**3GPP TSG-RAN2 Meeting #119e *R2-220***

**Electronic, 17th– 26th Aug, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.321** | **CR** | 1344 | **rev** | 2 | **Current version:** | **17.1.0** |  |
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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 | **X** | Core Network |  |

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| ***Title:*** | Change to the MAC spec for R17 Positioning enhancement | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | RAN2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh-Core | | | | |  | ***Date:*** | | | 2022-08-17 |
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| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | **Issue1:** For the transmission of SRS in RRC\_INACTIVE, the current spec refers to clause 5.25 for positioning measurement gap activation/deactivation request, which is wrong. The spec should refer to clause 5.26.  **Issue2:** Currently, when cg-SDT-TAT and legacy TAT are not running, it is specified the no UL transmission except for RACH should be allowed. The same should also be applicable for *inactivePosSRS-TimeAlignmentTimer*  **Issue3:** In the description of Positioning Measurement Gap Activation/Deactivation Request MAC CE (clause 6.1.3.40) and Positioning Measurement Gap Activation/Deactivation Command MAC CE (6.1.3.41) the definition of the “R” bit is missing.  **Issue4:** In clause 5.18.20, 6.1.3.40, 6.1.3.41 some editorial issues need to be fixed (missing prefix “pre-“, spelling of word “preconfigured”).  **Issue5:** According to TS 38.331, *BWP-DownlinkDedicated* -> *dl-PPW-PreConfigToAddModList-r17* has been defined to indicate the number of PPW configurations for the dedicated DL BWP, and *maxNrofPPW-Config-r17* is equal to 4.  DL-PPW-PreConfigToAddModList-r17 ::= SEQUENCE (SIZE (1..maxNrofPPW-Config-r17)) OF DL-PPW-PreConfig-r17  Since the value range of *DL-PPW-PreConfig-r17* -> *dl-PPW-ID-r17* is 0 to 15, and the length of the PPW ID field in PPW Activation/Deactivation Command MAC CE is 2 bits, the PPW ID field should indicate the index of an entry in *dl-PPW-PreConfigToAddModList-r17* but not directly mapped to *dl-PPW-ID-r17*.  **Issue6:** There are in general two scenarios for us to consider the pathloss reference update for SRS transmission as illustrated with the following figure    Scenario 1 refers to the case when there are SDT procedure and SRS transmission procedure in RRC\_INACTIVE going in parallel. In this case, it is possible that the UE receives TAC via either TAC MAC CE, TAC in RAR, or absolute TAC in msgB. For these cases, since TA is adjusted, it is also reasonable to update the downlink pathloss reference. Within the current spec, the pathloss update and restart of the TAT at reception of MAC CE, RRCRelease message is specified. While for RACH procedure during the SRS transmission, it is not specified yet. This needs to be added  refers to the case when SDT is terminated with SRS configuration included within the RRCRelease message. From the current spec, the spec is complete in this part.  Then, on the validity condition, the running of *inavtivePosSRS-TimeAlignmentTimer* should also be a condition for valid TA, similar to CG-SDT  **Issue7:** when the MAC CE that triggered SR has been cancelled, we think there is no need to transmit the SR anymore, since the cancelled MAC CE is the very reason why the SR needs to be transmitted.  **Issue8**: For the cancellation of RACH triggered by SR, as in legacy, the RACH may be terminated by the UE with the same condition for the cancellation of SR. Hence, we think the cancellation of the RACH triggered by SR can follow the same condition as that for the cancellation of SR: when the MAC CE is cancelled, the RACH that is triggered by the SR can be terminated.  **Issue9:** Current spec does not specify the default status of the PPW when it is configured. It should be clarified that the default state for PPW when it is configured is “deactivated”. Also, upon reconfig of the PPW, the PPW should be considered deactivated  **Issue10**: it is possible that the requested MG to be activated/deactivated has already been activated/deactivated. In this case, these is no need to send the activation/deactivation request anymore  **Issue11**: it has been agreed in R2#119 that dedicated SR configuration can be configured for SR. this should be reflected in the declaration part of the SR procdure. | | | | | | | | |
