accept/reject the procedure. FFS which signalling is used.

3 RRC signalling is defined for the interaction between UE/MN and MN/SN in SCG activation/deactivation. FFS if lower-layer signalling is needed.

Agreements

1 Confirm that there is no PUSCH transmission on deactivated SCG. FFS if any other UL is allowed towards SCG.

2 Confirm that there is no PDCCH monitoring on PSCell of the deactivated SCG.

3 Confirm that there is no support of SCell dormancy for SCG SCells within a deactivated SCG.

**Agreements**

**1 NW-triggered SCG activation is indicated to the UE via the MCG.**

**9 NW-triggered SCG deactivation can be indicated to the UE via the MCG. FFS via SCG.**

**Agreements**

**2 The UE behaviour when the SCG activation is indicated to the UE via the MCG is one or more of the following options:**

**option 1) similar to reconfiguration with sync, i.e. the UE always initiates random access to the PSCell.**

**option 2) in certain cases:**

**- the UE does not initiate random access and monitors PDCCH on the PSCell (at the latest after the specified processing time).**

**- the SCG can schedule data transmission on the PDCCH**

**The UE decides not to perform random access (one option to be selected):**

**option 2a) if the TA timer is still running and possibly other conditions (FFS how TAT starts)**

**option 2b) based on the contents of the SCG activation indication**

**FFS for option 2a): in the SCG deactivated state, the UE monitors some DL beams (FFS if the same as BFD or RLM) and, if the UE sees that the beams are not good enough (details FFS), the UE either (one of the options to be selected):**

**- will perform random access upon reception of the next SCG activation indication from the MCG**

**- reports measurement results (details FFS) via the MCG and wait for reconfiguration.**

**7 Further discuss the format and content of the SCG activation indication from the MCG to the UE after there is more progress on solution 2.**

**5 Continue to discuss whether some kind of beam monitoring (similar to RLM/BFD) should be supported when the SCG is deactivated. FFS if this only applies to when TAT is running.**

**6 Clarify the meaning of "the UE maintains DL sync while the SCG is deactivated" (e.g. whether that is a consequence of doing RRM measurements of the PSCell or something more is needed).**

**8 Further discuss the comparison between**

**- define a mechanism for SCG activation upon UL data arrival on SCG bearers**

**- use split bearer with primary path on MCG (network sees UL data and can initiate activation)**

**11 It is FFS whether the UE can provide some assistance information for deactivation of the SCG (but there is no proposal so far).**

**FFS if in absence of PDCCH monitoring and UL transmission, and it is possible to assume that TA is valid when the TA timer has not expired.**

### RAN2#113bis

Agreements

5 Only the MN can generate an RRC message with SCG (de)activation.

1 Indication of SCG deactivation to the UE via the SCG is not supported.

7 During handover preparation, the target MN can indicate the SCG state in the RRCReconfiguration message to be sent to the UE by the source MN.

8 The MN RRC reconfiguration message used to deactivate SCG and the embedded SN RRC reconfiguration message can reconfigure any parameter (any restriction requires an explicit decision).

9 While the SCG is deactivated, the MN RRC reconfiguration message and the embedded SN RRC reconfiguration message can reconfigure any parameter (any restriction requires an explicit decision).

Agreements

2 The UE can indicate to the MN that the UE would like the SCG to be deactivated. FFS on the details (e.g. reusing UAI or existing messages, information included, etc.). Network can configure whether UE is allowed to do the indication.

* RRM requirements for deactivated PSCell may be different than for activated PSCell. What they could be are FFS pending RAN4 work.

### RAN2#114e

|  |
| --- |
| * Confirm the scope of the post meeting email discussion:   - RACH-less SCG activation upon SCG activation indication (including related aspects of UE behaviour while the SCG is deactivated)  - UE triggered SCG activation (at least for UL data arrival on SCG bearers)  Multiple phases will be needed to confirm understandings and issues. |

### RAN2#115e

Agreements

* Support all of the following for RACH resources used in network-initiated SCG activation (at least using RRC):
* 1) common RACH resources;
* 3) dedicated RACH resources indicated in the SCG activation indication.
* FFS if we support also 2) (proponents are requested to provide CRs next time to illustrate how this can be done)
* We will support RACHless SCG activation in Rel-17
* Do not consider options 3) and 4)
* 5. The security key update is up to network implementation upon SCG activation from deactivation.
* PDCP entity is not suspended at SCG deactivation for at least AM DRB. FFS for Stage-3 details
* UL data processing is not prohibited during SCG deactivation for at least AM DRB. FFS for Stage-3 details
* UL data transmission to SCG is prohibited during SCG deactivation. FFS for Stage-3 details
* UE-initiated activation is still FFS.
* 1: The TAT associated with the PSCell continues running when the SCG is switched from activated to deactivated state and the UE considers the TA as valid as long as it is still running.
* 2: If instructed by the network in the SCG activation indication, the UE performs random access towards the PSCell (even if the TAT is still running).
* 3: The SCG activation indication can indicate the TCI state (with or without BWP switching) for PDCCH/PDSCH reception. Otherwise, the UE uses the previously activated TCI states and the network should ensure that the relevant TCI states are configured and activated for the UE to monitor PDCCH at RACH-less SCG activation.
* 4: The UE performs RLM and BFD on PSCell while the SCG is deactivated if network configures it.

### RAN2#116e

**Agreements:**

**2: The UE does not perform RACH after TAT expires while the SCG is deactivated.**

**3: At PSCell addition/change/HO/RRC resume, in case the SCG state is configured as deactivated, the UE does not perform random access. If the network wants the UE to perform random access, it can indicate the SCG as activated and deactivate it after the random access by RRC or MAC CE if supported.**

**Agreements:**

* **Network should ensure PDCP entity and RLC entity are "cleaned" when doing SCG   
  (de)activation, e.g. using PDCP data recovery and RLC re-establishment or RLC entity release. But this is already possible via existing RRC signalling, no we don't need to specify implicit actions.**

**1. Upon SCG deactivation, instruct the SCG MAC entity to perform partial MAC reset (FFS for the details).**

**2. Upon SCG deactivation, UE keeps all timeAlignmentTimers (e.g. associated with the PTAG and STAG) running, if configured.**

**3. UE implementation ensures that data loss for pre-processed data of UM DRB inside UE (e.g. due to RLC/PDCP re-establishment) is avoided upon SCG activation.**

**4. Upon SCG deactivation, the reordering delay for UM DRB can be resolved by UE implementation.**

**5. Do not suspend SRB3 upon SCG deactivation.**

**6. The old RRC message for SRB3 is discarded upon SCG deactivation (i.e. trigger the PDCP entity to perform SDU discard and re-establish the RLC entity for SRB3).**

**Agreements:**

**2: Support the following solutions for UL data arrival while the SCG is deactivated:**

**1) for split bearers, send the data via the MCG leg. FFS how this can be implemented in Stage-3.**

**2) for SCG bearers, the UE indicates via the MCG that it has UL data to send for an SCG bearer.**

**- FFS indication contents and format (e.g. MN RRC message, embedded SN RRC message)**

**- FFS whether this indication can be used for split bearers**