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| ***Summary of change:*** | | **Change1:** Change the reference of SRS transmission in RRC\_INACTIVE from 5.25 to 5.26.  **Change2:** Add description for UL transmission when *inactivePosSRS-TimeAlignmentTimer* is not running  **Change3:** In the description of Positioning Measurement Gap Activation/Deactivation Request MAC CE (clause 6.1.3.40) and Positioning Measurement Gap Activation/Deactivation Command MAC CE (6.1.3.41) the definition of the “R” bit has been added.  **Change4**: The editorial issues in clause 5.18.20, have been fixed  **Change5:** Add description for the PPW id field within the MAC CE that it corresponds to the index in *dl-PPW-PreConfigToAddModList-r17*  **Change6:**  1/ Add the procedure for the UE to update the pathloss reference when TAC is received during the RACH procedure  2/ Add RSRP validity and *inactivePosSRS-TAT* is running as condition for TA validation for SRS in RRC\_INACTIVE.  3/ Add the procedure for the UE to restart the TAT when RACH is successful during SRS transmission in RRC\_INACTIVE.  **Change7:** SR triggered for posMG activation/deactivation request is cancelled when the Positioning Measurement Gap activation/deactivation MAC CE is cancelled.  **Change8:** RACH triggered for SR for posMG activation/deactivation request can be terminated when the Positioning Measurement Gap Activation/Deactivation MAC CE is cancelled.  **Change9:** Clarify that the default state for PPW when it is configured is “deactivated”. Upon reconfig of the PPW, the PPW should be considered deactivated.  **Change10:** Add another condition for cancelling the MAC CE, when the MG requested to be activated/deactivated has already been activated/deactivated  **Change11**: Add explanation that dedicated SR configuration can be configured for posMG activation/deactivation request MAC CE. Also clarify on which SR configuration is used for posMG activation/deactivation request | | | | | | | | |
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| ***Consequences if not approved:*** | | **For change1:** SRS transmission will refer to the wrong clause of the spec, which will be misleading.  **For change2:** it is not clear what UL transmission is allowed or not allowed when there is ongoing procedure for SRS transmission in RRC\_INACTIVE while the *inactivePosSRS-TimeAlignmentTimer* is not running.  **For change3 and 4:** There will be inconsistencies in the spec for positioning ehnachement without such changes.  **For change5:** The meaning of PPW ID in the MAC CE will be ambiguous  **For change6:** Procedure for TA restart and pathloss reference update is not specified for SRS transmission in RRC\_INACTIVE when TAC is received by Random Access Procedure. TA-validation is incomplete without the running inactivePosSRS-TAT.  **For change7:**SR triggered for the MAC CE will always be pending, even if the MAC CE does not need to be transmitted anymore  **For Change8:** UE would transmit unnecessary RACH for SR triggered for the MAC CE for MG activation/deactivation  **For change9:** The default PPW status will be unclear. The configuration of PPW might already changed while the UE still keeps the previously configured PPW as activated.  For **Chagne10**: The MAC CE needs to be sent for a MG that has already been activated/deactivated, which is unnecessary.  For **Change11**: it would be unclear which SR configuration is used for posMG activation/deactivation request. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2, 5.4.4, 5.18.20, 5.18.21, 5.25, 5.26, 6.1.3.40, 6.1.3.41, 6.1.3.42 | | | | | | | | |
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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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Ver0 in RAN2#119e: R2-2207880  Ver1 in RAN2#119e: R2-2208818  Ver2 in RAN2#119e: R2-220 | | | | | | | | |

==================================CHANGE BEGINS===================================

5.2 Maintenance of Uplink Time Alignment

RRC configures the following parameters for the maintenance of UL time alignment:

- *timeAlignmentTimer* (per TAG) which controls how long the MAC entity considers the Serving Cells belonging to the associated TAG to be uplink time aligned;

- *inactivePosSRS-TimeAlignmentTimer* which controls how long the MAC entity considers the Positioning SRS transmission in RRC\_INACTIVE in clause 5.26 to be uplink time aligned;

- *cg-SDT-TimeAlignmentTimer* which controls how long the MAC entity considers the uplink transmission for CG-SDT to be uplink time aligned.

The MAC entity shall:

1> when a Timing Advance Command MAC CE is received, and if an NTA (as defined in TS 38.211 [8]) has been maintained with the indicated TAG:

2> apply the Timing Advance Command for the indicated TAG;

2> if *inactivePosSRS-TimeAlignmentTimer* is configured and there is ongoing Positioning SRS Transmission in RRC\_INACTIVE as in clause 5.26:

3> start or restart the *inactivePosSRS-TimeAlignmentTimer* associated with the indicated TAG.

2> if CG-SDT procedure triggered as in clause 5.27 is ongoing:

3> start or restart the *cg-SDT-TimeAlignmentTimer* associated with the indicated TAG.

2> start or restart the *timeAlignmentTimer* associated with the indicated TAG.

1> when a Timing Advance Command is received in a Random Access Response message for a Serving Cell belonging to a TAG or in a MSGB for an SpCell:

2> if the Random Access Preamble was not selected by the MAC entity among the contention-based Random Access Preamble:

3> apply the Timing Advance Command for this TAG;

3> start or restart the *timeAlignmentTimer* associated with this TAG.

2> else if the *timeAlignmentTimer* associated with this TAG is not running:

3> apply the Timing Advance Command for this TAG;

3> start the *timeAlignmentTimer* associated with this TAG;

3> when the Contention Resolution is considered not successful as described in clause 5.1.5; or

3> when the Contention Resolution is considered successful for SI request as described in clause 5.1.5, after transmitting HARQ feedback for MAC PDU including UE Contention Resolution Identity MAC CE:

4> stop *timeAlignmentTimer* associated with this TAG.

3> when the Contention Resolution is considered not successful as described in clause 5.1.5:

4> if CG-SDT procedure triggered as in clause 5.27 is ongoing:

5> set the NTA value to the value before applying the received Timing Advance Command as in TS 38.211 [8].

3> when the Contention Resolution is considered successful for Random Access procedure while the CG-SDT procedure is ongoing:

4> stop *timeAlignmentTimer* associated with this TAG;

4> start or restart the *cg-SDT-TimeAlignmentTimer* associated with this TAG.

3> when the Contention Resolution is considered successful for Random Access procedure while SRS transmission in RRC\_INACTIVE is ongoing:

4> start or restart the *inactivePosSRS-TimeAlignmentTimer* associated with this TAG.

2> else:

3> ignore the received Timing Advance Command.

1> when an Absolute Timing Advance Command is received in response to a MSGA transmission including C-RNTI MAC CE as specified in clause 5.1.4a:

2> apply the Timing Advance Command for PTAG;

2> start or restart the *timeAlignmentTimer* associated with PTAG.

1> when the indication is received from upper layer for stopping the *inactivePosSRS-TimeAlignmentTimer*:

2> stop the *inactivePosSRS-TimeAlignmentTimer*.

1> when the indication is received from upper layer for starting the *inactivePosSRS-TimeAlignmentTimer*:

2> start or restart the *inactivePosSRS-TimeAlignmentTimer*.

1> when instruction from the upper layer has been received for starting the *cg-SDT-TimeAlignmentTimer*:

2> start the *cg-SDT-TimeAlignmentTimer*.

1> when instruction from the upper layer has been received for stopping the *cg-SDT-TimeAlignmentTimer*:

2> consider the *cg-SDT-TimeAlignmentTimer* as expired.

1> when instruction from the upper layer has been received for starting the *TimeAlignmentTimer* associated with PTAG:

2> start the *TimeAlignmentTimer* associated with PTAG.

1> when a *timeAlignmentTimer* expires:

2> if the *timeAlignmentTimer* is associated with the PTAG:

3> flush all HARQ buffers for all Serving Cells;

3> notify RRC to release PUCCH for all Serving Cells, if configured;

3> notify RRC to release SRS for all Serving Cells, if configured;

3> clear any configured downlink assignments and configured uplink grants;

3> clear any PUSCH resource for semi-persistent CSI reporting;

3> consider all running *timeAlignmentTimer*s as expired;

3> maintain NTA (defined in TS 38.211 [8]) of all TAGs.

2> else if the *timeAlignmentTimer* is associated with an STAG, then for all Serving Cells belonging to this TAG:

3> flush all HARQ buffers;

3> notify RRC to release PUCCH, if configured;

3> notify RRC to release SRS, if configured;

3> clear any configured downlink assignments and configured uplink grants;

3> clear any PUSCH resource for semi-persistent CSI reporting;

3> maintain NTA (defined in TS 38.211 [8]) of this TAG.

1> when the *inactivePosSRS-TimeAlignmentTimer* expires:

2> notify RRC to release Positioning SRS for RRC\_INACTIVE configuration(s).

1> when the *cg-SDT-TimeAlignmentTimer* expires:

2> clear any configured uplink grants;

2> if a PDCCH addressed to the MAC entity's C-RNTI after initial transmission for the CG-SDT with CCCH message has not been received:

3> consider ongoing CG-SDT procedure as terminated;

3> indicate the expiry of *cg-SDT-TimeAlignmentTimer* to the upper layer.

2> flush all HARQ buffers;

2> maintain NTA (defined in TS 38.211 [8]) of this TAG.

When the MAC entity stops uplink transmissions for an SCell due to the fact that the maximum uplink transmission timing difference between TAGs of the MAC entity or the maximum uplink transmission timing difference between TAGs of any MAC entity of the UE is exceeded, the MAC entity considers the *timeAlignmentTimer* associated with the SCell as expired.

The MAC entity shall not perform any uplink transmission on a Serving Cell except the Random Access Preamble and MSGA transmission when the *timeAlignmentTimer* associated with the TAG to which this Serving Cell belongs is not running, CG-SDT procedure is not ongoing or SRS transmission in RRC\_INACTIVE as in clase 5.26 is not on-going. Furthermore, when the *timeAlignmentTimer* associated with the PTAG is not running, CG-SDT procedure is not ongoing and SRS transmission in RRC\_INACTIVE as in clause 5.26 is not ongoing, the MAC entity shall not perform any uplink transmission on any Serving Cell except the Random Access Preamble and MSGA transmission on the SpCell. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when the *cg-SDT-TimeAlignmentTimer* is not running during the ongoing CG-SDT procedure as triggered in clause 5.27. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when *inactivePosSRS-TimeAlignmentTimer* is not running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26.

==================================NEXT CHANGE====================================

5.4.4 Scheduling Request

The Scheduling Request (SR) is used for requesting UL-SCH resources for new transmission.

The MAC entity may be configured with zero, one, or more SR configurations. An SR configuration consists of a set of PUCCH resources for SR across different BWPs and cells. For a logical channel or for SCell beam failure recovery (see clause 5.17) and for consistent LBT failure recovery (see clause 5.21), at most one PUCCH resource for SR is configured per BWP. For a logical channel serving a radio bearer configured with SDT, PUCCH resource for SR is not configured for SDT. For beam failure recovery of BFD-RS set(s) of Serving Cell, up to two PUCCH resources for SR is configured per BWP. For Positioning Measurement Gap activation/deactivation request, a dedicated SR configuration is configured.

Each SR configuration corresponds to one or more logical channels and/or to SCell beam failure recovery and/or to consistent LBT failure recovery and/or to beam failure recovery of BFD-RS set(s) and/or to Positioning Measurement Gap activation/deactivation request. Each logical channel, SCell beam failure recovery, beam failure recovery of BFD-RS set and consistent LBT failure recovery, may be mapped to zero or one SR configuration, which is configured by RRC. The SR configuration of the logical channel that triggered a BSR (clause 5.4.5) or the SCell beam failure recovery or the beam failure recovery of BFD-RS set or the consistent LBT failure recovery (clause 5.21) (if such a configuration exists) or Positioning Measurement Gap activation/deactivation request (clause 5.25) is considered as corresponding SR configuration for the triggered SR. Any SR configuration may be used for an SR triggered by Pre-emptive BSR (clause 5.4.7).

RRC configures the following parameters for the scheduling request procedure:

- *sr-ProhibitTimer* (per SR configuration);

- *sr-TransMax* (per SR configuration).

The following UE variables are used for the scheduling request procedure:

- *SR\_COUNTER* (per SR configuration).

If an SR is triggered and there are no other SRs pending corresponding to the same SR configuration, the MAC entity shall set the *SR\_COUNTER* of the corresponding SR configuration to 0.

When an SR is triggered, it shall be considered as pending until it is cancelled.

All pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) prior to the MAC PDU assembly shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted and this PDU includes a Long or Short BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5) prior to the MAC PDU assembly. All pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the UL grant(s) can accommodate all pending data available for transmission.

The MAC entity shall for each pending SR not triggered according to the BSR procedure (clause 5.4.5) for a Serving Cell:

1> if this SR was triggered by Pre-emptive BSR procedure (see clause 5.4.7) prior to the MAC PDU assembly and a MAC PDU containing the relevant Pre-emptive BSR MAC CE is transmitted; or

1> if this SR was triggered by beam failure recovery (see clause 5.17) of an SCell and a MAC PDU is transmitted and this PDU includes a MAC CE for BFR which contains beam failure recovery information for this SCell; or

1> if this SR was triggered by beam failure recovery (see clause 5.17) for a BFD-RS set of a Serving Cell and a MAC PDU is transmitted and this PDU includes an Enhanced BFR MAC CE or a Truncated Enhanced BFR MAC CE which contains beam failure recovery information for this BFD-RS set of the Serving Cell; or

1> if this SR was triggered by beam failure recovery (see clause 5.17) of an SCell and this SCell is deactivated (see clause 5.9); or

1> if this SR was triggered by beam failure recovery (see clause 5.17) for a BFD-RS set of an SCell and this SCell is deactivated (see clause 5.9); or

1> if the SR is triggered by positioning measurement gap activation/deactivation request (see clause 5.25) and the Positioning Measurement Gap Activation/Deactivation Request MAC CE that triggers the SR has already been cancelled; or1> if this SR was triggered by consistent LBT failure recovery (see clause 5.21) of an SCell and a MAC PDU is transmitted and the MAC PDU includes an LBT failure MAC CE that indicates consistent LBT failure for this SCell; or

1> if this SR was triggered by consistent LBT failure recovery (see clause 5.21) of an SCell and all the triggered consistent LBT failure(s) for this SCell are cancelled:

2> cancel the pending SR and stop the corresponding *sr-ProhibitTimer*, if running.

Only PUCCH resources on a BWP which is active at the time of SR transmission occasion are considered valid.

As long as at least one SR is pending, the MAC entity shall for each pending SR:

1> if the MAC entity has no valid PUCCH resource configured for the pending SR:

2> initiate a Random Access procedure (see clause 5.1) on the SpCell and cancel the pending SR.

1> else, for the SR configuration corresponding to the pending SR:

2> when the MAC entity has an SR transmission occasion on the valid PUCCH resource for SR configured; and

2> if *sr-ProhibitTimer* is not running at the time of the SR transmission occasion; and

2> if the PUCCH resource for the SR transmission occasion does not overlap with a measurement gap:

3> if the PUCCH resource for the SR transmission occasion overlaps with neither a UL-SCH resource whose simultaneous transmission with the SR is not allowed by configuration of *simultaneousPUCCH-PUSCH* or *simultaneousPUCCH-PUSCH-SecondaryPUCCHgroup* nor an SL-SCH resource; or

3> if the MAC entity is able to perform this SR transmission simultaneously with the transmission of the SL-SCH resource; or

3> if the MAC entity is configured with *lch-basedPrioritization*, and the PUCCH resource for the SR transmission occasion does not overlap with the PUSCH duration of an uplink grant received in a Random Access Response or with the PUSCH duration of an uplink grant addressed to Temporary C-RNTI or with the PUSCH duration of a MSGA payload, and the PUCCH resource for the SR transmission occasion for the pending SR triggered as specified in clause 5.4.5 overlaps with any other UL-SCH resource(s), and the physical layer can signal the SR on one valid PUCCH resource for SR, and the priority of the logical channel that triggered SR is higher than the priority of the uplink grant(s) for any UL-SCH resource(s) where the uplink grant was not already de-prioritized and its simultaneous transmission with the SR is not allowed by configuration of *simultaneousPUCCH-PUSCH* or *simultaneousPUCCH-PUSCH-SecondaryPUCCHgroup*, and the priority of the uplink grant is determined as specified in clause 5.4.1; or

3> if both *sl-PrioritizationThres* and *ul-PrioritizationThres* are configured and the PUCCH resource for the SR transmission occasion for the pending SR triggered as specified in clause 5.22.1.5 overlaps with any UL-SCH resource(s) carrying a MAC PDU, and the value of the priority of the triggered SR determined as specified in clause 5.22.1.5 is lower than *sl-PrioritizationThres* and the value of the highest priority of the logical channel(s) in the MAC PDU is higher than or equal to *ul-PrioritizationThres* and any MAC CE prioritized as described in clause 5.4.3.1.3 is not included in the MAC PDU and the MAC PDU is not prioritized by upper layer according to TS 23.287 [19]; or

3> if an SL-SCH resource overlaps with the PUCCH resource for the SR transmission occasion for the pending SR triggered as specified in clause 5.4.5, and the MAC entity is not able to perform this SR transmission simultaneously with the transmission of the SL-SCH resource, and either transmission on the SL-SCH resource is not prioritized as described in clause 5.22.1.3.1a or the priority value of the logical channel that triggered SR is lower than *ul-PrioritizationThres*, if configured; or

3> if an SL-SCH resource overlaps with the PUCCH resource for the SR transmission occasion for the pending SR triggered as specified in clause 5.22.1.5, and the MAC entity is not able to perform this SR transmission simultaneously with the transmission of the SL-SCH resource, and the priority of the triggered SR determined as specified in clause 5.22.1.5 is higher than the priority of the MAC PDU determined as specified in clause 5.22.1.3.1a for the SL-SCH resource:

4> consider the SR transmission as a prioritized SR transmission.

4> consider the other overlapping uplink grant(s), if any, as a de-prioritized uplink grant(s);

4> if the de-prioritized uplink grant(s) is a configured uplink grant configured with *autonomousTx* whose PUSCH has already started:

5> stop the *configuredGrantTimer* for the corresponding HARQ process of the de-prioritized uplink grant(s);

5> stop the *cg-RetransmissionTimer* for the corresponding HARQ process of the de-prioritized uplink grant(s).

4> if *SR\_COUNTER* < *sr-TransMax*:

5> instruct the physical layer to signal the SR on one valid PUCCH resource for SR;

5> if LBT failure indication is not received from lower layers:

6> increment *SR\_COUNTER* by 1;

6> start the *sr-ProhibitTimer*.

5> else if *lbt-FailureRecoveryConfig* is not configured:

6> increment *SR\_COUNTER* by 1.

4> else:

5> notify RRC to release PUCCH for all Serving Cells;

5> notify RRC to release SRS for all Serving Cells;

5> clear any configured downlink assignments and uplink grants;

5> clear any PUSCH resources for semi-persistent CSI reporting;

5> initiate a Random Access procedure (see clause 5.1) on the SpCell and cancel all pending SRs.

3> else:

4> consider the SR transmission as a de-prioritized SR transmission.

NOTE 1: Except for SR for SCell beam failure recovery, the selection of which valid PUCCH resource for SR to signal SR on when the MAC entity has more than one overlapping valid PUCCH resource for the SR transmission occasion is left to UE implementation.

NOTE 2: If more than one individual SR triggers an instruction from the MAC entity to the PHY layer to signal the SR on the same valid PUCCH resource, the *SR\_COUNTER* for the relevant SR configuration is incremented only once.

NOTE 3: When the MAC entity has pending SR for SCell beam failure recovery and the MAC entity has one or more PUCCH resources (other than PUCCH resources of pending SR for beam failure recovery of BFD-RS set) overlapping with PUCCH resource for SCell beam failure recovery for the SR transmission occasion, the MAC entity considers only the PUCCH resource for SCell beam failure recovery as valid. When the MAC entity has pending SR for beam failure recovery of a BFD-RS set of Serving Cell and the MAC entity has one or more PUCCH resources (other than PUCCH resources of pending SR for beam failure recovery) overlapping with PUCCH resource for beam failure recovery of that BFD-RS set for the SR transmission occasion, the MAC entity considers only the PUCCH resource for beam failure recovery of that BFD-RS set as valid.

NOTE 4: For a UE operating in a semi-static channel access mode as described in TS 37.213 [18], PUCCH resources overlapping with the set of consecutive symbols where the UE does not transmit before the start of a next channel occupancy time are not considered valid.

NOTE 5: If the MAC entity is configured with *lch-basedPrioritization*, the MAC entity does not take UCI multiplexing according to the procedure specified in TS 38.213 [6] into account when determining whether the valid PUCCH resource for the SR transmission can be signalled by the physical layer and the SR transmission occasion overlaps with the PUSCH duration of an uplink grant of a MSGA payload.

NOTE 6: When the MAC entity has PUCCH resource for pending SR for SCell beam failure recovery overlapping with PUCCH resource for pending SR for beam failure recovery of BFD-RS set for the SR transmission occasion, it's up to UE implementation to select PUCCH resource for SCell beam failure recovery or PUCCH resource for beam failure recovery of BFD-RS set

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for BSR, which was initiated by the MAC entity prior to the MAC PDU assembly and which has no valid PUCCH resources configured, if:

- a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response or a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU includes a BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5) prior to the MAC PDU assembly; or

- the UL grant(s) can accommodate all pending data available for transmission.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for SL-BSR and/or SL-CSI reporting, which was initiated by the MAC entity prior to the sidelink MAC PDU assembly and which has no valid PUCCH resources configured, if:

- a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response or a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU includes an SL-BSR MAC CE which contains buffer status up to (and including) the last event that triggered an SL-BSR (see clause 5.22.1.6) prior to the MAC PDU assembly; or

- the SL grant(s) can accommodate all pending data available and/or SL-CSI reporting MAC CE for transmission.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for BFR of an SCell, which has no valid PUCCH resources configured, if:

- a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response or a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU contains a MAC CE for BFR which includes beam failure recovery information of that SCell; or

- the SCell is deactivated (as specified in clause 5.9) and all triggered BFRs for SCells are cancelled.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for BFR of a BFD-RS set of a Serving Cell, which has no valid PUCCH resources configured, if:

- a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response or a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU contains an Enhanced BFR MAC CE or a Truncated Enhanced BFR MAC CE which includes beam failure recovery information of that BFD-RS set of the Serving Cell.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for consistent LBT failure recovery, which has no valid PUCCH resources configured, if:

- a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response or a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU includes an LBT failure MAC CE that indicates consistent LBT failure for all the SCells that triggered consistent LBT failure; or

- all the SCells that triggered consistent LBT failure recovery are deactivated (see clause 5.9).

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for positioning measurement gap activation/deactivation request, which has no valid PUCCH resources configured, if:

- the Positioning Measurement Gap Activation/Deactivation Request MAC CE that triggers the SR corresponding to the Random Access procedure has already been cancelled.==================================NEXT CHANGE======================================

### 5.18.20 Positioning Measurement Gap Activation/Deactivation Command

If the UE is configured with pre-configured measurement gaps, the network may send DL MAC CE for Positioning Measurement Gap Activation/Deactivation Command to the UE as in clause 6.1.3.41. For the activated measurement gap, the UE shall follow the specified UE behaviour in clause 5.14.

Upon the reception of the MAC CE for Positioning Measurement Gap Activation/Deactivation Command, the MAC entity shall:

1> if the Measurement Gap Activation/Deactivation Command MAC CE indicates the deactivation of a pre-configured positioning measurement gap:

2> deactivate the positioning measurement gap.

1> else if the Positioning Measurement Gap Activation/Deactivation Command MAC CE indicates the activation of a pre-configured measurement gap:

2> activate the positioning measurement gap and perform the procedure specified in clause 5.14.

================================NEXT CHANGE========================================

5.18.21 PPW Activation/Deactivation Command

If the UE is configured with pre-configured PPW, the network may send DL MAC CE for PPW Activation/Deactivation Command to the UE as in clause 6.1.3.42. For the activated PPW, the UE shall follow the specified UE behaviour in clause 5.24.

Upon activation of DL BWP, the PPW(s) configured for that BWP are considered deactivated. Upon reconfiguration of PPW(s) of the active DL BWP, all the PPW(s) for that BWP are considered deactivated.

Upon the reception of the MAC CE for PPW Activation/Deactivation Command, the MAC entity shall:

1> if the DL MAC CE for PPW Activation/Deactivation Command indicates the deactivation of a pre-configured PPW:

2> deactivate the PPW.

1> else if the DL MAC CE for PPW Activation/Deactivation Command indicates the activation of a pre-configured PPW:

2> activate the PPW according to the procedure specified in clause 5.24.

================================NEXT CHANGE========================================

5.25 Positioning Measurement Gap Activation/Deactivation Request

If the UE is configured with pre-configured measurement gap, the UE may request the network to activate or deactivate the Positioning measurement gap with UL MAC CE for Positioning Measurement Gap Activation/Deactivation Request in clause 6.1.3.40.

The MAC entity shall, when triggered by the upper layer to send Positioning Measurement Gap Activation/Deactivation Request, cancel the triggered Positioning Measurement Gap Activation/Deactivation Request, if any and trigger another Positioning Measurement Gap Activation/Deactivation Request according to the upper layer's request.

The MAC entity shall,

1>if Positioning Measurement Gap Activation/Deactivation Request MAC CE has been triggered, and not cancelled:

2> if indication from upper layer has been received that the triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE should be cancelled; or

2> if the pre-configured measurement gap indicated in the Positioning Measurement Gap Activation/Deactivation Request MAC CE has already been activated/deactivated according to clause 5.18.20:

3> cancel the triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE.

2> if UL-SCH resources are available for a new transmission and these UL-SCH resources can accommodate the Positioning Measurement Gap Activation/Deactivation Request MAC CE plus its subheader as a result of logical channel prioritization:

3> instruct the Multiplexing and Assembly procedure to generate the Positioning Measurement Gap Activation/Deactivation Request MAC CE according to the upper layer's request;

3> cancel triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE.

2> else:

3> trigger a Scheduling Request for Positioning Measurement Gap Activation/Deactivation Request MAC CE.

================================NEXT CHANGE========================================

## 5.26 Positioning SRS transmission in RRC\_INACTIVE

### 5.26.1 General

Periodic and semi-persistent Positioning SRS can be configured for Positioning SRS transmission in RRC\_INACTIVE.

The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2:

- transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.214 [7].

### 5.26.2 TA validation for SRS transmission in RRC\_INACTIVE

RRC configures the following parameters for validation for SRS transmission in RRC\_INACTIVE:

- *inactivePosSRS-RSRP-ChangeThreshold*: RSRP threshold for the increase/decrease of RSRP for time alignment validation.

The MAC entity shall:

1> if the UE receives configuration for SRS transmission in RRC\_INACTIVE:

2> store the RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference as in TS 38.331 [5].

1> else if the UE is configured with SRS transmission in RRC\_INACTIVE:

2> if Timing Advance Command MAC CE is received for *inactivePosSRS-TimeAlignmentTimer* as in clause 5.2, or;

2> if Timing Advance Command or Absolute Timing Advance Command is received for Random Access procedure that is successfully completed:

3> update the stored downlink pathloss reference with the current RSRP value of the downlink pathloss reference.

The MAC entity shall consider the TA to be valid when the following condition is fulfilled:

1> compared to the stored downlink pathloss reference RSRP value, the current RSRP value of the downlink pathloss reference has not increased/decreased by more than *inactivePosSRS-RSRP-ChangeThreshold*, if configured; and

1> *inactivePosSRS-TimeAlignmentTimer* is running.

==================================NEXT CHANGE===================================

#### 6.1.3.40 Positioning Measurement Gap Activation/Deactivation Request MAC CE

The Positioning Measurement Gap Activation/deactivation request MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-2b.

It has a fixed 8-bit size defined as follows (Figure 6.1.3.40-1):

- Positioning MG ID: This field indicates the identifier for the pre-configured positioning measurement gap. The length of the field is 4 bits;

- A/D: This field indicates the activation or deactivation of the Positioning Measurement Gap. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;

- R: Reserved bit, set to 0.



Figure 6.1.3.40-1: Positioning Measurement Gap Activation/Deactivation Request MAC CE

#### 6.1.3.41 Positioning Measurement Gap Activation/Deactivation Command MAC CE

The Positioning Measurement Gap Activation/Deactivation Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b.

It has a fixed 8-bit size defined as follows (Figure 6.1.3.41-1):

- Positioning MG ID: This field indicates the identifier for the preconfigured positioning measurement gap. The length of the field is 4 bits;

- A/D: This field indicates the activation or deactivation of the Positioning Measurement Gap. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;

- R: Reserved bit, set to 0.



Figure 6.1.3.41-1: Positioning Measurement Gap Activation/Deactivation Command MAC CE

=================================NEXT CHANGE=====================================

#### 6.1.3.42 PPW Activation/Deactivation Command MAC CE

The PPW Activation/Deactivation Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b.

It has variable size defined as follows (Figure 6.1.3.42-1):

- numEntry: This field indicates the number of entries N-1 in the MAC CE. 00 indicates that N equals to 2; 01 indicates that N equals to 3 and so on. The length of the field is 2 bits;

- Serving Cell ID: This field indicates the identity of the Serving Cell for which the MAC CE applies. The length of the field is 5 bits;

- PPW ID: This field indicates the PPW configured on active DL BWP of the Serving Cell identified by the above Serving Cell ID. Index 0 corresponds to the first entry within the list of the PPW configuration in this BWP, index 1 corresponds to the second entry in the list and so on. The length of the field is 2 bits;

- A/D: This field indicates the activation or deactivation of the PPW. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;

- R: Reserved bit, set to 0.



Figure 6.1.3.42-1: PPW Activation/Deactivation Command MAC CE

==================================END OF CHANGES==================================